Volume 2

Environmental Impact Assessment Report

FOR

RETAIL DEVELOPMENT

AT

Lands to the south of the existing M1 Retail Park

December 2022

ON BEHALF OF

BPM GP3 Ltd

Prepared by
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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been commissioned by the Applicant, BPM GP3 Limited, in respect of a retail development at lands adjoining the existing M1 Retail Park, Mell, Drogheda, Co. Louth. This EIAR has been compiled in accordance with all current legislation and best practice guidance. This Chapter describes the methodology by which the Environmental Impact Assessment (EIA) was carried out and the EIAR was completed. The methodology used is broadly consistent across all Chapters in order to ensure the EIAR is clear and easy to navigate.

1.1.1 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is a wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Professional memberships include the Institute of Geologists of Ireland (IGI), Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.

1.1.2 Description of the Proposed Development

The Proposed Development (as detailed in Chapter 2) comprises of:

A retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311

no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

This application is accompanied by an Environmental Impact Assessment Report and a Natura Impact Statement.

1.2 Definition of EIA and EIAR

EIA is a systematic examination of the potential impacts of a Proposed Development on the environment. In assessing the environmental impacts this EIAR will evaluate the existing situation and assess any potential impacts of the Proposed Development. Where potential impacts are identified proposed mitigation measures will be identified. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

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

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

> *"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" (EPA, 2017)*

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

This process is illustrated in Figure 1-1.

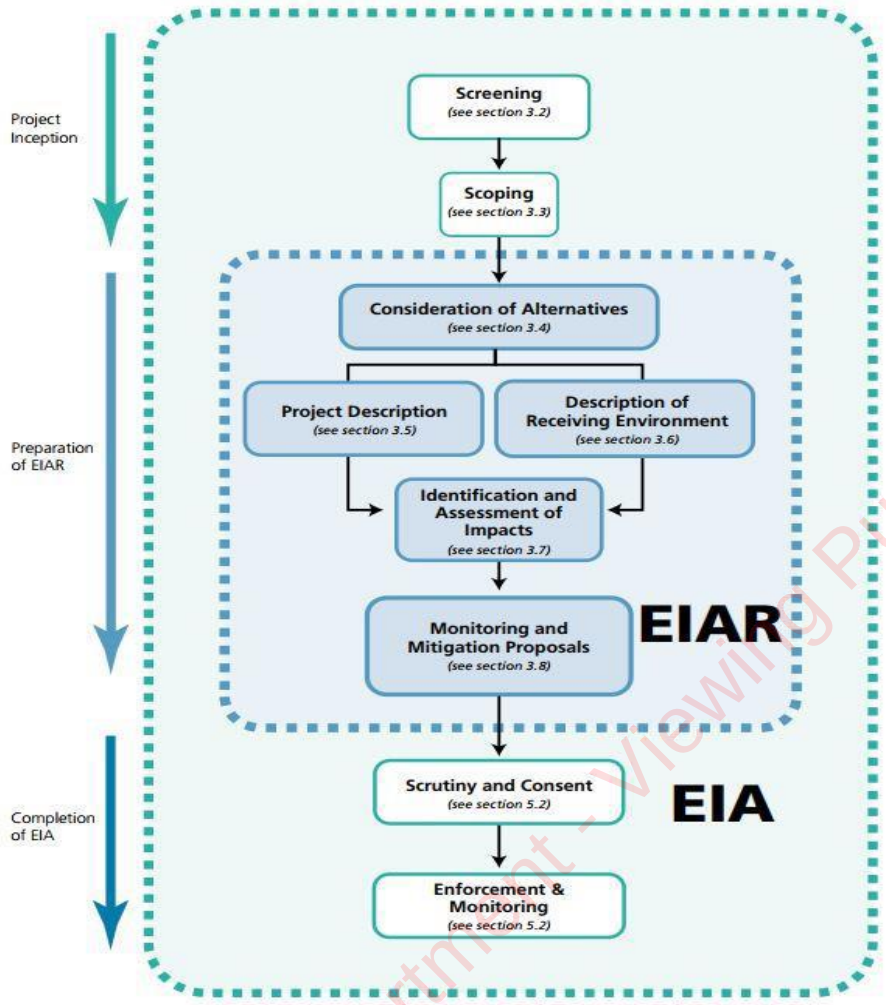

Figure 1-1: EIA Process

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

1.3 EIA Legislation

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

1.4 EIA Guidelines

This EIAR has been prepared in accordance with all relevant guidance. The documents listed below are common to all Chapters. Additional specific guidelines will be referred to in each specific Chapter.

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002);

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA draft September 2015a);
- Draft Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA draft September 2015b);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems; (Department of Housing, Planning, Community and Local Government 2017);
- Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999); and
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003).

- Appropriate Assessment Screening for Development Management; OPR Practice Note PN01(Office of the Planning Regulator March 2021).

- Environmental Impact Assessment Screening; Office of the Public Practice Note (PN02) (June 2021)

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

> *"(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);*
>
> *(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;*
>
> *(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;*
>
> *(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point;*
>
> *(iii) and, where appropriate, its own supplementary examination; and*
>
> *(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a".*

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

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

The interaction between the factors referred to in points (a) to (d)

1.5 Screening 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 in the case of sub threshold development, by reference to the type and scale of the Proposed Development and the significance or the environmental sensitivity of the receiving baseline environment.

Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

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

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

A retail development could constitute an urban development. The adjacent land use to the north is predominantly commercial and retail. Therefore, it is considered that the site is located within a business district. The overall site area is 4.82 ha which is greater than the 2-hectare threshold. It is on this basis that an EIAR has been prepared.

In considering the 'wide scope and broad purpose' of the EIA Directive, consideration should be given to the general objective of the Directive as expressed in Article 2(1), i.e. that '*projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to [...] an assessment with regard to their effects'*.

Under the EIA Directive, this type of development is therefore considered an 'Urban Development'. The underlying principle being that this retail development project is considered to be of an urban nature and therefore has the potential to cause similar types of environmental impacts. It is considered that an urban development project should be seen as a project that is urban in nature regardless of its location.

The Proposed Development is within a "business district" as defined above as it is located within a city or town in which the predominant land use is retail or commercial use. The total area of the Proposed Development is 4.82 hectares which exceeds the 2-hectare threshold for a business district. It is therefore concluded that the Proposed Development exceeds the threshold for a mandatory EIA, and a full EIAR is therefore required.

1.6 Scope of the EIAR

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

> '*Determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'*

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

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

The scope of this EIAR has had regard to the documents listed in Section 1.4 above, together with:

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

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

1.7 Purpose and Objectives of the EIAR

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

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

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

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes.

The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

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

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

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

1.8 Format and Structure of this EIAR

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

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

- Population and Human Health
- Biodiversity
- Land & Soils
- Water
- Air
- Climate
- Material Assets
- Cultural Heritage
- Landscape

The expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

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

Table 1-1: Structure of the EIAR

Chapter	Title	Content
1	Introduction and Methodology	Chapter 1 sets out the purpose, methodology and scope of the document.
2	Description of the Proposed Development & Assessment of Alternatives	As required under Article 5(1)(a) of the EIA Directive 2014/52/EU (subsequently referred to as the Directive), Chapter 2 provides a description of the Site, design and scale of Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
3	Planning and Development Context	Chapter 3 sets the national, regional, and local policy framework for the Proposed Development.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) of the Directive to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land, Soils and Geology	Chapter 6 covers the requirement under Article 3(1)(c) of the Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology	Chapter 7 covers the requirement under Article 3(1)(c) of the Directive to assess potentially significant effects to water quality arising from the Proposed Development. This Chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality and Climate	Chapter 8 covers the requirement under Article 3(1)(c) of the Directive on Air and Climate to assess potentially significant effects to air quality in the surrounding environment.
9	Noise and Vibration	Chapter 9 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the Directive on Human Health.
10	Landscape and Visual Amenity	Chapter 10 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on the landscape. This Chapter will assess any potential visual impacts to landscape caused by the Proposed Development.

Chapter	Title	Content
11	Archaeology and Cultural Heritage.	Chapter 11 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on cultural heritage.
12	Material Assets _Traffic, Utilities and Waste Management	Chapter 12 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on material assets. This Chapter will identify impacts to existing utilities and infrastructure from the development of the Proposed Development. Article 5(1), Annex IV, point 1(d) of the Directive requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development.
13	Risk Management	Chapter 13 covers the requirement under Article 3(2) of the Directive to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.
14	Interactions	As required under Article 3(1)(e) of the Directive, Chapter 14 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
15	Mitigation and Monitoring	Chapter 15 describes mitigation and monitoring as required under Article 5(1) of the Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

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

1.9 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-2. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

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

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

An outline of the methodology employed consistently in each Chapter of the EIAR to examine each environmental topic is provided below:

Table 1-2: Methodology Employed to Produce each EIAR Chapter.

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)	This section will describe and assess the receiving environment, the context, character, significance, and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other Proposed Developments that are likely to proceed in the immediate surroundings.
Characteristics of the Proposed Development	Consideration of the '*Characteristics of the Proposed Development'* allows for a projection of the '*level of impact'* on any particular aspect of the environment that could arise. For each Chapter, those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the Chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.
Potential Impact of the Proposed Development	This section provides a description of the specific, direct, and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. The assessment addresses whether the impacts are direct, indirect, secondary, or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Avoidance, Remedial and Mitigation Measures	This section of each Chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations. Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential

	impacts of the Proposed Development. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.
Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary, and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes *'details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved'* (EIA Directive, Annex IV, Part 6). Each Chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that Chapter.

1.10 EIAR Project Team

Table 1-3 EIAR Project Team

Chapter	Consultant Name and address	Specialist Area
1.0 Introduction and Methodology including Non-Technical Summary	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Planning and Environmental Consultants
2.0 Project Description and Alternatives Examined	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Planning and Environmental Consultants
3.0 Planning & Policy Context	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Mairead Foran	Planning and Development Consultants
4.0 Population and Human Health	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Planning and Environmental Consultants
5.0 Biodiversity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Rozalyn O'Hora	Multidisciplinary Planning and Environmental Consultants
6.0 Land, Soils and Geology	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Sam Marchant	Multidisciplinary Planning and Environmental Consultants
7.0 Hydrology	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Sam Marchant	Multidisciplinary Planning and Environmental Consultants
8.0 Air Quality and Climate	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Planning and Environmental Consultants
9.0 Noise and Vibration	Amplitue Acoustics G2 The Steelworks, Foley St, Dublin, D01 KP03 Benny Cryan/ James Cousins	Acoustic Consultancy Firm

10.0 Landscape and Visual Amenity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nuno Costa	Multidisciplinary Planning and Environmental Consultants
11.0 Archaeology, Architectural, and Cultural Heritage	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Arthur Greene	Multidisciplinary Planning and Environmental Consultants
12.1 Material Assets: Traffic	Barrett Mahony Consulting Engineers, Sandwith House, 52-54 Sandwith Street Lower, Dublin, D02 WR26 Dr Martin Rogers	Transport Planning Professional
12.2 Material Assets: Waste and Utilities	<u>Waste & Utilities</u> Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Planning and Environmental Consultants
13.0 Risk Management	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Planning and Environmental Consultants
14.0 Interactions	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Arthur Greene	Multidisciplinary Planning and Environmental Consultants
15.0 Mitigation and Monitoring Measures	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Arthur Greene	Multidisciplinary Planning and Environmental Consultants

1.11 Non-Technical Summary

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

1.12 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site. The AA Screening concluded:

> *"the possibility may not be excluded that the Proposed Development will have a likely significant effect on the following European Sites:*
>
> - *River Boyne and River Blackwater SAC (002299)*
> - *Boyne Coast and Estuary SAC (001957)*
> - *Boyne Estuary SPA (004080)"*

As such, a Natura Impact Statement has been prepared for the Proposed Development which states: *"it has been concluded **beyond any reasonable scientific doubt**, that the Proposed Development will not have any significant adverse effects on the above or any European Sites".*

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

1.13 Availability of EIAR Documents

A copy of this EIAR document and Non-Technical Summary is available for purchase at the offices of Louth County Council at a fee not exceeding the reasonable cost of reproducing the document.

1.14 Statement of Difficulties Encountered

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

1.15 Quotations

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

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a very misleading impression of the findings of the study. Therefore, the study team urge that quotations should, where reasonably possible, be taken from the conclusions of specialists' sections or from the Non-Technical Summary and not selectively.

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described. There were no such difficulties encountered in the production of this EIAR.

2 PROJECT DESCRIPTION & DESCRIPTION OF ALTERNATIVES

2.1 Introduction and Terms of Reference

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

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

A description of the Proposed Development and its surroundings is provided in this Chapter, together with the proposed design parameters. This description sets the basis against which the specialist assessments presented in this EIAR have been undertaken.

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

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

2.2 Site Location and Description

The site of the Proposed Development is located on lands to the south of the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the site), with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the site, and Barrack Lane is adjacent to the south of the site.

Refer to Figure 2-1 for the Location of the Proposed Development.

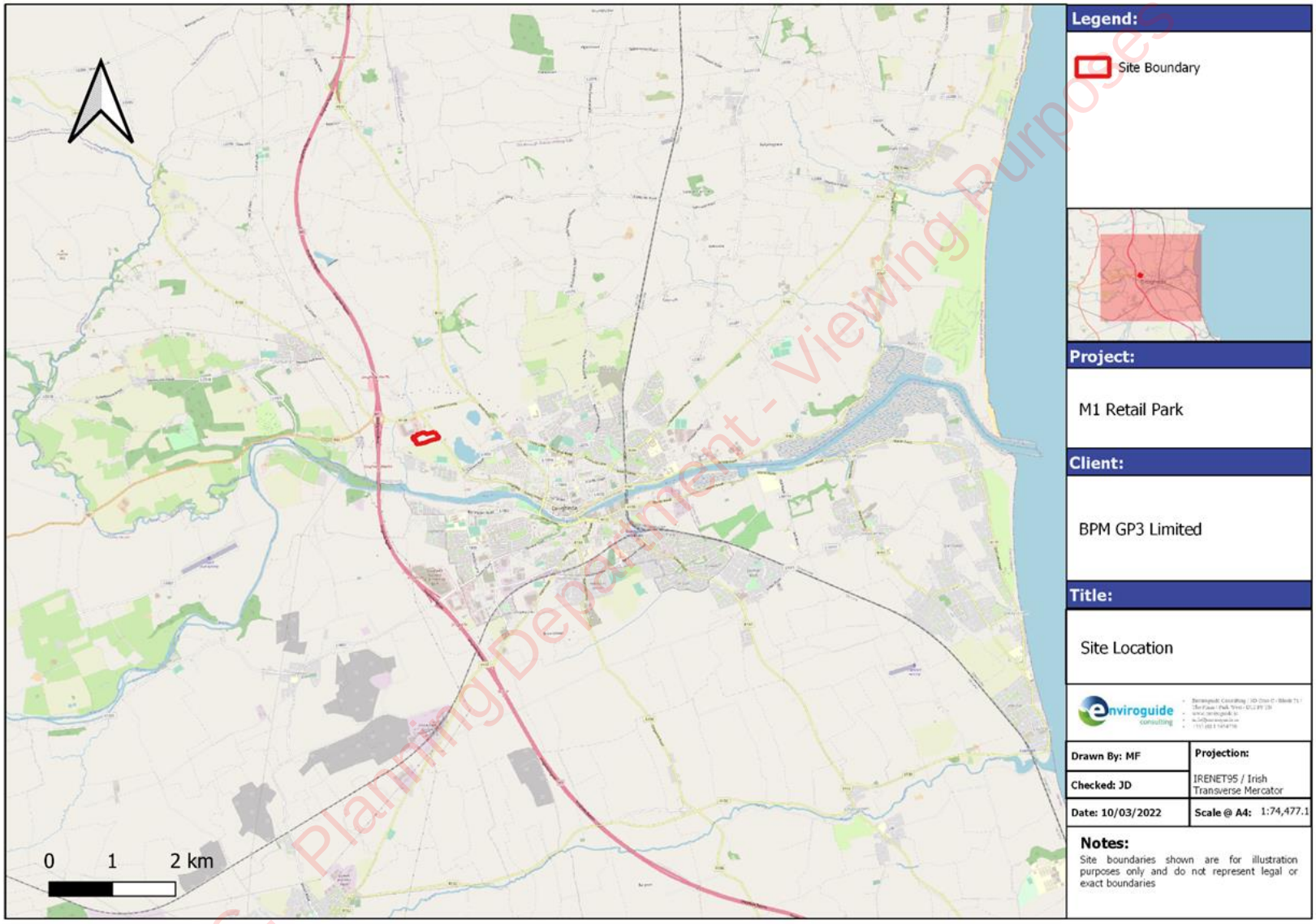

Figure 2-1 Location of the Proposed Development

2.3 Site History / Background

The site of the Proposed Development comprises an agricultural field within the administrative jurisdiction of Louth County Council. The majority of the site of the Proposed Development is located on lands which have been allocated Zoning Objective Type B4 'District Centre' with zoning objective "*To maintain and enhance retail led mixed-use district centres*". The portion to the northwest in which the drive thru is proposed is zoned C1 Mixed Use, with zoning objective "*To provide for commercial, business and supporting residential uses*."

2.3.1 Site Planning History

A full review has been conducted on Louth County Council and An Bord Pleanala's (ABP) online planning portals to establish the planning history. Table 2-1 details the applications as follows:

Table 2-1 Site Planning History

Application Reg. Ref.	Applicant	Development Proposal	Decision
96510185	P. Downey	Filling station, shop, advertising signs, canopy waste water treatment plant and percolation area	**REFUSED** November 12, 1996
94510189	P. Downey	Petrol filling station and shop	**REFUSED** February 22, 1995
06510177	Mellview Developments Ltd	Construction of double height warehouse building of 4980 sq.m including 12 no. enclosed dock levellers & 2 no. two-storey sections with ancillary office & staff areas; 2. Assoc.site dev.works including a new roundabout, a new access road, 50 no. car parking spaces, a service yard, an ESB substation & switch room, a waste compactor & waste storage enclosure, landscaping, new boundary treatments & services infrastructure & connections; 3. Assoc. building mounted advertising signage	**No Decision Available** **WITHDRAWN**
04510290	Mellview Developments Ltd	The proposed dev. will consist of the provision of the following. 181 no 2 storey 3 bedroom dwelling houses & assoc. car parking, 8 no. 3 storey buildings accommodating 24 2 bedroom apts. 24 one bedroom apts & assoc. car parking. 5 no. part 4 storey-part 3 storey buildings accommodating 30 2 bedroom duplex apts 50 2 bedroom apt, 50 1 bedroom apts & assoc. car parking. 4 ESB substations in 2 single storey buildings, landscaping & assoc. site works. The dev. proposes the upgrading of Barrack Lane as the primary vehicular access to the dev. with the provision of a new roundabout at the junction of the Collon Rd with Barrack Lane	**No Decision Available** **INCOMPLETED APPLICATION**
04510283	Mellview Developments Ltd	Dev. will consist of the provision of the following; 181 no 2 storey 3 bedroom dwelling houses & assoc. car parking; 8 no. 3 storey buildings accommod. 24 2 bedroom apts. 24 one bedroom apts & associated car parking; 5 no. part 4 storey-part 3 storey buildings accommod. 30 2 bedroom duplex apts. 50. 2 bedroom apts. 50 one bedroom apts. & assoc. car parking: 4 ESB substations in 2 single storey buildings, landscaping & assoc. site works. The dev. proposes the upgrading of Barrack Lane as the primary vehicular access to the dev with the provision of a new roundabout at the junction of the Collon Road with Barrack Lane	**No Decision Available** **INCOMPLETED APPLICATION**

2.4 Project Overview

The Proposed Development will consist of a retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m –

760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

Refer to Figure 2-2 for the Proposed Site Layout.

Figure 2-2 Proposed Site Layout (Drawing number MM1-MCA-00-00-DR-A-2000, MCA Architects)

2.5 Construction Phase

The total Construction Phase is estimated at 24 no. months. Site enabling works, including bulk excavations for foundations and attenuation tanks and infilling to the correct levels, will last approximately 2 no. months. Construction of the Proposed Development will last approximately 22 months.

2.6 Operational Phase

The Operational Phase of the Proposed Development will provide for additional commercial/retail units on lands to the immediate south of the existing M1 Retail Park, Mell, Drogheda Co. Louth, the area will therefore be operating at a greater retail use capacity.

2.7 Statutory Planning Context

The site of the Proposed Development is subject to National, Regional and Local level planning policy. The following outlines the key planning policy documents of relevance to the Proposed Development.

2.7.1 National

- Project Ireland 2040: National Planning Framework
- National Development Plan 2018-2027
- Guidelines for Planning Authorities Retail Planning (Department of the Environment, Community and Local Government, April 2012)
- Design Manual for Urban Roads & Streets (DMURS) (2013)
- National Policy Position on Climate Action & Low Carbon Development and the Climate Action Plan
- The Planning System & Flood Risk Management (2009
- Government Policy on Architecture 2009-2015: Towards a Sustainable Future

2.7.2 Regional and Local

- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031
- Louth Retail Strategy, 2021-2027
- County Louth Local Economic & Community Plan
- Louth County Development Plan 2021-2027

Chapter 3, Planning and Policy Context, of this EIAR details the policies and objectives contained in the various plans/policies that are relevant to the Proposed Development.

2.8 Description of Alternatives

2.8.1 Introduction

Consideration of reasonable alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the site of the Proposed Development within the constraints imposed by

environmental and planning conditions. This section provides a description of the reasonable alternatives that have been considered.

Article 5 of the EIA Directive requires that that the EIAR contain:

"*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 Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects*."

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

- Alternative locations
- Alternative designs
- Alternative layouts
- Alternative processes

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

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

The EPA Guidelines (EPA, 2022) states:

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

Thus, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

2.8.2 Alternative Locations

Three possible alternatives have been considered in terms of alternative locations for the Proposed Development

1. The Do-Nothing Alternative
2. Develop another greenfield site
3. Purchase another existing site with current planning permission for a similar development

The Do-Nothing Alternative would see the Site remain as an undeveloped field.

Another theoretical greenfield site was developed on the assumption that such a site was available. It was deemed that a greater impact would be created by the siting of a commercial development at this scale on such a site, given that the existing Site of the Proposed Development lies within lands that have already been zoned for district centre development, and are currently underutilised in that respect. Additionally, if the theoretical greenfield site was in an area of outstanding natural beauty, the impact would be worse.

The Site of Proposed Development is already owned by the applicant, hence purchasing another existing site with current planning permission was discounted due to the unlikely availability of such a site on the market and the levels of capital that would be required to purchase such a site. Additionally, the Proposed Development Site is well located, served by public transport and is within a short distance of key residential locations such as Tullyallen Village and Drogheda Town, with links to the M1. Access to the M1 Drogheda (Exit 10) is located approximately 550m from the site. Bus route No. 173N serves the M1 Retail Park area with direct links to Drogheda Town Centre.

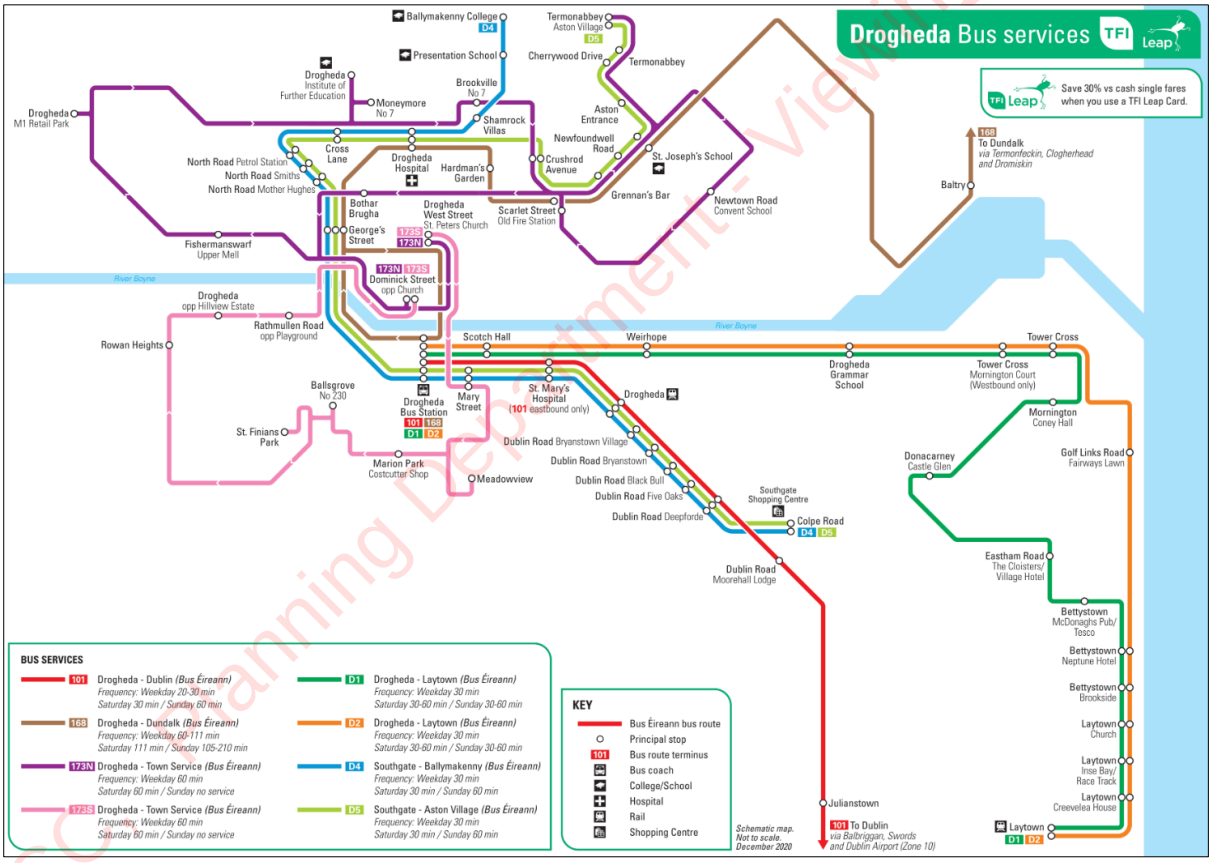

Figure 2-3 Drogheda Bus Service Map (Source: Transport for Ireland)

The Proposed Development is also well located in relation to natural recreational and amenity areas which attract tourists and hence shoppers to the area, such as the Battle of the Boyne Visitor Centre and Brú na Bóinne Visitor Centre, which are situated approximately 2.1 km and 5.2 km to the west and southwest of the Site of the Proposed Development, respectively.

Having regard to the above alternatives, the selected location is considered the most suitable location for the Proposed Development.

2.8.3 Alternative Uses

The Proposed Development Site is located on lands which have been allocated Zoning Objective Type B4 District Centre for the majority of the site, with zoning objective "*To maintain and enhance retail led mixed-use district centres*". Within the Louth County Development Plan (LCDP) 2021-2027, it is considered that "*District Centres provide a range of primary retail and non-retail functions and serve a wide catchment population. The range of services and functions available is higher than a Neighbourhood Centre. This generally includes a supermarket and non-retail services such as banks, local offices, restaurants, and community facilities*". The lands to the northwest of the site (containing the proposed drive thru) have been zoned C1 Mixed Use, with zoning objective *"To provide for commercial, business and supporting residential uses."* Refer to Figure 2-4 for the Drogheda Zoning and Flood Zones Map (LCDP 2021-2027).

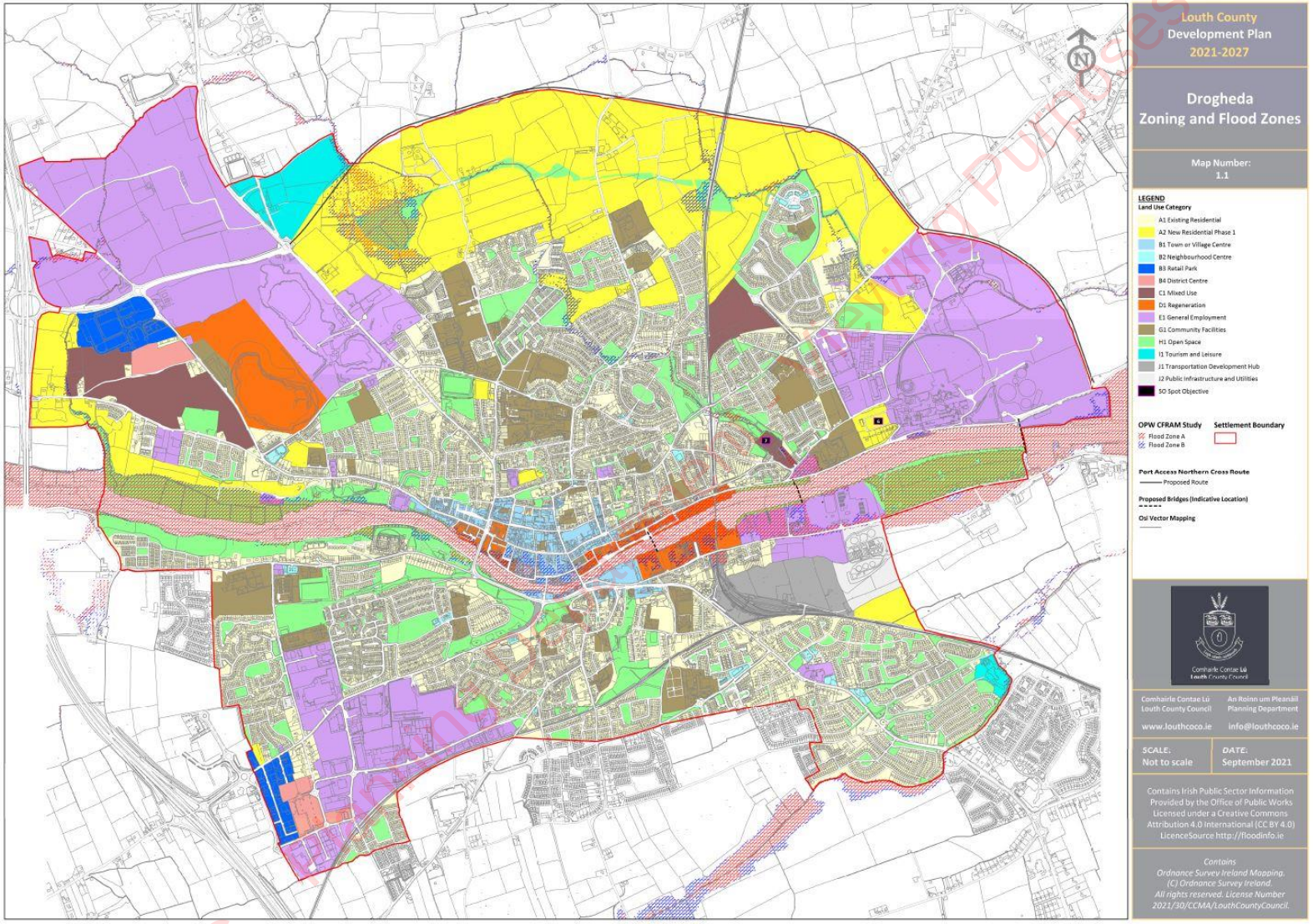

Figure 2-4 Drogheda Zoning and Flood Zones Map (LCDP 2021-2027)

The following use classes relating to the B4 District Centre zoned land, and C1 Mixed Use zoned land are 'Permitted in Principle' (Louth County Development Plan 2021-2027):

Generally Permitted Use Car Park, Coffee Shop/Tea Room, Community facility, Restaurant, Service Station, Shop, Shop(Convenience) ≥1,500m².
Open for Consideration Bank/Financial Institution, Betting Office, Bring Banks, Childcare Facility, Drive thru Restaurant, Garden Centre, Health Care Centre, Healthcare Practitioner, Nursing Home, Offices, Plant and Tool Hire, Public Services, Takeaway/Fast Food Outlet, Telecommunications Structures, Utilities.

Figure 2-5 Permissible Use Classes related to Zoning Objective B4 District Centre (Source LCDP 2021-2027)

Generally Permitted Use Bank/Financial Institution, B&B/ Guest House, Bring Banks, Business Enterprise Centre, Coffee Shop/Tea Room, Car Park , Casual Trading, Childcare Facility, Cinema, Community Facility, Craft Centre/Shop, Cultural Facility, Digital Innovation Hub/Co-working Space, E-Charging Facility, Hotel/Hostel/Aparthotel, Offices, Park/Playgrounds, Place of Worship, Public House, Public Services, Nursing Home, Recreational/Amenity Open Space, Residential, Residential Institution, Retirement Village, Restaurant, Sheltered Accommodation, Shop, Shop (Convenience) ≤1,500m², Telecommunications Structures, Third Level, Student Accommodation, Tourist Facility, Training Centre, Utilities.
Open for Consideration Advertisements and Advertising Structures, Amusement Arcade, Betting Office, Crematorium, Funeral Home/Mortuary, Garden Centre, Health Care Centre, Healthcare Practitioner, Nightclub, Recreational/Sports Facility, Recycling Facility (Civic & Amenity), Service Station, Taxi Office, Traveller Accommodation.

Figure 2-6 Permissible Use Classes related to Zoning Objective C1 Mixed Use (Source LCDP 2021-2027)

As the Proposed Development consists of a combination of shops/convenience shops (>1,500m^2), with a drive thru restaurant, and garden centre, these uses are all listed under "Generally Permitted Uses" under the associated Zoning Objectives.

The drive thru is located on the portion of the site that is zoned C1, this is not included on the C1 zoning matrix as a permissible nor an open for consideration land use, however section 13.21.2.3 of the County Development Plan recognises that there may be scenarios where there are proposals for uses not included on the permissible or open for consideration land use lists. Where such a situation arises, it is noted that proposals will be considered on their merits, taking into consideration the surrounding land uses, the compatibility of the use/development in the area, as well as demonstrating compliance with the relevant policy objectives, standards and requirements as set out in the County Development Plan.

As such, it was not considered necessary to consider alternative uses for the Proposed Development.

2.8.4 Alternative Design & Layouts

Both the context and approach to the design and layout of the Site of the Proposed Development, and the emerging final design have been subject to consultation with the Louth County Council Planning Department under Section 247. The overall layout of the Proposed Development aligns with the concepts laid out in the Louth County Development Plan 2021-2027.

As part of the preliminary design process, a number of alternative designs for the Proposed Development were considered and developed through a number of design team meetings. The process involved an evolving design whereby different solutions were tested to establish

the optimum design. Factors which were considered during the design process in terms of site layout were:

- Integration with the existing M1 Retail Park
- Extent and size of the retail park units
- Traffic flow into and out of the Proposed Development
- Access and egress to/from the Drive Thru
- Access and egress to/from the retail delivery bays
- Car parking, Click and Collect and E-Car charging arrangements
- Landscaping

Figures 2-7 and 2-8 illustrate earlier design iterations for the Proposed Development site.

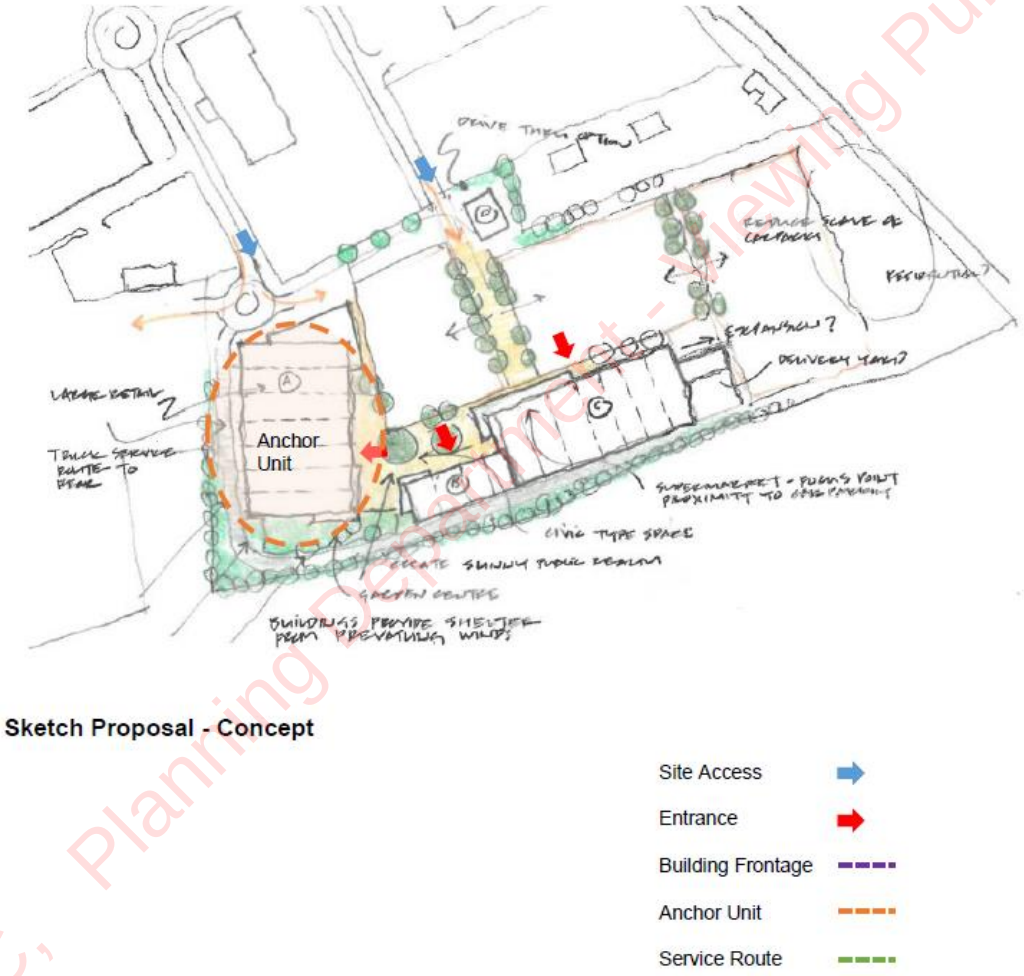

Figure 2-7 Initial Concept Design for the Proposed Development (Source: M1 Retail Park Design Statement, MCA Architects 2022)

Figure 2-8 Early design iterations for the Proposed Development (Source: M1 Retail Park Design Statement, MCA Architects, 2022)

Following a number of iterations of the overall site design, a high-quality final layout and design has been achieved, regarding the position of the Proposed Development, as is presented in the Design Statement (MCA Architects, 2022). It is considered that the layout of the scheme as proposed is the optimal solution for the lands. It is further considered that the design ensures that the development potential of a strategically positioned and underutilised plot is maximised.

2.8.5 Alternative Process

Alternative processes for the proposed retail development and supporting facilities, amenities and infrastructure, at the Construction Phase works comprise of relatively standard building construction processes. As such there are no specific alternative construction processes identified in this EIAR. Additionally, no new, unusual or technically challenging operational techniques are required for the Operational Phase of the Proposed Development, as such no alternative operational processes have therefore been considered at this point.

2.9 The Existence of the Project

The Construction Phase will last approximately 2 years in total. During the Construction Phase of the Proposed Development there will be approximately 150 jobs created at the peak of the construction works. Hence, for the duration of the Construction Phase of the Proposed Development there will be a short-term increase in construction employment in the area, which will have a positive impact, both directly and indirectly, on the local economy.

The Operational Phase of the Proposed Development will create employment in the local area, directly in the retail and drive thru units of the Proposed Development. Employment will be also created by the maintenance and management of the Proposed Development. The provision of additional retail units to a densely populated area will have a positive impact on the local human health and the socio-economic environment.

The primary likely significant environmental impacts of the Proposed Development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population & Human Health, Land & Soil, Hydrology and Hydrogeology, Landscape & Visual, Noise and Air Quality & Climate associated with the Proposed Development.

The Proposed Development has the potential for cumulative, secondary, and indirect impacts, these can be difficult to quantify due to complex inter-relationships. All interactions and cumulative impacts have been addressed in Chapter 14 (Interactions) with cumulative impacts and interactions fully addressed in the relevant specialist Chapters of this EIAR.

3 PLANNING AND POLICY CONTEXT

3.1 Introduction

The planning and policy context gives an overview of the relevant legislation that supports the Proposed Development at a local, regional and national level. This Chapter of the EIAR gives an overview of the relevant legislation that supports the Proposed Development at a local, regional and national level and sets out the strategic and statutory context governing the planning and development of the Proposed Development and was prepared by Mairéad Foran. Mairéad Foran has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has over 4 years professional experience as an Environmental Consultant and has experience working on a large number of EIARs and EIA Screening Reports for projects of a similar scale to that of the Proposed Development.

> *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.*

The following sections describe how the Proposed Development complies with the stated and statutory requirements of Louth County Council (LCC) with respect to planning and sustainable development, as well as national and regional planning policies and objectives. The relevant local planning policy with which the Proposed Development complies primarily comprises the Louth County Development Plan 2021-2027.

The Proposed Development Site is located on lands which have been allocated Zoning Objective Type B4 District Centre for the majority of the site, with zoning objective "*To maintain and enhance retail led mixed-use district centres*". The lands to the west of the site (containing

the proposed drive thru) have been zoned C1 Mixed Use. With zoning objective "*To provide for commercial, business and supporting residential uses*."

3.2 National and Regional Planning Policy Context

3.2.1 National Planning Context

3.2.1.1 National Framework Plan

The *Project Ireland 2040: National Planning Framework* (NPF), published on 16th February 2018, replaces the previous National Spatial Strategy. It is the Government's high-level strategic plan for shaping the future growth of the country to the year 2040. It will guide public and private investment and create and promote opportunities for people, and to protect and enhance the environment. The companion to this document is the National Development Plan (NDP), a ten-year strategy for public capital investment of almost €116 Billion.

The NPF outlines key future planning and development place making policies for the Eastern and Midland Regions and outlines the National Strategic Outcomes and Priorities of the National Development Plan. These include the following:

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

The Proposed Development will assist in meeting and achieving these shared set of goals, as set out in the Plan. A Strategic Outcome of particular note in the context of the Proposed Development includes: *Securing Compact and Sustainable Growth*. The Plan recognises that all our urban settlements contain many potential development areas, centrally located and frequently publicly owned, that are suitable and capable of re-use to provide housing, jobs, amenities and services, but which need a streamlined and co-ordinated approach to their development, with investment in enabling infrastructure and supporting amenities, to realise their potential. Activating these strategic areas and achieving effective density and consolidation, rather than more sprawl of urban development, is a top priority. The Proposed Development will assist in achieving this goal, as it will provide employment, access to amenities and services in an already established Retail Park, located just off the M1 and an 8-minute drive from Drogheda Town Centre.

Likewise, a number of Strategic Housing Developments have been granted permission in the Drogheda area in recent years (ABP-305552-19, ABP-305110, ABP-305703-19) and the Proposed Development will assist in providing employment and commercial opportunities along the Dublin – Belfast economic and transport corridor, along which there are settlements with significant populations such as Dundalk and Drogheda, and located close to an area that

is considered to have undergone a rapid phasing of housing delivery in recent years. The Proposed Development will assist in improving 'liveability' and quality of life, enabling greater densities of development to be achieved within the nearby existing built-up Drogheda area.

As part of the National Planning Framework, the Government intends to capitalise upon and further support and promote the Dublin-Belfast Economic Corridor, building upon existing strengths. This includes "*Effectively planning and developing large centres of population and employment along the main economic corridor, including in particular Drogheda".* The Proposed Development will provide employment and retail opportunities and will strengthen the existing M1 Retail Park and increase the economic potential of the area.

The Proposed Development also supports National Policy Objective 7:

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

- *… Strengthening Ireland's overall urban structure, particularly in the Northern and Western and Midland Regions, to include the regional centres of Sligo and Letterkenny in the North-West, Athlone in the Midlands and cross-border networks focused on the Letterkenny-Derry North-West Gateway Initiative and Drogheda-Dundalk-Newry on the Dublin-Belfast corridor;*

- *Encouraging population growth in strong employment and service centres of all sizes, supported by employment growth;*

- *Reversing the stagnation or decline of many smaller urban centres, by identifying and establishing new roles and functions and enhancement of local infrastructure and amenities; and*

- *Addressing the legacy of rapid unplanned growth, by facilitating amenities and services catch-up, jobs and/or improved sustainable transport links to the cities, together with a slower rate of population growth in recently expanded commuter settlements of all sizes."*

The Proposed Development will assist with the Plan Objectives and is in line with the vision of future proposals within this sector.

3.2.1.2 National Development Plan 2021-2030

The National Development Plan (NDP) is considered the companion document to the National Planning Framework. Their joint publication as Project Ireland 2040 aims to align our investment strategy with our strategic planning documents with a goal to create a unified and coherent plan for the country, therefore ensuring our investment strategy supports spatial planning behind a shared set of strategic objectives for rural, regional and urban development.

The Proposed Development is in line with Objective 5 of the NDP – "*A Strong Economy, supported by Enterprise, Innovation and Skills"* and sets a priority within each of the three regions for the generation of 660,000 new jobs.

3.2.1.3 Guidelines for Planning Authorities Retail Planning (Department of the Environment, Community and Local Government, April 2012)

The Minister for the Environment, Community and Local Government has issued these Guidelines under section 28 of the Planning and Development Act 2000 (as amended). Planning authorities and An Bord Pleanála are required to have regard to the Guidelines in the performance of their functions under the Planning Acts. These Guidelines update and replace the Retail Planning Guidelines for Planning Authorities (January 2005) taking account of the recommendations of the Review of the Economic Impact of the Retail Cap - Forfás (April 2011).

The Retail Planning Guidelines are a comprehensive retail planning and development framework update with 5 policy objectives, designed to:

- Ensure retail development is plan-led;
- Promote city centre vitality through the sequential approach to development;
- Enable good quality development in appropriate locations so ensuring competitiveness;
- Facilitate a modal shift in retail access to non-private vehicle modes; and
- Delivering quality urban design outcomes.

The aim of the Guidelines is to ensure that the planning system continues to play a key role in supporting competitiveness in the retail sector for the benefit of the consumer in accordance with proper planning and sustainable development. In addition, it is proposed that the planning system must promote and support the vitality and viability of city and town centres thereby contributing to a high standard of urban design and encouraging a greater use of sustainable transport.

In addition, according to the Guidelines, there is a presumption against out-of-town retail centres which could impact on the viability and vitality of city and town centres and also generate significant additional traffic with potential to impact on the national road network and the performance of junctions and interchanges. A Traffic and Transport Assessment (TTA)(2022) has been prepared by Barrett Mahony Consulting Engineers to accompany the planning application. This TTA "*demonstrates that the additional traffic generated by the proposed retail development at the south end of the M1 retail Park plus the planned drive-through restaurant to the north of the site will have a relatively limited impact on the efficient working of the local road network*".

1. ***Ensure Retail Development is Plan-Led***

The first national policy objective outlined in the Guidance document is to secure plan-led development. This indicates that proposed future retail development should be plan-led following the settlement hierarchy (including the identification of retail requirements and appropriate planning policies and objectives and implementation measures aimed at securing development plan objectives). The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The Louth County Retail Hierarchy (Appendix 4 of the Louth County Development Plan 2021-2027) has regard to the Retail Hierarchy for the region identified within the Regional Spatial and Economic Strategy (RSES). Drogheda and Dundalk are the Level 1 retail settlements within the County, reflective of their status as Regional Growth Centres in the National Planning Framework (NPF).

A Regional Growth Centre is described as "*large towns with a high level of self-sustaining employment and services that act as regional economic drivers and play a significant role for a wide catchment area".* Therefore, the Proposed Development is located in a site that plays an important economic role in terms of employment provision and offers an opportunity to assist in maintaining a high level of self-sustaining employment within this Regional Growth Centre.

The Proposed Development Site is located on lands which have been allocated Zoning Objective Type B4 District Centre for the majority of the site, with zoning objective "*To maintain and enhance retail led mixed-use district centres*". Within the Development Plan it is considered that "*District Centres provide a range of primary retail and non-retail functions and serve a wide catchment population. The range of services and functions available is higher than a Neighbourhood Centre. This generally includes a supermarket and non-retail services such as banks, local offices, restaurants, and community facilities*". The lands to the west of the site (containing the proposed drive thru) have been zoned C1 Mixed Use. With zoning objective "*To provide for commercial, business and supporting residential uses*."

The following use classes relating to the B4 District Centre zoned land, and C1 Mixed Use zoned land are '*Generally Permitted Use*' (Louth Development Plan 2021-2027):

<u>B4 District Centre</u>

Generally Permitted Use Car Park, Coffee Shop/Tea Room, Community facility, Restaurant, Service Station, Shop, Shop(Convenience) ≥1,500m².
Open for Consideration Bank/Financial Institution, Betting Office, Bring Banks, Childcare Facility, Drive thru Restaurant, Garden Centre, Health Care Centre, Healthcare Practitioner, Nursing Home, Offices, Plant and Tool Hire, Public Services, Takeaway/Fast Food Outlet, Telecommunications Structures, Utilities.

<u>C1 Mixed Use</u>

Generally Permitted Use Bank/Financial Institution, B&B/ Guest House, Bring Banks, Business Enterprise Centre, Coffee Shop/Tea Room, Car Park , Casual Trading, Childcare Facility, Cinema, Community Facility, Craft Centre/Shop, Cultural Facility, Digital Innovation Hub/Co-working Space, E-Charging Facility, Hotel/Hostel/Aparthotel, Offices, Park/Playgrounds, Place of Worship, Public House, Public Services, Nursing Home, Recreational/Amenity Open Space, Residential, Residential Institution, Retirement Village, Restaurant, Sheltered Accommodation, Shop, Shop (Convenience) ≤1,500m², Telecommunications Structures, Third Level, Student Accommodation, Tourist Facility, Training Centre, Utilities.
Open for Consideration Advertisements and Advertising Structures, Amusement Arcade, Betting Office, Crematorium, Funeral Home/Mortuary, Garden Centre, Health Care Centre, Healthcare Practitioner, Nightclub, Recreational/Sports Facility, Recycling Facility (Civic & Amenity), Service Station, Taxi Office, Traveller Accommodation.

It is considered that the Proposed Development complies with *Generally Permitted Use* under the zoning objectives for the land of the site. In addition, as discussed in further detail in the

Planning Report (Hughes Planning and Development Consultants, October 2022) whilst it is noted that the zoning matrix for C1 zoned lands does not include Drive-Thru facilities as a generally permitted use or an open for consideration use, we would note the provisions of Section 13.21.2.3 of the current Development Plan which provides guidance in respect of uses not listed and stipulates that whilst there is a comprehensive list of potential uses in '*Generally Permitted*' and '*Open for Consideration'* categories, it is recognised that there may be scenarios where there are proposals for uses not included on these lists. It is considered that the proposed Drive-Thru facility is appropriately located on the subject site and will integrate well with the proposed retail development located further east within the site.

Therefore, the Proposed Development assists in securing the Development Plan's policies and objectives for this zoned land.

Likewise, in achieving a Plan-Led Approach, the Guidelines required the preparation of strategies, by relevant planning authorities, of joint or multi-authority retail strategies. The Louth Retail Strategy (Appendix 4 of the Development Plan 2021-2027) has been prepared under these Guidelines and will be discussed further in Section 3.2.2.2.

2. Sequential Development Approach

The second national policy objective is to promote greater vitality in city and town centres by promoting a sequential approach to retail development. As outlined in the Louth Retail Strategy, Louth County Council will seek to ensure that any future retail developments are carried out in accordance with the requirements of the Retail Planning Guidelines 2012. It is therefore the policy of Louth County Council: "*To adhere to the Sequential Approach principle in the consideration of retail applications located outside of core retail areas*";

The Retail Planning Guidelines 2012 state:

"…*that the order of priority for the sequential approach is to locate retail development in the city/town centre (and district centre if appropriate), and only to allow retail development in edge-of-centre or out-of-centre locations where all other options have been exhausted. Where retail development in an edge-of-centre site is being proposed, only where the applicant can demonstrate and the planning authority is satisfied that there are no sites or potential sites including vacant units within a city or town centre or within a designated district centre that are (a) suitable (b) available and (c) viable, can that edge-of-centre site be considered. Where retail development on an out-of-centre site is being proposed, only in exceptional circumstances where the applicant can demonstrate and the planning authority is satisfied that there are no sites or potential sites either within the centre of a city, town or designated district centre or on the edge of the city/town/district centre that are (a) suitable (b) available and (c) viable, can that out-of-centre site be considered*".

The Proposed Development is located in zoned land primarily designated "*B4 District Centre*", and therefore in in line with the Sequential Test. In addition, and as outlined in Chapter 2 Description of the Proposed Development, the Site of Proposed Development is already owned by the applicant, hence purchasing another existing site with current planning permission was discounted due to the unlikely availability of such a site on the market and the levels of capital that would be required to purchase such a site.

As outlined in the Retail Impact Assessment Report (Hughes Planning & Development Consultants, October 2022), "…*it is submitted that given the scale of development proposed, it cannot be accommodated on an alternative site within the retail core area of Drogheda. Moreover, it is not considered that there is another more suitable location for the subject development, with the subject site neighbouring an existing, established and commercially strong Retail Park, The M1 Retail Park. Whilst the proposed development does not represent an extension to the existing M1 Retail Park, both the existing and proposed retail developments will be complimentary of one another, delivering significant improvements to the offering of Drogheda, and the operation of the existing M1 Retail Park, whilst also providing for an enhanced customer experience. By locating the proposed retail development adjacent lands will see a concentration of retail floor space in one accessible and established retail destination. Having regard to the ongoing commercial success of the existing M1 Retail Park, it is considered that the provision of a wider variety of shopping opportunities will significant bolster is successful functioning.*

In addition to the above, it is also noteworthy that the proposed retail comparison and retail warehouse floor space is seeking to counterbalance the leakage of comparison and bulky goods expenditure to other competing centres outside of the county by increasing the service offering to the residents of Louth."

The Retail Impact Assessment demonstrates that there is sufficient capacity within County Louth to accommodate the proposed retail development and that there will be no resultant adverse impacts on the viability and vitality of Drogheda Town Centre.

3. ***Competitiveness in the Retail Sector***

The third national policy objective is to ensure that the planning system continues to play its part in ensuring an effective range of choice for the consumer, thereby promoting a competitive market place. Strong competition is essential to reduce retail costs and ensure that savings are passed on to retail customers through lower prices. Competition also promotes innovation and productivity (Retail Guidelines, 2012).

A series of retail objectives and policies have been devised and outlined in the Retail Strategy to inform retail policies which will protect and reinforce existing retail offering and look to develop appropriate additional retail services, in keeping with the role of the settlements of Louth as prescribed within the Louth Core Strategy and the Regional Spatial and Economic Strategy for the Eastern and Midland Region. This includes:

- *"To sustain and improve the retail profile and competitiveness of Drogheda and Dundalk in their capacity as Regional Growth Centre's; and*

- *Maintain, and where possible, enhance the existing competitiveness of the County's main centres by facilitating the development of additional retail floorspace".*

The Proposed Development will support these retail objectives to provide a competitive retail outlet for consumers in the existing M1 Retail Park.

4. ***Encouraging Sustainable Travel***

The fourth national policy objective relates to securing a general shift towards sustainable travel modes through careful location and design of new retail development relative to the catchment area being served.

As outlined within the Retail Impact Assessment (Hughes Planning & Development Consultants, October 2022), with regards to existing public transport, it is noted that the 173N route connects the north town centre of Drogheda town centre to the M1 Retail Park. This service runs every 60 minutes from Monday through to Saturday. This service also connects into the south town area via the 173S service which runs from the town centre to the south area.

This report also outlines the various planned bus routes for Louth put forward as part of the National Transport Authority's document 'Connecting Ireland – Rural Mobility Plan', published in November 2021. Moreover, as part of the proposed Cycle Scheme for Drogheda, in the area aligning the Collon Road Hill of Rath Roundabout, onto which the proposed development directly access via the R168, and Rosehall Roundabout directly east of the Hill of Rath Roundabout, 2.25km of footpaths and cycle lanes will be constructed. This will provide access to the proposed scheme and the adjoining M1 Retail Park. In addition a cycle lane and footpath will be installed on the North Road from Rosehall roundabout to Patrick Street. This will also serve commercial, retail and residential developments in the vicinity.

Given the significant public transport and cycling enhancements planned for the area, it is considered that there will be a great incentive, particularly for future workers of the scheme, to rely on sustainable forms of transport. Planned enhancements to bus and rail services will also increase the attractiveness of pubic transport. The significant cycle parking facilities proposed on site and the enhanced cycle land facilities planned for the surrounding road network will also enhance the attractiveness of this mode of travel to and from the scheme.

5. ***Retail Development and Urban Design***

The fifth national policy objective is to ensure that retail development plays its part in realising quality outcomes in relation to urban design. Quality design aims to create attractive, inclusive, durable, adaptable places for people to work in, to live in, to shop in, or pass through.

The Retail Guidelines states that all designers of retail developments should be encouraged to carry out an appraisal of the distinctive character of the area adjoining the site and to consider how the design and layout of the Proposed Development responds to, and preferably enriches that character. Therefore, a Design Statement (MCA Architects, 21st September 2021) has been carried out and included in the application for the Proposed Development.

In addition, the Guidelines are accompanied by a Retail Design Manual which looks at the practical issues of relating design principles to retail development at a variety of scales and in various settings. It sets out design principles which should be used in formulating development plan policies and objectives, in discussing design quality at pre-application meetings, and in the assessment of planning applications and appeals (Retail Guidelines, 2012).

The Proposed Development has been designed with the principles of relevant statutory documents including the Urban Design Manual.

3.2.1.4 Design Manual for Urban Roads & Streets (DMURS) (2019)

The Design Manual was prepared by the Department of Transport, Tourism and Sport, together with the Department of Environment, Community and Local Government in 2013 for Urban Roads and Streets and sets out design guidance and standards for urban roads/streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas. The Planning Report (Hughes Planning and Consulting Engineers, October 2022), and the DMURS Compliance Statement (Barret Mahony Civil & Structural Consulting Engineers, October 2022) provides further detail in respect of the compliance of the Proposed Development with this Design Manual.

3.2.1.5 The Planning System & Flood Risk Management (2009)

A Flood Risk Assessment Report (FRA) (Barrett Mahony Civil & Structural Consulting Engineers, 07/09/2022) was carried out and will be submitted with this planning application. This FRA was undertaken to identify whether flood risk is an issue, as well as to develop appropriate flood risk mitigation and management measures for the development. The FRA has concluded that there is no significant risk of flooding in on the Proposed Development Site or no significance increased flooding risk to surrounding areas from the development. Therefore, the development is deemed acceptable from a flood risk assessment perspective.

3.2.2 Regional and Local Planning Context

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

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

The RSES identifies the significant employer and economic contributions that the retail sector plays in the Eastern & Midland regions, and the key role it contributes in placemaking and creating attractive liveable environments, as well as its role in role in the regeneration of areas.

The Strategy outlines specific Regional Policy Objectives (RPO) concerning proposed retail developments:

RPO 6.10: *EMRA (Eastern and Midlands Regional Authority) will support the preparation of a Retail Strategy / Strategies for the Region in accordance with the Retail Planning Guidelines for Planning Authorities 2012, or any subsequent update, to update the Retail Hierarchy and apply floorspace requirements for the Region*.

RPO 6.11: *Future provisions of significant retail development within the Region shall be consistent with the Retail Planning Guidelines for Planning Authorities 2012, or any subsequent update, and the Retail Hierarchy for the Region, expressed in the RSES, until such time as this hierarchy is updated.*

At the time of writing there was no indication from EMRA regarding any timeframe or proposal to update the Retail Hierarchy for the Region in accordance with RPO 6.10 (Louth Retail Strategy, 2021-2027, Appendix 4 of the Louth County Development Plan 2021-227).

3.2.2.2 Louth Retail Strategy, 2021-2027

This Retail Strategy has been prepared by Louth County Council in accordance with provisions set out in the '*Retail Planning Guidelines for Planning Authorities'* published by Department of the Environment, Heritage and Local Government (DoECLG) in 2012. The overarching aim of the Strategy is to ensure that future retail development in County Louth is carried out in accordance with efficient, equitable and sustainable objectives. The goal of the Retail Strategy is to implement the objectives of the Retail Planning Guidelines 2012, as discussed in Section 3.2.1.3.

The Strategy includes details regarding the M1 Retail Park, as follows:

"A range of national and international bulky comparison retailers are located within the M1 Retail Park and Drogheda Retail Park. The M1 Retail Park is anchored by Woodies and includes operators such as EZ Living, Smyths Toys and Sports Direct. Drogheda Retail Park (within the Meath County boundary) is anchored by Homebase, Harvey Norman, TK Maxx and Homestore & More."

The Proposed Development will achieve the retail objectives (that have informed the retail policies in the Development Plan) as outlined in the Retail Strategy (2012). These include:

- To sustain and improve the retail profile and competitiveness of Drogheda and Dundalk in their capacity as Regional Growth Centre's;
- To ensure that the retail needs of the residents of County Louth are catered for as much as possible within the area, to enable a reduction in the requirement to travel to meet these needs and accessibility to shopping and services across all sectors of the community;
- To ensure the orderly development of future retail developments within County Louth, to keep the Retail Strategy under review having regard to changes in the retail sector and have regard to any such review in determining applications for retail development;
- Maintain, and where possible, enhance the existing competitiveness of the County's main centres by facilitating the development of additional retail floorspace in keeping with the analysis outlined in the Strategy;
- Encourage a healthy diversity of retail types and scales, as well as uses that are complementary to retail; and
- To align, as far as practicable, new retail development with existing and proposed public transport infrastructure and services and encourage access by foot and bicycle to reduce the dominance of access by private car.

Likewise, the Proposed Development is in line with the relevant Retail Policies, as outlined in the Retail Strategy (2012), in accordance with a development of this type.

3.2.2.3 County Louth Local Economic & Community Plan 2016-2022

Under the Local Government Act 2014, each Local Authority is obliged to develop a Local Economic & Community Plan. The County Louth Local Economic & Community Plan 2016-2022 (LECP) sets out a number of targeted complementary measurable actions, with clearly defined timeframes and indicators, which will be delivered in partnership with other economic, statutory and community development stakeholders.

The objective of the LECP is that Louth will be a prosperous, proud, safe and inclusive county where people want to live, work, visit and invest and where there is equal opportunity for all. The LECP sets out the following integrated priorities;

- Prosperity & Job Creation;
- Access to Education Skills & Development;
- Empowered, Inclusive, Communities;
- Health & Wellbeing;
- Entrepreneurship, Innovation & Enterprise; and
- A Valued, Sustainable & Connected Environment.

The LECP outlines economic goals and objectives for the County. These include a number of retail specific objectives such as Economic Objective 019 to '*Promote the Growth of the Retail Sector*'. The actions proposed to achieve this objective include 091- "*Creating incentives for the sequential development of existing and new retail and retail services businesses in accordance with the Louth Retail Hierarchy*." The Proposed Development will assist in achieving the Economic Objectives as set out in the LECP.

3.2.2.4 Louth County Development Plan 2021-2027

The Louth County Development Plan 2021-2027 was adopted by the members of Louth County Council at a Special Council Meeting on the 30th September 2021. The Plan came into effect on the 11th November 2021. The Louth County Development Plan 2021-2027 has superseded the following Development Plans/Local Area Plans:

- Drogheda Borough Council Development Plan 2011-2017
- Dundalk and Environs Development Plan 2009-2015
- Ardee Local Area Plan 2010-2016
- North Drogheda and Environs Local Area Plan

It is also noted that a statutory joint Urban Area Plan (UAP)/ Local Area Plan (LAP) will be prepared for Drogheda between Louth County Council and Meath County Council during the lifetime of this Plan which will facilitate its future development as a Regional Growth Centre and economic driver in the Region.

The potential floor space capacity for each town is in accordance with the settlement and retail hierarchy of the County and has been proportioned in accordance with the population target of the towns of Drogheda, Dundalk and Ardee for 2027. In accordance with the Retail Planning Guidelines, the indicative floorspace requirements set out in the Development Plan and the Louth Retail Strategy are only intended to provide broad guidance as to the additional quantum of floorspace provision. The quantum of floorspace should not be considered as upper or lower limits, merely as indicative of the scale of new floor space required to meet the needs of existing and future population and expenditure within the County. In accordance with the indicative floorspace potential for Drogheda by 2027, 3,060 m² has been allocated for Convenience, 2,243 m² for Comparison and 1,043 m² for Bulky Comparison. The Proposed Development will assist in the provision of the additional retail floorspace required for the Drogheda area, in accordance with the changes to population, population forecasts, updated information on expenditure, trading retail floorspace and vacant retail floorspace in the Drogheda area.

The Proposed Development supports the policy objectives as outlined in the Development Plan, including the following:

SO 1 - Realise the potential and promote the development and growth of County Louth through harnessing the economic and employment potential of the competitive advantages of the County. This includes its strategic location, connectivity and accessibility to external markets and having regard in particular to the role of Drogheda and Dundalk as Regional Growth Centres located on the Dublin-Belfast Economic Corridor.

SO 2 - Support and promote the role of Drogheda and Dundalk as key designated Regional Growth Centres with high levels of self-sustaining employment and services, to act as regional economic drivers, playing a significant role for a wide catchment area and to help achieve a more coordinated and sustainable settlement and travel pattern across the region.

SO 3 - Direct new development in accordance with the Core and Settlement Strategies, which will provide for the sustainable development of the County for the period 2021-2027 and beyond and in accordance with the principles of compact growth, consolidation and regeneration.

SO 8 - Develop and support vibrant, inclusive, sustainable and healthy communities in Louth where people can live, work, invest and visit, enjoying access to a wide range of community, health and educational facilities and amenities, suitable for all ages and needs, in both urban and rural areas, thereby supporting a high quality of life for all to enjoy.

SO 10 - Support implementation of the objectives and actions for strengthening economic and community development in the County in accordance with the Louth Local Economic and Community Plan (LECP).

SO 11 - Support the further development of a resilient economic base in Louth and promote both enterprise and entrepreneurship, underpinned by innovation and talent resulting in the delivery of sustainable jobs and economic growth.

SS 1 - To support the role of Drogheda as a Regional Growth Centre and a driver of growth along the Dublin-Belfast Economic Corridor and to facilitate the continued expansion and growth of the town based on the principles of balanced, sustainable development that enables the creation of employment, supports economic investment, and creates an attractive living and working environment.

SS 2 - To continue to support and promote the economic role of Drogheda as a regional centre of employment along the Dublin-Belfast Economic Corridor and to facilitate any infrastructural investment or employment generating sustainable development that will strengthen the role of the town and maintain its competitiveness.

EE 37 - To support the development of employment lands in the town including: i) The lands in the northern part of the town adjacent to the M1 Retail Park ii) The lands adjacent to Tom Roes Point. The development of these lands shall be for economic investment and employment generating uses.

EE 64 - To promote a healthy competitive retail environment within County Louth and to maintain the vitality and viability of the town and village centres and their role as primary retail core areas.

EE 66 - To ensure that applications for retail development comply with the provisions of the Louth Retail Strategy.

EE 73 - To support the development of Drogheda and Dundalk as Regional Growth Centres and principle locations for future retail development, Ardee and Dunleer as Self Sustaining Growth Centres and the retail function of all other settlements, commensurate with locally generated needs.

EE 74 - To promote the provision of local retail centres serving small, localised catchment populations in new residential areas, commensurate with locally generated needs.

3.2.3 The EIA Directive

The EIA Directive (85/337/EEC) is in force since 1985 and applies to a wide range of defined public and private projects. The EIA Directive was amended in 1997, 2003, 2009, 2011 and 2014 by Directives 97/11/EC; 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU. The EIA Directive requires environmental impact assessments to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive, and amendments, are transposed into Irish law through the Planning and Development Acts 1996 to 2019 in particular S.I. No. 296 of 2018.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

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

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

A retail development could constitute an urban development. The adjacent land use to the north is predominantly commercial and retail. Therefore, it is considered that the site is located within a business district. The overall site area is 4.82 ha which is greater than the 2-hectare threshold. It is on this basis that an EIAR has been prepared.

Draft "*Guidelines on the Information to be contained in Environmental Impact Assessment Reports"* published by the Environmental Protection Agency (EPA) in August 2017 detail the key changes made by the amended 2014 EIA Directive. In August 2018, the Department of Housing, Planning and Local Government published a document entitled '*Guidelines for*

Planning Authorities and An Bord Pleanála' on carrying out Environmental Impact Assessment." This document has been consulted in the preparation of this EIAR.

In May 2022, the EPA published the Final "*Guidelines on the information to be contained in Environmental Impact Assessment Reports".* The Guidelines have been updated following the introduction of transposing legislation and are now formally adopted. The preparation of these updated Guidelines has involved extensive consultation. Participants in this consultation included government departments, national agencies, regional and local government, independent statutory bodies, non-governmental organisations, members of the public, developers and bodies representing various professional, industrial and sectoral groups. The Guidelines emphasise the importance of the methods used in the preparation of an EIAR to ensure that the information presented is adequate and relevant. This document has been used in the preparation of this EIAR.

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

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

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

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

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

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

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

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

(a) Population and Human Health;
(b) Biodiversity, with particular attention to species and habitats protected under the Habitats and Birds Directives;
(c) Land, Soil, Water, Air and Climate;
(d) Material Assets, Cultural Heritage and the Landscape; and
(e) The Interaction between the factors referred to in points (a) to (d).

The requirements of the Revised EIA Directive in relation to each Chapter are addressed in the EIAR as follows:

- Chapter 2: Description of Development
- Chapter 3: Planning and Policy Context

- Chapter 4: Population and Human Health
- Chapter 5: Biodiversity;
- Chapter 6: Land, Soils and Geology;
- Chapter 7: Hydrology;
- Chapter 8: Air Quality and Climate;
- Chapter 9: Noise and Vibration;
- Chapter 10: Landscape and Visual Amenity;
- Chapter 11: Archaeology and Cultural Heritage;
- Chapter 12: Material Assets including Traffic; Waster and Utilities
- Chapter 13: Risk Management;
- Chapter 14: Interactions;
- Chapter 15: Mitigation and Monitoring Measures.

4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This chapter of the EIA Report considers the potential effects of the Proposed Development on human beings, living, working and visiting in the vicinity of the application site at the M1 Retail Park, Drogheda, County Louth. The chapter details the potential direct and indirect effects of the Proposed Development on population and human health.

Human beings are one of the most significant elements of the environment to be considered, therefore any potential impact on the status of humans by a development proposal must be comprehensively addressed. One of the principle concerns in any proposed development is that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis. This chapter also examines the socio-economic impacts of the development proposal focusing on pertinent issues such as residential amenity, economic activity, tourism, population levels, and agriculture.

The section on Population and Human Health is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as ‘groups’ or ‘populations’. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the proposal and quantifiable documentary research.

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

4.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.

4.2 Study Methodology

A desk-based study was undertaken in September 2022 to assess information regarding population, age structure, economic activity, employment, and unemployment within the vicinity of the Proposed Development.

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022 however the main results will be published over several months starting in April 2023. The preliminary 2022 census results have been reviewed however for some demographic parameters they do not contain the required region-specific information for the purpose of this assessment. As such, the more robust and

complete 2016 census results have been used in this assessment (Accessed September 2022). The remaining information analysed as part of the desktop study was accessed in September 2022. The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and EIARs. The aim of the study was to assess the current baseline environment.

The potential impact of the Proposed Development on the local population is assessed in this EIAR in relation to:

- Population;
- Socio Economic impacts;
- Tourism and Amenity;
- Air quality;
- Water;
- Noise;
- Traffic; and
- Risk

4.2.1 Information Sources

The principal sources of information are as follows;

- Census and employment information published by the Central Statistics Office (CSO). Available at https://data.cso.ie/#
- Louth County Development Plan 2021-2027, Available at: https://www.louthcoco.ie/en/publications/development-plans/louth-county-development-plan-2021-2027/volume-1-all.pdf
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 4-1.

Table 4-1: Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative/adverse Effects	A change which reduces the quality of the environment

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 4-2.

Table 4-2: Definition of Significance of Effects

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects. See Table 4-3.

Table 4-3: Definition of Duration of Effects

Quality	Definition
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day.
Temporary Effects	Effects lasting less than a year.
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years.
Reversible Effects	Effects that can be undone, for example through remediation or restoration.

4.2.2 Study Area

The Proposed Development is located in the St. Peter's Electoral Division (ED) and the Drogheda Rural Local Electoral Area (LEA) in County Louth (Figure 4-1). The nearest large town from the Proposed Development for which population statistics are available is Drogheda

which is located approximately 1.14km southeast. For this assessment, the town of Drogheda has been selected as the study area.

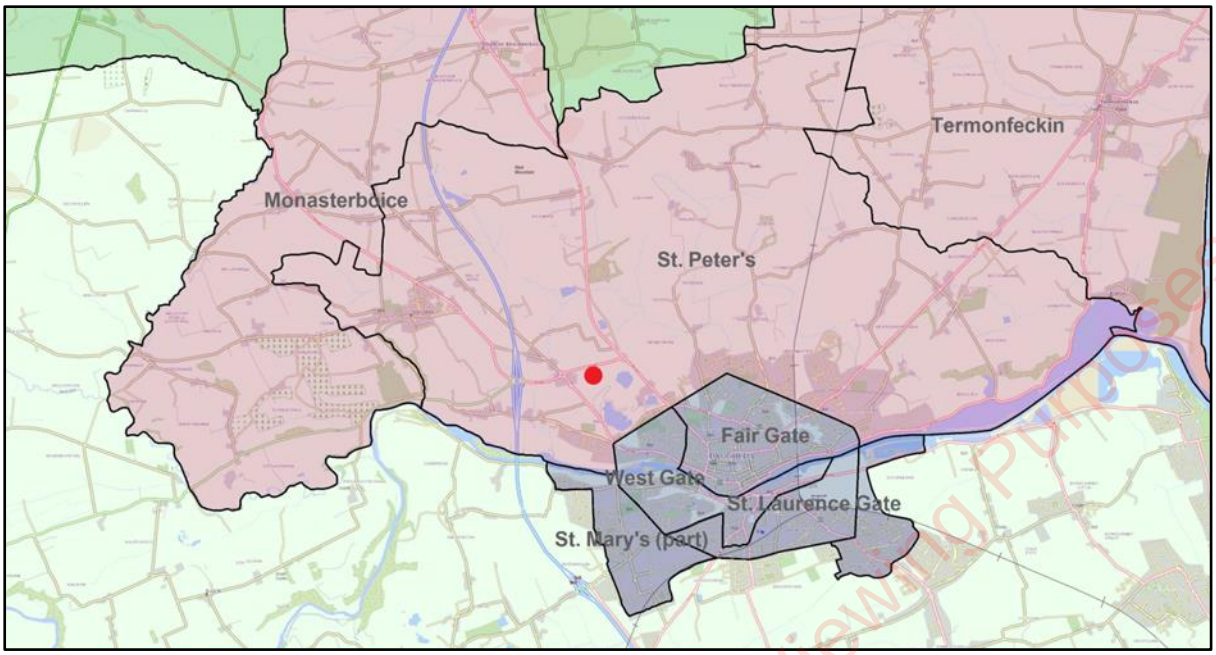

Figure 4-1: Electoral Division (ED) and Local Electoral Area (LEA) of Proposed Development (marked in red) extracted from the Louth County Council Local Electoral Boundary Area (Louth County Council, 2019)

4.3 The Existing and Receiving Environment (Baseline Situation)

4.3.1 Population and Demographic Analysis

In terms of the County, Region and the State, population structure and change are more strongly influenced by migration and emigration rates than by birth and death rates. The mid to late 1980s in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the country at that time. The most recent population estimates (June 2022) published by the Central Statistics Office indicate that the combination of a net inward migration and high birth rates have resulted in the population of Ireland exceeding 5 million people for the first time since 1851. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most moderate scenario and over 6.7 million under the most extreme scenario. Population projections for Northern Ireland up to 2034 anticipate a population of approximately two million.

According to Preliminary CSO figures from the 2022 Census, the total population of Louth is 139,100.

- Between 2016 and 2022 the population of County Louth increased by 10,206 or 7.9% compared to the average for the State of 7.6% (Table 4-4)
- Relatively speaking, there are high levels of young people and fewer older people in Louth. An age breakdown comparison is detailed in Table 4-5.

Table 4-4: Census information for County Louth in 2016 and 2022

County	Population 2016 Census Data	Preliminary 2022 Census Data	Change in Number of Persons	Percentage change in Population
Louth	128,884	139,100	10,216	7.9

4.3.2 Population and Age

The social and community needs are assessed based on consideration of the existing and potential population growth and best practice provision. Of most relevance to the Proposed Development are the Census data on population numbers and structure relating to the town of Drogheda located approximately 1.14km southeast of the Proposed Development. Urban settlements generally include a range of residential, commercial and community facilities. Smaller villages typically include a school, church, local shops as well as other community and recreational facilities. In the CSO data for 2016, the population of the town of Drogheda was recorded at 40,956.

Table 4-5 shows the breakdown of the population of Drogheda based on their age range during the 2016 Census against the Louth County and State averages. This table is further broken down into percentages of the population within these age ranges.

Table 4-5: Town, County and National Population Categorisation by Age

Age Range	Drogheda		Louth		Ireland	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
0-4 years	3,212	7.84	9,473	7.35	331,515	6.96
5-24 years	11,165	27.26	35,818	27.79	1,251,489	26.28
25-34 years	5,892	14.39	16,869	13.09	659,410	13.85
35-44 years	7,003	17.10	20,235	15.70	746,881	15.68
45-54 years	5,465	13.34	17,392	13.49	626,045	13.15
55-64 years	3639	8.89	13,020	10.10	508,958	10.69
65-74 years	2679	6.54	9,594	7.44	373,508	7.84
75 years and over	1901	4.64	6,483	5.03	264,059	5.55
Total	**40,956**		**128,884**		**4,761,865**	

As evident from Table 4-5, the population demographics for Drogheda and County Louth are in line with those for the State with each age group varying from the State average by maximum +/- 2%. People aged 5-24 years make up the largest age group in Drogheda and represent 27.26% of the population. The number of people aged 55-64 (8.89%), 65-74 (6.54%) and 75+ (4.64%) are slightly lower than the State averages. Children aged 0-4 years make up 7.84% of the population which is slightly higher than the state average of 6.96%.

4.3.3 Economic Activity & Employment

The labour force is defined as the number of people above the legal working age that are available to work. The labour force participation rate is the number of people who are employed and unemployed but looking for a job, divided by the total working-age population.

In 2016, there were 2,304,037 persons in the labour force in Ireland. This represented an increase of 71,834 (3.2%) on 2011 statistics. The substantial increase in retired persons (up 19.2% to 545,407) has impacted on the labour force participation rate, which fell to 61.35%.

Table 4-6 shows the percentage of the total population aged 15+ who were in the labour force during the 2016 Census. This figure is further broken down into the percentages that were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force, i.e., those who were students, retired, unable to work or performing home duties.

Table 4-6: Economic Status of the Population of Drogheda, Louth and the State Aged 15+ in 2016 (Source: CSO)

Status		Drogheda	% of People	Louth	% of People	State	% of People
% of population aged 15+ who are in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	Employer or own account worker	1580	5.07	6880	6.93	313,404	8.35
	Employee	14668	47.03	43327	43.67	1,688,549	44.96
	Unemployed looking for first regular job	380	1.22	1145	1.15	31,434	0.84
	Unemployed having lost or given up previous job	3072	9.85	8913	8.98	265,962	7.08
	Assisting relative	26	0.08	110	0.11	4,688	0.12
Total population aged 15+ who are in the labour force		**19,726**	**63.25**	**60,375**	**60.84**	**2,304,037**	**61.35**
% of population aged 15+ who are not in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	Student or pupil	3074	9.86	11145	11.23	427,128	11.37
	Looking after home/family	2518	8.07	8514	8.58	305,556	8.14
	Retired	4136	13.26	13989	14.10	545,407	14.52
	Unable to work due to permanent sickness or disability	1637	5.25	4879	4.92	158,348	4.22
	Other economic status	100	0.32	317	0.32	14,837	0.40
Total population aged 15+ who are not in the labour force		**11,465**	**36.76**	**38,844**	**39.15**	**1,451,276**	**38.65**

When assessing the percentage of people in the labour force it is noted that 63.25% of people in Drogheda are in the workforce. This reflects a high number of people working in the area and is higher than the average for County Louth (60.84%) and the State (61.35%).

The percentage of people who are *Unemployed having lost or given up previous job* in Drogheda is 9.85% which is slightly higher than the values for Louth County (8.98%) and the State (7.08%).

The percentage of people who are *unemployed and looking for first regular job* in Drogheda is 1.22% which is similar to those in Louth County and the State (1.15% and 0.84% respectively).

The percentage of people who are retired in Drogheda is 13.26% which is similar to the averages for Louth County (14.10%) and the State (14.52%).

The closest social welfare office to the Proposed Development which has figures available for the number of people on the Live Register / unemployed is the Drogheda Intreo Centre. The monthly unemployment release contains a series of monthly unemployment rates and volumes. These series are based primarily on the Labour Force Survey and are compiled in accordance with agreed international practice. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection. Table 4-7 details the most recent information available from the CSO from March 2022 to August 2022 on the number of persons on the Live Register. Excluding the month of May 2022, the number of people on the Live Register has been increasing each month with 3,368 people unemployed in March increasing up to 3,703 in August, representing a 9.94% increase.

Table 4-7: Number of people on the live register in Drogheda

Month	March 2022	April 2022	May 2022	June 2022	July 2022	August 2022
Number of Persons on Live Register	3,368	3,460	3,286	3,478	3,671	3,703

Table 4-8 shows the main industrial groups in Drogheda that people are employed in. The largest group are *Unemployed, having lost or given up previous job* representing 15.57% followed by *Wholesale and retail trade; repair of motor vehicles and motorcycles* representing 13.71% and *Human health and social work activities* representing 11.35%.

Table 4-8: Population Aged 15+ in the Labour Force in Drogheda by Broad Industrial Group (Source CSO Census 2016)

Broad Industrial Group	No. of People	Percent
Agriculture, forestry and fishing	83	0.42
Mining and quarrying	25	0.13
Manufacturing	1732	8.78
Electricity, gas, steam and air conditioning supply	108	0.55
Water supply; sewerage, waste management and remediation activities	74	0.38
Construction	718	3.64
Wholesale and retail trade; repair of motor vehicles and motorcycles	2704	13.71
Transportation and storage	1084	5.50
Accommodation and food service activities	956	4.85
Information and communication	473	2.40
Financial and insurance activities	703	3.56
Real estate activities	51	0.26
Professional, scientific and technical activities	612	3.10
Administrative and support service activities	647	3.28
Public administration and defence; compulsory social security	741	3.76
Education	1243	6.30
Human health and social work activities	2238	11.35
Arts, entertainment and recreation	305	1.55
Other service activities	393	1.99
Activities of households as employers producing activities of households for own use	13	0.07
Activities of extraterritorial organisations and bodies	5	0.03
Industry not stated	1366	6.92
Unemployed looking for first regular job	380	1.93
Unemployed, having lost or given up previous job	3072	15.57
Total in labour force	**19726**	

4.3.4 Tourism and Amenities

Drogheda is designated as a 'Destination Town' by Fáilte Ireland under Project Ireland 2040 and features many tourist attractions within the town itself and the surrounding areas.

Drogheda is located 11km from the historical World Heritage Site Newgrange. The passage and chamber was built by Stone Age farmers and is aligned with the rising sun on the mornings around the Winter Solstice. The site is one of three prehistoric sites that make up the Brú na

Bóinne Complex, with Knowth and Dowth being the remaining site. The three sites make up Europe's largest and most important concentration of prehistoric megalithic art. The sites can be accessed via the Brú na Bóinne Visitor Centre with a footbridge connecting the visitor centre to the sites located across the River Boyne. The Knowth visitor centre recently received €1.4 million in funding from Failte Ireland and it is estimated that the centre will attract an additional 14,000 visitors per year to the Boyne Valley Region by year 5 of opening (Failte Ireland, 2022).

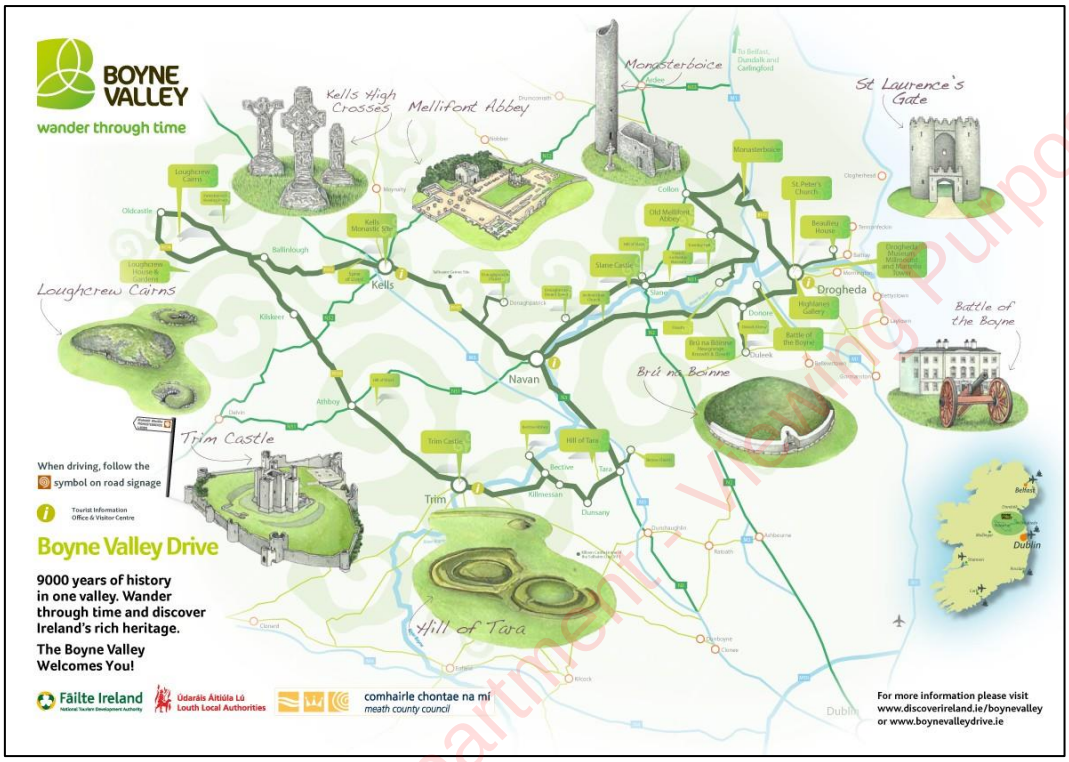

Figure 4-2: Boyne Valley Historical Tourist Attractions (Source Boyne Valley Tourism Strategy)

The Medieval Drogheda Town Walk departs from the Tourist Office in the town Monday to Friday from May to September and visits key historic landmarks such as St Peter's R.C. Church, Shrine of St. Oliver Plunkett, Highlanes Gallery (former Franciscan Church), Laurence's Gate, Old Town Walls, St Peter's Churchyard and the Tholsel.

The number of tourists coming to Ireland on walking and cycling holidays has grown exponentially in recent years, from 371,000 in 2012 to 1.8 million in 2017 (Louth County Development Plan 2021-2027). The Boyne Greenway is a 1.9km cycling and walking facility that begins at St. Dominic's Park near the 'Bridge of Peace' in Drogheda along the south bank of the River Boyne to the site of the Battle of the Boyne Visitor Centre at Oldbridge. The greenway connects the town centre of Drogheda to the Oldbridge Estate which has a number of self-guiding walks with information on the historic Battle of the Boyne site.

The DART Expansion Programme includes an extension of the existing electrified rail network from Drogheda MacBride station which will facilitate an increase to the rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station. Such an expansion will facilitate greater permeability for tourists visiting Dublin to travel to Drogheda and other parts of County Louth.

A full assessment of the potential impact of the Proposed Development on the heritage sites and surrounding areas is carried out under Chapter 10 (Landscape and Visual) and Chapter 11 (Archaeology, Architecture and Cultural Heritage) of this EIAR.

4.3.5 Travel and Commuting

An assessment of commuter times, duration and means of travel are summarised for Drogheda in Tables 4-9 to 4-11.

A total of 8,455 people (33.22%) of people commute to work or school for less than 15 minutes which represents the majority of people. In total, just under two thirds of people in Drogheda spend less than 30 minutes commuting each day (59.59%). A further 14.5% of people commute for between 30-45 minutes and the remaining 25.91% of people commute for 45 minutes or more (Table 4-9).

Table 4-9: Duration of Commute from Drogheda

Duration of Travel Times	No. of People (Total)	Percentage	Population aged 15 years and over at work	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over
< ¼ hour	8,455	33.22	4053	2979	1296	127
¼ hour - < ½ hour	6,711	26.37	3861	1576	1115	159
½ hour - < ¾ hour	3,689	14.50	2802	300	337	250
¾ hour - < 1 hour	1,539	6.05	1295	27	76	141
1 hour - < 1½ hours	2,092	8.22	1698	31	78	285
1½ hours and over	934	3.67	756	7	34	137
Not stated	2,028	7.97	1361	411	177	79
Total	**25,448**		**15,826**	**5,331**	**3,113**	**1,178**

The most popular time to leave home is between 08:31 and 09:00 with 25.72% of people beginning their commute in this time. The second most popular time is between 08:01 and 08:30 with 19.34% of people beginning their commute. A quarter of people (25.09%) leave home before 07:30. The majority of people leave home between 07:31 and 09:00 (57.33%) and a further 11.62% of people leave home after 09:01 (Table 4-10).

Table 4-10: Time Leaving Home

Time Leaving Home	No. of People (Total)	Percentage
Before 06:30	2060	8.09
06:30 - 07:00	2103	8.26
07:01 - 07:30	2225	8.74
07:31 - 08:00	3123	12.27
08:01 - 08:30	4921	19.34
08:31 - 09:00	6546	25.72
09:01 - 09:30	1083	4.26
After 09:30	1872	7.36
Not Stated	1515	5.95
Total	**25,448**	

Table 4-11 shows that the most popular mode of transport in Drogheda is Motor car: Driver (36.35%) followed by On Foot (21.96%) and Motor car: Passenger (17.31%).

Table 4-11: Means of Travel in Drogheda

	No. of People (Total)	Percentage	Population aged 15 years and over at work	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over
On foot	5651	21.96	2443	1731	1260	217
Bicycle	346	1.34	239	52	42	13
Bus, minibus or coach	2891	11.23	878	888	595	530
Train, DART or LUAS	706	2.74	585	1	53	67
Motorcycle or scooter	63	0.24	60	0	2	1
Motor car: Driver	9355	36.35	9141	0	20	194
Motor car: Passenger	4454	17.31	954	2369	1030	101
Van	652	2.53	644	3	3	2
Other, incl. lorry	30	0.12	29	0	1	0
Work mainly at or from home	288	1.12	283	2	1	2
Not stated	1300	5.05	853	287	107	53
Total	25736		16109	5333	3114	1180

4.3.6 Landscape and Visual

The site of the Proposed Development is currently predominately greenfield with some dispersed trees and shrubs and is located on lands adjoining the existing M1 Retail Park. The immediate surrounding landscape is urban/residential to the north, with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the site, and Barrack Lane is adjacent to the south of the site. The existing M1 Retail Park and a dwelling lie adjacent to the northern boundary of the site. There are no protected views within the site of the Proposed Development. However, there are 4 protected views in the broader landscape: Townley Hall Nature Walk, Drybridge Escarpment, Waterunder Plateau and Views of the Boyne and the Loughboy Callows from Loughboy.

4.3.7 Human Health

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

health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone's lived experience.

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

Table 4-12 shows that 84.94% of people have self-identified themselves as having "very good" or "good" health.

Table 4-12: Health Status of Drogheda

Health Status	Drogheda No. of People	Percent	Louth No. of People	Percent
General health - Very good	22837	55.76	75029	58.21
General health - Good	11953	29.18	36279	28.15
General health - Fair	3801	9.28	11231	8.71
General health - Bad	707	1.73	1948	1.51
General health - Very Bad	174	0.42	433	0.34
Not stated	1484	3.62	3964	3.08

4.4 Characteristics of the Proposed Development

The Proposed Development will consist of the construction of a retail development comprising: A retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian

crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

4.5 Potential Impact of the Proposed Development

4.5.1 Construction Phase

4.5.1.1 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term social health. This will be a positive impact due to the creation of direct and indirect employment during the construction phase. It is anticipated that up to 150 no. construction personnel will be employed either directly or indirectly during the peak of Construction Phase which is anticipated to extend over a period of 24 months. This will have a moderate, positive, short-term impact on human health.

It is expected that all workers employed during the operational phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19. If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that the Proposed Development poses no additional COVID-19 risk.

During the construction phase there will be a maximum of 160 vehicles accessing the site on a daily basis. The site is currently permeable to pedestrians. Chapter 12.1 of this EIAR states that *"Appropriate hoarding will be erected around the site perimeter in order to protect the works and members of the public. The boundary to the site will be maintained and site security will be provided throughout the construction period*". This will minimise the potential for accidents between pedestrians and construction vehicles to occur.

Chapter 6 of this EIAR, Land, Soil and Geology has identified the levels of radon in the area. This chapter concludes that the Proposed Development is not located within a High Radon Area. Therefore, no further assessment of radon is required in relation to human health.

4.5.1.2 Socio economic

The Proposed Development will allow for the creation of direct employment. There will be approximately 150 workers directly employed during the peak of the Construction Phase of the project. The Proposed Development will also create additional indirect employment for suppliers, drivers delivering supplies to and from the Site and workers on the Site utilising local shops and other businesses in the surrounding areas which will benefit the local economy. Therefore, the Proposed Development will have a moderate, positive impact in terms of additional direct and indirect employment and on the local socio-economic environment and will be short-term in duration.

4.5.1.3 Air Quality and Climate

Nuisance dust emissions from construction activities, including traffic, are a common and well recognised problem which can negatively impact air quality. Fine particles from these sources

are recognised as a potential significant cause of pollution and can be damaging to the health of the surrounding population during the Construction Phase.

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

- Nitrogen Dioxide, Sulphur Dioxide, Ozone - Irritate the airways of the lungs, increasing the symptoms of those suffering from lung diseases.
- Particles (PM10, PM2.5) - Can be carried deep into the lungs where they can cause inflammation and a worsening of heart and lung diseases.
- Carbon Monoxide - Prevents the uptake of oxygen by the blood and poses a greater risk to those suffering from heart disease.

There are a number of high-sensitivity receptors (residential dwellings) located within 50m of the Site boundary in the absence of mitigation, it is considered that there is potential for dust impacts to occur at these locations. Considering the proposed mitigation measures (Section 9.6), typical weather conditions, and natural buffers in the form of trees and hedgerows it is not considered that significant air quality impacts will occur as a result of dust.

Construction traffic is not expected to result in a significant change in Annual Average Daily Traffic (AADT) flows and any such increase is not considered significant and will be well within relevant ambient air quality standards.

Chapter 8 of this EIAR has concluded that there will be no significant impacts on air quality as a result of the Proposed Development and as such there will be no significant impact on human health.

4.5.1.4 Noise and Vibration

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home.

The Construction Phase is intended to be a 24-month programme. The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

During the Construction Phase all operations will comply with the BS5228:2009 “Noise and Vibration Control on Construction and Open Sites”. The noise-generating activities associated with the Site are as follows:

- Site clearance
- Building construction works;
- Trucks entering and exiting the Site.

When assessing noise and population and human health, particular consideration has been given to residential properties or noise sensitive receptors such as schools, hospitals, nursing homes and recreational spaces within close proximity to the Proposed Development. There are three residential noise sensitive locations (NSL) immediately adjacent to the development site, two of these with multiple residences. Construction noise is within the limits outlined in Chapter 9 of this EIAR, with the exception of substructure stage noise levels at NSL1, however

mitigation measures as outlined in Section 9.6.1 of this EIAR will reduce the noise levels to below the required 65dBA limit.

Based on the predicted vibration levels calculated in Section 9.5.1.3 and the *BS5228 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration* the predicted significance of effects due to construction vibration is slight.

Based on the conclusion of Chapter 9 of this EIAR, it has been determined there will be no significant noise impacts and that construction activities will not exceed any outlined thresholds. As such, there will be no significant impacts on human health as a result of noise and vibration.

4.5.1.5 Hydrology

During the Construction Phase there is potential for works to impact ground water and surface water quality which could subsequently impact the health of the surrounding population. Pollution of water bodies and ground water can occur from accidental spills of fuel or chemicals used during construction. Mismanaged construction waste can also enter water bodies if not disposed of or stored correctly. Any water quality impacts can negatively impact the human health of residents of the Proposed Development and surrounding dwellings.

Chapter 7 of this EIAR has concluded that based on the implementation of the proposed mitigation measures in Section 7.6 there will be no significant impact on the receiving groundwater and surface water environment. As there will be no impact on ground water there will be no subsequent impact on drinking water and therefore no significant impact on water consumption and human health. This will ensure there will not be a significant impact on population and human health as a result of the Construction Phase of the Proposed Development.

4.5.1.6 Landscape and Visual

The landscape and visual amenity of an area can affect the emotional and physiological health of those within it. During the Construction Phase, the Site landscape will undergo a change. The landscape impacts which have the potential to impact human health will reduce rapidly with distance from the site boundaries, and intervening hedgerows, open park spaces, and existing buildings. The impact on human health will be minor, negative and short to medium-term during the Construction Phase.

4.5.1.7 Traffic

There is potential for construction traffic to impact the surrounding population and human health by causing congestion on the local road network and within the adjoining retail park. Construction traffic can also cause air quality and noise impacts however these have been incorporated into the relevant sections of this chapter (Section 4.5.1.3 and 4.5.1.4).

During the construction phase which is predicted to last approximately 24 months it has been estimated that 160 vehicles will be accessing the site daily during the enabling works phase which will reduce to 80 vehicles outside of the excavation period. According to Chapter 12.1 the impact of construction vehicles on the road network will be slight, negative and short term.

The CEMP prepared by Enviroguide Consulting (2022) has also detailed measures to prevent construction vehicle accidents by minimising vehicle movements and ensuring pedestrians and construction vehicles are kept apart.

4.5.2 Operational Phase

4.5.2.1 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term health. This will be a positive impact due to the creation of jobs during the operational phase from direct employment.

Research undertaken by the applicant would indicate that a supermarket of the size proposed would employ up to 120 No. staff, with approximately 70% of these employed on a part-time basis. On the basis of this assumption, a figure of 78 no. full time equivalents (120×0.3+ 120×0.5×0.7) can be computed, equivalent to 1 No. worker per 44 m^2 Gross Floor Area (GFA) for the proposed development. As the food superstore comprises only 33% of the development, with the remaining non-food-based retail outlets typically employing 50% to 70% of the food superstore requirement (1 No. worker per 70m^2 GFA), this would result in an overall figure for the development of 1 No. worker per 61m^2 GFA. This will have a moderate, positive impact on human health.

It is expected that all workers employed during the operational phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19. If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that the Proposed Development poses no additional COVID-19 risk.

Radon is a radioactive gas that causes lung cancer. It is formed in the ground by the radioactive decay of uranium which is present in all rocks and soil. Radon can cause lung cancer when exposed to high levels over a long period of time. The Proposed Development Site is not considered to be within a High Radon Area and as such no further assessment is required in relation to human health.

4.5.2.2 Socio economic

The Proposed Development will allow for the creation of new employment. It is proposed that approximately 78 people directly employed during the operational phase having a positive impact, both directly and indirectly to the local economy and employment. The Proposed Development has the potential to increase the level of direct and indirect employment associated with the operation of the retail units and drive through. The development will have economic benefits such as positive effects in terms of generating economic activity with spin-off economic activity created for local retail and service providers. This will have a positive, slight, long term socio-economic effect.

Research undertaken by the applicant would indicate that a supermarket of the size proposed would employ up to 120 No. staff, with approximately 70% of these employed on a part-time basis. On the basis of this assumption, a figure of 78 no. full time equivalents (120×0.3+ 120×0.5×0.7) can be computed, equivalent to 1 No. worker per 44 m^2 Gross Floor Area (GFA) for the proposed development. As the food superstore comprises only 33% of the

development, with the remaining non-food-based retail outlets typically employing 50% to 70% of the food superstore requirement (1 No. worker per 70m^2 GFA), this would result in an overall figure for the development of 1 No. worker per 61m^2 GFA.

4.5.2.3 Air Quality and Climate

The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions. The IAQM issues a set of criteria which determines whether an air quality assessment is required in relation to traffic related emissions. According to the Traffic and Transport Assessment (AECOM, 2022) and Chapter 8 of this EIAR it is considered unlikely for significant air quality impacts to occur as a result of increased traffic flow and as such there will be no significant impact on population and human health.

4.5.2.4 Noise and Vibration

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home.

Operational noise impacts which could impact population and human health of both the surrounding residents and existing retail park have been assessed in Chapter 9 of this EIAR. External mechanical and electrical (M&E) plant will include rooftop and ground mounted equipment. Deliveries will be loaded and unloaded to the rear (south) of the proposed retail units. The deliveries will include HGVs and the rolling noise of pallet trucks, forklifts and cages on trailer beds. Details on retail road traffic within the Proposed Development (i.e., the R168 / Retail Park roundabout junction) has been provided by Barret Mahony Consulting Engineers. Plant noise impacts have been assessed as being slight and road network traffic impact have been assessed as being not significant. Delivery related noise has the potential to cause significant adverse noise impacts on NSL2 however mitigation measures have been proposed in Section 9.6.2.2 and "*if fully implemented, should be sufficient to avoid significant adverse noise impacts from deliveries*".

4.5.2.5 Landscape and Visual

During the Operational Phase, the site will be transformed from a greenfield site to a retail development. It is considered, in the context of the Development Plan zoning, the Proposed Development is a continuation of existing trends in the local area.

Chapter 10 of this EIAR has concluded that in terms of visual effects, 14% of the viewpoints assessed are considered to have a moderate to significant or significant impact. Mitigation measures have been proposed in Chapter 10 (Section 10.6) and the residual impacts of the operational phase will be negligible, neutral and long-term.

Negative impacts on surrounding properties relating to the provision of daylight and sunlight or overshadowing can occur due to the Proposed Development. Overshadowing can reduce the residential amenity of neighbouring properties and thus have an impact on the health of the occupants. A Daylight and Sunlight Overshadowing Analysis was completed by Lawler Sustainability for 8 no. surrounding properties to assess the impact of the Proposed Development. The surrounding properties are residential and are located at the entrance of the Barrack Lane, the end of the Barrack Lane and just off the Trinity Road. The components

assessed were: Vertical Sky Component (VSC), Annual Probable Sunlight Hours (APSH), Sunlight to neighbouring Back Gardens and Sunlight to Proposed Development Public Amenity Areas. In terms of VSC, results are greater than 27% for all the windows tested both before and after the proposed development in place therefor the Proposed Development will have a negligible, adverse impact and is within the BR209 guidelines. In terms of APSH to neighbouring properties windows the Proposed Development will have a negligible, adverse impact on the 8 no. neighbouring properties and is within the BR209 guidelines. The Daylight Sunlight Overshadowing Analysis concluded that "*at least 50% of each of the neighbouring gardens and at least 50% of proposed development amenity space receives at least two hours of sunlight on the 21st of March. Therefore, the proposed development has a negligible adverse impact on the neighbouring garden APSH's*".

Based on the above, there will be a negligible, negative impact on human health as result of the Proposed Development.

4.5.2.6 Traffic

The Proposed Development will create additional retail and food units in the existing M1 Retail Park increasing the amount of people visiting the retail park and subsequently the number of vehicles utilising the local road network. A Traffic Assessment (TA) was carried out by Barret Mahony Civil and Structural Consulting Engineers (2022) which assessed 3 no. critical junctions surrounding the Proposed Development; the R168 / Retail Park Roundabout Junction, the N51 / R168 / L6322 Roundabout Junction and the R132 / N51 Roundabout Junction. The TA demonstrated that all junctions presently operate within capacity and will continue to do so in the opening year of 2024 with the Proposed Development in place. However, the N51 / R168 roundabout will reach capacity by 2029 and 9% over capacity on its busiest approach by 2039.

Chapter 12.1 of this EIAR has concluded "*the Proposed Development will have a moderate to significant impact with a moderately negative long-term effect on the 3 no. critical junctions*" and mitigation measures have been proposed to limit the effect (Section 12.1.6). Based on this conclusion there will be a moderate to significant, negative, long-term impact on the population and human health of the surrounding environment.

4.5.2.7 Community Amenity

A Retail Impact Assessment (RIA) was carried out by Hughes Planning (October 2022). This report demonstrated that the Proposed Development is of an appropriate scale for the location and that it will adequately serve the growing demand for convenience, comparison and bulky goods providers in the area. Currently the site is vacant and does not provide a practical use of space in an area zoned as Type B4 'District Centre' with zoning objective "*To maintain and enhance retail led mixed-use district centres*". The Proposed Development will increase the service offering to the residents of Louth. According to the RIA "*there will be no resultant adverse impacts on the viability and vitality of Drogheda Town Centre*". Overall the proposed Development will have a slight, positive and long term impact on community amenity by increasing the service offering in the area.

4.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects

which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

Table 4-13 details the existing, proposed and granted planning permissions on record in the area:

Table 4-13: Potential Cumulative Impacts

Planning Ref No.	Applicant Name	Summary of Development
211283 09/02/2022	Loughdale Properties Limited	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works. ABP-311678-21
211046 14/12/2021	Louth County Council	Part 8 application for permission to carry out the development of 20 No. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda Co Louth the development will comprise of the following: Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling new pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e., 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores new pedestrian route from Boice Court Phase 2 to Cement Road All associated landscaping and ancillary/site development works.
LB191735 (Meath County Council) 21/02/2020	CAP Developments LLC	Alterations to existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.m; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A

Planning Ref No.	Applicant Name	Summary of Development
		new main entrance and access control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq.m.; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring 19.46 hectares. An EIAR has been submitted with this application.
19880 18/12/2019	Wogans Build Centre	Permission for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works.
18667 11/10/2018	Moffett Investment Holdings ULC	Extension of Duration Parent Ref: (08/101) 10-year permission - for a mixed-use development comprising a total of 527 no. dwellings (terraces, semi-detached, duplex and apartments and a civic/commercial neighbourhood centre of c 5,823sqm
1858 21/03/2018	Simon Paler Elmsont Limited	FURTHER EXTENSION OF DURATION REF: 12510022 which consists of Permission for Residential development of 190 units & a 430 sq.m. creche which, shall comprise of 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services & all associate works. PARENT PERMISSION REF: 06510077
17310 17/01/2018	North Drogheda Development Partnership	Permission for development to consist of amendments to a permitted residential development (Ref. 071507) to alter dwelling unit types, and to amend conditions 6(ii) and 51 (i)(a). The total permitted number of units of 1056 no. will remain unchanged

The main cumulative impacts associated with Population and Human Health are potential pollution and nuisance associated with the construction phase (i.e., dust, air quality, construction traffic and noise). During the operational phase, there will be an increase in the population of the surrounding area. This could cumulatively impact the existing local road network in terms of congestion and add pressure to the existing community infrastructure.

The cumulative impacts associated with air, noise and traffic are dealt with in the individual assessments contained in the EIAR. Notably, the conclusion of each assessment is that the Proposed Development will not give rise to likely significant environmental impacts post application of proposed mitigation measures.

4.5.4 "Do Nothing" Impact

The Do-Nothing scenario would result in the site remaining as an undeveloped, agricultural field on land zoned as Type B4 'District Centre' with an objective "*to maintain and enhance retail led mixed-use district centres*" and a portion in the northwest zoned C1 'Mixed Use' with zoning objective "*to provide for commercial, business and supporting residential uses*". The Site remaining undeveloped would represent a lost opportunity to provide direct and indirect employment to the surrounding area and provide community amenities in the form of 10 no. retail units including an anchor retail supermarket store, a DIY/Home store (including a garden centre), retail/commercial units (including a café and pharmacy) and 1 no. drive-thru restaurant/café unit.

4.6 Avoidance, Remedial & Mitigation Measures

4.6.1 Construction Phase

During the Construction Phase of the Proposed Development, it is expected that HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility. Frequently touched objects and surfaces such as door handles, machine steering wheels and gear levers will be cleaned and disinfected frequently.

No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air quality, noise, traffic, waste etc. are identified in their respective chapters in this EIAR.

4.6.2 Operational Phase

All workers employed during the Operational Phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to Covid-19.

No specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions, noise, traffic etc. are identified in their respective chapters in this EIA Report.

4.6.3 "Worst Case" Scenario

No specific mitigation measures have been proposed in relation to Population and Human Health as such a worst-case scenario is not applicable.

4.7 Residual Impacts

Residual Impacts are defined *as 'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

The Proposed Development will result in an expansion of the existing retail park and an increase in the number of people visiting the area. This will have a slight positive impact in terms of both direct and indirect employment and economic activity. No specific mitigation measures have been proposed for population and human health so residual impacts will be slight positive.

4.8 Monitoring

4.8.1 Construction Phase

No specific monitoring measures are proposed or required in relation to Population and Human Health for the Construction Phase of the Proposed Development.

Monitoring activities will be implemented for the for the Construction Phase in accordance with the CEMP submitted as part of this planning application.

4.8.2 Operational Phase

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, water, noise and traffic are identified in their respective Chapters in this EIAR.

4.9 Interactions

4.9.1 Air Quality

Interactions with air quality during the construction and operational phase has the potential to cause dust nuisances and traffic related emissions impacting on human health. However, Chapter 8 has concluded that there will be no significant air quality impacts. All ambient air quality legislative limits will be complied with and therefore the predicted impact is not significant with a neutral effect on human health. Air quality is discussed further in Chapter 8 of this EIAR.

4.9.2 Hydrology

Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Mitigation measures have been proposed in Chapter 7 of this EIAR and following their implementation there are no likely significant adverse impacts as a result of Hydrology and as such there will be no significant impacts on population and human health. Hydrology has been fully assessed in Chapter 7 of this EIAR.

4.9.3 Noise and Vibration

Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to interact with the surrounding population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction and

operational phase will not cause a significant impact. The operation of external M&E plant, delivery noise, and retail related traffic noise have also been assessed and based on the implementation of the proposed mitigation measures no significant impacts will be experienced.

4.9.4 Landscape and Visual

The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the urban nature of the surrounding landscape, will not cause any significant impacts and as such there will be no significant impact on population and human health.

4.9.5 Material Assets – Waste and Utilities

The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Construction and Demolition Waste Management Plan (CDWMP) (AECOM, August 2022) and CEMP (Enviroguide, August 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Chapter 12.2 of this EIAR has concluded there will be no significant impacts on the Material Assets (Waste and Utilities) as a result of the Proposed Development and subsequently there will be no significant impact on population and human health.

4.9.6 Material Assets - Traffic

Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the number of people utilising the road network to visit the retail park and subsequently an increase in the number of vehicles. The site is also permeable to pedestrians posing a potential human safety impact with construction vehicles.

The Construction Phase will have a slight, short term, negative impact on human health and the Operational Phase will have a moderate to significant, long term negative impact on human health. Mitigation measures have been proposed in Chapter 12.1 of this EIAR to ensure pedestrian safety during the construction phase and the limit the effects of the Proposed Development on the road network and subsequently the human health of those utilising it.

4.10 Difficulties Encountered When Compiling

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

4.11 References

The Central Statistics Office (CSO)

The Regional Planning Guidelines of the Greater Dublin Area 2010-2022

Ordinance Survey Ireland (OSI)

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

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

Healthy Ireland Framework 2013-2025

Farrell, C., McAvoy, H., Wilde, J. and Combat Poverty Agency (2008), Tackling Health Inequalities – An All-Ireland Approach to Social Determinants. Dublin: Combat Poverty Agency/Institute of Public Health in Ireland.

Wilkinson, Richard; Marmot, Michael, eds. (2003). The Social Determinants of Health: The Solid Facts (PDF) (2nd ed.). World Health Organization Europe.

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

General guide on management of COVID-19 outbreaks in nonhealthcare workplace setting (HSE, April 2022).

Louth County Development Plan 2021-2027, Louth County Council, Available at: https://www.louthcoco.ie/en/publications/development-plans/louth-county-development-plan-2021-2027/volume-1-all.pdf

Map County Louth Local Electoral Area by Electoral Division, Louth County Council

Brú na Bóinne - Archaeological Ensemble of the Bend of the Boyne, UNESCO World Heritage Convention. Available at: https://whc.unesco.org/en/list/659/

Boyne Valley Tourism Strategy 2016-2020

Failte Ireland, 2022. Available at: https://www.failteireland.ie/Utility/News-Library/knowth-visitor-experience-bru-na-boinne.aspx

5 BIODIVERSITY

5.1 Introduction

This Chapter describes the Biodiversity of the Site of the Proposed Development and surrounding environs, with emphasis on habitats, flora, and fauna, and details the methodology of assessment used in each case. It provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation, or considered to be of Conservation Importance; and proposes measures for the mitigation of these impacts, where appropriate.

The Chapter has been completed having regard to the *Guidelines for Ecological Impact Assessment in the UK and Ireland*, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), together with the guidance outlined in the Environmental Protection Agency documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (May 2022) and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015). The value of the ecological resources, the habitats, and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's (NRA, now Transport Infrastructure Ireland) *Ecological Assessment Guidelines* (NRA, 2009).

5.1.1 Quality assurance and competence

All surveying and reporting has been carried out by qualified and experienced ecologists and environmental consultants. Brian McCloskey, ecologist with Enviroguide Consulting undertook the bird and bat surveys for this report, Rozalyn O'Hora undertook the remaining ecological surveys and desktop research for this Chapter.

This Chapter has been written by Rozalyn O'Hora, Project Ecologist with Enviroguide. Rozalyn has a M.Sc. Hons. (Ecological Assessment) from University College Cork and a B.Sc. (Honours) in Environmental Science from National University of Ireland, Galway. She has a wealth of experience in desktop research, literature scoping-review, and report writing; as well as practical field experience (habitat surveys, bird surveys, terrestrial large mammals, invasive species surveys etc.). Rozalyn has experience in compiling Biodiversity Chapters of EIARs, Ecological Impact Assessment Reports, AA screening and NIS reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.

Brian McCloskey, Ornithologist with Enviroguide Consulting has a B.Sc. in Environmental Management from Technical University Dublin (TUD) and a wealth of experience in a range of ornithological surveys including breeding bird, vantage point, hinterland and breeding wader surveys as well as research and report writing.

5.1.2 Description of the Proposed Development

The Proposed Development will consist of the construction of a retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground

mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development. Relevant Legislation

5.1.2.1 National Legislation

Wildlife Act 1976 (as amended)

The Wildlife Act 1976 (as amended) was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regard to the listed species, “Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.”

Flora (Protection) Order, 2022

The Flora (Protection) Order affords protection to several species of plant in Ireland, including 89 vascular plants, 40 mosses, 25 liverworts, 2 stoneworts and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

5.1.2.2 International Legislation

EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 165 Special Protection Areas have been designated.

EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, the second cycle ran from 2016 – 2021 and the current (third) cycle runs from 2022 - 2027. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994 Ha.

5.2 Study Methodology

This section details the steps and methodology employed to undertake the Ecological Impact Assessment of the Site of the Proposed Development.

5.2.1 Scope of assessment

The specific objectives of the study were to:

- Undertake a baseline ecological survey of the Site and evaluate the nature conservation importance of the Site.
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the project during its lifetime.
- Where possible, proposed mitigation measures to remove or reduce those impacts at the Design, Construction and Operational Phases; and
- Achieve the best possible biodiversity outcome for the future of the Site.

5.2.2 Zone of Influence

The 'zone of influence' (ZOI) for a project is the area over which ecological features may be affected by changes as a result of a proposed development and associated activities. This is likely to extend beyond the development site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change. The ZOI of the Proposed Development is considered to be the lands within the Proposed Development Site for most ecological receptors (with the exception of designated sites, e.g., European Sites, Ramsar sites, Natural Heritage Areas and proposed Natural Heritage Areas – see below).

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

In addition, the guidance document published by the Department of Housing, Planning and Local Government (then DEHLG) 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities' (2009) was considered, which recommends an arbitrary distance of 15km as the precautionary ZOI for a plan or project being assessed for likely significant effects on European Sites, stating however that this should be evaluated on a case-by-case basis.

As such, the 15km ZOI is used in this report as an initial starting point for collating designated sites for this Biodiversity Chapter.

The methodology used to identify relevant designated sites comprised of the following:

- Use of current GIS spatial datasets for designated sites and water catchments – downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) to identify designated sites which could potentially be affected by the Proposed Development.

- The catchment data were used to establish or discount potential hydrological connectivity between the project boundary and any designated sites.

- All designated sites within the ZOI (within 15km of the Proposed Development) were identified and are shown in Figure 5-1.

- The potential for connectivity with designated sites at distances greater than 15km from the Proposed Development was also considered in this initial assessment. In this case, there is no potential connectivity between the Proposed Development Site and designated sites located at a distance greater than 15km based on the Source-Pathway-Receptor model.

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- Table *5-5* provides details of all relevant designated sites as identified in the preceding steps. The potential for pathways between designated sites and the Proposed Development Site was assessed on a case-by-case basis using the Source-Pathway-Receptor model as per the OPR Practice Note PN01 (March 2021). Pathways considered include:

    - Direct pathways e.g., proximity (i.e., location within the designated sites), water bodies, air (for both air emissions and noise impacts).
    - Indirect pathways e.g., disruption to migratory paths, 'Sightlines' where noisy or intrusive activities may result in disturbance to shy species.

5.2.3 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. The desk study, completed in August 2022, relied on the following sources:

- Information on species records [1] and distributions, obtained from the National Biodiversity Data Centre (NBDC) at https://maps.biodiversityireland.ie/
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.*gis.epa.ie;*
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at *www.gsi.ie*;
- Information on the network designated conservation sites, site boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at *www.npws.ie*;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from Louth County Council and An Bord Pleanála .
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.
- Information on the proposed works to be followed as part of the Proposed Development, taken from the Final Project description provided by the design team.
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021).
- The pollinator friendly planting code provided by The All-Ireland Pollinator Plan (2015-2020, 2021-2025) available at www.pollinators.ie.

[1] The proposed development site lies within the 10km grid square O07, and spread across the 2km grid square O07T and the 1km grid square O0676. Records from the last 20 years from available datasets are given in the relevant sections of this Chapter.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 5-11 References.

5.2.4 National Biodiversity Data Centre (NBDC) records

The Site of the Proposed Development is located within the Ordinance Survey Ireland National 2km grid square O07T and 1km grid square O0676. Species records dated within the last 20 years were studied for the presence of invasive, rare or protected flora and fauna. In addition, data from various sources (e.g., Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the Proposed Development. These records are presented in section 5.3.6. In addition, data from various sources (e.g., Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the Proposed Development.

5.2.5 Field Surveys

5.2.5.1 Habitat surveying mapping and evaluation

A habitat survey of the Site of the Proposed Development was carried out by Enviroguide Ecologists on the 18th of July and 22nd of September 2022. Habitats were categorised according to the Heritage Council's '*A Guide to Habitats in Ireland*' (Fossitt, 2000) to Level 3. The habitat mapping exercise had regard to the '*Best Practice Guidance for Habitat Survey and Mapping'* (Smith *et al*., 2010) published by the Heritage Council. Habitat categories, characteristic plant species and other ecological features and resources were recorded on field sheets. Habitats within the surrounding area of the Proposed Development were classified based on views from the site and satellite imagery where necessary (Google Earth, Digital Globe and OSI).

Surface water from the Proposed Development will discharge to a surface water sewer along Barrack Lane, ultimately discharging to the Mell Stream adjacent to Dry Bridge. The details of this discharge location with be agreed with the Local Authority following a pre-construction ecological survey, should a grant of planning be forthcoming.

A baseline assessment of the area of the Mell stream adjacent to Dry Bridge was undertaken on the 22nd of September 2022 for it's potential to support Otter and Kingfisher.

5.2.5.2 Invasive Species Surveys

The Site was assessed for the presence of invasive plant species during the habitat surveys undertaken on 18th of July and 22nd of September 2022. The location of invasive species was documented on the field map or through the use of GPS in the field. Non-native species in Ireland have been assessed and assigned an impact rating of either 'High', 'Medium' or 'Low' impact based on a number of factors that determine a species' potential to become established in this country and have significant impacts (Kelly *et al*., 2013). Invasive species can also be rated as an 'Amber-list species', which signifies a 'Medium' impact potential or established invasive species that may pose a threat to conservation goals (Invasive Species Ireland).

The invasive species surveys were primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be 'High impact' invasive species e.g., Japanese Knotweed (*Reynoutria japonica*). Incidental observations of other terrestrial plant species known to be potentially invasive, such as Butterfly bush (*Buddleja davidii*), were also recorded. The invasive flora surveys were undertaken during the growing season of May – August.

It is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow any invasive species scheduled on the European Communities (Birds and Habitats) Regulations and species listed as 'high' impact under the National Biodiversity Data Centre's (NBDC) 'Invasive Species in Ireland Prioritisation Risk Assessment'.

5.2.5.3 Mammals Surveys

Mammal surveys of the Site were carried out in conjunction with other field surveys. The mammal surveys conducted as part of this assessment had regard to the survey guidelines contained in *Guidelines for the Assessment of Ecological Impacts of National Road schemes* (NRA, 2009a) and associated guidance *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2009b). The Site was searched for signs of mammals such as burrows, setts, droppings, foraging signs and tracks as per Bang and Dahlstrom (2001). The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area.

5.2.5.4 Other Fauna

During the course of the habitat surveys at the Site of the Proposed Development, other species of fauna were noted if present, and are included in the report where applicable.

5.2.5.5 Breeding Bird Surveys

Enviroguide Ecologist Brian McCloskey carried out a breeding bird survey of the Site on the 6th of July 2022. The survey methodology followed the British Trust for Ornithology's (BTO) *Common Bird Census* (CBS) technique (2nd edn) (Bibby *et al.*, 2000). Several transects were walked and all bird species identified were recorded on field sheets including where possible their locations, behaviour and numbers. Three transects were completed through the Site to record all species present therein. A final zig-zag walk through the Site was carried out at the end of each survey to ensure no additional species were missed.

5.2.5.6 Bat Survey

A dusk transect bat survey was carried out on Site on the 20th of July 2022 to ascertain the bat species present and the areas of the Site where most activity was evident. Survey methodologies followed those of the Bat Conservation Trust *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Evidence of bats if present includes live/dead bats, droppings, urine staining, feeding remains etc. Features of the Site were also assessed for potential roosting habitat (natural hollows in trees, cracks in stems or branches, man-made cavities in woody vegetation). A bat detector was used to determine the species of bats present on or near the Site of the Proposed Development. Bat survey works were undertaken within the recommended survey period of May to September inclusive (Collins, 2016).

<u>Potential Bat Roost (PBR) and Commuting/foraging Habitat Survey</u>

Potential Bat Roost (PBR) and commuting/foraging habitat suitability surveys were conducted during the day of the 20th of July 2022, prior to the dusk transect bat activity survey.

Trees on Site were assessed for Potential Roost Features (PRFs) which were used to determine the potential bat roost value of trees as per Table 4.1 in the Bat Conservations Trust's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine

staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also can indicate that bat usage of a crevice, for example, has occurred in the past.

Daytime inspections were undertaken of all of the trees within the Site of the Proposed Development in order to make a list of trees within the Site that may be suitable as roosting sites for bats. Inspections were undertaken visually, from the ground, with the aid of a strong torch beam during the daytime search for PRFs.

The Site was assessed during daytime walkabout surveys (20/07/2022), in relation to potential bat foraging habitat and potential bat commuting routes. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs.

2022 Dusk Transect Bat Activity Survey

A dusk bat activity survey was undertaken at the Site on the evening of the 20th of July 2022. The bat activity survey commenced at 21:10, approximately 30 minutes before sunset (sunset on the night was 21:40) and finished 2 hours later at 23:10. The survey was conducted in optimal conditions for bat surveys i.e., calm, dry and warm with temperature of approximately 16 – 27°C over the course of the survey.

The surveyors were equipped with an Elekon BatLogger M2 full spectrum bat detector, powerful head torches and hand held torch, along with aerial maps of the Site.

A predetermined transect of the Site based on the daytime walkover was walked, allowing the Site's field boundaries and areas of vegetation to be surveyed for bat usage. Where activity was noted the surveyors remained in place for several minutes to ensure a representation of the activity was recorded.

The data collected by the bat detector was analysed using Elekon's BatExplorer software (Version 2.1.10.1). Bat data was analysed, and species assigned to each record with reference to species identification guides such as Russ (2012).

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

5.2.6 Baseline Assessment

The value of the ecological resources i.e., the habitats and species present or potentially present, was determined using the ecological evaluation guidance provided in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009) (presented in

Table *5-1*). This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. The NRA (2009a) defines key ecological receptors as those ecological features which are evaluated as Locally Important (higher value) or higher, that are likely to be impacted significantly by the Proposed Development. Internationally important receptors would include Special Areas of Conservation (SAC) or Special Protected Areas (SPA) while those of national importance would include Natural Heritage Areas (NHA).

This evaluation scheme has been adapted here to assess the value of habitats and fauna within the Site of the Proposed Development. The value of habitats is assessed based on the condition, size, rarity, conservation, and legal status. The value of fauna is assessed on its biodiversity value, legal status, and conservation status. Biodiversity value is based on its national distribution, abundance or rarity, and associated trends.

Using the evaluation criteria as described above, some of the habitats and species identified as being present were assessed. As per the NRA guidelines, impact assessment is only undertaken of **Key Ecological Receptors (KERs).**

5.2.6.1 Value of Ecological Resources

The ecological features identified within the Site of the Proposed Development and the wider area are evaluated based on their value. These values are detailed in Table 5-1 are taken from the Guidelines for Assessment of Ecological Impacts of National Road Schemes published by the NRA (2009b), now Transport Infrastructure Ireland (TII).

Table 5-1: Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b).

Importance	Criteria
International Importance	- 'European Site' (as now defined in section 177R of the Planning and Development Act 2000, as amended, to include: a candidate site of Community importance, a site of Community importance, a candidate special area of conservation, a special area of conservation, a candidate special protection area and a special protection area; - including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. - Proposed Special Protection Area (pSPA). - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). - Features essential to maintaining the coherence of the Natura 2000 Network - Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive - Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). - World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). - Biosphere Reserve (UNESCO Man & The Biosphere Programme) - Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). - Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). - Biogenetic Reserve under the Council of Europe. - European Diploma Site under the Council of Europe. - Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	- Site designated or proposed as a Natural Heritage Area (NHA). - Statutory Nature Reserve. - Refuge for Fauna and Flora protected under the Wildlife Acts. - National Park. - Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Acts; and/or a National Park. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: o Species protected under the Wildlife Acts; and/or o Species listed on the relevant Red Data list. o Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive
County Importance	- Area of Special Amenity. - Area subject to a Tree Preservation Order. - Area of High Amenity, or equivalent, designated under the County Development Plan. - Resident or regularly occurring populations (assessed to be important at the County level) of the following: o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Importance	Criteria
	○ Species protected under the Wildlife Acts; and/or ○ Species listed on the relevant Red Data list. ○ Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. - County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP); if this has been prepared. - Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. - Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP if this has been prepared. - Resident or regularly occurring populations (assessed to be important at the Local level) of the following: ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; ○ Species protected under the Wildlife Acts; and/or ○ Species listed on the relevant Red Data list. ○ Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; - Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value)	- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; - Sites or features containing non-native species that is of some importance in maintaining habitat links.

5.2.6.2 Impact Assessment Criteria

Once the value of the identified Key Ecological Receptors (KERs) was determined, the next step was to assess the potential effect or impact of the Proposed Development on these KERs. This was carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009b; CIEEM, 2018) that set down a number of parameters such as quality, magnitude, extent and duration that should be considered when determining which elements of the proposal could constitute impact or sources of impacts. Once impacts are defined, their significance was categorised using EPA Guidelines (EPA, 2022).

Identification of a risk does not constitute a prediction that it will occur, or that it will create or cause significant impact. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the ecological receptor.

5.2.6.2.1 Criteria used to Define Quality of Effects

In line with the EPA EIAR Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 5-2.

Table 5-2: Definition of Quality of Effects.

Quality	Definition
Positive Effects	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).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

5.2.6.2.2 Criteria used to Define Significance of Effects

European Commission (EC) Guidance on EIAR (EC, 2017) states that assessment of significance should be determined using appropriate, clear, and unambiguous criteria which take '*the characteristics of the impact and the values associated with the environmental issues affected into account'*. Consequently, in line with the EPA EIAR Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 5-3.

Table 5-3: Definition of Significance of Effects.

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

5.2.6.2.3 Criteria Used to Define Duration of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects. See Table 5-4

Table 5-4: Definition of Duration of Effects.

Quality	Definition
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

5.2.7 Limitations

An extensive search of available datasets for records of rare and protected species within proximity to the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.

No limitations were encountered which would prevent robust conclusions being drawn as to the potential impacts of the Proposed Development.

5.3 The Existing and Receiving Environment (Baseline Situation)

5.3.1 Site Overview

The Proposed Development Site, of 4.82 hectares, is situated to the immediate south of the existing M1 Retail Park. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The Site is bound to the east by Trinity Street (R168), to the north by the existing M1 Retail Park, to the south by Barrack Lane and to the west by undeveloped greenfield lands, which are also in the ownership of the applicant. The Sites eastern boundary fronts the adjacent R168 Regional Road (Trinity Street) for approximately 130 metres, the N51 National Road is also located due north of the lands.

5.3.2 Geology, Hydrology and Hydrogeology

The Site is located within the *Drogheda* groundwater body (EU Code: IE_EA_G_025). The overall status of this waterbody is recorded as *Good* and the risk status assigned to the Dublin GWB is identified as *Not at Risk* (EPA, 2022).

The Proposed Development is within the *Boyne* Water Framework Directive (WFD) catchment (Catchment I.D.07), the *Boyne_SC_130* SubCatchment (SubCatchment I.D. 07_17) and the *Tullyeskar_010* River Sub Basin (IE_EA_07T270880) (EPA, 2022).

The closest waterbody as identified by EPA data is the *Mell Stream* (also referred to as the Kenny stream) (EPA Code: 07M53) which lies 0.3km west of the Site. The Mell Stream has a WFD status of *Poor* (EPA, 2022). The Mell Stream flows past the Site in a southern direction for 0.8km prior to discharging into the Boyne Estuary (IE_EA_010_0100). The Boyne Estuary has a WFD status of *Moderate* and is *At Risk* of not achieving its WFD status objectives (EPA, 2022).

The bedrock beneath the Site is mapped as the *Tullyallen* (Stratigraphic CodeTA; New Code: CDTUAL) which is comprised of *pale micritised grainstone–wackestone* (GSI, 2022).

The Geological Survey of Ireland (2022) have classified the bedrock beneath the Site and surrounding area as a *Regionally Important Aquifer – Karstified (diffuse) (Rkd).* The groundwater vulnerability rating assigned to the groundwater in the bedrock aquifer beneath the central portion of the Site is *Low* (L), the vulnerability beneath the western portion of the Site is *Moderate (M*) and the eastern portion of the Site is assigned a vulnerability rating ranging from *Moderate (M)* to *High* (H) and ultimately *Extreme* (E) in the southeast corner of the Site (GSI, 2022).

The soils (Teagasc Soils) beneath the Site are mapped as *Mineral poorly drained (Mainly acidic)*. The bedrock beneath the Site is mapped as Limestone and carboniferous shale of the Tullyallen Formation. The quaternary sediments beneath the Site are mapped by the GSI as *Irish Sea Till derived from Lower Palaeozoic sandstones and shales* (GSI, 2022).

5.3.3 Designated sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive 79/409/EEC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Table *5-5* presents details of the key ecological features of the designated sites within a 15km radius of the Proposed Development. The result of this preliminary screening concluded that there is a total of three SACs, three SPAs and nineteen pNHAs located within the ZOI of the Proposed Development Site. The distances to each site listed are taken from the nearest possible point of the Proposed Development Site boundary to nearest possible point of each European Site or pNHA. European Sites outside of this 15km radius were also considered but are deemed to be either; located a considerable physical distance inland; separated by a significant marine buffer; and/or located within different catchment zones to the Proposed Development.

A Screening for Appropriate Assessment (Enviroguide, 2022) and Natura Impact Statement (Enviroguide, 2022) for the Proposed Development, prepared in accordance with the requirements of Part XAB of the Planning and Development Act, 2000 (as amended) are submitted with this application under a separate cover. The following conclusions are extracted from the Appropriate Assessment Screening Report and Natura Impact Statement, which concluded that the Proposed Development would not have a significant effect on any European Sites:

"*The Proposed Development at the M1 Retail Park, Mell, Drogheda, Co. Louth has been assessed taking into account:*

- *the nature, size and location of the Proposed Development works and possible impacts arising from the construction works.*
- *the qualifying interests and conservation objectives of the European Sites.*
- *the potential for in-combination effects arising from other plans and projects.*

In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that, on the basis of objective information; the possibility ***may be excluded*** *that the Proposed Development will have a significant effect on any of the European Sites listed below:*

- *Clogher Head SAC (001459)*
- *River Boyne and River Blackwater SPA (004232)*
- *River Nanny Estuary and Shore SPA (004158)*

However, upon examination of the relevant information including the nature of the Proposed Development and the potential for significant effects on European Sites, the possibility may not be excluded that the Proposed Development will have a likely significant effect on the following European Sites:

- *River Boyne and River Blackwater SAC (002299)*
- *Boyne Coast and Estuary SAC (001957)*
- *Boyne Estuary SPA (004080)*

The Appropriate Assessment Screening Report concludes that a degree of uncertainty exists that the Proposed Development could give rise to potentially significant effects on the River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC and Boyne Estuary SPA

via groundwater flows to the Boyne Estuary and surface water discharges from the Site reaching the Mell stream during the Construction Phase. Accordingly, a Natura Impact Statement has been prepared for the Proposed Development and is included under a separate cover."

"This Natura Impact Statement details the findings of the Stage 2 Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the Proposed Development planning application at the M1 Retail Park, Mell, Drogheda, Co. Louth, on the following European Sites:

- *River Boyne and River Blackwater SAC (002299)*
- *Boyne Coast and Estuary SAC (001957)*
- *Boyne Estuary SPA (004080)*

The above sites were identified by a screening exercise that assessed likely significant effects of a range of impacts that have the potential to arise from the Proposed Development. The Appropriate Assessment investigated the potential direct and indirect effects of the proposed works during the Construction Phase, on the integrity and qualifying interests of the above European Sites, alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives.

Where potentially significant adverse effects were identified, a range of mitigation and avoidance measures have been proposed to negate them. Therefore, as a result of the complete, precise and definitive findings of this Appropriate Assessment; it has been concluded ***beyond any reasonable scientific doubt****, that the Proposed Development will not have any significant adverse effects on the above or any European Sites.*

As a result of the complete, precise and definitive findings in this NIS, it has been concluded, beyond reasonable scientific doubt, that the Proposed Development will have no adverse effects on the qualifying interests, special conservation interests and on the integrity and extent of the River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC and Boyne Estuary SPA. Accordingly, the Proposed Development will not adversely affect the integrity of any European Site."

Table 5-5: Designated sites of Conservation Importance within the Precautionary Zone of Influence of the Proposed Development (15km)

Site Code	Site Name	Qualifying Interests (*= priority habitats)	Distance to Site
Special Areas of Conservation (SAC)/candidate Special Areas of Conservation (cSAC)			
002299	River Boyne and River Blackwater SAC	[7230] Alkaline fens [91E0] Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [1099] River Lamprey *Lampetra fluviatilis* [1106] Salmon *Salmo salar* [1355] Otter *Lutra lutra*	0.4km
001957	Boyne Coast and Estuary SAC	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] Salicornia and other annuals colonising mud and sand [1330] Atlantic salt meadows [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2130] Fixed coastal dunes with herbaceous vegetation (grey duens)	5km
001459	Clogher Head SAC	[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [4030] European dry heaths	12.1km
Special Protection Areas (SPA)			
004232	River Boyne and Blackwater SPA	[A229] Kingfisher *Alcedo atthis*	0.9km
004080	Boyne Estuary SPA	[A048] Shelduck *Tadorna tadorna* [A130] Oystercatcher *Haematopus ostralegus* [A140] Golden Plover *Pluvialis apricaria* [A141] Grey Plover *Pluvialis squatarola* [A142] Lapwing *Vanellus vanellus* [A143] Knot *Calidris canutus* [A144] Sanderling *Calidris alba* [A156] Black-tailed Godwit *Limosa limosa* [A162] Redshank *Tringa totanus* [A169] Turnstone *Arenaria interpres* [A195] Little Tern *Sterna albifrons* [A999] Wetland and Waterbirds	3.9km
004158	River Nanny Estuary and Shore SPA	[A130] Oystercatcher *Haematopus ostralegus* [A137] Ringed Plover *Charadrius hiaticula* [A140] Golden Plover *Pluvialis apricaria* [A143] Knot *Calidris canutus*	9.5km

Site Code	Site Name	Qualifying Interests (*= priority habitats)	Distance to Site
		[A144] Sanderling *Calidris alba* [A184] Herring Gull *Larus argentatus* [A999] Wetland and Waterbirds	
National Heritage Areas (NHAs)			
There are no NHAs within 15km of the Proposed Development			
Proposed National Heritage Areas pNHAs[2]			
001862	Boyne River Islands pNHA	No site synopsis available for this pNHA.	0.5km
001804	King William's Glen pNHA	No site synopsis available for this pNHA.	1.8km
001861	Dowth Wetland pNHA	No site synopsis available for this pNHA.	2.5km
001957	Boyne Coast and Estuary pNHA	No site synopsis available for this pNHA.	5km
001578	Duleek Commons pNHA	This site lies 1km north-west of Duleek, Co. Meath. Duleek Commons occupies a level, drained marsh area associated with the floodplain of a stream rising in Thomastown Bog to the west and running through the undulating drift landscape to the River Nanny. While many other wetlands in the area have disappeared due to drainage, this wetland remains in relatively good condition and is thus of importance.	6.8km
000553	Crewbane Marsh pNHA	No site synopsis available for this pNHA.	7.4km
001464	Mellifront Abbey Woods pNHA	This site lies 7km south-west of Dunleer, Co. Louth. The site consists of areas of mixed woodland, wet woodland, conifer plantations, grassland and a lake. A notable invertebrate species, the Pyrenean Snail (*Semilimax pyrenaicus*) has been described from this site.	7.7km
001589	Rossnaree Riverbank pNHA	No site synopsis available for this pNHA.	7.8km
001293	Blackhall Woods pNHA	Blackhall woods lies 3km north-west of Termonfeckin in Co. Louth. This site is a planted woodland. The interest in this area lies in the bryophytes that it contains. These form a typical Atlantic community which grows on fallen timber.	8.4km
000554	Laytown Dunes/Nanny Estuary pNHA	No site synopsis available for this pNHA.	8.8km
001493	Thomastown Bog pNHA	No site synopsis available for this pNHA.	9km
001592	Boyne Woods pNHA	No site synopsis available for this pNHA.	9.9km

[2] Where available, brief site synopses are provided for the pNHAs. These synopsis are available from the NPWS (https://www.npws.ie/protected-sites/nha). It is noteworthy that these synopses are based in many cases on old survey data and may not accurately reflect the status of the site at the current time.

Site Code	Site Name	Qualifying Interests (*= priority habitats)	Distance to Site
001458	Castlecoo Hill pNHA	No site synopsis available for this pNHA.	10km
001591	Slane Riverbank pNHA	No site synopsis available for this pNHA.	10.3km
001801	Barmeath Woods pNHA	This woodland is almost entirely deciduous dominated by Beech and Oak and lies around Barmeath Castle, approximately 2km east of Danber.	11.3km
001576	Cromwell's Bush Fen pNHA	Cromwell's Bush Fen is a small wetland lying some 6 km south-west of Duleek in a pastoral/arable setting over poorly draining glacial drift. A wide variety of fen communities are represented on site, from open water to relatively dry coarse grassland. The rare floating plant Frogbit (*Hydrocharis morsus-ranae*) has been recorded here.	11.7km
001579	Barlath Woods pNHA	Balrath Woods forms narrow wooded roadside strips along the N2 and L125 at their junction, about 5km south-west of Duleek in Co. Meath. There are three blocks of woodland, which are largely similar in species composition. Balrath Woods is of importance within a county where very few mature woodlands with any degree of natural character are to be found. The occurrence of a nationally rare plant (Common Wintergreen (*Pyrola minor*) enhances the importance of this site.	11.9km
001459	Clogher Head pNHA	No site synopsis available for this pNHA.	12km
001806	Kildemock Marsh pNHA	Kildemock Marsh pNHA is a small reed bed lying about 3km southeast of Ardee, development in poorly draining glacial tull over Upper Silurina rocks. There is no feature of the natural history of this wetland that makes it of outstanding importance. It has been designated because it is representative of wetlands in the area, it provides refuge for wildlife and presumably supports a typical lowland wetland invertebrate community.	14.8km

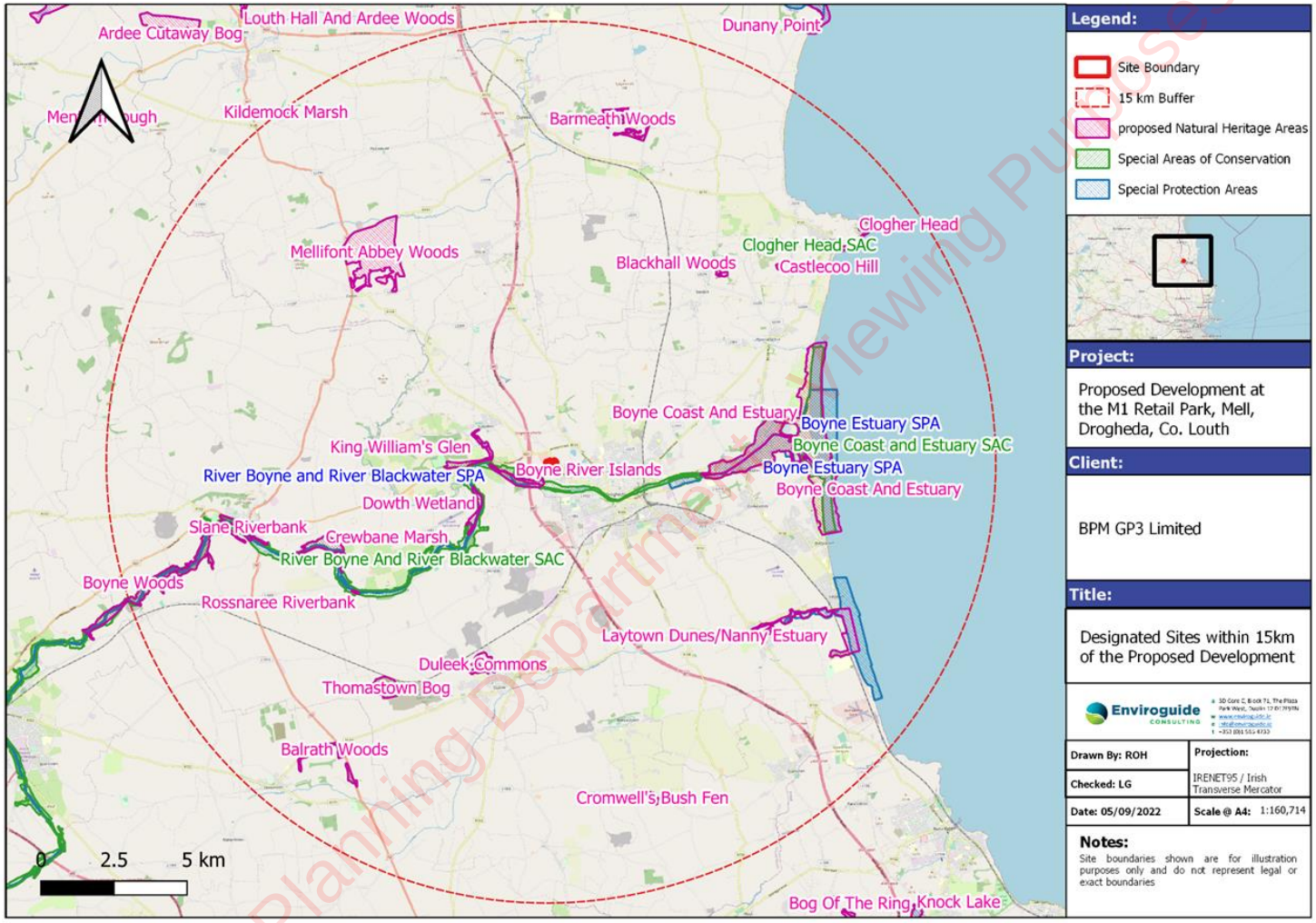

Figure 5-1: Designated Sites within 15km of the Proposed Developmen

5.3.4 Habitats

The habitats within the study area are coded and categorised for the most part according to (Fossitt, 2000) and are described in detail in the following sections. The habitat map of the Site of the Proposed Development is shown in Figure 5-9.

5.3.4.1 Buildings and Artificial Surfaces (BL3)

A disused tarmac road runs through the Site from east to west. This is a manmade habitat and has no ecological value.

Figure 5-2. Buildings and artificial surfaces habitat at the Site.

5.3.4.2 Recolonising Bare Ground (ED3)

This habitat lies along the northern Site boundary, species found within this habitat include Autumn hawkbit *Scorzoneroides autumnalis*, Coltsfoot *Tussilago farfara*, Daisy *Bellis perennis*, Ragwort *Jacobaea vulgaris,* Dock *Rumex* sp., Red clover *Trifolium pratense*, Spear thistle *Cirsium vulgare* and Butterfly-bush saplings *Buddleja davidii.* This habitat may provide a seed source for pollinators and birds but is not considered of conservation value.

Figure 5-3. Recolonising bare ground habitat (ED3) (right) and Spoil and bare ground habitat (ED2) (left) at the Site.

5.3.4.3 Spoil and Bare Ground (ED2)

This habitat lies at the north of the Site, the margins of this habitat have transitioned to recolonising bare ground habitat. There is limited vegetation in this habitat and it has little biodiversity value.

5.3.4.4 Hedgerows (WL1)

A planted hedgerow lies adjacent to the northern-eastern boundary of the Site. This Cherry laurel *Prunus laurocerasus* hedgerow makes up the boundary hedgerow of the back gardens of the adjacent residential dwellings and is outside the area of works for the Proposed Development. Native hedgerows at the Site are dominated by Hawthorn *Crataegus monogyna*, Willow *Salix* sp, Sycamore *Acer pseudoplatanus*, Ash *Fraxinus excelsior* and Bramble *Rubus fructicosus*. The non-native Butterfly-bush *Buddleja davidii* is also dominant within the hedgerows at the Site.

Figure 5-4. Planted hedgerow (WL1) habitat along the north-eastern boundary of the Site.

Figure 5-5 Native hedgerow (WL1) habitat at the Site of the Proosoed Development with Scrub (WS1) habitat in the foreground.

5.3.4.5 Treelines (WL2)

A short Treeline lies in the southeast boundary of the Site, species found here include Ash *Fraxinus excelsior*, Sycamore *Acer pseudoplatanus*, Hawthorn *Crataegus monogyna* and Horse chestnut *Aesculus hippocastanum*. The understory is dominated by Nettle *Urtica dioica*, Bramble *Rubus fructicosus*, Herb Robert *Geranium robertianum* and Ivy *Hedera Hibernica*.

Figure 5-6 Treeline (WL2) habitat at the Site of the Proposed Development.

5.3.4.6 Scrub (WS1)

This habitat is made up of large areas of dense Bramble *Rubus fructicosus,* Nettle *Urtica dioica,* Rosebay willowherb *Chamaenerion angustifolium* and Willow *Salix* sp. The non-native Butterfly-bush *Buddleja davidii* is also abundant within this habitat.

Figure 5-7. Scrub (WS1) habitat at the Site of the Proposed Development.

5.3.4.7 Dry Meadows and Grassy Verges (GS2)

Dry Meadows and Grassy Verges is present throughout the Site of the Proposed Development. Species recorded within this habitat include Creeping buttercup *Ranunculus repens*, Meadow buttercup *Ranunculus acris*, Bush vetch *Vicia sepium*, Red clover *Trifolium pratense*, White clover *Trifolium repens*, Autumn hawkbit *Scorzoneroides autumnalis*, Dock *Rumex* sp., Colt's foot *Tussilago farfara*, Bramble *Rubus fructicosus*, Meadowsweet *Filipendula ulmaria*, Field woundwort *Stachys arvensis*, Rosebay willowherb *Chamaenerion angustifolium*, Creeping thistle *Cirsium arvense*, Marsh thistle *Cirsium palustre* and Nettle *Urtica dioica*.

Figure 5-8 Dry meadows and grassy verges (GS2) habitat at the Site of the Proposed Development.

5.3.5 Habitat evaluation

Habitats have been evaluated below in Table 5-6 for their conservation importance, based on the NRA evaluation scheme (NRA, 2009b). Those selected as Key Ecological Receptors are those which are evaluated to be of at least local importance (higher value). The impact of the Proposed Development on these receptors are assessed in Section 5.5 of this Chapter. The summary in Table 5-6 indicates the evaluation rating assigned to each habitat and the rationale behind these evaluations.

Table 5-6: The evaluating rating assigned to each habitat and the rationale behind the evaluation.

Species	Evaluation	Rationale	Key Ecological Receptor (KER)
Buildings and artificial surfaces (BL3)	Local importance (lower value)	Man-made habitat with little to no vegetation present, low biodiversity value.	No
Recolonising bare ground (ED3)	Local importance (lower value)	Disturbed habitat with low biodiversity value. Although this habitat may offer a temporary food source for birds (seeds from vegetation) it is not of conservation value.	No
Spoil and Bare ground (ED2)	Local importance (lower value)	Disturbed habitat with low biodiversity value.	No
Scrub (WS1)	Local importance (higher value)	This habitat may offer a foraging/roosting habitat for birds, bats and small mammals in terms of connectivity, shelter and foraging.	**Yes**
Hedgerows (WL1)	Local importance (higher value)	Important habitat for a variety of species of bird, bats and small mammals in terms of connectivity, shelter and foraging.	**Yes**
Treelines (WL2)	Local importance (higher value)	Important habitat for a variety of species of bird, bats and small mammals in terms of connectivity, shelter and foraging.	**Yes**
Dry Meadows and Grassy Verges (GS2)	Local importance (higher value)	This habitat is unmanaged and may provide habitat for birds and small mammals in terms of connectivity, shelter and foraging.	**Yes**

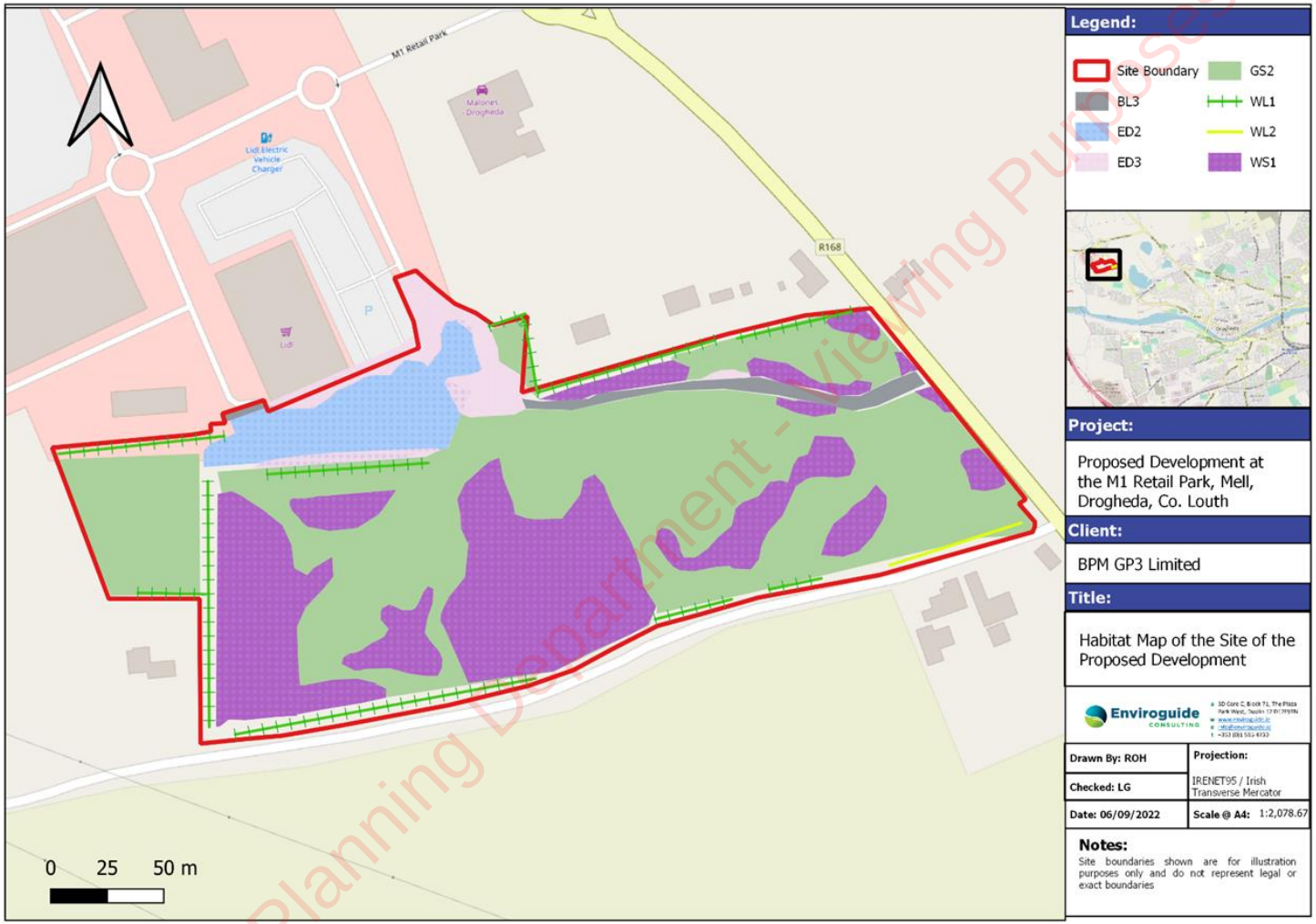

Figure 5-9. Habitat map of the Proposed Development Site.

5.3.6 Species and species groups

5.3.6.1 Flora

5.3.6.1.1 Rare and Protected Flora

Species records available from the National Biodiversity Data Centre (NBDC) online database for the 2 km grid square O07T and 1km Grid square O0676 were studied for the presence of rare or protected flora species. A review of the above datasets yielded no records. Furthermore, according to the *Flora Protection Order - Bryophytes Map Viewer*[3] provided by the Department of Arts, Heritage and the Gaeltacht (DAHG), there are no records for bryophytes listed on the Flora Protection Order within the vicinity of the Proposed Development.

No rare or protected flora were identified within the Site of the Proposed Development during surveys.

5.3.6.1.2 Invasive Species

Japanese knotweed *Reynoutria japonica* was recorded within the 2km grid square O07T, no invasive species were recorded within the 1km grid square O0676.

No high impact invasive plant species were recorded at the Site during the surveys carried out on the 18th of July or 22nd of September 2022. Two non-native, medium impact species were recorded within the Site boundary, Butterfly-bush *Buddleja davidii* and Sycamore *Acer pseudoplatanus*. As previously mentioned, neither species are listed under regulation S.I. 477[4].

Source: National Biodiversity Data Centre [https://maps.biodiversityireland.ie/Map] [Accessed 21-07-2022]

5.3.6.2 Mammals (excl. bats)

Four native terrestrial mammals were recorded within the 2km grid square O07T, all of which are afforded legal protection under the Wildlife (Amendment) Act, 2000, namely Eurasian Badger *Meles meles*, Irish Hare *Lepus timidus* subsp. *hibernicus*, Pine Marten *Martes martes* and West European Hedgehog *Erinaceus europaeus*.

[3] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e

[4] Two non-native, medium impact invasive species was recorded at the Site during walk over surveys, Butterfly-bush and Sycamore. There are no NBDC records of invasive flora for the 1km grid square within which the Site of the Proposed Development is located.

Table 5-7 National Biodiversity Data Centre records of native and non-native mammals within the 2km grid square O07T and 1km grid square O0676.

Species Group	Name	Grid square	Date of last record	Database	Legal Status	Conservation status
Terrestrial Mammals (Native)	Eurasian Badger	O07T	30/05/2015	Atlas of Mammals in Ireland 2010-2015	- Wildlife (Amendment) Act 2000 - Berne Convention Appendix III	Least Concern
	Irish Hare	O07T	08/02/2015	Atlas of Mammals in Ireland 2010 – 2015	- Wildlife (Amendment) Act 2000	Least Concern
	Pine Marten	O07T	28/05/2013	Atlas of Mammals in Ireland 2010 – 2015	- EU Habitats Directive – Annex V - Wildlife (Amendment) Act 2000	Least Concern
	West European Hedgehog	O07T O0676	04/10/2012 10/08/2010	Road Kill Survey	- Wildlife (Amendment) Act 2000 - Bern Convention Appendix III	Least Concern
Terrestrial Mammals (non-native)	European Rabbit	O07T	05/07/2014	Atlas of Mammals in Ireland 2010 – 2015	- Medium Impact Invasive Species	

No rare or protected mammal species were directly recorded during the Site surveys. No evidence of Badger activity such as setts or latrines were recorded at the Site. Areas of the Site contained dense impenetrable scrub, the perimeter of the dense scrub habitat was surveyed where accessible and no evidence of mammal activity (entrance / exit trails, scat, snuffle holes etc.) was noted.

Feeding signs in the form of small dug out pits were observed within the dry meadows and grassy verges habitat (GS2). As these pits were relatively small, and dug out on one side only, these feeding signs were attributed to Rabbits. Badger also make similar pits (referred to as 'snuffle-holes' however these are typically larger (10cm-15cm across) with the material dug out on more than one side (Dept. Agricultural, Environmental and Rural Affairs, UK).

Figure 5-10. Evidence of Rabbit activity within the Dry meadows and grassy verges habitat at the Site.

Red fox may visit the Site as they are a relatively widespread species. Although not afforded the same level of protection as the other mammal species mentioned above; wilful harming of the animal should be avoided. Fox is also protected from a variety of hunting/extermination techniques as per the Wildlife Acts 1976 to 2012; and from acts of cruelty as per the Animal Health and Welfare Act 2013.

Smaller mammals such as Hedgehog and Pygmy Shrew are likely present at the Site of the Proposed Development due to an abundance of suitable habitat (i.e., high cover grassland, scrub and hedgerows).

Otter (*Lutra lutra*) are listed as a qualifying interest for the River Boyne and River Blackwater SAC and likely utilise sections of the Boyne and Mell Stream downstream of the Proposed Development. There is no habitat on Site for Otter, the area of the Mell stream adjacent to Dry Bridge was assessed for its potential habitat suitability for Otter. No field signs (spraints, prints, holts or couches) along the area of the proposed works were identified, however Otter likely utilise the Mell stream for commuting. It is noted that the Mell stream is located outside of the Proposed Development Site, the details of the discharge location to the Mell stream will be agreed with the Local Authority following a pre-construction ecological survey, should a grant of planning be forthcoming.

5.3.6.3 Bats

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats Directive and some, such as the lesser horseshoe bat, are given further protection and listed on Annex II of this Directive. The obligations of the Habitats Directive

have been transposed into Irish law and combined with the Wildlife Acts 1976 to 2018, ensure that individual bats and their breeding sites and resting places are fully protected. This has important implications for those who own or manage sites where bats occur.

All bat species are protected under the Wildlife Acts which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Acts permit limited exemptions for certain kinds of development.

There are no records for bat species within the 1km and 2km NBDC Grid Squares associated with the Site of the Proposed Development.

According to the NBDC's bat suitability index (Lundy *et al*. 2011), which provides a visual map of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species; the area surrounding the Site of the Proposed Development carries an overall bat suitability score of 33.89 out of 100. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The species with the highest individual suitability scores for the area encompassing the Site are Lesser Noctule *Nyctalus leisleri*, Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus* with 47,47 and 44, respectively.

5.3.6.3.1 Potential Bat Roost Assessment

Most of the Site is comprised of Butterfly bush, Bramble and Willow dominated scrub habitat and dry meadows and grassy verges habitat. Portions of the northern, western, and southern boundary are bounded by linear habitat features such as hedgerows. In addition, 5 no. trees are located along the south-eastern Site boundary. These habitats were assessed for their bat roost potential and commuting/foraging suitability. All trees on-site were considered to have 'low' bat roost potential given the nature of potential bat roost features present, as outlined in Table 4.1 in the Bat Conservations Trust's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Given the interspersed nature of these trees coupled with their degree of connectivity to the surrounding landscape, these trees are likely of low-moderate commuting value for bats. The linear hedgerow habitats to the west and south of the Site are considered to offer 'moderate' foraging and commuting suitability to bats given the degree of connectivity of the Site to the surrounding landscape (Collins, 2016). The hedgerows on Site are considered to have 'negligible' bat roost potential (Collins, 2016).

5.3.6.3.2 Bat Activity

In general, bat activity across the Site was low during the bat activity survey on the 20th of July 2022, with the majority of activity confined to the northern portion of the Site (Figure 5-11). In total, 3 bat species were recorded, Common Pipistrelle (*Pipistrellus pipistrellus*) Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*) (Table 5-8). Common Pipistrelle was the most common bat encountered, accounting for 52% of recordings, followed by Leisler's bat (27%) and Soprano Pipistrelle (21%). The majority of bats were recorded commuting across the Site, however, feeding buzzes (rapid calls emitted before capturing prey) were heard from Soprano Pipistrelle at 23:04 and Common Pipistrelle at 23:10. In addition, the call shapes of all Leisler's bats were indicative of foraging activity high over open ground (Russ, 2012). Therefore, it is likely that bats utilise the area of scrubland to the north and centre of the Site as foraging habitat. Several Common Pipistrelle and Leisler's bat were also recorded foraging/commuting along the hedgerow to the northwest of the Site during the survey. No bat activity was recorded along the hedgerows to the west and south of the Site

(Figure 5-11). As the scrub in these areas was thick and impenetrable in places, it was possible to get within 20-50m of these habitats at best. As such, bat activity in this area may not be detected, however, these habitats are likely to offer moderate foraging and commuting value to bats. No bats were detected in the in the vicinity of the 5 trees along south-eastern Site boundary (Figure 5-11).

Table 5-8. Summary of bat activity recorded during bat activity surveys on the 20th of July 2022 (non-bat 'noise' records were removed).

Species	Common name	Number of recordings	Number of calls
Pipistrellus pipistrellus	Common Pipistrelle	10	260
Nyctalus leisleri	Leisler's Bat	5	26
Pipistrellus pygmaeus	Soprano Pipistrelle	4	133

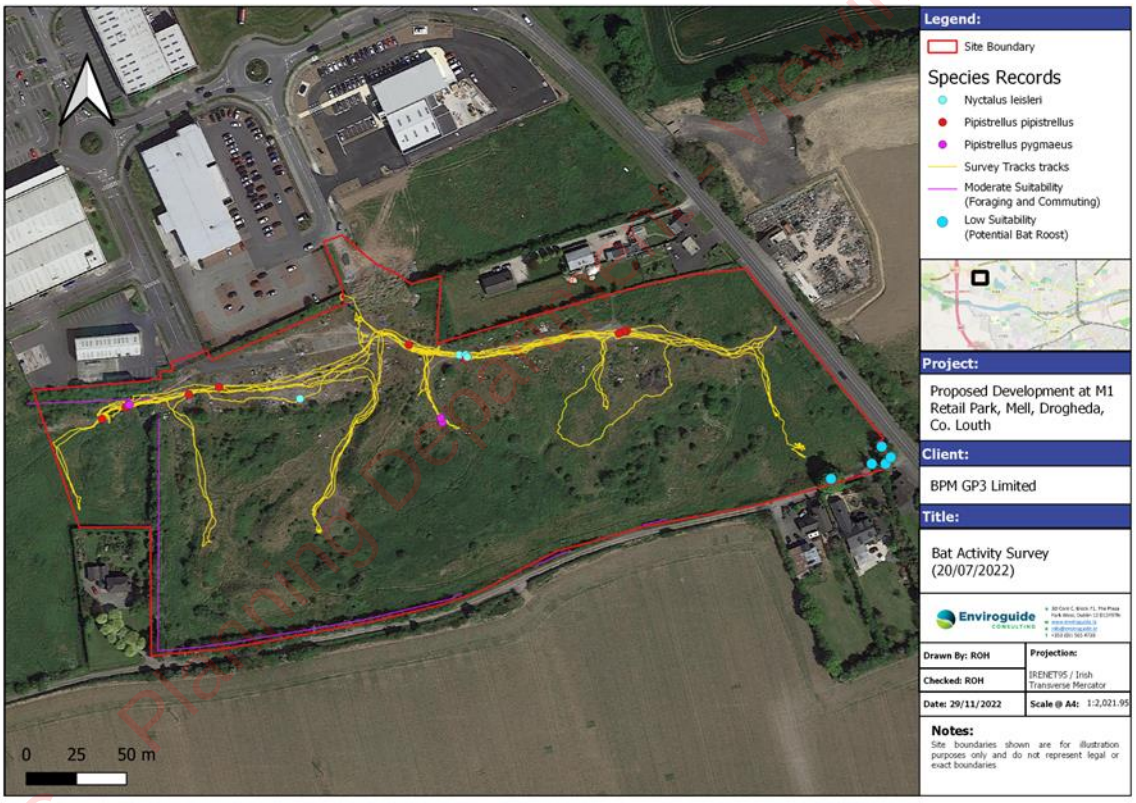

Figure 5-11. Bat activity survey results from the survey of the Site on the 20th of July 2022 (species points indicate bat passes and not necessarily individual bats).

5.3.6.4 Birds

Sixty-two bird species were recorded within the 2km grid square O07T, seven of which are on the Red List of the *Birds of Conservation Concern*[5] *in Ireland 2020-2026* (Gilbert et al., 2021)., twenty-one of which are on the Amber List of the Birds of Conservation Concern.

Red listed species recorded within the 2km grid square O07T:

- Common Goldeneye *Bucephala clangula*
- Common Kestrel *Falco tinnunculus*
- Common Pochard *Aythya ferina*
- Common Swift *Apus apus*
- Meadow Pipit *Anthus pratensis*
- Redwing *Turdus iliacus*
- Yellowhammer *Emberiza citrinella*

Amber listed species recorded within the 2km grid square O07T:

- Barn Swallow *Hirundo rustica*
- Black-headed Gull *Larus ridibundus*
- Common Coot *Fulica atra*
- Common Linnet *Carduelis cannabina*
- Common Shelduck *Tadorna tadorna*
- Common Starling *Sturnus vulgaris*
- Eurasian Teal *Anas crecca*
- European Greenfinch *Carduelis chloris*
- Goldcrest *Regulus regulus*
- Goosander *Mergus merganser*
- Great Cormorant *Phalacrocorax carbo*
- Great Crested Grebe *Podiceps cristatus*
- Herring Gull *Larus argentatus*
- House Sparrow *Passer domesticus*
- Mallard *Anas platyrhynchos*
- Mute Swan *Cygnus olor*
- Northern Fulmar *Fulmarus glacialis*
- Sky Lark *Alauda arvensis*
- Spotted Flycatcher *Muscicapa striata*
- Tufted Duck *Aythya fuligula*
- Willow Warbler *Phylloscopus trochilus*

Limited bird species were recorded during the breeding bird survey conducted on the 6th of July 2022. Bird activity within the Site of the Proposed Development was recorded using a combination of direct sightings and identification of songs and calls. Three transects were walked through the Proposed Development Site to record all species present. Each transect was divided up into four parts (all a similar distance) and the transect was walked with all

[5] Gilbert et al., (2021). Birds of Conservation Concern in Ireland 2020 – 2026.

species noted at each side of the ecologist. Distance brackets were also used, however, due to the lack of suitable habitat outside of the Site, the majority of species were recorded inside the Site boundary and within 50 meters each side of the surveyor on each transect.

A total of eighteen species were identified at the Site of the Proposed Development. All species recorded during the survey are shown below in Table 5-. One Red Listed species was recorded at the Site, Meadow Pipit. Three species recorded at the Site are on the Amber List of the Birds of Conservation Concern in Ireland, House Sparrow (*Passer domesticus)*, Linnet *(Carduelis cannabina)* and Swallow (*Hirundo rustica)*. All other species observed at the Site are on the Green List of the Birds of Conservation Concern in Ireland (Gilbert et al., 2021).

Table 5-10. Bird species recorded on the Site during the surveys on the 6th of July 2022.

Species	BoCCI[6] status	Breeding Activity
Wren *Troglodytes troglodytes*	Green	Recently fledged young
Woodpigeon *Columba palumbus*	Green	
Whitethroat *Sylvia communis*	Green	
Swallow *Hirundo rustica*	Amber	
Stonechat *Saxicola torguatus*	Green	Recently fledged young
Rook *Corvus frugilegus*	Green	
Robin *Erithacus rubecula*	Green	
Reed Bunting *Emberiza schoeniclus*	Green	
Pied Wagtail *Motacilla alba yarrellii*	Green	
Meadow Pipit *Anthis pratensis*	Red	
Magpie *Pica pica*	Green	
Linnet *Carduelis cannabina*	Amber	Recently fledged young
House Sparrow *Passer domesticus*	Amber	Recently fledged young
Hooded Crow *Passer domesticus*	Green	
Goldfinch *Carduelis carduelis*	Green	Recently fledged young
Dunnock *Prunella modularis*	Green	Recently fledged young
Chaffinch *Fringila coelebs*	Green	
Blackbird *Turdus merula*	Green	

[6] Birds of Conservation Concern in Ireland 4: 2020-2026 Gilbert, G. Stanbury, A. and Lewis, L., 2021.

An initial assessment of the area of the Mell stream adjacent to Dry Bridge determined that the stream does not provide suitable breeding habitat for Kingfisher. Kingfisher require steep, vertical to near vertical banks of soft exposed earth faces (Cummins *et al*. 2010). The area of the Mell stream adjacent to Dry Bridge was heavily vegetated and lacked suitable perch sites for foraging. Based on this initial assessment, the area of the Mell stream proposed for the installation of a headwall does not provide suitable habitat for Kingfisher.

5.3.6.5 Fish

5.3.6.5.1 Atlantic Salmon (*Salmo salar*)

There are three salmonid fish species native to Ireland, namely Atlantic Salmon *Salmo salar*, Brown Trout *S. trutta* and Arctic Char *Salvelinus alpinus*. In Ireland, Arctic Char are confined to lentic habitats. They typically occur in upland lakes, corries, as well as lowland small and larger lakes with areas of deep water. Given the lack of suitable habitat for Arctic Char in the vicinity of the Proposed Development, they are not considered threatened by it and are therefore not considered further in this report. Conversely, Brown Trout are a relatively common species, occurring in almost every brook, stream, river and lake in Ireland (Kennedy and Fitzmaurice, 1971 cited in King et al., 2011). In addition, anadromous populations (sea trout) occur in many coastal river systems. Brown Trout are protected by the Fisheries Acts 1959 to 2006.

Atlantic Salmon are generally widespread in Ireland where habitat quality is suitable and access to river systems from the sea is possible (no barriers to obstruct migration). Atlantic Salmon are listed under Annex II and V of the Habitats Directive and are protected by the Fisheries Acts 1959 to 2006. Furthermore, Atlantic Salmon are categorised as ‘vulnerable’ in the Irish Freshwater Fish Red List (King et al., 2011).

There are no NBDC records of this species in the 2km and 1km national grid squares associated with this Site. No suitable habitat for this species is present at the Site of the Proposed Development, however, they likely occur within the Mell Stream and River Boyne. Salmon are a qualifying interest for the River Boyne and River Blackwater SAC.

5.3.6.5.2 Lamprey (Lampetra sp. & Petromyzon marinus)

Ireland has three native lamprey species, Sea Lamprey P*etromyzon marinus*, River Lamprey *Lampetra fluviatilis* and Brook Lamprey *L. planeri*. The latter species is potamodromous whereas the two former species are anadromous. All three species are listed under Annex II of the Habitats Directive and are protected by the Fisheries Acts 1959 to 2006. Sea Lamprey are categorised as ‘near threatened in the Irish Freshwater Fish Red List (King et al., 2011). Lamprey surveys in Ireland are focussed on juvenile lampreys, as *L. fluviatilis* and *L. planeri* are indistinguishable as juveniles, most available data relates to “*Lampetra* sp.” and cannot be assigned to one species or the other.

It is highly unlikely that Sea Lamprey will be affected by the Proposed Development. The most important locations for Sea Lamprey in Ireland are the Lower Shannon, the River Suir in Clonmel, the River Nore in Kilkenny, the River Moy in Ballina and the River Corrib in Galway (Igoe et al., 2004). Sea Lamprey were recorded in the River Liffey at Island Bridge in 1906 (Igoe et al., 2004).

Although juvenile lamprey typically inhabit slow flowing, silty habitats within rivers (Kelly & King, 2001), adult lamprey require similar spawning habitats to salmonids (clean gravels) and

may occur within the River Boyne. There are no records for any species of lamprey within the 2km or 1km grid squares associated with the Site. No suitable habitat for these species was present at the Site of the Proposed Development, however, they may occur downstream in the Mell Stream and River Boyne.

5.3.6.5.3 European eel (Anguilla anguilla)

European Eel are a red listed species and are currently considered to be the most threatened fish species in Ireland, following a red-listed publication (King *et al*. 2011). European Eel can inhabit a range of waterway types including lakes, small streams and rivers; migrating from where they live in freshwater habitats to breed out at sea, before returning as a young eel to their freshwater homes (King et al. 2011). Eels are protected by the Fisheries Acts 1959 to 2006, conservation of Eel fishing bye-law No. C.S. 303, 2009; EC Regulation (Council Regulation 1100/2007) for the recovery of the Eel stock and are listed under CITES Annex II (King et al., 2011). There are no NBDC records of European Eel within the 2km and 1km grid squares associated with this Site and no suitable habitat for this species is present on the Site of the Proposed Development. They may occur downstream of the Site within the Mell Stream and River Boyne.

5.3.6.6 Amphibians

There are no records of Common Frog *Rana temporaria* or Smooth Newt *Lissotriton vulgaris* within the 2km and 1km grid squares associated with the Proposed Development. The Proposed Development Site does not contain drainage ditches, attenuation ponds or slow flowing river habitats and therefore does not provide a suitable habitat for these species.

5.3.6.7 Invertebrates

5.3.6.7.1 White-clawed Crayfish (Austropotamobius pallipes)

In Ireland, the white-clawed crayfish most commonly occurs in small and medium-sized lakes, large rivers, streams and drains, wherever there is sufficient lime (Reynolds, 2007). The overall conservation status of the white-clawed crayfish in Ireland is inadequate, due to the reduction in its range and the continuing pressures that it faces (NPWS, 2013).

There are no records for this species within the 2km or 1km grid squares which encompasses the Site of the Proposed Development and no suitable habitat types are present within the Site. This species may occur downstream within the Mell Stream or River Boyne.

5.3.6.7.2 Marsh Fritillary (Euphydryas aurinia)

Marsh Fritillary butterfly is listed under Annex II of the EU Habitats Directive and is the only insect protected by law in Ireland. There are records for this species within the 2km grid square O07T. Neither Marsh Fritillary, nor its associated food plant; Devil's bit scabious (*Succisa pratensis*), were recorded during site surveys. Butterfly forms of Marsh Fritillary are active in May-June and Devil's bit scabious flowering in July-September.

The Site does not contain wet grassland, a habitat often inhabited by this species. It is deemed that the Site does not provide suitable habitat for Marsh Fritillary.

5.3.6.8 Other species and species groups

There are no records of common lizard *Zootoca vivipara* within the 2km grid square O07T. In addition, this species is associated with coastal and heathland habitats, but also locally in rural gardens, stone walls and roadside verges (King et al., 2011). The habitats at the Site of the Proposed Development are not considered suitable for this species and this species is not assessed further.

5.3.6.9 Designated sites and species evaluation

Fauna that have the potential to utilise the immediate area of the Proposed Development Site, or for which records exist in the wider area, have been evaluated in Table 5- for their conservation importance. Designated sites considered to have the potential to be impacted by the Proposed Development via impact pathways e.g., hydrological links to the Site, are also assessed in this table. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009b). The rationale behind these evaluations is also provided. The NRA (2009a) defines key ecological receptors as those ecological features which are evaluated as Locally Important (higher value) or higher, that are likely to be impacted significantly by the Proposed Development. Internationally important receptors would include Special Areas of Conservation (SAC) or Special Protected Areas (SPA) while those of national importance would include Natural Heritage Areas (NHA).

Table 5-11. Evaluation of designated sites and fauna recorded within the surrounding area of the Proposed Development Site.

Designated Sites/Species	Evaluation	Key Ecological Receptor (KER)	Rationale
Designated Sites			
River Boyne and River Blackwater SAC (002299) Boyne Coast and Estuary SAC (001957) Boyne Estuary SPA(004080)	International Importance	**Yes**	Potential impacts to these European Sites are addressed in the AA screening and NIS which accompany this application under a separate cover.
Boyne Coast and Estuary pNHA (001957)	National Importance	**Yes**	This pNHA boundary is contiguous with the boundary of the Boyne Coast and Estuary SAC and Boyne Estuary SPA. As such, potential impacts to the Boyne Coast and Estuary pNHA are addressed in the AA screening and NIS which accompany this application under a separate cover.
Mammals			
Eurasian Badger	Local Importance (Lower value)	No	The badger is an adaptable species of lowland grassland and woodland habitats (Marnell et al., 2009). There was no evidence of badger utilizing the Site of the Proposed Development.
West European Hedgehog	Local Importance (Higher value)	**Yes**	Potential nesting/foraging habitat for hedgehog is present on Site in the scrub, hedgerow and grassland habitat.
Eurasian Pygmy Shrew	Local Importance (Higher value)	**Yes**	Pygmy shrews are found throughout Ireland in a variety of habitats ranging from areas bordering coniferous and deciduous woodland to any area with good ground cover such as grassland, heaths, hedgerows, peatlands and sand dunes. Potential nesting/ foraging habitat on Site in the scrub, hedgerow and grassland habitat.
European Otter	Local Importance (Higher value)	**Yes**	No potential habitat at the Site to support Otter, however, they may occur downstream of the Proposed Development in the Mell Stream and River Boyne which are hydrologically connected to the Site.
Pine Marten	Local Importance (Lower value)	No	The habitats at the Site of the Proposed Development are considered unsuitable for this species due to the lack of woodland/forestry.
Irish Hare	Local Importance (Lower value)	No	The favoured habitat of the Irish hare is improved grassland (Marnell et al., 2009). The habitats at the Site of the Proposed Development are considered unsuitable for this species.

Designated Sites/Species	Evaluation	Key Ecological Receptor (KER)	Rationale
Red Fox	Local Importance (Lower value)	No	Although this species is likely to occur at the Site, it is not considered to be of conservation concern and therefore is not assessed further in this report.
Bat Assemblage	Local Importance (higher value)	**Yes**	Potential foraging and commuting habitat at the Site of the Proposed Development.
Birds			
Bird assemblage (**Red** listed)	Local Importance (Higher value)	**Yes**	One Red listed species recorded on Site.
Bird assemblage (**Amber** listed)	Local Importance (Higher Value)	**Yes**	Three species recorded at the Site are on the Amber List of the Birds of Conservation Concern in Ireland, House Sparrow, Linnet and Swallow.
Bird assemblage (**Green** listed)	Local Importance (Higher Value)	**Yes**	Fourteen green listed species were recorded utilising the Site.
Amphibians			
Common Frog	Local Importance (Lower value)	No	There are no suitable breeding sites (ditches, attenuation pond) within the Site of the Proposed Development.
Smooth Newt	Local Importance (Lower value)	No	There are no suitable breeding sites (ditches, attenuation pond) within the Site of the Proposed Development.
Fish			
Brown Trout; European Eel; Brook and River Lamprey.	Local Importance (Higher value)	**Yes**	No potential habitat at the Site to support these species, however they may occur downstream of the Proposed Development in the Mell Stream or River Boyne which are hydrologically connected to the Site via the local surface water drainage network.
White-clawed Crayfish	Local Importance (Higher value)	**Yes**	No potential habitat at the Site to support these species, however they may occur downstream of the Proposed Development in the Mell Stream or River Boyne which are hydrologically connected to the Site via the local surface water drainage network.

5.4 Characteristics of the Proposed Development

The Proposed Development will consist of the construction of a retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a *DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.* Potential Impact of the Proposed Development

5.5 Potential Impact of the Proposed Development

As per the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA,2009), likely effects have been assessed for Key Ecological Receptors only, as listed in Table 5-11. All impacts are described in the *absence of mitigation.*

The following were identified as KERs:

Designated Sites

- River Boyne and River Blackwater SAC (002299)
- Boyne Coast and Estuary SAC (001957)
- Boyne Estuary SPA(004080)
- Boyne Coast and Estuary pNHA (001957)

Habitats

- Hedgerows and Treelines - WL1/WL2
- Dry Meadows and Grassy verges - GS2
- Scrub - WS1

Species/ Species Groups

- Small mammals
- European Otter within the Mell Stream and River Boyne
- Bat assemblage
- Bird assemblage
- Fish species within the Mell Stream and River Boyne (e.g., salmonids, eel, lamprey)
- White-clawed Crayfish within the Mell Stream and River Boyne if present

The potential significant effects of the Proposed Development on European Sites are addressed in the AA Screening Report and NIS accompanying this application.

5.5.1 Construction Phase

5.5.1.1 Impacts to Designated Sites

The AA Screening Report (Enviroguide, 2022) has concluded that, on the basis of objective information, the possibility cannot be ruled out that the Proposed Development will not have a significant effect on the European Sites listed below:

- River Boyne and River Blackwater SAC (002299)
- Boyne Coast and Estuary SAC (001957)
- Boyne Estuary SPA(004080)

A Natura Impact Statement (NIS) has been prepared by Enviroguide and accompanies this planning application under a separate cover. The NIS concludes the following:

"This Natura Impact Statement details the findings of the Stage 2 Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the Proposed Development planning application at the M1 Retail Park, Mell, Drogheda, Co. Louth, on the following European Sites:

- *River Boyne and River Blackwater SAC (002299)*
- *Boyne Coast and Estuary SAC (001957)*
- *Boyne Estuary SPA (004080)*

The above sites were identified by a screening exercise that assessed likely significant effects of a range of impacts that have the potential to arise from the Proposed Development. The Appropriate Assessment investigated the potential direct and indirect effects of the proposed works during the Construction Phase, on the integrity and qualifying interests of the above European Sites, alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives.

Where potentially significant adverse effects were identified, a range of mitigation and avoidance measures have been proposed to negate them. Therefore, as a result of the complete, precise and definitive findings of this Appropriate Assessment; it has been concluded ***beyond any reasonable scientific doubt****, that the Proposed Development will not have any significant adverse effects on the above or any European Sites.*

As a result of the complete, precise and definitive findings in this NIS, it has been concluded, beyond reasonable scientific doubt, that the Proposed Development will have no adverse effects on the qualifying interests, special conservation interests and on the integrity and

extent of the River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC and Boyne Estuary SPA. Accordingly, the Proposed Development will not adversely affect the integrity of any European Site."

The Boyne coast and estuary pNHA is linked to the Site via potential inadvertent surface water discharges to the Mell Stream and ultimately the River Boyne. As the boundary of this pNHA is contiguous with the boundary of the Boyne Coast and Estuary SAC and Boyne Estuary SPA the potential impacts to this hydrologically linked site are covered in detail within the NIS which accompanies this application under a separate cover.

5.5.1.2 Impacts to Habitats and Flora

The majority of the existing grassland habitat on Site will be lost to facilitate the Proposed Development. This habitat is considered to be relatively common in the surrounding landscape. The removal of the Dry meadows and grassy verges, scrub and hedgerow habitat, along with the fragmentation of an ecological corridor constitutes a *negative, permanent, moderate* impact in the absence of suitable mitigation.

One tree within the treeline on Site is scheduled for removal. The remaining trees within this treeline will be retained and protected for the duration of the Proposed Development; this represents a *positive, permanent, neutral* impact.

Hard and soft landscape works at the Site of the Proposed Development will be completed as part of the main contract construction works, with all tree and shrub planting completed within the first suitable planting season after completion of construction works. The planting of native trees and shrubs at the Site will have a *positive, permanent, moderate* impact at a Site level. The landscape design also includes a wildflower meadow, this will have a *positive, permanent, moderate* impact at a Site level.

5.5.1.3 Impacts on Terrestrial Fauna

5.5.1.3.1 Small mammals

The Site of the Proposed Development contains habitats suitable for small mammals such as Hedgehog and Pygmy Shrew (scrub, grassland, hedgerows). Clearance of vegetation may put these species at risk of injury or death if present when clearance is taking place. This risk constitutes a *negative, short-term, moderate* impact on the local population of these species.

Small mammal species have the potential to become entangled in construction materials such as netting and plastic sheeting, as well as other waste materials, causing entrapment and injury or death. This constitutes a *negative, short-term, significant* impact at a local level.

Disturbance to mammals due to noise and dust generated during the Construction Phase, although unlikely, is possible and, as such a precautionary approach is adopted with these disturbances representing a potential *negative, short-term, slight* impact at a local level.

5.5.1.3.2 Birds

Several bird species were recorded utilising the hedgerow, grassland and scrub habitats within and bordering the Site. Should vegetation be cleared or cut back during the breeding bird season (March 1st to August 31st); there is the potential for nesting birds to be harmed and nests to be destroyed. This would be in contravention of the Wildlife Act 1976 (as amended) which provides protection to breeding bird species and their nests and young. In the absence

of mitigation or preventative measures, this risk constitutes a *negative, short-term, significant* impact on local bird populations.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, moderate* impacts to local bird populations in the absence of mitigation.

5.5.1.3.3 Bats

Felling of trees may place a bat at risk of injury or death if it is present within a tree at the time of felling. This constitutes a *negative, short-term, significant* impact on bats. In addition, there is a potential *negative, short-term, moderate* impact on bats from Construction Phase lighting at the Site in the absence of mitigation measures. There will also be the loss of commuting and foraging habitat at the Site. Although efforts have been made to retain the boundary treelines where possible, the loss of these features represents a *negative, permanent, moderate* impact at a local scale.

5.5.1.4 Impacts on Semiaquatic and Aquatic Fauna

5.5.1.4.1 Otter

There is potential for the Proposed Development to result in indirect effects on Otter within the River Boyne as a result of reduction of water quality within the Mell Stream or River Boyne or Boyne Estuary. The reduction of water quality and consequent impact on fish species has the potential to impact Otter by reducing prey availability within the Mell Stream or River Boyne. This constitutes a *negative, short-term, moderate* impact in the absence of suitable water quality mitigation

There is no habitat within the main Site for Otter, however Otter likely utilise the Mell Stream for commuting. No signs of Otter were present in the immediate vicinity of the proposed works area adjacent to the Mell Stream. The near stream works required for the installation of the surface water headwall does not have the potential to impact any commuting territories along the Mell Stream in terms of physical impediments. However, there is potential for minor disturbance to Otter during the near stream works should they be present in the vicinity, this constitutes a *negative, short-term, moderate* impact in the absence of suitable mitigation.

5.5.1.4.2 Fish and White-clawed Crayfish

There is potential for negative impacts on Fish and White-clawed crayfish in the Mell Stream or River Boyne due to a reduction of water quality. Negative impacts could result from water quality deterioration due to surface water run-off containing silts, hydrocarbons, cementitious materials and other chemicals used in construction. This constitutes a *negative, short-term, moderate impact* at the local level in the absence of suitable water quality mitigation.

5.5.2 Operational Phase

5.5.2.1 Impacts to Designated Sites

There will be no impacts to designated sites during the Operational Phase of the Proposed Development.

5.5.2.2 Impacts on Habitats and Flora

The landscape design for the Proposed Development includes a native woodland mix along the southern boundary of the Site, species proposed here include Oak *Quercus* sp., Scots pine *Pinus sylvestris*, Birch *Betula* sp., Mountain ash *Sorbus aucuparia*, Holly *Ilex aquifolium*, Hazel *Corylus avellana* and Hawthorn *Crataegus monogyna (Figure 5-12)*. On the northern Site boundary, it is proposed to plant an open planting of narrow columnar trees (Downy birch *Betula pubescens* and Oak *Quercus robur)* combined with larger tree specimens such as Scots pine and Oak *Quercus petraea* and a understorey of Holly, Hazel, Hawthorn, Blackthorn *Prunus spinosa* and Guelder rose *Viburnum opulus*. The significant increase in native tree planting at the Site will have *a positive, permanent, moderate* impact at a local level and will maintain habitat connectivity around the margins of the Site into the future.

Figure 5-12. Landscape plan for the Proposed Development (Stephen Diamond, Drg. No. 22-574-SDA-PD-DR-GF-001)

5.5.2.3 Impacts on Fauna

5.5.2.3.1 Small mammals

During the Operational Phase, there is potential for disturbance to small mammals utilising the Site in general through night-time light pollution. This could have a *negative, permanent, moderate* impact on local small mammals.

5.5.2.3.2 Birds

No significant effects on birds are anticipated during the Operational Phase. The planting of native trees, shrubs and wildflowers at the Site of the Proposed Development will have a

positive, permanent, moderate impact to local birds, providing potential nesting and foraging habitat.

5.5.2.3.3 Bats

During the Operational Phase of the Proposed Development, there is potential for disturbance to local bats utilising the general area through night-time light pollution. Excess light spill could render normally dark commuting and foraging routes unsuitable for bats. Bats were recorded commuting and foraging along the treelines and hedgerows within the Site. The lighting alterations at the Site may act cumulatively with other changes to the surrounding area. This is considered to represent a *negative, permanent, moderate* impact to bats in the absence of mitigation.

The planting of native tree species at the Site provides potential foraging, commuting and roosting habitat for bats at the Site, this is considered to represent a *positive, permanent, moderate* impact to bats.

5.5.2.3.4 Semi-aquatic and aquatic fauna

No significant effect on semi-aquatic and aquatic fauna are anticipated during the Operational Phase. Mandatory SuDS measures have been incorporated into the project design to treat and minimise surface water runoff from the Site.

5.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

5.5.3.1 Existing planning permissions

22682: BPM GP3 Limited. Planning permission was sought for (i) the provision of a new single storey drive-thru restaurant/café within the north-eastern portion of the main car park serving the existing retail park. The proposed development will comprise: (a) provision of a vehicular access and exit point to the north and a pedestrian entrance along the south-eastern elevation of the building; (b) the provision of a total of 17 no. car parking spaces to serve the proposed development (including 1 no. accessible parking space); (c) the installation of signage on the buildings external elevations; (d) the provision of a new access road, pedestrian crossing and a pedestrian circulation area surrounding the proposed pedestrian entrance; (e) the provision of a single storey bin store (10.5sqm) to the north-west; (f) the installation of a speaker/order post and a height restriction barrier adjacent to the vehicular entrance point; and (g) the provision of external signage including a totem sign adjacent to the proposed vehicular entrance, and external seating area, menu boards, a collection window, landscaping, footpaths, boundary treatments, lighting and all ancillary works necessary to facilitate the proposed development; (ii) The proposed development will necessitate

amendments to the existing M1 Retail Park car parking layout, including the removal of 76 no. existing car parking spaces (net loss of 59 no. spaces in total). **A decision on this development was not available at the time of writing this report.** This site lies 200m north of the Proposed Development.

2220 Western Motors Ltd. Planning permission was sought for the construction of a single storey motor showroom and service workshop extension to side of existing building, construction of a single storey remote sales office, along with attached illuminated building signage and all associated site works, including new driveways, parking areas, landscaping, drainage and additional 5m high pylon sign. **Planning permission granted with conditions, decision date: 04/03/2022.** This development lies approximately 0.2km north of the Proposed Development.

211283 / ABP Ref. 311678 Loughdale Properties Ltd. Planning permission was sought for 247 no. dwellings in detached, semi-detached, terraced/townhouse, terraced/duplex and apartment form. Buildings range in height from 1 to 5 storeys in the following mix – 19 no.1 bed, 98 no. 2 bed, 99 no. 3 bed and 21 no. 4 bed. Apartment block 5 will have an undercroft car park. All buildings proposed have the option for the installation of photovoltaic/solar panels. The development will provide for a creche with potential capacity for 65 children. Open public space provided extends to c.9240sq.m. Construction of a footpath with public lighting from northern boundary along southern side of R168 providing pedestrian only connection to the M1 Retail Park. A single vehicular connection to the site is proposed from the Old Slane Road at the southern boundary. Full footpath connectivity will be provided along the Old Slane Rd eastwards to the junction with R168 at Leonards Cross. Works to Old Slane Rd provide for sections of footpath, revised road markings and public lighting. Full footpath connection will be available through site connecting Old Slane Rd to the south with R168 to the north and then on to the M1 Retail Park. All associated site development works incl. a pumping station and rising main, infrastructure and service provision, landscaping, boundary treatments, roads, footpaths and cycle paths, public lighting, ESB substation, electrical vehicle charging points, regrading/infilling of land levels, retaining walls/structures. A Natura Impact Statement was submitted with this application. **Planning permission granted with conditions, decision date: 09/02/2022.** This development lies 0.3km west of the Proposed Development.

211431 Tullybrook Developments Ltd. An extension of duration of 06/510077; 12/510022 and 18/58 for a residential development consisting of 190 units and a 430 sq.m. creche which, shall comprise of a 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services and all associated site works. **Extension of duration granted, decision date: 27/01/2022.** This development lies 0.3 km southwest of the Proposed Development.

211046 Louth County Council. A part 8 application for permission was sought to carry out the development of 20 no. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda, Co. Louth. The development will comprise of the following; Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling New pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e. 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores New pedestrian route from Boice Court

Phase 2 to Cement Road All associated landscaping and ancillary/site development works. **Planning permission granted with conditions, decision date: 14/12/2021.** An AA Screening was submitted with this application with a finding of no significant effects. This development lies 0.7km southeast of the Proposed Development.

LB191735 CAP Developments LLC. Alterations to existing road to the existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.m; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A new main entrance and access control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq.m.; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring 19.46 hectares. An EIAR has been submitted with this application. **Planning permission granted with conditions, decision date: 06/02/2020.** This development lies 2.3km south of the Proposed Development.

19880 Wogans Build Centre. Planning permission was sought for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works. **Planning permission granted with conditions, decision date: 10/12/2019.** This development lies 1km east of the Proposed Development.

5.5.3.2 Relevant Plans and Policies

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

- Louth County Development Plan 2021 – 2027

The Louth County Development Plan 2021 - 2027 has directly addressed the protection of European Sites through specific policies such as Policy NBG 5 which aims to '*ensure that no plan, programme, or project giving rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, duration of construction, operation, decommissioning or from any other effects*

shall be permitted on the basis of this Plan, either individually or in combination with other plans, programmes or projects.' The relevant recommendations and mitigation measures have been integrated into the plan. The core strategy, policies and objectives of the Louth County Development Plan have been developed to avoid the need for developments that would be likely to significantly affect the integrity of a European Site as such there is no potential for the Proposed Development to act in-combination with the Louth County Development Plan.

Existing or proposed projects or plans impacting on the same KERs have the potential to lead to impacts of a higher level of significance when assessed cumulatively. This applies to potential impacts on bats as a consequence of the combined loss of suitable commuting and/or foraging habitat in the locality and potential impacts on birds as a consequence of the combined loss of suitable nesting bird habitat in the locality.

Although the Proposed Development would result in a general loss of habitat in the area, given the vast quantity of agricultural land surrounding the Proposed Development, it is highly unlikely that there would be wide-scale vegetation clearance in the surrounding locality. As such it is unlikely that the above granted developments would result in any significant cumulative impacts with the Proposed Development.

5.5.4 "Do Nothing" Impact

If the Proposed Development were not to proceed, habitats at the Site would continue to evolve. The hedgerow and treeline habitats would continue to serve as ecological corridors for local wildlife, providing habitat connectivity, as well as nesting and foraging habitat for birds and mammals. The scrub habitat would continue to encroach on the grassland habitat. The grassland habitat would continue to offer resources to local pollinators, and the scrub habitat would continue to provide habitat for local wildlife.

5.6 Avoidance, Remedial & Mitigation Measures

5.6.1 Construction Phase

5.6.1.1 Mitigation 1: Construction Phase Surface Water Management

Although there are no waterbodies immediately adjacent to the Proposed Development, the following best practise measures will be put in place to ensure the minimisation of potential impacts to waterbodies as a result of the Proposed Development.

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environmental Section of Louth County Council.

Personnel working on Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international practice including but not limited to:

- CIRIA (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- BPGCS005, Oil Storage Guidelines.

- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004; Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006).
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

The following standard measures will protect surface waters during the Construction Phase of the Proposed Development:

- There will be no discharges to groundwater or surface water during the Construction Phase of the Proposed Development.
- The contractor will ensure that no contaminated water / liquids leave the Proposed Development Site (as surface water run-off or otherwise) and enters the existing drainage at the Site or local drainage gullies on the adjoining roads.
- There may be a requirement for localised dewatering or sump pumping on a temporary basis during excavation works and management of water from these excavations will include control of surface water runoff and pumping of water from excavations.
- Silt fencing will be installed and maintained as a protective measure during the Construction Phase. The silt fencing will act as a temporary sediment control device to protect the public surface water network adjacent to the Site. Silt fencing will be installed along the Site boundaries where there may be a risk of runoff.
- This fencing will be monitored to ensure they remain functional throughout the construction phase of the Proposed Development. Where necessary, maintenance will be carried out to on the fences to ensure they continue to be effective. This will be particularly important after heavy rainfall events. The frequency of the monitoring will depend on the stage of works, and the local environmental conditions. Daily checks may be appropriate during the initial Site clearance and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.
- It will be ensured that all protection measures will be maintained in good and effective condition for the duration of the proposed works and checked regularly to ensure that they are operating effectively.
- To prevent elevated levels of erosion and sedimentation at the Site during the Construction Phase, surface water at the Site will be managed and controlled for the duration of the construction works, until the permanent surface water drainage system for the Proposed Development is complete.
- There will be no cement washout on Site except for washout of chutes, the washings of which will be collected into an appropriate container for compliant off-Site management.

- Run-off from the working Site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with overflows directed to land rather than a watercourse.
- Silty water generated on Site will be treated using settlement ponds and temporary interceptors and traps will be installed until such time as permanent facilities are constructed. Where settlement ponds are not practical due to location constraints, filtration bags or silt buster systems will be utilised
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.
- Any imported materials will, as much as possible be placed on Site in their proposed location and double handling will be avoided. Where this is not possible, designated temporary material storage areas will be used.
- Where cast-in-place concrete is required, all work will be carried out in the dry and effectively isolated from any drainage ditch or surface water sewer.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling stations located on Site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site.
- Only emergency breakdown maintenance will be carried out on Site. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed off Site.
- All personnel working on Site will be trained in pollution incident control response.
- Any other diesel, fuel or hydraulic oils stored on Site will be stored in bunded storage tanks. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCD005).
- All associated waste from portaloos and/or containerised toilets and welfare units will be removed from Site by a licenced waste disposal contractor.

<u>Headwall and Surface Water Sewer Construction</u>

It is proposed to discharge surface water from the Site of the Proposed Development to the Mell Stream, the exact location of the proposed headwall will be agreed with the County Council following grant of planning and a pre-construction ecological survey of the area of works.

The Headwall and base will be construction via *in situ* concrete. If required, sandbags will be placed at the outfall during the Construction Phase.

All near stream works will be carried out in accordance with an approved method statement and under the direction of Inland Fisheries Ireland personnel. Once the schedule of near stream works has been drawn up, the developer will consult with Inland Fisheries Ireland (IFI) before commencing works. All works will be completed in agreement with IFI.

Any works near the Mell Stream will be carried out in accordance with IFI (2016) *Guidelines on the Protection of fisheries during construction works in and adjacent to water*. Works associated with the headwall construction will be supervised by an appropriately qualified Ecological Clerk of Works (EcOW) engaged by the appointed contractor.

Field parameters (pH, temperature and conductivity) will be collected directly downstream of the works, prior to commencement of works for the construction of the headwall. This will confirm the baseline conditions, field parameters will also be collected at regular intervals during the construction works to ensure there is no potential risk to water quality in the Mell Stream or downstream associated waterbodies during the near stream works. The EcOW will visually inspect the water quality during the works, observe for the release of suspended sediment or contaminants to the stream and ensure silt fencing and other protection measures are installed and remain effective for the duration of the works near the Mell Stream. Works for the headwall and surface water sewer will not occur during periods of high rainfall.

5.6.1.2 Mitigation 2: Protection of Habitats

Trees that are proposed to be retained will be protected by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on Site and prior to any development or soil stripping taking place. Areas that are designated for new plantings will similarly be protected. Barriers will be fit for the purpose of excluding construction activity. In most cases barriers will consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage will be affixed to the barrier in an unrestricted easily viewed location. The protective barriers will remain in an undisturbed condition and only removed on completion of all construction activity finished grading and sodding. Any breach of the protective fence will be reported to the consulting arborist.

During the course of the Construction Phase the integrity of the protective fencing must be respected and remain in place at all times. No building materials or soil heaps will be stored within this area. Should essential works need to take place within the root protection area, the project arborist must be informed in advance and any necessary mitigation measures will be put in place. The protective fencing will remain in situ for the duration of the project and will only be removed upon completion of all works. Construction will only commence once the protective barriers and/or ground protection have been erected.

Further information on Tree Protection measures can be found in the Arboricultural Impact Assessment accompanying this application.

5.6.1.2.1 Invasive Species

No high impact or legally controlled invasive plant species were identified on or adjacent to the Site of the Proposed Development during field surveys by Enviroguide Consulting.

The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development.

For the Construction Phase, the contractor will prepare a project specific Invasive Alien Plant Species (IAPS) standard operating procedure document, in advance of work commencement. The document will cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS onsite, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite. These measures to include:

- Validation that all machinery/vehicles are free of IAPS, prior to their first introduction to Site.
- Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS.
- A regular schedule of Site inspections across the SIAPS growing season, for the duration of the Construction Phase.
- Validation that all machinery/vehicles are free of IAPS, prior to leaving the Site.
- Appropriate and effective Site biosecurity hygiene to ensure that no IAPS are transmitted offsite for the duration of the Proposed Development.

Although not considered to be 'high impact' invasive species or listed under regulation S.I. 477, the non-native species recorded at the Site, Sycamore *Acer pseudoplatanus* and Butterfly-bush *Buddleja davidii*, should be controlled/removed as per the appropriate best-practice guidelines and under the supervision of an appropriate qualified invasive species professional. Removal and disposal will be carried out in accordance with appropriate guidelines such as TII (formerly NRA) Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010), with consideration given to the prevention of spread of these plants. Removal and management options for the invasive species found on Site, namely Sycamore and Butterfly Bush are provided below:

5.6.1.2.2 Sycamore

There are no specific eradication methods available for Sycamore, the following guideline for removal and management of this species is amended from the guidelines for Cherry Laurel:

- Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth.
- Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth.
- Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a machine. To avoid regrowth, stumps will be turned upside down and soil will be brushed off the roots.
- Stump regrowth and seedlings can be effectively killed by spraying regrowth with a suitable herbicide. Best practice spraying protocols should be carefully followed. General broadcast spraying is not as effective as stump spot treatment and has the potential to impact on surrounding non-target species. For herbicide treatment to be effective each individual leaf needs be thoroughly wetted with herbicide to kill the plant.
- Disposal of material will be undertaken with due caution to prevent accidental spread of the plant.

5.6.1.2.3 Butterfly Bush

Buddleia (also known as the butterfly bush) is a member of the *Buddlejaceae* family. It is very fast growing and can reach 2m in its first year, producing flowers and setting seed. It colonises bare ground very rapidly and can quickly form mono-typic stands. As buddleia is a plant that

favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care will be taken to ensure material is disposed of in a manner to avoid this risk.

After uprooting, it is essential to plant the ground (e.g., with native flower and shrub species) in order to prevent a flush of new seedling growth.

5.6.1.3 Mitigation 3: Protection of Terrestrial Fauna

5.6.1.3.1 Small mammals

As best-practice, all construction related waste on Site e.g., plastic sheeting, netting etc. will be kept in designated areas on Site and kept off ground level to protect Hedgehogs from entrapment and death. These measures will also act to mitigate potential negative impacts on any other small mammal species potentially utilising the Site.

5.6.1.3.2 Vegetation Clearance

Any clearance of vegetation will be carried out outside the main bird breeding season, i.e., outside the period of 1st March to 31st August, in compliance with the Wildlife Act 1976 (as amended). Should any vegetation removal be required during this period, this vegetation will be checked for bird or nests by a qualified Ecologist. If encountered, the precise location within the hedgerow/trees and the species of bird present will be recorded. The area will be protected and the NPWS will be consulted prior to any works commencing in this area. The Site manager will be informed of the presence of nesting birds and advised that no works can commence in this area until further notice. Appropriate protection measures will be implemented in consultation with the project ecologist.

Table 15-1 provides guidance for when vegetation clearance is permissible. Information sources include the Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act*, 2000.

The preferred period for vegetation clearance is within the months of **September and October**. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., Hedgehog, Pygmy Shrew). Where this seasonal restriction cannot be observed, a check for active roosts and nests will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist/ ornithologist and repeated as required to ensure compliance with legislative requirements.

Table 5-9. Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/works are not permissible.

<table>
<tr><th>Ecological Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Breeding Birds</td><td colspan="2">Vegetation clearance permissible</td><td colspan="6">Nesting bird season. No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist.</td><td colspan="3">Vegetation clearance permissible.</td></tr>
<tr><td>Bats</td><td colspan="8">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist.</td><td>Preferred period for tree-felling</td><td colspan="2">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist</td></tr>
<tr><td>Hibernating mammals (e.g., Hedgehog, Pygmy Shrew)</td><td colspan="3">Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.</td><td colspan="7">Vegetation clearance permissible</td><td colspan="2">Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.</td></tr>
</table>

5.6.1.3.3 Bats and Tree Felling

The over-mature Ash tree identified for removing was identified as holding low bat roost potential. As a precautionary measure, this tree will be subject to a pre-felling survey by a qualified bat ecologist, the evening/ dawn before felling; to confirm the presence or absence of bats.

Should bats be found, felling will be postponed until a derogation licence is obtained by the bat ecologist from the NPWS. This will avoid any harm to bats and the committing of an offence under the The Wildlife Act 1976 as amended. Should the trees be found to be free of bats by the bat ecologist then felling can proceed within 24hrs of the survey, any longer than this and a second survey will be required to ensure bats are not present. Felling of Moderate roost

potential trees will be by 'soft-felling', where the tree in question is section felled by a tree surgeon under the supervision of the bat ecologist if the bat ecologist recommends it.

If the bat specialist is content that section felling is not required, then trees will be felled as follows (as per NRA (Now TII) Guidelines):

- Tree-felling will be undertaken in the period September to late October. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Tree-felling will be undertaken using heavy plant and chainsaw. Prior to felling the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active.
- The tree should then be pushed to the ground slowly and should remain in place for a period of 48 hours to allow bats/other wildlife to escape. Trees will then be inspected by a bat specialist.
- Trees will not be sawn up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, will elapse prior to such operations to allow bats to escape.
- Trees for future landscaping will comprise of semi-mature native Irish species where possible.
- When felling trees with a chainsaw, it is important to ensure that the rate of fall is not accelerated by the use of a chain and vehicle (e.g., tractor). It is unlikely that a bat would survive such a heavy impact.

5.6.1.3.4 Bat Box installation

To offset the loss of hedgerows on Site, a series of 10 bat boxes will be erected on suitably large trees along the boundaries of the Site to provide future roosting opportunities. The guidance of a suitably qualified Bat ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes should be placed over 4m high (if possible), the trees in which they are placed should not be illuminated.

5.6.1.3.5 Reduction of noise related impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. The following best practise measures will be put in place to ensure the minimisation of potential impacts on fauna as a result of the Proposed Development. Limiting the hours during which Site activities likely to create high levels of noise are permitted.

- Establishing channels of communication between the contractor/developer, local authority and residents.

- Appointing a Site representative responsible for matters relating to noise.
- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

5.6.1.3.6 Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development, and will ensure no significant dust related impacts occur on nearby sensitive receptors including local faunal species:

- Haulage vehicles transporting gravel and other similar materials to Site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the construction period.
- 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 thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the Site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel will be used at Site exit points to remove caked-on dirt from tyre tracks.
- Equipment will be washed at the end of each workday.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If practical, wheel-washing facilities will be located at all exits from the Construction Site.

- Dust production as a result of Site activity will be minimised by regular cleaning of the Site access roads using vacuum road sweepers and washers. Access roads will be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the Site agent and is weather and activity dependent.
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind
    - Stockpiles
    - Areas where there will be loading and unloading of dust-generating materials.
- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

5.6.1.4 Mitigation 4: Protection of Semiaquatic and Aquatic Fauna

The surface water and groundwater mitigation and management measures detailed in section 5.6.1.1 will serve to protect the water quality of the Mell Stream and River Boyne, which in turn will eliminate any potential negative impacts on aquatic species that are sensitive to water quality changes.

To ensure there is no potential harm/disturbance to Otter utilising the Mell Stream during the proposed installation of the surface water headwall, preconstruction ecological surveys for Otter along the area of works will be undertaken. This will ensure there has been no new holts established in close proximity of the proposed outfall location and ensure compliance with the legal protection afforded to Otter. The following measures are proposed:

- Upon grant of planning and prior to construction works commencing, the appointed contractor will engage the services of a suitably qualified ecologist to conduct a preconstruction Otter survey of the Mell stream. This survey will be undertaken in accordance with the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006).
- If an active Otter holt is confirmed within 150 meters of the proposed works, a local NPWS conservation ranger will be contacted. This may require an application for a derogation licence from the NPWS to exclude the Otter holt. If required, any further mitigation measures required will follow those outlined in the *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (NRA, 2006) and will be agreed with the NPWS at the time of licence application.

5.6.2 Operational Phase

5.6.2.1 Mitigation 5: Protection of Habitats and Flora

The landscaped sections of the Proposed Development will be managed in a way so as to mitigate the loss of the existing hedgerows as much as is possible. In this way new hedgerows, treelines and areas of scrub will be maximised in the ecological value they provide at the Site, with habitat connectivity ensured along the margins of the Proposed Development; connecting it in with the wider field boundary network in the area. This connectivity is vital for wildlife such as birds, bats, mammals and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows, treelines and scrub in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increase provision of food resources and higher quality shelter to wildlife inhabiting and commuting through the area.

The above low intervention approach may not be suitable for the more landscaped areas of the Site, which may need to be maintained to a higher degree for health and safety or aesthetic reasons. However, native species will be used wherever possible in these locations to maximise the biodiversity value of these internal landscaped parts of the Site.

For the hedgerows and scrub running along the outer margins of the Site, the following management approach is proposed to maximise their biodiversity value and offset the loss of existing hedgerows at the Site:

- Hedgerows will be maintained with a natural meadow strip of 1-2m at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A two-cut management approach is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip once during February and March (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge once again during September and October (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).

  N.B. Raising the cutter bar on the back cut will lower the risk to amphibians, reptiles and small mammals.
- Hedgerows, where possible, should be allowed to reach at least 2.5m in height, and should be trimmed in an A-shape; maintaining a wider base to compliment the natural meadow strip at their base.
- Where hedgerow trimming needs to occur delay trimming as late as possible – until January and February as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow cutting should be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) needs to be taken.
- Where possible, cut these outer boundary hedgerows on a minimum 3-year cycle (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (Blackthorn in March, Hawthorn in May).

- Where they occur naturally, Bramble and Ivy should be allowed grow in hedgerows, as they provide key nectar and pollen sources in summer and autumn.

Methods to Avoid

Hedgerows will not be over-managed. Tightly cut hedges mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.

Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.

DO NOT use pesticide/ herbicide sprays or fertilisers near hedgerows, scrub or areas of wildflower meadows as they can have an extremely negative effect on the variety of plants and animals that live there.

5.6.2.2 Mitigation 6: Protection of Fauna

5.6.2.2.1 Bat friendly lighting measures

To minimise disturbance to bats in the immediate vicinity of the Site, the lighting and layout of the Proposed Development has been designed to minimise light spill. This will be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust 'Artificial Lighting and Wildlife Interim Guidance' and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'.

It is recommended that bat-friendly lighting measures are incorporated into the project design and associated lighting plan. Dark buffer zones can be effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of features do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature. Examples of this application can be seen in Figure 5-13.

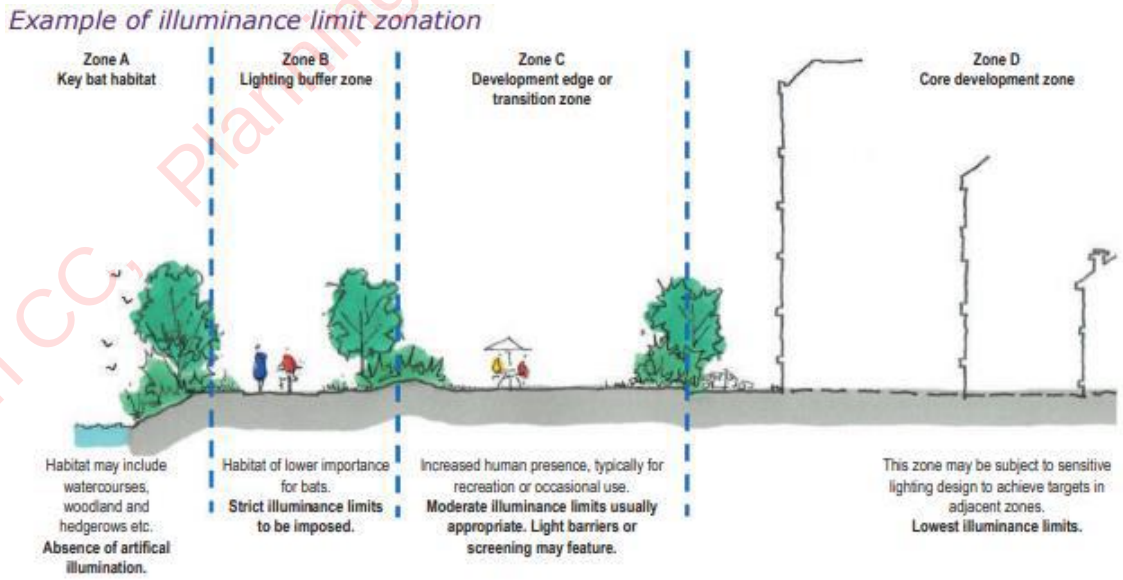

Figure 5-13 External lighting zonation diagram adapted from ILP (2018).

Night-time lighting across the Site will be kept to a minimum (once satisfying health and safety requirements), through the reduction of light spill from the buildings via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and through the Proposed Development grounds. For safety reasons, lighting will be required to illuminate the car park on Site however several factors have been included in the lighting design to mitigate the disruption to bats in the vicinity of the Proposed Development.

Incorporation of appropriate luminaire specifications will have a considerable input in mitigating the potential impact of night-time lighting on local bats. Based on the above guidance documents, the lighting scheme for the Proposed Development, as confirmed by Lawler Consulting, has incorporated the following measures:

- The lighting installation has been designed to only illuminate the new car parking area. The proposed luminaires minimise light spill to any other area forming part of the bats commute (boundary features). The luminaries included in the project design provide no up light and have narrow downward beams of light, and optics which prevent back spill.
- Lighting design software will be utilised to predict where light spill will occur.
- Lighting cowls/shields will be installed on luminaries where there may be the potential for any light spill onto the perimeter of the Site.
- The light output from dusk to dawn will be restricted using LED controls to dim the luminaires located across the carpark and along the boundaries of the Site. This will benefit commuting and foraging bats as the dimmer can be set to suitable times throughout the year.
- LED luminaries will be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Narrow spectrum bulbs will be used to lower the range of species affected by lighting. Light sources that emit minimal ultra-violet light and avoid the white and blue wave-lengths of the light spectrum will be utilised to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats may utilise for foraging.
- Maintain dark zones for foraging bats in areas where lighting is not necessary e.g., along the vegetated boundaries of the Site and southern woodland area. However, where lighting is required, this lighting will be placed at a minimum height using the lowest lux value permitted for public health and safety.
- 'Warm white' (more yellow/orange colour) at 2700^{o}K will be used, warmer colour tem-peratures with peak wavelengths greater than 550nm (~2700^{o}K) cause less impacts on bats.
- Retained treelines will not incur an increase in current lux levels due to the Proposed Development.
- Planting will provide areas of darkness suitable for bats to feed and commute.
- Reflective surfaces will not be placed under lights.

5.6.3 "Worst Case" Scenario

In the 'worst case' scenario at the Site of the Proposed Development, where the recommendations and mitigation measures described in this report were to be disregarded or should fail; vegetation would be cleared during the nesting bird season or small mammal hibernation season causing the destruction of all nests, eggs and some birds and small mammals during the clearance works.

Should any mature trees marked for felling support roosting bats, and be felled without prior surveys, roosting bats could be injured/killed during the works.

All of the above would represent violations of national wildlife legislation, i.e., offences under the Wildlife Act 1976 as amended; and the harming of bats and destruction of roosts would be contrary to the EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011.

5.7 Residual Impacts

Residual impacts are defined as '*effects that are predicted to remain after all assessments and mitigation measures*'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. Table 5-10*Table 5-10. Summary of potential impacts on KER(s), mitigation measures/mitigating factors and residual impacts.* provides a summary of the impact assessment for the identified Key Ecological Resources (KERs) and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

All mitigation measures detailed in this Chapter will be implemented in full and will remain effective throughout the lifetime of the facility. Therefore, no significant negative residual impacts on the local ecology or on any designated nature conservation sites will result from the Proposed Development.

Table 5-10. Summary of potential impacts on KER(s), mitigation measures/mitigating factors and residual impacts.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Designated Sites								
Relevant European Sites	International Importance	Surface water run-off containing silt / pollutants reaching the Mell Stream during the Construction Phase.	Negative	n/a	Short-term	Slight	Surface water protection measures as outlined in section 5.6.1.1 and the NIS accompanying this application.	**Imperceptible**
Boyne Coast and Estuary pNHA	National Importance							
Habitats								
Hedgerows (WL1) and Treelines (WL2), Dry Meadows and Grassy Verges (GS2), Scrub (WS1)	Local Importance (Higher value)	Loss of hedgerow, scrub and dry meadows and grassy verges habitat as a result of Proposed Development. Retention of treeline at the Site of the Proposed Development, one tree is scheduled for removal. Trampling and damage to trees identified for retention during Construction Phase. The landscape plan includes a native woodland mix along the southern boundary of the Site and an intermittent open planting of trees and scrub along the northern Site boundary.	Negative Neutral Negative Positive	Localised	Permanent	Moderate Slight Moderate Moderate	No further mitigation proposed for loss of habitat. With time, the maturing planted trees and hedgerows will neutralise the effects of habitat loss. Tree protection measures as outlined in section 5.6.1.2	**Imperceptible**

Fauna								
Small mammals	Local Importance (Higher value)	Risk of injury and/or death as a result of vegetation clearance works. Noise and dust disturbance as a result of the Construction Phase of the Proposed Development. Light disturbance as a result of the Operational Phase of the Proposed Development. Creation of potential habitat at the Site within the proposed Scrub habitat.	Negative Negative Negative Positive	Localised	Permanent Short-term Short-term Long-term	Significant Slight Slight Moderate	Clearing of vegetation (i.e., hedgerows), outside of hibernation period (Outside period November - March). Range of best practise construction and operational noise control measures to be put in place for the duration of the Construction Phase and Operational Phase respectively.	Imperceptible
Bird assemblage	Local importance (Higher value)	Mortality during the Construction Phase due to vegetation removal. Disturbance due to noise and dust generated during the Construction Phase of the Proposed Development.	Negative	Localised	Permanent Short-term	Significant Moderate	No removal of vegetation to be carried out during nesting season. If removal is unavoidable during this period, an Ecologist to survey vegetation prior to removal and make recommendations on protection of any birds/nests/young found Range of best practise construction and operational noise control measures to be put in place for the duration of the Construction Phase and Operational Phase respectively.	Imperceptible

Bat Assemblage	Local importance (Higher value)	Mortality during construction Phase due to vegetation removal. Loss of stretches of commuting/foraging habitat. Disturbance due to light generated during Operational Phase.	Negative	Localised	Permanent	Significant Moderate Moderate	Pre-felling survey of tree identified for removal on Site by a bat ecologist the night/dawn before felling. NPWS derogation licence is required if bats are present. Provision of increased tree cover along the southern boundary and across the site will maintain habitat connectivity at the Site and allow bats to continue to commute/forage through the Site in the future. Wildlife friendly lighting measures as outlined in section 5.6.2.2.1	Imperceptible
Aquatic and semi-aquatic fauna of the River Boyne (Otter, Fish assemblage and White-clawed Crayfish).	Local importance (Higher value)	Deterioration in water quality of the River Boyne, causing disturbance and/or displacement of fish and WCC, and reduction in prey for otter. Disturbance or displacement to Otter in the Mell Stream during the construction of the surface water outfall.	Negative Negative	Localised Localised	Short-term Short-term	Moderate Moderate	Mitigation measures to protect surface waters as outlined in section 5.6.1.1 Preconstruction Otter survey of the Mell Stream.	Imperceptible

5.8 Monitoring

5.8.1 Construction Phase

As a precautionary measures, it is recommended that the relevant potential bat roost tree, located within the south-eastern boundary of the Site is surveyed for bats the night/morning before felling by a suitably qualified bat ecologist and, if required by the Bat ecologist, is section-felled under their supervision. If bats are present, all work must cease, and NPWS contact in order to obtain a derogation licence.

Should any vegetation removal be required during the period of March 1st to September 1st, this vegetation will be checked for birds by a suitably qualified ecologist, and if any are noted during this evaluation prior to removal, the recommendations of the ecologist will be followed in terms of protecting the nest/eggs onsite.

Prior to construction works commencing for the surface water outfall to the Mell Stream, the appointed contractor will engage the services of a suitably qualified ecologist to conduct a preconstruction Otter survey of the area of works. This survey will be undertaken in accordance with the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006).

5.8.2 Operational Phase

Monitoring is not considered to be necessary during the Operational Phase.

5.9 Interactions

This chapter pertaining to the ecological and biodiversity aspects of the Proposed Development, has the potential to interact with aspects of the following chapters of this EIAR:

- Chapter 6: Land, Soil & Geology
- Chapter 7: Hydrology & Hydrogeology
- Chapter 8: Air Quality & Climate
- Chapter 9: Noise and Vibrations
- Chapter 10: Landscape and Visual Assessment
- Chapter 12: Material Assets

5.9.1 Land, Soil & Geology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the impact of the Proposed Development on the receiving soils underlying the Site during the Operational Phases of the Proposed Development, is described in Chapter 6 - ‘Land, Soil & Geology’ of this EIAR. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these

potential impacts are described in full in Chapter 6. The bulk removal of soils at the Site can have implications for biodiversity. Natural regeneration of native and local seeds is the preferred option for re-vegetating areas to be retained for biodiversity.

5.9.2 Hydrology & Hydrogeology

The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7 - 'Hydrology & Hydrogeology' of this report as well as in his Chapter, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an accidental pollution event during the construction and operational phase. This interaction has the potential to result in impacts on habitats and fauna that are hydrologically linked to the Site.

5.9.3 Air Quality and Climate

An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR. Dust emissions arising from the Construction Phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.

5.9.4 Noise and Vibrations

An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9- 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9. There is potential for interactions between noise and sensitive fauna, e.g., birds, that occur in adjacent habitats from increased noise levels during the Construction Phase. However, as described, noise related impacts are not deemed to be significant.

5.9.5 Landscape and Visual Amenity

An assessment of the potential impacts of the Proposed Development on the surrounding landscape character is outlined in Chapter 10 – Landscape and Visual. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 10. Landscaping at a development site can have significant implications for biodiversity. The landscape plan for the Proposed Development includes an area to be retained for biodiversity. The lighting plan for the Site has also been sensitively designed to protect bats from light pollution. Significant negative effects are not predicted.

5.9.6 Material Assets (Waste and Utilities)

Construction waste arising from Site operations could negatively affect local fauna through entrapment, for example. However, appropriate waste management practices on Site will ensure no significant effects occur on local biodiversity.

5.10 Difficulties Encountered When Compiling

No difficulties were encountered during the compilation of this EIAR Biodiversity Chapter.

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6 LAND SOIL AND GEOLOGY

6.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the land, soils and geology within and immediately surrounding the Proposed Development Site, an assessment of the potential impacts of the Proposed Development on land, soils and geology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Land, soils, and geological characteristics of the receiving environment at the Proposed Development Site.
- Potential impacts that the Proposed Development may have on land, soils and geology including "worst case" scenario assessment.
- Potential constraints that the environmental attributes may place on the Proposed Development.
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

6.1.1 Quality Assurance and Competence

This chapter of the EIAR was written by Sam Marchant MSc., BSC., who is a Hydrogeologist with Enviroguide Consulting. The chapter was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

6.1.2 Description of the Proposed Development

BPM GP3 Limited intend to apply for Planning Permission for development on lands to the south of the existing M1 Retail Park, Mell, Drogheda, Co. Louth.

The development will consist of:

> *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the*

eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

The proposed Site layout is presented in Figure 6-1.

Figure 6-1: Proposed Site Layout (MM1-MCA-00-00-DR-A-2000, MCA Architects)

6.2 Study Methodology

6.2.1 Regulation and Guidance

The methodology adopted for the assessment takes cognisance of the relevant guidelines in particular, the following:

- S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014.
- S.I. No. 98 of 2008- European Parliament and of the Council on waste and repealing certain Directives.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
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- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002).
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013); and
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).

6.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of land, soils and geological environment, to establish the activities associated with the Proposed Development and to undertake an assessment and impact determination.

This stage of the assessment included a desk top study that comprised a review of the following sources of information:

- Environmental Protection Agency (EPA) web mapping 2022.
- GSI Datasets Public Viewer web mapping, 2022.
- Ordnance Survey Ireland (OSI) web mapping 2022.
- Information provided by the Applicant including:
    - Barrett Mahony (Barret Mahony, 2022). Civil Infrastructure Report
    - Hughes Planning (Hughes Planning, 2022) Planning Report, Retail/ Commercial Development

The study area, for the purposes of assessing baseline conditions for the Land, Soils and Geology Chapter of the EIAR, extends beyond the site boundaries and includes potential receptors with which there may be a pathway from the Site and receptors that may be indirectly impacted by the Proposed Development. The extend of the wider study area was based on the IGI, 2013, Guidelines which recommend a minimum distance of 2.0km from the Site.

Element 2: Involves Direct and Indirect Site Investigation and Studies stage where necessary to refine the CSM and evaluate the potential impacts associated with the Proposed Development. A ground investigation was not completed for this Site.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction and Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Land, Soil and Geology sections of the EIAR in this Chapter which includes all the associated figures and documents.

6.2.3 Description of Importance of Receiving Environment

The Transport Infrastructure Ireland (TII) criteria for rating of the importance of geological features at the Site as documented in the National Roads Authority Guidelines (NRA, 2009), are summarised in Table 6-1.

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this chapter is described in Table 6-1.

Table 6-1: Criteria for Rating Site Importance of Geological Features

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on-site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale.	Contaminated soil on-site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

6.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 6-2.

Table 6-2: Assessment of Potential Terminology and Methodology

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	**Definition**
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	**Definition**
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

6.3 The Existing and Receiving Environment (Baseline Situation)

6.3.1 Site Location and Description

The site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the Site), with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the Site, and Barrack Lane is adjacent to the south of the Site.

The Proposed Development Site location is presented in Figure 6-2.

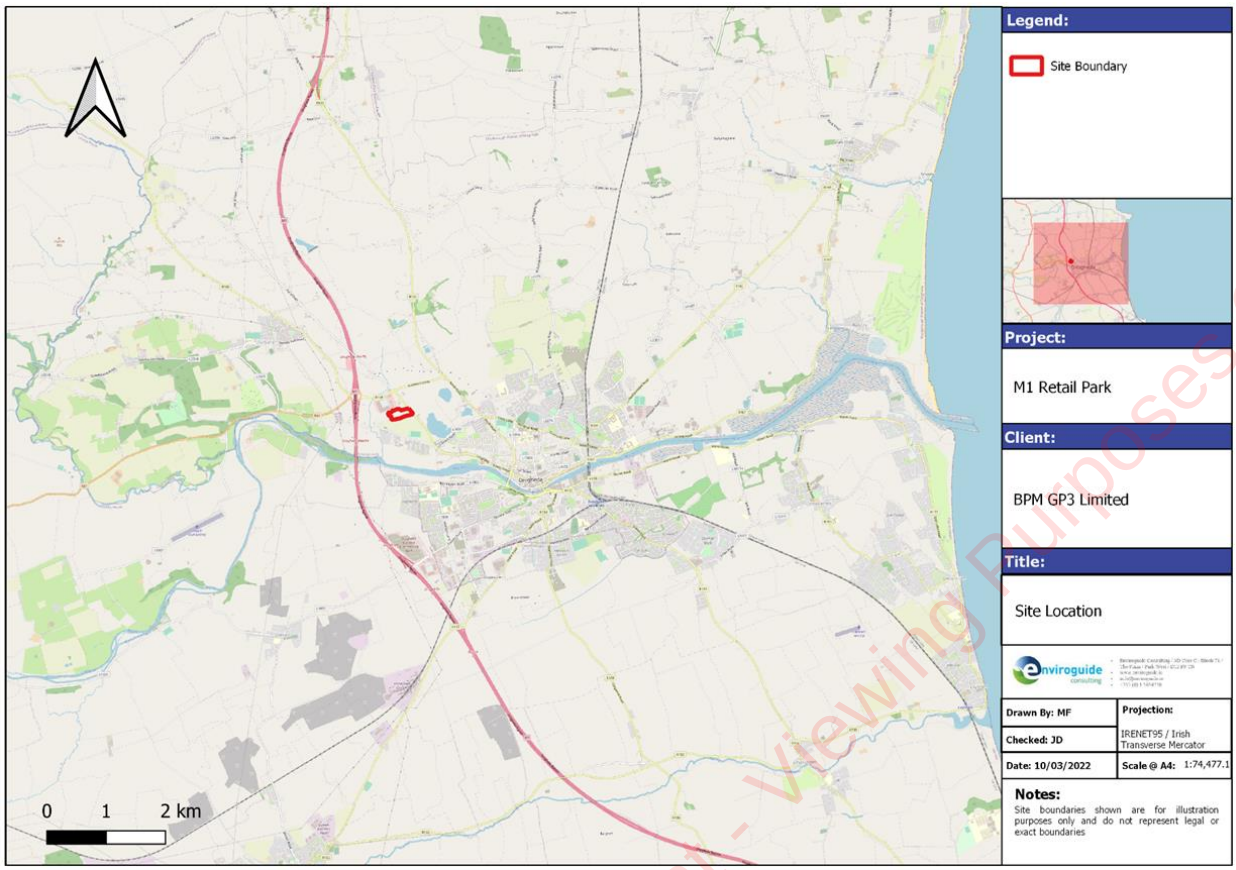

Figure 6-2. Site Location

6.3.2 Current and Historical Land Use at the Proposed Development Site

The Proposed Development Site is 4.82 hectares (Ha). The site of the Proposed Development comprises agricultural field within the administrative jurisdiction of Louth County Council. The majority of the site of the Proposed Development is located on lands which have been allocated Zoning Objective Type B4 'District Centre' with zoning objective "*To maintain and enhance retail led mixed-use district centres*". The portion to the northwest in which the drive thru is proposed is zoned C1 Mixed Use, with zoning objective "*To provide for commercial, business and supporting residential uses*."

The Proposed Development Site is undeveloped.

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2022) and Google Earth (Google Earth, 2022) were reviewed and key observations on-site and off-site are summarised in Table 6-3. An aerial photo of the present site is shown in Figure 6-3.

Table 6-3: Historical Land Use

Date	Information Source	Site Description
1837-1842	**OSI map 6inch**	**On-site:** The Proposed Development Site is a greenfield site. There is an unnamed road identified along the southern boundary of the Proposed Development Site. The site is bounded by a major road to the east. There is a police station in the southeast corner of the Site. **Off-site** The surrounding lands are predominantly open fields with a number of scattered one-off and groups of buildings. There is a quarry located approximately 0.35km north of the Site. There is a well "St Patrick's Well" located 40m to the southeast of the Site.
1888-1913	**OSI map 25inch**	**On-site:** There are open fields divided by field boundaries with a number. The police station is replaced by the "Mell Court House". **Off-site:** The quarry to the north of the site has been replaced by buildings. There is a quarry located approximately 0.4km southeast of the site boundary.
1830-1930	**OSI Cassini map 6inch**	**On-site:** The courthouse in the southeast is replaced by a Presbytery. **Off-site:** There is another quarry located approximately 0.7km east of the site boundary.
1995	**OSI Aerial photography**	**On-site:** The Site is entirely greenfield. **Off-site:** There are residential dwelling to the west, southeast and northeast boundaries of the Site. The well is no longer obvious on the map. The quarries to east and southeast have expanded considerably and include three open water bodies.
2000	**OSI Aerial photography**	**On-site:** No significant changes. **Off-site:** There are several residential estates in the surrounding areas.
2005	**Google Earth Aerial Photos**	**On-site:** Evidence of ground disturbance and removal of surface vegetation / soil with internal haul routes present on Site. There is activity in the southeast corner of the site (appear to be site cabins and equipment from the aerial photo). **Off-site:** The M1 Motorway has been built to the west of the Site. There is a quarry with three ponds to the east of the Site.
2007	**Google Earth Aerial Photo**	**On-site:** Activity in the southwest corner of the site is no longer evident. The site remains stripped of soil for most of the site. Stockpiling of materials to the northwest of the site **Off-site:** Crystal clear has been constructed to the northwest of the site.
2011	**Google Earth Aerial Photo**	**On-site:** The internal road remains, the stockpile material in the northwest remains. Grass covers most of the site. **Off-site:** No significant changes.
2013	**Google Earth Aerial Photo**	**On site:** The material in the stockpile area to the northwest have been cleared. **Off site:** No significant changes.
2022	**Google Maps Photography**	**On-site:** The site is heavily vegetated. **Off-site:** The M1 retail park has extended to the north of the site.

Figure 6-3: Current Land use

6.3.3 Licensed Sites

The Proposed Development Site is located next to the M1 retail complex.

There are three (3no.) EPA licensed facilities located within a 2km radius of the Proposed Development Site:

- Drogheda Landfill - Drogheda Borough Council, Active Waste License, Licence Number (W0033-01).
- Height for Hire Ltd, Other Waste License, License Number (W0154-01).
- ADSIL Drogheda, Applied IEL License, License Number (P1181-01).

6.3.4 Topography

The topographical survey of the Proposed Development Site indicates that the overall topography ranges from approximately 25.5meters above ordnance datum (above mOD) in the southwest to 36m above OD in the centre of the Site

- The southern portion of the Proposed Development Site generally falls from north (32m above OD) to southwest (25m above OD).
- To the west of the Site boundary, the topography slopes towards the Mell stream at approximately 14m above OD.
- Regionally the ground is sloping to the south-east towards the Boyne Estuary and Irish Sea

Figure 6-4 shows the site survey as presented in the Design statement (MCA Architects, 2022).

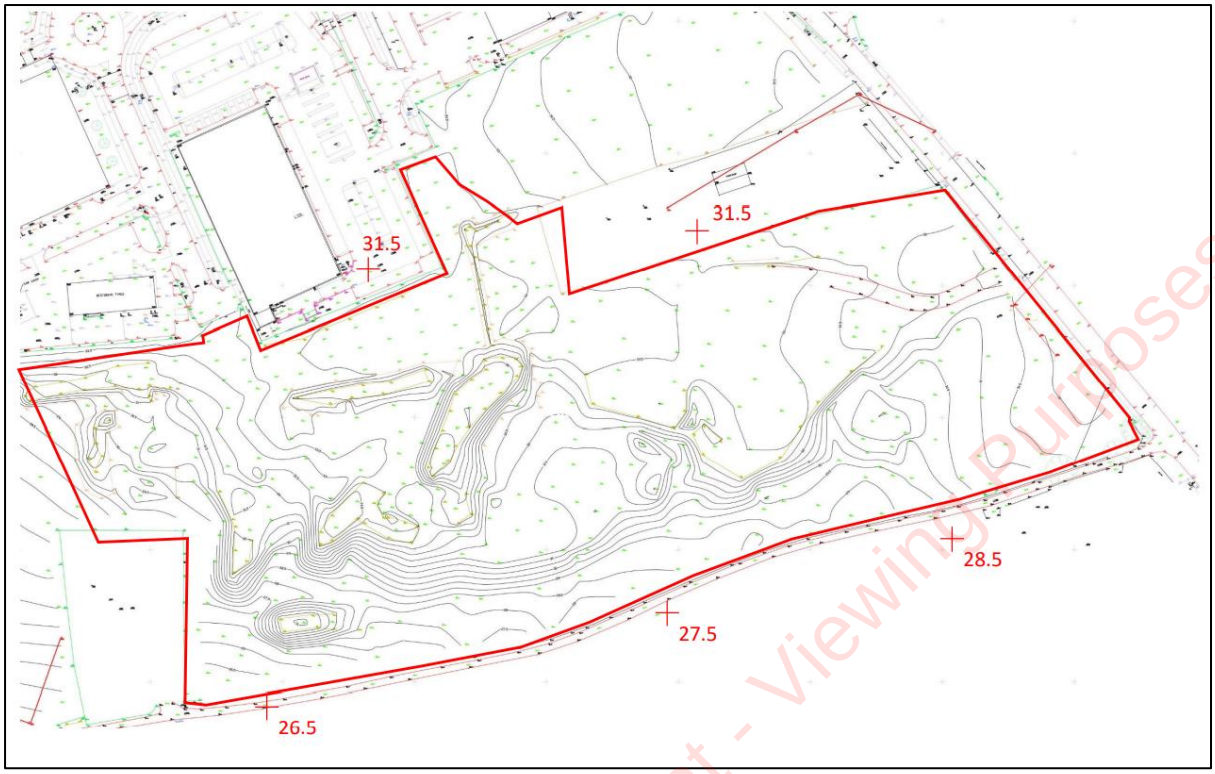

Figure 6-4: Site Survey (MCA Architects, 2022)

6.3.5 Soils

The soils beneath the Proposed Development Site have been mapped by Teagasc (Teagasc, 2022) as "Mineral poorly drained (Mainly acidic)". The Teagasc (Teagasc, 2022) mapped soils at the Proposed Development Site are presented in Figure 6-5.

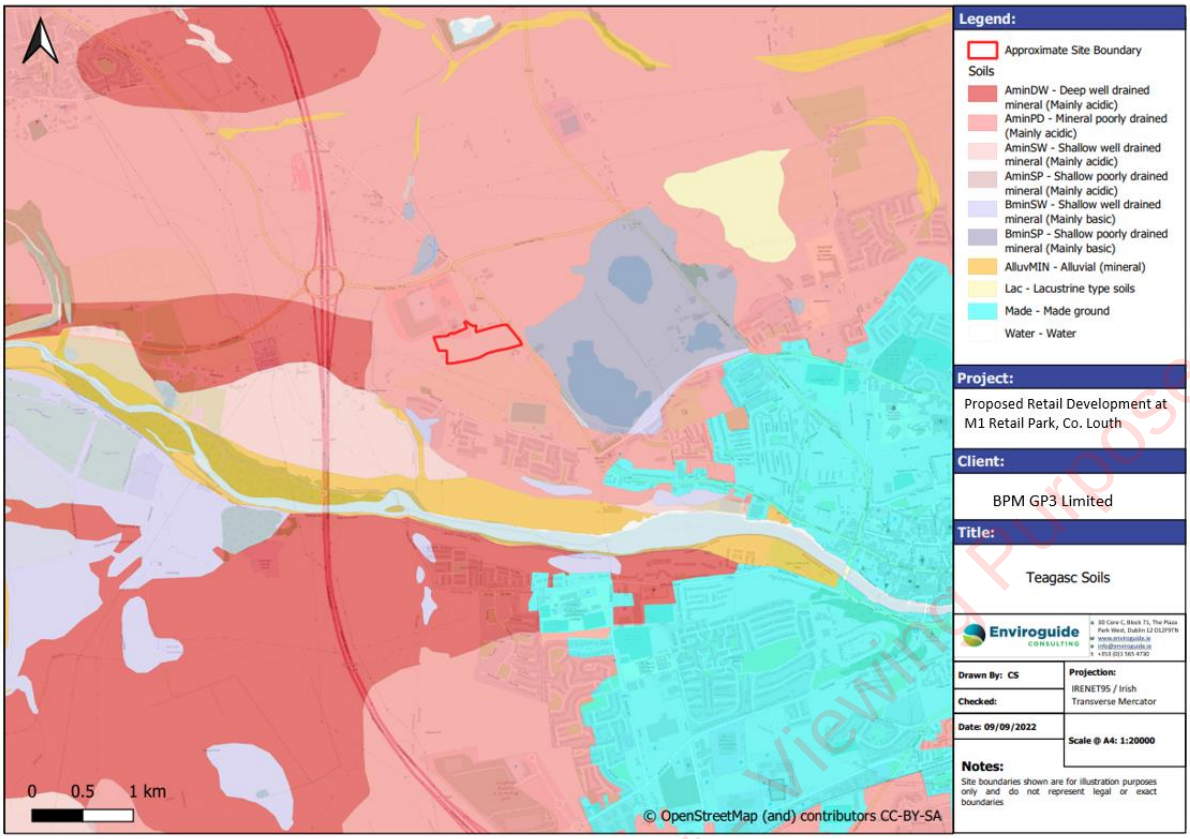

Figure 6-5: Teagasc Soils

6.3.6 Quaternary Soils

The subsoils or quaternary soils beneath the Proposed Development Site are mapped by the GSI (GSI, 2022) as 'Irish Sea Till derived from Lower Palaeozoic sandstones and shales" (IrSTLPSsS). The quaternary soils at the Proposed Development Site are presented in Figure 6-6.

Within the GSI geotechnical database, the GSI report (ID 6784) (Naomh Seosamh) is mapped by the GSI within the Irish Sea Till derived from Lower Palaeozoic sandstones and shales, as is the Site. The ground investigation is located approximately 0.85km southeast of the Proposed Development site. The generally lithology of the sub-soils was silt/clay overlying gravelly clay with occasional sand and gravel layers.

The GSI report (ID 6265) east and adjoining the site boundary is mapped within the Irish Sea Till however there was no natural ground encountered during the ground investigation. The maximum excavated depth was 1.8mbgl in the nine slit trenches and all ground encountered was logged as Made Ground. The GSI reports ID 6889 and ID 2611, are mapped by the GSI within the Urban quaternary sediment and not representative of the site.

The inferred soil lithology on Site (based on the GSI report ID 6784) is topsoil, overlying silt/clay overlying gravelly clay with occasional sand lenses present.

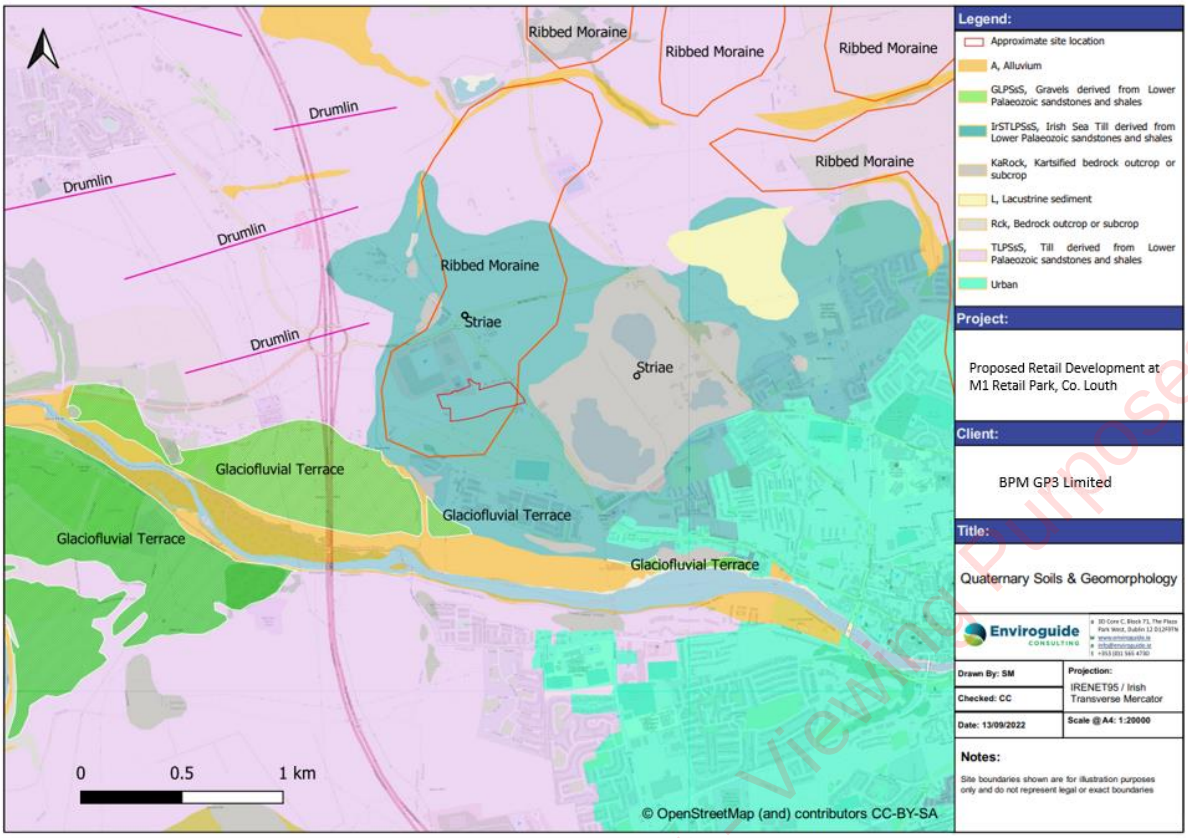

Figure 6-6: Quaternary Soils

6.3.7 Quaternary Geomorphology

The GSI quaternary geomorphology database (GSI, 2022) indicates the Site is located on the south-east of a ribbed moraine; a subglacial formation comprised of drift. The moraine is elongated in a north-south direction and forms the south-west corner of a cluster of ribbed moraines. The formation is mapped within the Site Boundary as shown in Figure 6-6 above.

There are a series of drumlins orientated in a south-west-west to north-east-east direction to the north-west of the Site within a 2km radius (closest Drumlin is mapped 0.5km northwest of the Site boundary). Striae are identified within a 2km of the Site, the striae indicate direction of late-Pleistocene ice-flows in eastern counties of Meath and Louth.

6.3.8 Bedrock Geology

Based on the GSI database (GSI, 2022) the bedrock beneath the Proposed Development Site is mapped as the Tullyallen Formation (Stratigraphic Code: TA; New Code CDTUAL) which is comprised of pale micritised grainstone-wackestone from the Carboniferous period with formation thickness more than 500m. There are no mapped or identified bedrock outcrops within the Site, several outcrops are mapped within a 2km radius of the Proposed Development Site boundary, the closest of which is located 0.2km east Site in the disused Mell quarry (GSI, 2022).

The surrounding geology within a 2km radius is highly fractured, with a fault system running south-west-west to north-east-east and a second system running perpendicular in a north—north-west to south-south-east direction. Strike and dip of bedding (right way up) of the Tullyallen formation approximately 0.3km north of the Site is to the southwest (strike 293.83,

dip 14), the strike and dip within the same unit approximately 2.2km southeast of the Site is to the northwest (Strike: 44.03, dip 30). The bedrock geology is presented in Figure 6-7.

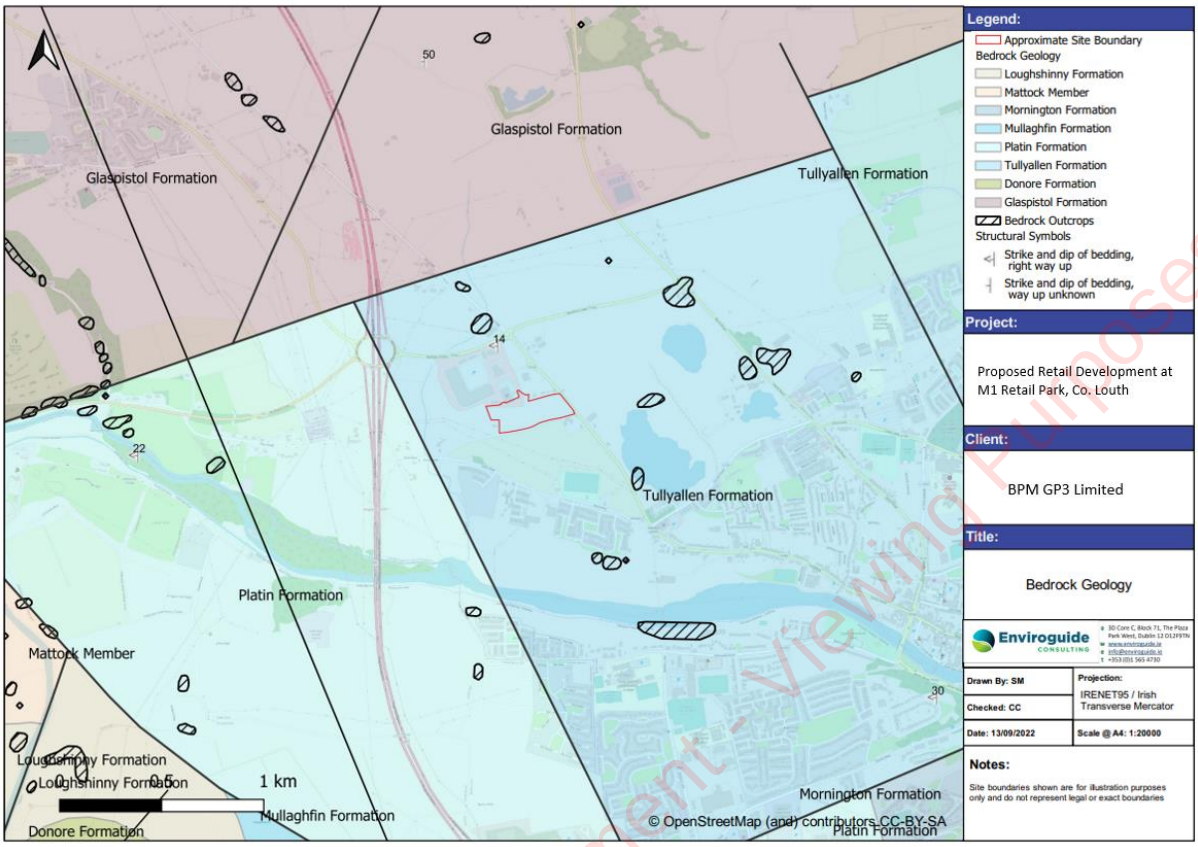

Figure 6-7. Bedrock Geology

The GSI database of geotechnical sites (GSI, 2022) shows there are four ground investigation reports available for sites within a 2km radius of the Site. Bedrock was not encountered in any of the ground investigation records within a 2km radius of the Site. The maximum borehole depth in the ground investigation was 7mbgl i.e. rock confirmed not present in top 7m at these locations.

The GSI wells and springs database is summarised in Table 6-4 for the wells and springs listed within a 2km where the depth to bedrock is recorded. Depth to bedrock is highly variable ranging from 1.5mbgl (1.2km east of the Site) to 36mbgl (1.25km northwest of the Site). The Drybridge Water Supply report (Louth County Council, 2014) presents a map with the depth to bedrock (Figure 4 Subsoil Geology of the Study Area). The closest well labelled “DRY01” to the Site is immediately north and records a depth to bedrock of “>9.5m”. The subsoil K assessment is described as “Silt/Clay with rounded gravels”. Another well located immediately north of “DRY01” recorded a depth to bedrock of 3mbgl further emphasising the variability of the top of rock.

Table 6-4:GSI Wells and Springs database where depth to bedrock is recorded

GSI Name	Distance from Site Approx (km)	Direction from Site	Total Well Depth (mbgl)	Depth to Bedrock (mbgl)
2927SEW065	1.1	East	61	1.5
2927SEW052	0.2	North	42.7	16.1
2927SEW096	0.1	North	7	3
2927SEW059	0.4	Southwest	45	8
2927SEW083	0.5	West	18	6
2927SEW082	0.6	East	12	4.8
2927SEW075	0.6	Northwest	19.5	3.2
2927SEW074	0.6	Northwest	18.3	1.7
2927SEW073	0.6	Northwest	16.5	8
2927SEW079	0.65	Northwest	20	15.5
2927SEW066	0.5	Southwest	61	18.3
2927SEW054	1.15	Northwest	43	10
2927SEW086	1.25	Northwest	37	36
2927SEW085	1.25	Northwest	26.5	22
2927SEW053	1.05	East	62	42
2927SEW045	1.8	Southwest	57.2	4.9
2927SEW012	1.4	South	46.9	16.5
Note: Distance from Site is approximate, location accuracy of the GSI wells and spring is as low as “to 500m” for some of the wells listed				

An assessment of the groundwater vulnerability is provided in Chapter 7. The vulnerability provides a range of depth to bedrock based on the classification. Based on the vulnerability rating of the Site, the depth to bedrock is interpreted in the centre of the Site as greater than 10mbgl decreasing to between 0m and 3mbgl on a thin section to the east.

In summary, the bedrock geology beneath the Site is grainstone-wackestone of the Tullyallen formation. Depth to bedrock is highly variable in the area however is expected to be greater than 10mbgl in the centre of the site decreasing to between 0m and 3mbgl on a thin section to the east of the Site. There is no exposed rock at the surface within the Proposed Site Boundary.

6.3.9 Radon

The majority of the Proposed Development Site is in an area mapped by the EPA radon risk maps (EPA, 2022) as “About 1 in 10 homes in this area is likely to have high radon levels”.

While a small portion to the south-east of the Site is mapped as “About 1 in 5 homes in this area is likely to have high radon levels.”

Therefore, overall, the Proposed Development Site is not considered to be within a High Radon Area. A High Radon area is an area where it is predicted that more than 10% of homes will exceed the national reference level. It is noted that a high radon level can be found in any home, in any part of the country, but these homes are more likely to be located in High Radon Areas.

6.3.10 Geohazards

There are a number of karst features recorded in the GSI (GSI, 2022) records within a 2km radius of the Site. There are no mapped (GSI, 2022) karst features within the Site and no records of any issues associated with karst features at the adjoining properties. The karst features are summarised below:

- Spring (Identifier: 2927SEK004) reported as rising during dry weather with resurgence of swallow hole 100m upstream. Stream bed is dry in between, presumably underwater during wet weather. The epikarst spring is located approximately 0.44km north of the Site.
- Swallow hole (Identifier: 2927SEK001) reported as “low water all river sinks here through bed”. It is presumed to be one of many. The spring is located approximately 0.55km north of the Proposed Development.
- Superficial Solution features (Identifier: 2927SEK005) reported as “extensive epikarst seen from quarry cliff”. The features are located approximately 0.61km north of the Proposed Development.
- Swallow hole (Identifier: 2927SEK00) with comments as “probably”. The probable swallow hole is located approximately 0.65 north of the Proposed Development.
- Enclosed depression (Identifier: 2927SEK003) with comment “exact location not determined”. Located approximately 0.82km east of the Proposed Development.

All karst features within a 2km radius are in the Tullyallen Formation. The karst features are shown in Figure 6-8 overlying the bedrock aquifer map.

The Proposed Development Site is located within an area of “Low” landslide susceptibility classification (GSI,2022). There has been one reported landslide within a 2km radius of the Site (event ID: GSI_LS06-0302) which occurred in Rosehall in the townland of Mell (approximately 0.82km northeast of the site). The GSI reports that the landslide was near the reservoir, the landslide comprised undifferentiated material of quaternary type sandstone and shale till. The trigger cause is unknown, the landslide mechanism is undefined, and no human factors were identified. A review of google maps, shows the elevation profile of the mapped landslide locations is sloping from west to east, from 42m OD to 38mOD over a 150m path.

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978. There are six permanent broadband seismic recording stations in Ireland operated by DIAS. Records show that most recorded seismic events were associated with quarry blasts. Seismic activity with a magnitude of 1.1 was recorded in Drogheda on the 21st of September 2022, the blast was associated with a quarry blast.

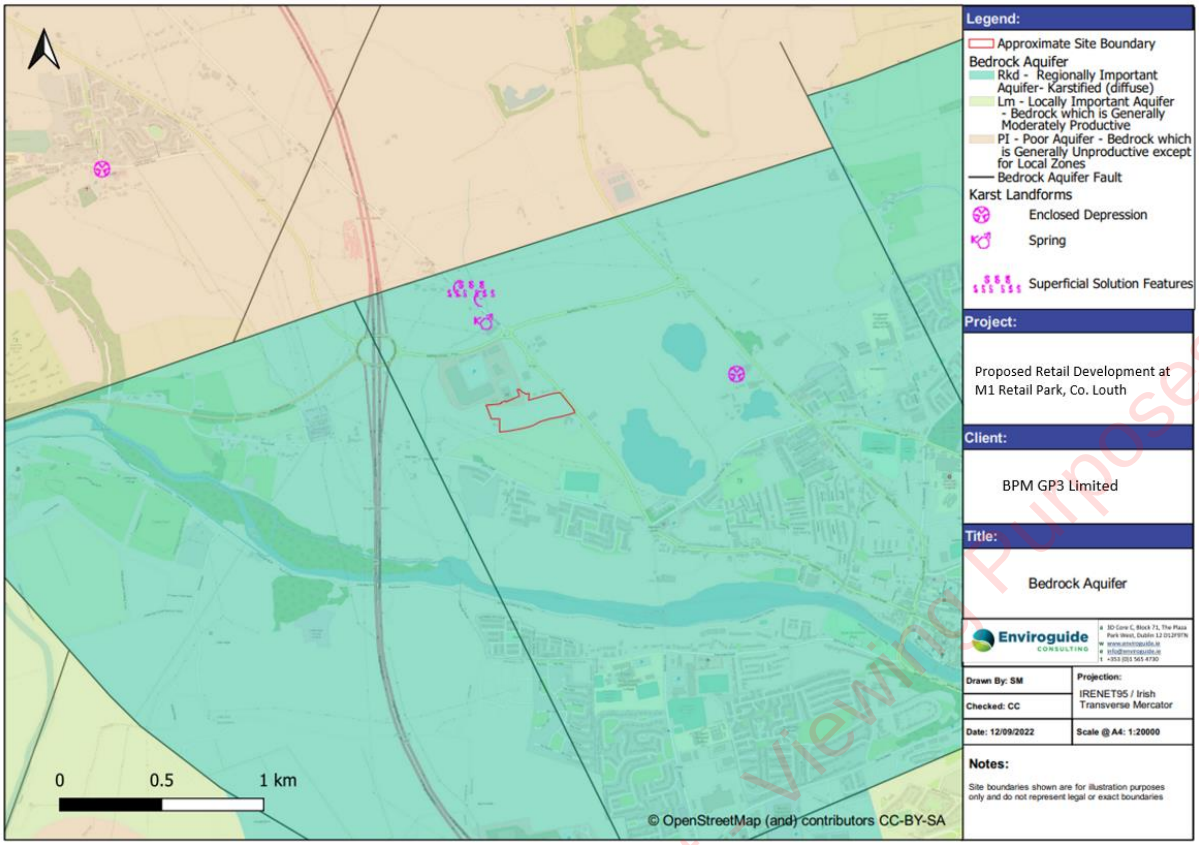

Figure 6-8: Karst Landforms on the Bedrock Aquifer Map

6.3.11 Geological Heritage

A review of the GSI Geological Heritage Database (GSI, 2022) indicates that there are 4no. recorded geological heritage sites located within a 2km radius of the Proposed Development which are summarised in Table 6-5 and shown in Figure 6-9. There are no geological heritage sites within the Proposed Development Site

Table 6-5: Sites of Geological Importance within 2km of the Proposed Development

Site Name	Site Code	Location	Distance from Site (km)	Geological Importance & Description of Site
Mell Quarry	LH023	East	0.01 (East of R168)	Mell quarry is designated as a County Geological Site. This a complex of disused quarries adjacent to the northwest of the town of Drogheda and adjoining the east of the site. The limestone at Mell quarry is the best exposure of the Tullyallen Formation in the district.
Waterunderbridge – Dry Bridge	LH032	North & West	0.25	The Waterunderbridge- Drybirdge site is a County Geological Site. The site is mostly in a narrow, shallow gorge with the sometimes-dry streambed in it. A karstic sinking river, a good example of classical karstic drainage, with sinks and risings.
Boyne Valley	MH011	Southwest	0.55	The Boyne Valley is a County Geological site which may be recommended for geological National Heritage Area. A glacial U-Shaped valley with characteristic depositional and erosional features associated with ice flow and glacial meltwater
King William's Glen	LH021	Northwest	1.82	The King William's Glen is a County Geological Site. This is a deep almost 2km-long nw-se stream channel cut into till and bedrock. Meltwater channel, up to 20 deep with a particularly well-developed U-shaped profile.

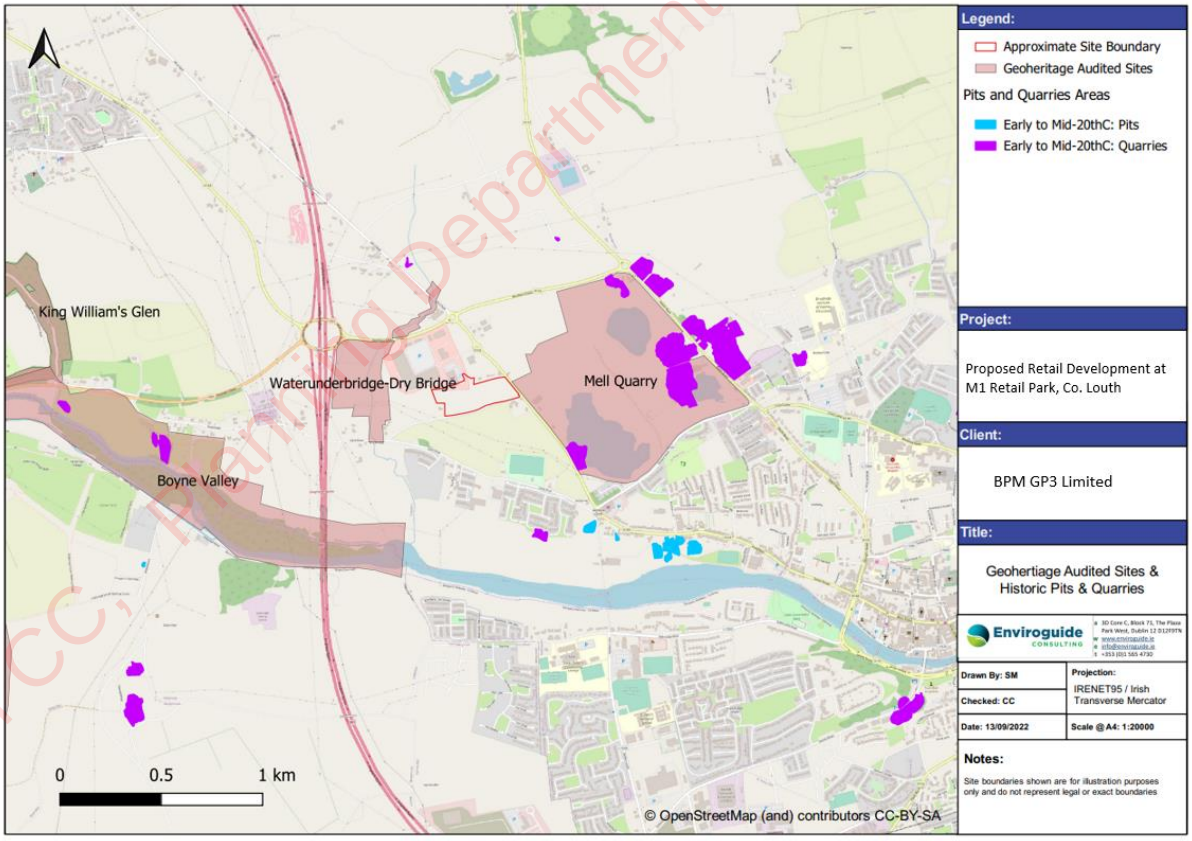

Figure 6-9:Geoheritage Sites and Historic Pits & Quarries

6.3.12 Economic Geology

The lands within the Proposed Site boundary have no mapped granular aggregate potential. Within the 2km radius, deposits along the Boyne Estuary are mapped as having between “low” and “very high” potential.

The bedrock beneath the Proposed Development Site has been identified by the GSI (GSI, 2022) as having a “moderate” to ‘high potential’ for crushed rock aggregate. The Mell quarry and a connected strip to the west of the Site is recorded as having “very high potential” for crushed rock aggregate.

There are a number of historical pits and quarries mapped by the GSI (GSI, 2022) located within a 2km radius of the Proposed Development Site which are listed below in Table 6-6.

Table 6-6: Historical Pits and quarries located within 2km of the Proposed Development Sites

Name/Type	Status	Distance from Proposed Development(km)	Location from Site
Quarry	Historic	0.34	South-east
Quarry	Historic	0.39	South-east
Quarry	Historic	0.70	East
Quarry	Historic	0.72	East
Quarry	Historic	0.93	East
Quarry	Historic	1.34	East
Quarry	Historic	0.71	Northeast
Quarry	Historic	0.84	Northeast
Quarry	Historic	0.85	Northeast
Quarry	Historic	0.73	Northeast
Quarry	Historic	0.65	North
Quarry	Historic	0.65	South
Quarry	Historic	0.66	South
Pit	Historic	0.72	Southeast
Pit	Historic	0.86	Southeast
Pit	Historic	0.97	Southeast
Pit	Historic	0.98	Southeast
Pit	Historic	0.99	Southeast
Pit	Historic	1.00	Southeast
Pit	Historic	1.02	Southeast
Pit	Historic	1.12	Southeast
Quarry	Historic	0.68	Northwest
Quarry	Historic	1.33	West
Quarry	Historic	1.40	West
Quarry	Historic	1.82	West
Pit	Historic	1.64	Southwest
Quarry	Historic	1.94	Southwest

6.3.13 Summary of Baseline

The baseline characteristics relating to the land, soil and geology of the Proposed Development Site is summarised below:

- Soils beneath the site are poorly drained mineral soils.
- Subsoils comprise of Irish Sea Tills are expected to comprise of silts/clay with occasional sand/gravel lenses.
- Bedrock comprises grainstone-wackestone from the Tullyallen Formation. The depth to bedrock is highly variable in the area but is expected to be greater than 10mbgl in the centre of the site decreasing to between 0m and 3mbgl on a thin section to the east of the Site.
- There is no exposed rock at the surface within the Site Boundary.
- Most of the site is mapped on the GSI radon map where approximately 10% of homes in the area likely to have high radon levels.
- There are no mapped karst features within the Proposed Development Site.
- The site is mapped in a “Low” landslide susceptibility.
- There are four geological heritage sites within a 2km radius of the site boundary, all four sites are considered County Geological Sites, the Boyne Valley may be recommended as a geological National Heritage Area.
- The bedrock beneath the site is identified as having “moderate” to “high” potential for crushed rock aggregate. There is no mapped granular aggregate potential beneath the Site.

It is noted that, in accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 6-1 the soil and geology underlying the Proposed Development would be rated as “low” importance as the land, soils and geology are value on a local scale. The site is undeveloped. The soils are mapped as poorly drained. While the bedrock is mapped as moderate to high potential for crushed rock, it is considered uneconomical to extract considering the estimated depth to bedrock. The subsoils are not mapped as containing a mineral resource.

6.4 Characteristics of the Proposed Development

The characteristics required to carry out the Proposed Development as described in Section 6.1.2 are detailed in Sections 6.4.1 and 6.4.2.

6.4.1 Construction Phase

The Construction Phase of the Proposed Development will require:

- Excavation of subsoil and bedrock to reduce levels to construct the surface water drainage including an attenuation tank to a maximum depth of 3.3mbGL. The approximate cut and fill volumes are as follows:
    - Cut volume: 51,405m^3
    - Fill volume: 16,720m^3
- Foundation solutions will be designed to suit the ground conditions and will include raft foundations, pad or strip foundation or piled foundations. Excavated material that

cannot be reused on-site will be temporarily stockpiled at the Site and then be removed by the licenced waste carriers and sent for reuse at other local development sites or recovery with disposal considered as a final option only.

- The Proposed Development will include the importation of aggregates for the construction of roads and other infrastructure.

6.4.2 Operational Phase

There will be no excavation of soil or bedrock or infilling of waste during the Operational Phase of the Proposed Development.

There will be discharges to ground via the SuDs during the Operational Phase of the Proposed Development.

Approximately 66% of the Proposed Development Site area will be hard covered with buildings and impermeable pavement on completion of the Proposed Development.

6.5 Potential Impact of the Proposed Development

6.5.1 Construction Phase

6.5.1.1 Direct

6.5.1.1.1 Land Take and Land-use

The total land take area of the Proposed Development Site is 4.82Ha. The Proposed Development will require a change of use from undeveloped land to commercial land-use which is in accordance with the zone objective of the Louth County Council Development Plan, 2021 to 2027. Therefore, the change of land use will result in a “neutral” “slight” and “permanent” impact on the land at the Proposed Development Site.

6.5.1.1.2 Soil Quality and Contamination

The current Site use is un-development land. The excavation and re-use of soil onsite and removal of surplus soils during construction will be subject to control procedures which will include soil quality testing to ensure suitability for use onsite and for removal offsite in accordance with engineering and environmental specifications for the Proposed Development.

There is a potential risk associated with the use of cementitious materials during construction of subsurface structures (attenuation tanks and foundations) on the underlying soil and geology at the Proposed Development. It is considered that this may result in a ‘negative’, ‘slight’ and ‘long-term’ impact on existing quality of soil within a localised area underlying the Proposed Development.

The potential accidental release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary containment or a materials’ handling accident on the Proposed Development could potentially result in a ‘negative’, ‘moderate’, ‘long-term’ impact on the receiving soil and geology depending on the nature of the incident.

6.5.1.1.3 Soil Structure

The excavation and reuse of soils and bedrock at the Proposed Development will result in the exposure of the materials to various elements including weather and construction traffic. Soils and bedrock pending reuse onsite will be stockpiled in a controlled manner with a potential 'negative', 'slight' and long-term' impact on the natural strength of the materials.

6.5.1.1.4 Excavation of Soil and Bedrock

Excavation of subsoil and bedrock will be required to an anticipated maximum depth of 3.3mbgl at the Proposed Development Site. This is based on the proposed foundation and subsurface infrastructure design including installation of an attenuation tank to a maximum proposed depth of approximately 3.3mbgl (based on typical stormtech tank cross section, drawing number MRE-BMD-00-00-DR-C-1208, Barrett Mahoney, 2022). The final attenuation tank design will be tailored to Site specific characteristics (Barrett Mahoney, 2022) at the Construction Phase. Where possible, it is intended to retain, and re-use excavated soil and subsoil at the Site for fill and landscaping with in the Proposed Development. Land regrading to required levels will take place during construction.

Any surplus soils will be stockpiled prior to removal offsite for reuse. The removal of surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011. The potential impact with removal offsite of surplus soil and other material as wastes is assessed in Chapter 12 Material Assets.

The soils underlying the Proposed Development Site are considered to be of "low" importance. Based on the assigned importance of the underlying in-situ soils, the Proposed Development Site is anticipated to have a "negative" "imperceptible" and "permanent" impact associated with the loss of soils from the Site.

6.5.1.1.5 Importation of Aggregates

The Proposed Development will require the importation of aggregates during the Construction Phase as construction materials for filter drains and attenuation tank in accordance with the specification of the detailed design. The anticipated infill required during the construction is 16,720m^3/hr.

In order to minimise the requirement to import virgin quarried materials, recycled aggregates will be used where available and subject to meeting specified design requirements and all current construction and environmental legislation. This will include where suitable, by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011 and other applicable statutory requirements.

In the unlikely event that aggregate materials are sourced from unlicensed or unauthorized sources, it may result in the importation of contaminated materials, uncertified or material not suitable for use at the Proposed Development. In the unlikely event of the importation of contaminated materials onsite, there would be a 'negative', 'moderate to significant' and 'long term' impact on the receiving lands, soil and geology at the Proposed Development.

6.5.1.1.6 Geological Hazards

Earthquakes are not likely to occur in the vicinity of the Proposed Development at a sufficient intensity to pose a risk for the Proposed Development. The GSI database indicates that the Proposed Development is located within an area of low susceptibility to landslides.

The EPA maps the majority of the Proposed Development Site within “areas where 1 in 10 houses are above the high radon reference level” and is therefore identified as not being located within a High Radon Area.

There are no karst features recorded within the Site boundary as detailed in Section 6.3.10. The potential presence of karst could result in potential ground stability issues with a potential for a “negative” “moderate” and “permanent” impact. The mitigation measures to be incorporated are discussed in included in Section 6.6.1.6

6.5.1.2 Indirect

Excavation and Removal of Soil

It is anticipated that the Construction Phase of the Proposed Development will include the excavation and removal offsite of surplus soil and stone for reuse / recovery. In this scenario, the removal of soil and stone will be managed in accordance with all statutory obligations. Surplus material to be removed offsite will be reused as a by-product under Article 27 by-product notification or sent for recovery at a suitable authorised facility. Disposal of material will be considered only if re-use and recovery are not feasible. The receiving waste facilities will be appropriately licenced/permitted to accept the surplus soil and stone and the potential impacts will therefore have been adequately assessed and mitigated. Conditions for material to be consider under Article 27 are set out by the EPA to ensure material is suitable for reuse in the designated facility. Accordingly, it is considered that offsite removal and recovery will have a ‘neutral’, ‘imperceptible’ ‘permanent’ impact on the receiving site.

Importation of Fill Materials

The Proposed Development will include the importation of aggregates during the Construction Phase for the construction of filter drains at the Proposed Development. The potential impacts may include loss of attribute and changes in the geological regime at the source site. It is anticipated that the required aggregates identified for importation onsite will have a ‘neutral’, ‘imperceptible’ and ‘permanent’ impact on the source site taking account of the fact that the statutory consent process would have required the necessary environmental impacts to be assessed and mitigated as appropriate at the source site.

6.5.1.3 Secondary

There will be no secondary impacts associated with the Construction Phase of the Proposed Development.

6.5.2 Operational Phase

6.5.2.1 Direct

Design measures taken during the Construction Phase will limit potential for any direct adverse impact on the receiving land, soil, geological environment during the operational phase of the Proposed Development.

There will be no discharge to ground except for rainfall to open areas and rainfall to SuDs (through permeable paving, bio-retention and tree pits). Surface water runoff will be collected in newly constructed attenuation devices prior to discharging to the existing foul and surface water drainage, refer to Chapter 7 of this EIAR for additional information. Therefore, there will be a “neutral”, “imperceptible” and “permanent” impact on the receiving geological environment for the duration of the Operational Phase.

There is no identified potential human health impact associated with the soil and geological environmental at the Site considering the Site is undeveloped.

6.5.2.2 Indirect

There will be no indirect impacts associated with the Operational Phase of the Proposed Development.

6.5.2.3 Secondary

There will be no secondary impacts associated with the Operational Phase of the Proposed Development.

6.5.3 Potential Cumulative Impacts

6.5.3.1 Existing Planning Permissions

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

Table 6-7: Recent applications granted permission in the vicinity of the Proposed Development

Planning Ref No.	Applicant Name	Summary of Development
211283 09/02/2022	Loughdale Properties Limited	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works. ABP-311678-21
211046 14/12/2021	Louth County Council	Part 8 application for permission to carry out the development of 20 No. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda Co Louth the development will comprise of the following: Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling new pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e., 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores new pedestrian route from Boice Court Phase 2 to Cement Road All associated landscaping and ancillary/site development works.
LB191735 (Meath County Council) 21/02/2020	CAP Developments LLC	Alterations to existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A new main entrance and access control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq..; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and

		Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring 19.46 hectares. An EIAR has been submitted with this application.
19880 18/12/2019	Wogans Build Centre	Permission for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works.
18667 11/10/2018	Moffett Investment Holdings ULC	Extension of Duration Parent Ref: (08/101) 10-year permission - for a mixed-use development comprising a total of 527 no. dwellings (terraces, semi-detached, duplex and apartments and a civic/commercial neighbourhood centre of c 5,823sqm
1858 21/03/2018	Simon Paler Elmsont Limited	FURTHER EXTENSION OF DURATION REF: 12510022 which consists of Permission for Residential development of 190 units & a 430 sq.m. creche which, shall comprise of 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services & all associate works. PARENT PERMISSION REF: 06510077
17310 17/01/2018	North Drogheda Development Partnership	Permission for development to consist of amendments to a permitted residential development (Ref. 071507) to alter dwelling unit types, and to amend conditions 6(ii) and 51 (i)(a). The total permitted number of units of 1056 no. will remain unchanged

Excavated soil and bedrock from the Proposed Development Site could potentially be directed to the same receiving waste facilities for recovery / disposal as excavated soil and stone from other developments outlined in Table 6-7 and within the wider Louth area. All surplus soil and stone from the Proposed Development Site will be removed off-site in accordance with the requirements of the CDWMP which will be prepared by Enviroguide and all statutory legislation. Surplus material to be removed off-site will be directed to appropriately permitted/licensed waste facilities operated in compliance with the relevant statutory consents for the facility. Accordingly, it is considered that any cumulative impact on the land, soils, geology associated with the Proposed Development will be 'neutral', 'imperceptible' and 'permanent'.

There are no other cumulative impacts on land, soil or geology associated with the Construction Phase and Operational Phase of the Proposed Development.

6.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario the potential impact on the receiving land, soils and geological environment of the Proposed Development did not proceed is considered. It is considered that there would be no change or resulting impact on the nature of the Proposed Development Site which would remain undeveloped land and there would be no impact or change to the land, soil and geology at the Proposed Development Site.

6.6 Avoidance, Remedial & Mitigation Measures

The mitigation measures, as outlined below, will ensure that there will be no significant impact on the receiving land, soil, and geology environment.

6.6.1 Construction Phase

The Construction Environmental Management Plan (CEMP) will be prepared (Enviroguide, 2022) to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground having regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA - C532', CIRIA, 2001).

The CEMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

Detailed design will be specified by an appropriately qualified geotechnical Engineer for the construction of foundation at the Site to ensure that ground conditions are engineered and controlled appropriately.

6.6.1.1 Export of Soil and Stone Material

The removal offsite of surplus soil and stone from the Proposed Development will be reused as a by-product under Article 27 by-product notification or sent for recovery at a suitable authorised facility. It will be the contractor's responsibility to engage a specialist waste service contractor (s) who will possess the requisite authorisations, for the collection and movement of by-product / waste materials offsite. Material will be brought to an authorised facility which currently holds an appropriate waste facility permit or licence for the specified waste types. Waste Permitting, Licences & Documentation under the Waste Management (Collection Permit) Regulations 2007, as amended, a collection permit to transport waste, which is issued by the National Waste Collection Permit Office (NWCPO), must be held by each waste collection contractor.

The reuse of excavated soil and stone for the Proposed Development (i.e., topsoil for landscaping) will be subject to assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.

The approximate cut and fill volumes for the Proposed Development are:

- Cut: 51,405m^3.
- Fill: 16,720m^3.

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWMP (Enviroguide, 2022) and will be managed in accordance with all legal obligations.

6.6.1.2 Import of Aggregates

Contract and procurement procedures will ensure that all imported aggregates required for the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates shall be subject to management and control

procedures which shall include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

6.6.1.3 Management of Stockpiles (soil and other materials/ waste)

For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area shall be identified and designated.
- All stockpiles shall be assigned a stockpile number.
- Material identified for reuse on site, off site and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawings.
- Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust.
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the Site.
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will not be located near Site boundaries or sensitive receptors and a set-back of 10m will be maintained from any boundary with offsite receptors.

When a stockpile has been sampled for classification purposes, it shall be considered to be complete, and no more soil shall be added to that stockpile prior to removal off Site. An excavation/stockpile register shall be maintained on-site

Any waste generated from construction activities, including concrete, asphalt and soil stockpiles, will be stored on-site in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required).
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

6.6.1.4 Concrete Works

Where possible precast concrete will be used where required during construction. However, where cast-in-place concrete is required (i.e., foundations, footpaths), all work will be carried out to avoid any contamination of the receiving soil and geological environment through the

use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

6.6.1.5 Handling of Chemicals and Fuels

- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station to be determined by the contractor by mobile road tanker brought to the Site as required. Each station will be fully contained equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works onsite.
- Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed offsite.
- There will be no bulk storage of fuels and oils or other chemicals. Any required quantity of these materials will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005) and Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004 as amended); and
- Emergency procedures will be developed by the appointed contractor, and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements. In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to soils and geology associated with the Construction Phase of the Proposed Development.

6.6.1.6 Geotechnical design

Appropriate geotechnical design avoidance and reductive measures will be incorporated in the design to prevent any potential impacts associated with karst.

Detailed design will be specified by an appropriately qualified geotechnical Engineer for the construction of foundations at the Site to ensure that ground conditions are engineered and controlled appropriately.

6.6.2 Operational Phase

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.

The Proposed Development Site is within a Moderate Radon Area. The EPA required radon barriers will be installed in accordance with current building regulations in High Radon Areas only.

6.6.3 "Worst Case" Scenario

Surface water runoff including runoff of deleterious material (i.e., fuels from vehicles onsite) will be directed to the stormwater drainage system and treated via. the petrol interceptor at the Proposed Development.

In a 'Worst Case' scenario there is a potential risk of accidental release of untreated water via failure of the drainage system with potential impacts on the receiving geological environment. The depth to bedrock is highly variable but expected to be greater than 9.7m in the centre of the Site. The subsoils encountered in surrounding ground investigation (within the same GSI quaternary unit) are described as low permeability clay. Degradation will occur before contaminated reach the underlying aquifer. It is considered that the potential risk of the release of untreated water would present a 'negative', moderate' and 'long-term' impact on the receiving land, soils and geology environment. However, this is deemed to be an unlikely scenario.

6.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in in terms of quality, significance, extent, likelihood and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

Table 6-8. Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of the Proposed Development	Land take	There will be a land take of 4.82Ha for the entire Proposed Development with a change of land use from undeveloped land to retail/commercial land use.	Neutral	Slight	Permanent	Direct	None required. The Proposed Development is in line with the Louth 2021 to 2027 Development Plan within the zoning of B4 "District Centre" and "C1 Mixed Use"	Slight
Accidental release of deleterious materials including fuel and other materials being used on-site.	Land, Soil and Geology	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident, to the land, soil and geological environment.	Negative	Moderate	Long-term	Direct	Refuelling of plant during the Construction Phase will only be carried in a designated impermeable area on-site equipped with spillage kits. Any other diesel, fuel or hydraulic oils stored on-site or within fuel containing equipment will be stored in bunded storage tanks / drip trays.	Imperceptible
Use of cementitious materials.	Soil and Geology	Potential release of cementitious material during construction works for foundations, pavements and infrastructure.	Negative	Slight	Long-term	Direct	The cementitious materials used during construction will avoid any contamination of soil and geology through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with industry standards.	Imperceptible
Excavation Soil	Soil Structure	Stockpiling of soil and subsoil pending reuse on-site will result in the exposure of the materials to various elements including weather and construction traffic.	Negative	Slight	Long-term	Direct	Soil and subsoil pending re-use on-site will be stockpiled in a controlled manner and in accordance with the requirements of the CEMP which will be developed by the appointed	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
							Contractor in advance of construction works commencing.	
Excavation Soil	Soil & Bedrock	The Proposed Development will require the excavation of soil, subsoil and bedrock. Approximate volumes: -cut 51,405m^3/hr -fill 16,720m^3/hr	Negative	Imperceptible	Permanent	Direct	The potential impacts on the underlying soils and bedrock are unavoidable and there is no mitigation however the underlying soil at the Proposed Development Site is rated as an attribute of 'low" importance (IGI, 2013).	Imperceptible
Import of required aggregates for the construction of the Proposed Development.	Land, Soil and Geology at the Proposed Development Site	The potential impacts may include importation of unsuitable of contaminated materials	Negative	Moderate to Significant	Long Term	Direct	Contract and procurement procedures will ensure that all imported aggregates meet with industry conformity/compliance standards and statutory obligations	Slight to Moderate (Unlikely)
Ground stability	Karst features	The presence of Karst within the Tullyallen formation could cause ground stability where cut and fill is required. There are no karst features mapped by the GSI within the site boundary.	Negative	Moderate	Permanent	Direct	Appropriate geotechnical designs avoidance and reductive measures will be incorporated in the design.	Imperceptible
Excavation and Removal of Soil	Article 27 destination site	Potential impacts may include unsuitable material to destination site.	Neutral	Imperceptible	Permanent	In direct	Removal will be managed in accordance with all statutory obligations	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Importation of Fill Material	Soil at Source Site	Loss of attribute and changes in the geological regime at the source site	Neutral	Imperceptible	Permanent	In direct	Statutory consent process would have required the necessary environmental impacts to be assessed and mitigated	Imperceptible
Operational Phase								
Infiltration of Surface Water	Soil Quality	Given the low permeability rate of the underlying soils (GSI,2022) it is considered that there is limited potential for infiltration to ground via the storm water drainage network	Negative	Neutral	Imperceptible	Permanent	SuDs maintenance	Imperceptible

6.8 Monitoring

There are no monitoring requirements specifically in relation to land, soil and geology.

6.9 Interactions

6.9.1 Material Assets (Transport)

Soil excavated during construction works for the Proposed Development will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.

Specific issues relating to Traffic associated with the Proposed Development are out in the Traffic Assessment (Barrett Mahony, 2022).

6.9.2 Population and Human Health

No public health issues associated with the land, soil, geology conditions at the Proposed Development have been identified for the Construction or Operational Phase.

The Proposed Development is not considered to be within a High Radon Area and where required radon barriers will be installed in accordance with current building regulations.

Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers.

The necessary measures will also be implemented to address any nuisance issues associated with dust dispersion during construction works including the offsite removal of surplus soil. The potential impacts associated with airborne dust is addressed in Chapter 8 (Air Quality) and Chapter 4 (Population& Human Health) of this EIAR. Specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.

6.9.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.

6.9.4 Material Assets

An assessment of the potential impact of the Proposed Development on the material assets including built services, infrastructure, traffic, and waste management is included in Chapter 12 of this EIAR.

6.9.5 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and

species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

6.9.6 Landscape and Visual

During the construction phase the Site landscape will undergo a change from agricultural land to a retail part with landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 10 of this EIAR.

6.9.7 Air Quality and Climate

The excavation of soils across the Proposed Development Site and the temporary stockpiling of soils pending reuse or removal off-site has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate are included in Chapter 8 of this EIAR.

6.10 Difficulties Encountered When Compiling

There was not site-specific ground investigation data available for the Site. However, this is not considered to have been a difficulty for this assessment taking account of the design for the Proposed Development including design avoidance and mitigation measures that will be implemented and the fact that worst-case scenario has been assessed.

6.11 References

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7 HYDROLOGY AND HYDROGEOLOGY

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the hydrology and hydrogeology (water) environment within and immediately surrounding the Site of the Proposed Development and an assessment of the potential impacts of the Proposed Development on hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the Proposed Development Site.
- Potential impacts that the Proposed Development may have on the receiving water environment.
- Potential constraints that the environmental attributes may place on the Proposed Development.
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

7.1.1 Quality Assurance and Competence

This chapter of the EIAR was written by Sam Marchant MSc., BSc, who is a Hydrogeologist with Enviroguide Consulting and reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

7.1.2 Description of the Proposed Development

BPM GP3 Limited intend to apply for Planning Permission for development on lands to the south of the existing M1 Retail Park, Mell, Drogheda, Co. Louth.

The development will consist of:

> *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking*

spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

The proposed Site layout is presented in Figure 7-1.

Figure 7-1: Proposed Site Layout (MM1-MCA-00-00-DR-A-2000, MCA Architects)

7.2 Study Methodology

7.2.1 Regulations and Guidelines

The methodology adopted for the assessment has regard to the relevant guidelines and legislation including:

- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive, WFD).
- European Commission, 2022. WFD Reporting Guidance 2022. Final Draft V4.
- Local Government, October 2021. No. 1.1977. Local Government (Water Pollution (Amendment) Act.
- Local Government, October 2007. No. 30.2007. Water Services Act 2007.
- Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990.
- Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977 with amendments.
- S.I. No. 722/2003 – European Communities (Water Policy) with amendment S.I. No. 413/2005.
- S.I. No. 489/2011 – European communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011.
- S.I. No. 122/2010 – European Communities (Assessment and Management of flood Risks) Regulations 2010 including amendment S.I. No. 495/2015.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201; and
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Ground-water Abstractions (WFD, 2005).

Other guidance used in the assessment of potential impacts on the receiving water environment are referenced where relevant in this EIAR Chapter and includes

- Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).
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- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009); and
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).

7.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination. This element of the assessment

also included developing the Conceptual Site Model (CSM) for the Proposed Development Site and receiving environment.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the Proposed Development Site. The study area, for the purposes of assessing the baseline conditions for the Hydrology and Hydrogeology Chapter of the EIAR, extends beyond the Site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development Site, those outside of this radius but that are potentially hydraulically connected with the Site were also considered. The extent of the wider study area was based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) that recommends a minimum distance of 2.0km radius from the Proposed Development Site. The purpose of this increased search radius was to ensure that any potential hydrogeological / hydrological connections to sensitive receptors including habitats were identified.

The desk study involved collecting all the relevant data for the Proposed Development site and surrounding area including published information and details pertaining to the Proposed Development provided by the applicant and design team.

A Site walkover survey to establish the environmental Site setting and baseline conditions at the Proposed Development Site relevant to the hydrological and hydrogeological environment was undertaken by Enviroguide Consulting on the 1st of July 2022.

The Element 1 stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) web mapping (EPA, 2022).
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater web mapping (EPA, 2022).
- National Parks and Wildlife Services (NPWS) web mapping (NPWS, 2022).
- Ordnance Survey Ireland (OSI) web mapping (OSI, 2022).
- Water Framework Directive Ireland (WFD) web mapping (WFD, 2022).
- Teagasc web mapping (Teagasc, 2022).
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2022); and
  Information provided by the Applicant pertaining to previous Site investigations and the design proposals for the Proposed Development.

Element 2: Involves Direct and Indirect Site Investigation and Studies stage where necessary to refine the CSM and evaluate the potential impacts associated with the Proposed Development. A ground investigation was not complete for this Site.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction and Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Hydrology and Hydrogeology sections of the EIAR in this Chapter which includes all the associated figures and documents.

7.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of hydrogeological features at the Proposed Development Site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 7-1.

Table 7-1 Criteria for Rating Site Importance of Hydrogeological Features

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

7.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter are described in Table 7-2.

Table 7-2. Assessment of Potential Impacts Terminology and Methodology

Quality of Effects / Impacts	Definition
Positive	A change that improves the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effects	A change which reduces the quality of the environment.
Significance of Effects / Impacts	**Definition**
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Extend and Context of Effects	
Extend	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe weather the extent, duration or frequency will conform or contrast with established (baseline) conditions
Probability of Effects	
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration of Effects / Impacts	**Definition**
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Types of Effects	
Indirect Effects	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
Cumulative Effects	he addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
"Do-nothing" Effects	The environment as it would be in the future should the subject project not be carried out
"Worst-case" Effects	he effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.

Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Site Location

The Site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the Site), with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the Site, and Barrack Lane is adjacent to the south of the Site.

The Proposed Development Site location is presented in Figure 6-2.

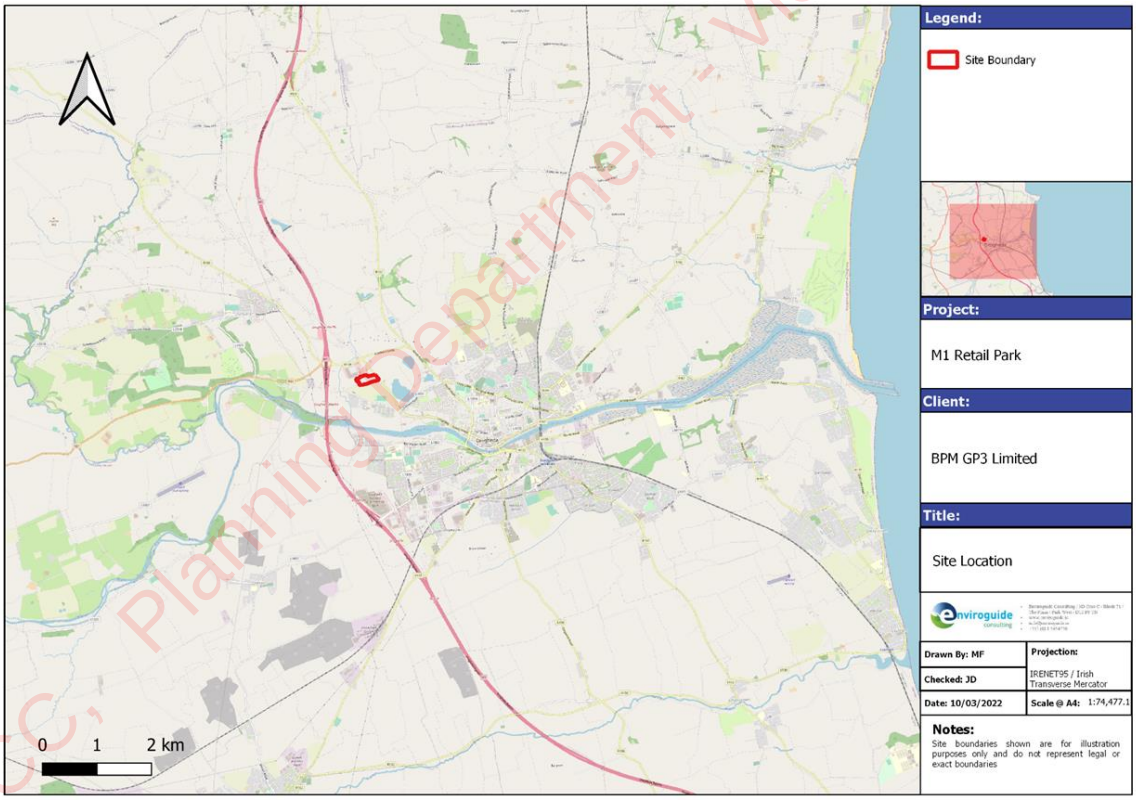

Figure 7-2. Site Location

7.3.2 Current & Historical Land Use at the Site and Surrounding Area

The Proposed Development Site consists of previously undeveloped land.

Historical mapping and aerial photography available from the Ordnance Survey of Ireland (OSI, 2022) and Google Earth (Google Earth, 2022) were reviewed. The full findings are

summarised in Chapter 6. In relation to the hydrologic regime, In the 1837 to 1842 OSI Map 6 Inch, a well named “St. Patrick’s Well” is located 0.4m southeast of the Site.

The Proposed Development Site is located south of the M1 retail complex.

The immediate surrounding landscape is urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the Site). A residential dwelling is located along the western boundary of the Site. The south of the Site is bound by Barrack Lane and agricultural lands further south. While the east of the Site is bound by Trinity Street (R168) and more agricultural lands further east. The remaining surrounding landscape to the east, south and west is predominantly agricultural in nature.

7.3.3 Topography

The topographical survey of the Proposed Development Site indicates that the overall topography ranges from approximately 25.5meters above ordnance datum (above mOD) in the southwest to 36m above OD in the centre of the Site

- The southern portion of the Proposed Development Site generally falls from north (32m above OD) to southwest (25m above OD).
- To the west of the Site boundary, the topography slopes towards the Mell stream at approximately 14m above OD.
- Regionally the ground is sloping to the south-east towards the Boyne Estuary and Irish Sea

Figure 6-4 in the Chapter 6 presents the topographic site survey.

7.3.4 Surrounding Land Use

There are three (3no.) EPA licensed facilities located within a 2km radius of the Proposed Development Site:

- Drogheda Landfill - Drogheda Borough Council, Active Waste License, Licence Number (W0033-01).
- Height for Hire Ltd, Other Waste License, License Number (W0154-01).
- ADSIL Drogheda, Applied IEL License, License Number (P1181-01).

7.3.5 Rainfall

Monthly rainfall data available for 1km x 1km grids (for the period 1981 to 2010) was sourced from Met Éireann (Walsh, 2012) and is presented in Table 7-3.

Table 7-3: Long Term Mean Monthly Rainfall Data (mm) (Walsh, 2012)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
78	54	66	58	57	64	68	83	71	88	76	77	839
Note: 1km x 1km Irish Grid Coordinates selected for the Proposed Development Site = X (Easting): 304000, Y (Northing):387000												

The closest synoptic meteorological station to the Proposed Development Site is at Dunsany station in Co. Meath. Dunsany station is located approximately 29km south-west of the Proposed Development. A summary of the average PE at Dunsany station for the period 2019 to 2021 (Met Éireann, 2022) is presented in Table 7-4.

Table 7-4: Average Potential Evapotranspiration (Met Éireann, 2022)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual Average (2019 to 2022 data)
10.7	21.0	35.3	56.3	81.2	80.4	84.2	65.9	45.4	25.8	11.3	8.9	526.3

The average annual PE at the Proposed Development Site is 526.3mm/year, calculated based on available monthly potential evapotranspiration data from 2019 to 2021 (Met Éireann, 2022) (refer to Table 7-4). The GSI (GSI, 2022) have calculated an Effective Rainfall (ER) value of 354.8mm/year across the Proposed Development Site.

7.3.6 Soil, Geology

The soils and geology encountered during the desk study and from site investigations in the vicinity of the site are assessed in Chapter 6 of the EIAR.

The soil and geology at the Site are mapped as "'Irish Sea till'" overlying "Irish Sea Till derived from Lower Palaeozoic sandstones and shales" (IrSTLPSsS) subsoils. The bedrock beneath the Site is mapped as Limestone and Carboniferous shale of the Tullyallen Formation (GSI, 2022).

7.3.7 Regional Hydrogeology

7.3.7.1 Groundwater Body

The bedrock aquifer of the Tullyallen Formation beneath the Proposed Development Site is within the Drogheda Groundwater Body (GWB) (EU Code:IE_EA_G_025) (EPA, 2022). The Drogheda GWB covers an area of 49km^2 and occupies and an area across Louth and Meath (GSI, 2022).

The GSI (GSI, 2022) have identified a recharge coefficient for the aquifer beneath the Proposed Development Site between 7.5 and 15% of effective rainfall. The calculated average recharge is between 27 and 53mm/year.

The Drogheda GWB report (GSI, 2022) states that groundwater will enter the aquifer by point and diffuse recharge. Rainwater will enter aquifer directly at enclosed depressions and swallow holes. There is a swallow hole noted approximately 0.5km north of the Site. Diffuse recharge is more widespread but thick poorly permeable subsoils overlying the aquifer will reduce amount of water reaching the water table. Highest diffuse recharge will occur where subsoils are thinner i.e., in limestone – derived till and gravel deposits outside of the site boundary.

Groundwater will discharge from the aquifer directly to the coast as well as to rivers in the area, as baseflow or as springs in the vicinity of the rivers. The GSI (Drogheda GWB Report)

identifies that the majority of groundwater flow direction in the aquifer is towards the river Boyne and the coast with flow paths of up to a couple of kilometres expected. Most of the groundwater occurs in the top 30m of the aquifer in a network of connected fractures and fissures.

Groundwater flow in the Drogheda GWB (GSI, 2022) will be from the main recharge areas i.e., areas of thin subsoil in the west and north towards the discharge area i.e., River Boyne and the coast.

The nature of the groundwater flow will depend on the degree of karstification. Where the aquifer is heavily karstified, groundwater flow will be through a series of connected fractures and joints. The Drogheda groundwater descriptor report highlights that trial wells in Mell have shown up to 10% of the total rock penetrated had cavities, the limestone was massive and crystalline with strong vertical jointing and karstification. The Mel Quarry located approximately 0.2km west of the Site, shows the limestone to have a high degree of karstification (Louth-County Geological Site Report, Mell Quarry).

There are two groundwater inner source protection zones located within a 2km radius of the Site (Drybridge Water Supply Scheme and Ballymakenny Group Water Scheme). The outer source protection zone is the same as the inner source protection zone for Drybridge Water Supply Scheme and Ballymakenny Group water Scheme. The Site is located within the source protection zones for Drybridge Water Supply Scheme. The associated reports provide information on the depth to bedrock, groundwater flow, karstification and water quality. Information on the yield and use as a drinking water supply is further discussed in Section 7.3.1. The hydrogeological information available is discussed below.

Drybridge Water Supply Scheme:

The Drybridge Water Supply Scheme report was prepared by the GSI on behalf of Louth County Council in 2014 (Louth County Council, 2014). The water supply borehole is located approximately 0.4km southwest of the Proposed Development Site. The well was drilled in 1979 to a depth of 43m, depth to bedrock is 7.8mbgl. Groundwater monitoring at the well show the Drybridge Water Supply Scheme is very responsive to rainfall events. This is typical of point recharge in karst areas. The GSI interpretation of the pumping test analysis state recharge is “likely from point recharge where these fractures are active; from the saturated gravel deposits down gradient of the borehole; and from the diffuse karst fissure network”. The report notes the well is tidally influenced. The general groundwater flow direction is south towards the Boyne River.

Ballymakenny:

The Ballymakenny Group Water Scheme report was prepared by CDM Smith on behalf of the EPA in 2014 (EPA, 2011b). The group water scheme boreholes are located approximately 2.5km north-east of the Site boundary. The group water scheme consists of three wells- BH1 and BH2 were drilled in 1992 by Meehan Drilling Ltd (there are no well construction records available). Borehole BH3 was drilled in August 2005 by Patrick Briody & Sons Ltd. Fractured bedrock was encountered at approximately 36.4mbgl, with water from approximately 47.2m, competent bedrock was encountered at approximately 48.8m, further weathering was present between 59.4m and 62.3mbgl with competent bedrock between, indicating discrete fractured zones. The general flow direction is from the north towards the Boyne River and Estuary. The report states “groundwater is believed to flow predominantly through fractures and fissures

rather than conduits and solution cavities. However, the potential presence and hydraulic influence of karst features in the immediate vicinity of the GWS cannot be ruled out". The faults and fractures will enhance the permeability of the aquifer locally, where groundwater flow converges on higher permeability zones.

Locally, groundwater flow direction in the vicinity of the Proposed Development Site is assumed to reflect local topography and may discharge to the Mell stream located west and downgradient of the Proposed Development Site.

7.3.7.2 Recharge

The GSI groundwater recharge map provides an estimate of the average amount of rainwater that percolates down through the subsoils to the water table over a year. The map accounts for rainfall that percolates diffusely through soils and subsoils but does not take into account water that enters aquifers at points (e.g., at sinkholes) or along linear features (e.g., along sinking streams/rivers). Groundwater recharge amounts are estimated by considering soil drainage, subsoil permeability, thickness and type, the ability of the aquifer to accept the recharge, and rainfall. The GSI recharge in the area is detailed in Section 7.3.7.1.

Information from the EPA document for the Ballymakenny group water scheme report (EPA, 2014) indicates that direct recharge will occur at the Mell Quarry where bedrock is exposed. The quarry likely has a regional control over groundwater levels in the Drogheda area, acting as recharge mounds.

7.3.7.3 Aquifer Classification and Groundwater Vulnerability

The bedrock aquifer within the Tullyallen Formation beneath the Site is classified by the GSI (2022) as "Regionally Important Aquifer -Kartsified (diffuse)" (Aquifer Code: Rkd). The area is heavily faulted with a mapped aquifer boundary approximately 0.6km north of the Proposed Development Site. '

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 7-5. The publication states that '*as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area:*

- *the subsoils that overlie the groundwater.*
- *the type of recharge - whether point or diffuse; and*
- *the thickness of the unsaturated zone through which the contaminant moves*.'

Table 7-5: Vulnerability Mapping Criteria (DEHLG/EPA/GSI, 1999)

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability & Type			(Swallow holes, losing streams)	(sand & gravel aquifers *only*)
	High permeability (sand & gravel)	Moderate permeability (sandy subsoil)	Low permeability (clayey subsoil, clay, peat)		
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High
Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.					

The GSI assignment of groundwater vulnerability for groundwater beneath the Site ranges from “Low” to “Extreme” (GSI, 2022). The “Low” is mapped in the centre of the Site and the vulnerability increases towards the exposed rock in the disused Mel quarry to the east (mapped as ‘X’ ‘Rock at or near karst’ by the GSI, 2022). The groundwater vulnerability beneath the west of the Proposed Development is mapped as low. Based on the vulnerability rating of the Site, the depth to bedrock is interpreted in the centre of the Site as greater than 10mbgl decreasing to between 0m and 3mbgl on a thin section to the east.

The bedrock aquifer classification and groundwater vulnerability rating maps are provided in Figure 7-3 and Figure 7-4 respectively.

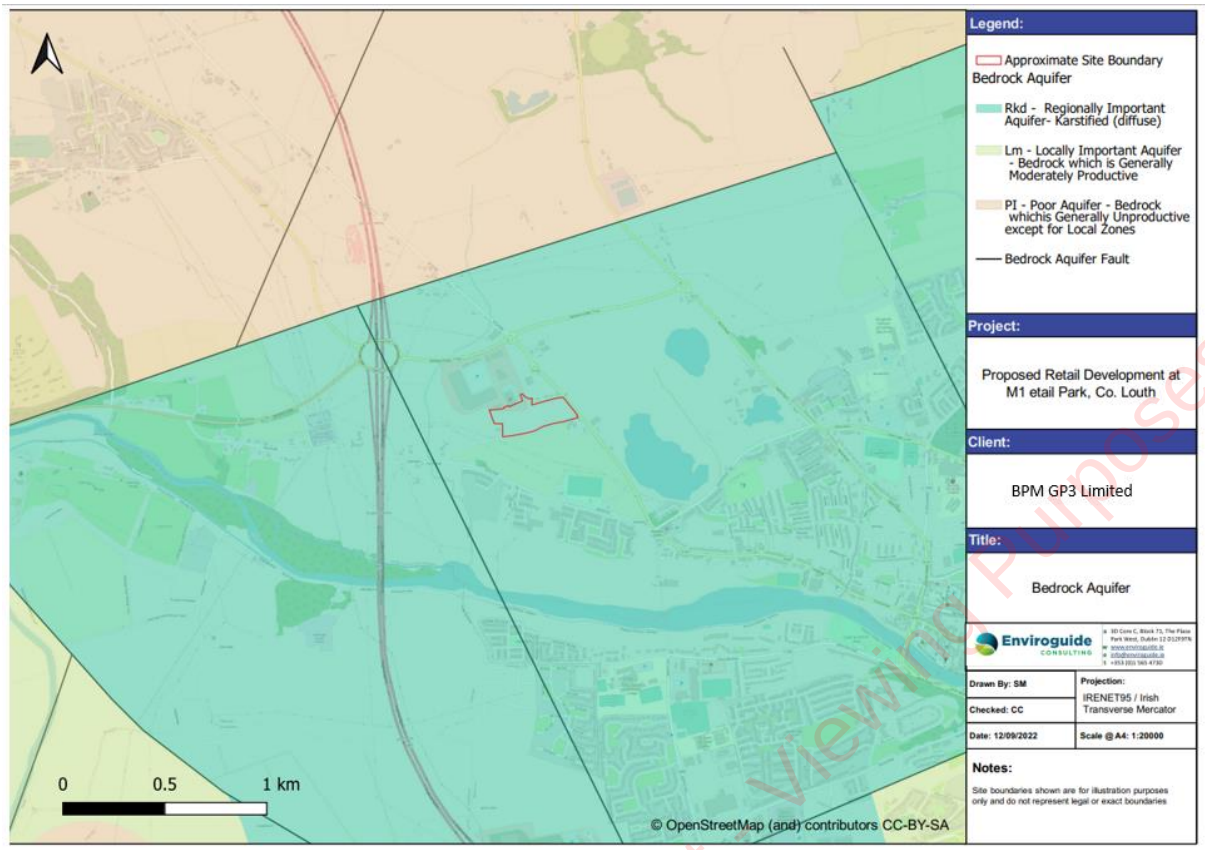

Figure 7-3. Bedrock Aquifer

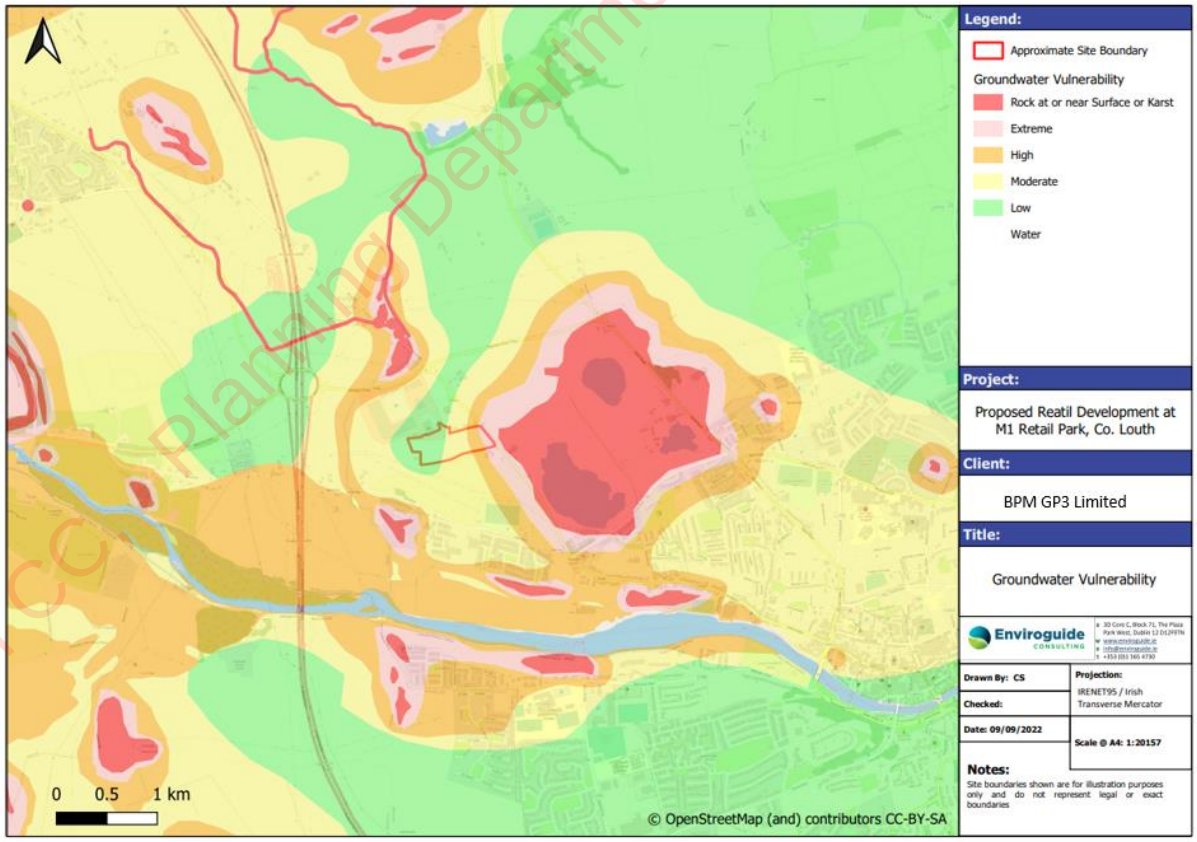

Figure 7-4. Groundwater Vulnerability

7.3.8 Hydrology

The Site is located within the Boyne Hydrometric Area 07 and the Boyne Sub-Catchment (Sub-catchment I.D.:07_17). The Site is located within the Tullyeskar River Sub-basin.

The EPA records surface waterbodies. Those that are identified as having a potential hydraulic connection to the Proposed Development Site is:

- The Mell stream (EU code: IE_EA_07T270880, WFD Name: Tullyeskar_010) is located downgradient approximately 0.32km west of the Proposed Development. The Mell stream flows to the south and joins the Boyne Estuary transitional waterbody. The Mell stream is within the WFD 'Tullyeskar_010' sub catchment. The Tullyeskar_010 contains four tributaries which flow southwards into to the Boyne Estuary. The Mell is the western most tributary.
- Stagrennan River (EU code: IE_EA_07S320550, WFD Name: Stagrennan_010) is located approximately 0.27km south of the Site. The Stagrennan River flows into the Boyne Estuary from the south (flowing northwards).
- Boyne Estuary (European Code: IE_EA_010_0100) is located approximately 0.77km south of the Proposed Development Site. The Boyne Estuary flows eastwards and enters the Boyne Estuary Plume Zone (EU Code: IE_EA_010_0000).

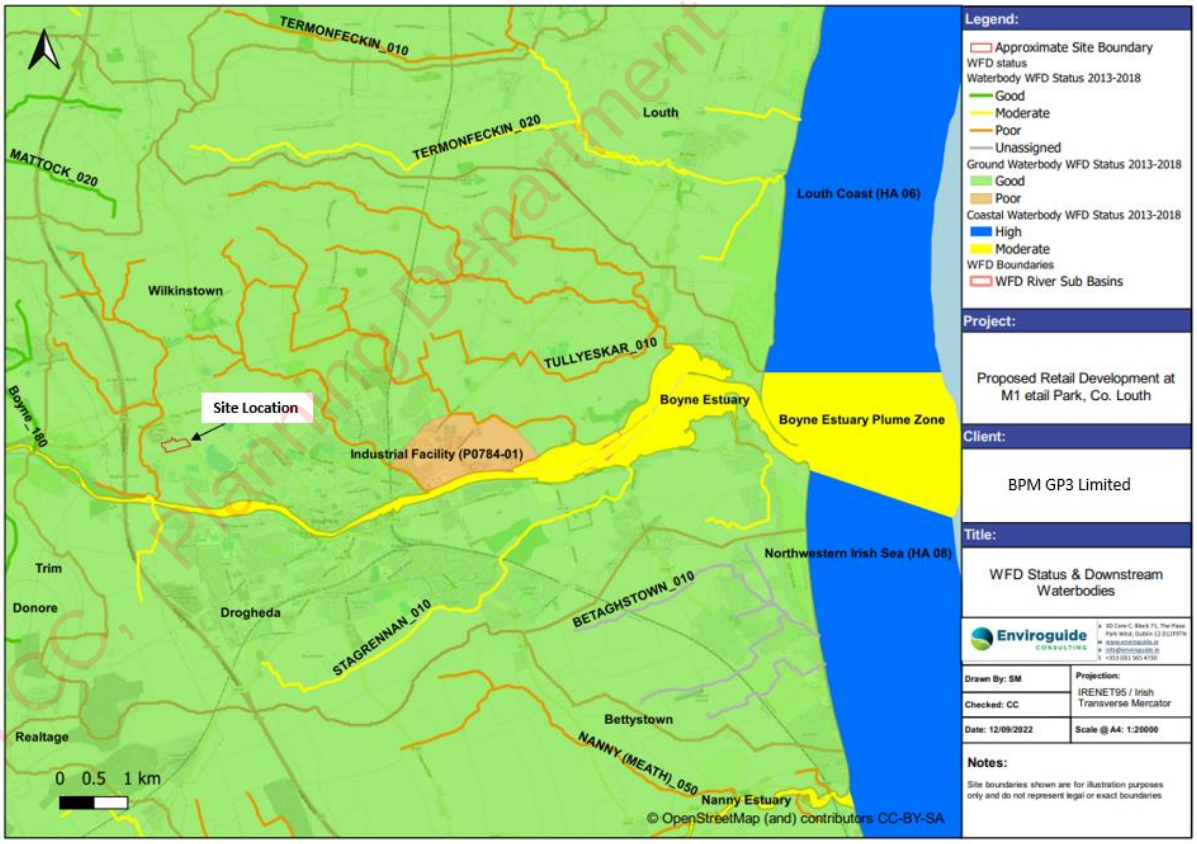

Figure 7-5. Local Surface Water Features & WFD Status

7.3.9 Flooding

A site-specific flood risk assessment (FRA) report was produced (Barrett Mahony, 2022) for the Proposed Development Site. The FRA assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding. There were no flooding or surface water management issues identified relating to the Site. The FRS takes account of potential impact of climate change.

7.3.10 Water quality Data

7.3.10.1 Published Regional Surface Water Quality

The EPA surface water quality monitoring database was consulted and relevant water quality data pertaining to the Site was reviewed. There are no recorded surface water monitoring stations located on the Mell stream.

There are numerous water monitoring stations in the Boyne Estuary transitional waterbody. The two closest stations to the Mell stream/Boyne Estuary confluence are described below:

- Station 'Downstream of TPEFF2100D0266SW001' (station ID: TW21001002BE1009) is located approximately 0.95km upstream of the Mell stream tributary to Boyne Estuary confluence. The station is listed as investigative, there is no available monitoring data (EPA, 2022).
- Station 'BE010 - Leonard's Cross' (station ID: TW`21001002BE1002) is located approximately 0.95km downstream of the Mell stream tributary to the Boyne Estuary confluences. The station type is listed as surveillance, there is no available monitoring data (EPA, 2022).

The biotic indices also known as Q values, biotic indices based on macro-invertebrates' numbers, which reflect the average water quality, were assessed by the EPA at the "Oldbridge (Obelisk Br)" located approximately 1.8km upstream of the confluence between the Mell stream and the Boyne Estuary and results are provided in Table 7-6.

Table 7-6: EPA surface water monitoring stations and assigned Q values

EPA Monitoring Station name	Station Code	Location from Site	Distance from Site (km)	Assigned Q value
Oldbridge (Obelisk Br)	RS07B042200	West	1.9	4 "Good"

7.3.10.2 Published Regional Groundwater Quality

The EPA groundwater monitoring database was consulted. Drybridge station (station code: GWIE_EA_G_02521000005) is within the Drogheda GWB located approximately 0.4km southwest of the Proposed Development Site on the western banks of the Mell stream. The EPA (EPA,2022) have defined the trend analysis and indicative quality of the WFD parameters. The data is summarised in Table 7-7 for the 2013 to 2018 period.

The trend assessment indicates whether the concentrations are showing an increasing, decreasing or no trend in the available data as assigned by the EPA. Chloride has an upward trend while Orthophosphate is not displaying a trend. Both Chloride and Orthophosphate are listed as "Failing to achieve good" quality. However, overall, the WFD status for the Drogheda groundwater body is good and not at risk, further discussed in Section 7.3.12. The Site is

located within the Drogheda groundwater body and thus the assessment is indicative of groundwater in the area and beneath the Site.

Table 7-7: EPA groundwater water quality data for Drybridge monitoring station with EPA assigned Indicative Quality and Trend

Parameter	Indicative Quality	Trend
Ammonia -Total (as N)	Good	Upwards
Chloride	Failing to achieve good	Upwards
Conductivity at 25°C	Good	Downwards
Nitrate (as NO3)	Good	Upwards
ortho-phosphate (as P) -unspecified	Failing to achieve good	None

7.3.10.3 Water Quality in Water Supply Boreholes in the Drogheda GWB

Groundwater quality from the Drybridge Water Supply Scheme and the Ballymakenny Group Water Scheme is available in their respective reports.

The Drybridge Water Supply Scheme was sampled on twenty-two occasions between June 1993 and December 2009. Elevated chloride, phosphate and bacteria concentration were present, suggesting contamination from an organic waste source. Elevated Chloride was also present partially due to the natural coastal influence on the groundwater source.

The report notes that surface water quality in the Mell stream (referred to as the “Drybridge Stream” in the report) will likely have a direct impact on the quality of the groundwater with potential direct recharge via the sinking reach of the stream, with all surface water contamination treated as a threat to the underlying Drogheda groundwater body (Louth County Council, 2014).

The Ballymakenny group water scheme has been monitored by the EPA since 1993. The water is “moderately hard” to “hard”. The hydrochemical signature of the water supply is calcium bicarbonate. Nitrate concentrations averaged at 3.66mg/l, low nitrate concentrations in a confined aquifer may suggest denitrification. Average Chloride concentrations are below the EPA status threshold value for “Good” chemical status, however the range indicated values above the threshold. The report states that the concentrations are considered natural in occurrence given the proximity to the sea and given that Chloride was not displaying a sustained upward trend (EPA, 2011b). Metal concentrations were within a normal range. Concentrations of Molybdate Reactive Phosphate (MRP) or orthophosphate exceeds the EPA status threshold value for “good” groundwater status. There are no apparent correlations between orthophosphate and other pollutants. The groundwater body may be impacted by diffuse pressures of an agricultural nature (EPA, 2011b).

Based on the groundwater quality data within the Drogheda groundwater body. The indicative baseline groundwater beneath the site will be “moderately hard” to “hard” with elevated concentrations of chloride, phosphate, and bacteria present.

7.3.11 Water Use and Drinking Water Source Protection

There are no mapped (EPA, 2022) surface water bodies delineated as drinking water rivers or lakes in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007) that have a hydraulic connection to the Site. The bedrock aquifer of the Drogheda GWB is delineated as a drinking water source.

There is a total of thirty (30 No.) groundwater sources recorded within a 2km radius of the Site in the GSI wells and springs database (GSI, 2022). The Proposed Development Site is located within an area serviced by mains water supply and there is no supply well at the Site. The wells with a recorded yield or use are listed in Table 7-8 below.

Table 7-8: GSI Wells and Springs within 2km radius with a recorded yield classification or use

GSI Name	Distance from Site Approx km)	Direction from Site	Yield classification	Yield (m3/day)	Use
2927SEW065	1.1	East	Moderate	54.5	Agri & domestic use
2927SEW052	0.2	North	Excellent	490	Industrial use
2927SEW059	0.4	South-West	Excellent	924.5	Unknown
2927SEW066	0.5	South-West	Good	200	Industrial wells
2927SEW081	0.6	South-East	Intermediate Spring	1140	n/a
2927SEW055	1	North-West	Good	129.6	n/a
2927SEW054	1.15	North-West	n/a	86.4	Group Scheme
2927SEW053	1.05	East	Good	231	Industrial Use
2927SEW045	1.8	South-West	Moderate	81.8	n/a
2927SEW012	1.4	South	n/a	n/a	Domestic Use Only
2927SEW042	1.65	South	Failure	n/a	n/a
2927SEW043	1.7	South	Poor	28	n/a
2927SEW056	1.8	North	Good	110	Agri & domestic use

*n/a = not available in the GSI records (GSI, 2022)

In addition to the wells and springs, there are two inner source protection areas and one group water scheme protection area recorded within 2km radius of the Site:

- Drybridge Water Supply Scheme: The daily supply in 2010 was 275m^3/day with capability to produce 350m^3/day, serving approximately 800 people (Louth County Council, 2011). The inner source protection zone is delineated within the Site boundary. The source protection zone is split into different source protection areas. The proportion of the source protection area within the Site boundary is classified as “SI/L” (Louth County Council, 2014), indicating it is within the “low (L)” groundwater vulnerability of the inner source protection area (SI) (EPA, 2011a);

- Ballymakenny Group Water Scheme: The zone of contribution was delineated for an expected abstraction rate in 2011 of 600m^3/hr, plus 50%, for a total abstraction rate of 960m^3/hr. The source protection zone extends to approximately 0.7km east of the Site;
- Drybridge Group Water Scheme, Group Scheme Preliminary Source Protection Areas: Drybridge. There is no additional information available on the GSI website.

The Groundwater SPAs in the vicinity of the Proposed Development Site are also presented in Figure 7-6.

The presence of “St.Patrick’s Well" on the 1837 to 1842 OSI Map may indicate shallow groundwater levels. The well is located 0.4km southeast of the Site Boundary. The well type is not stated (i.e., spring or dug well).

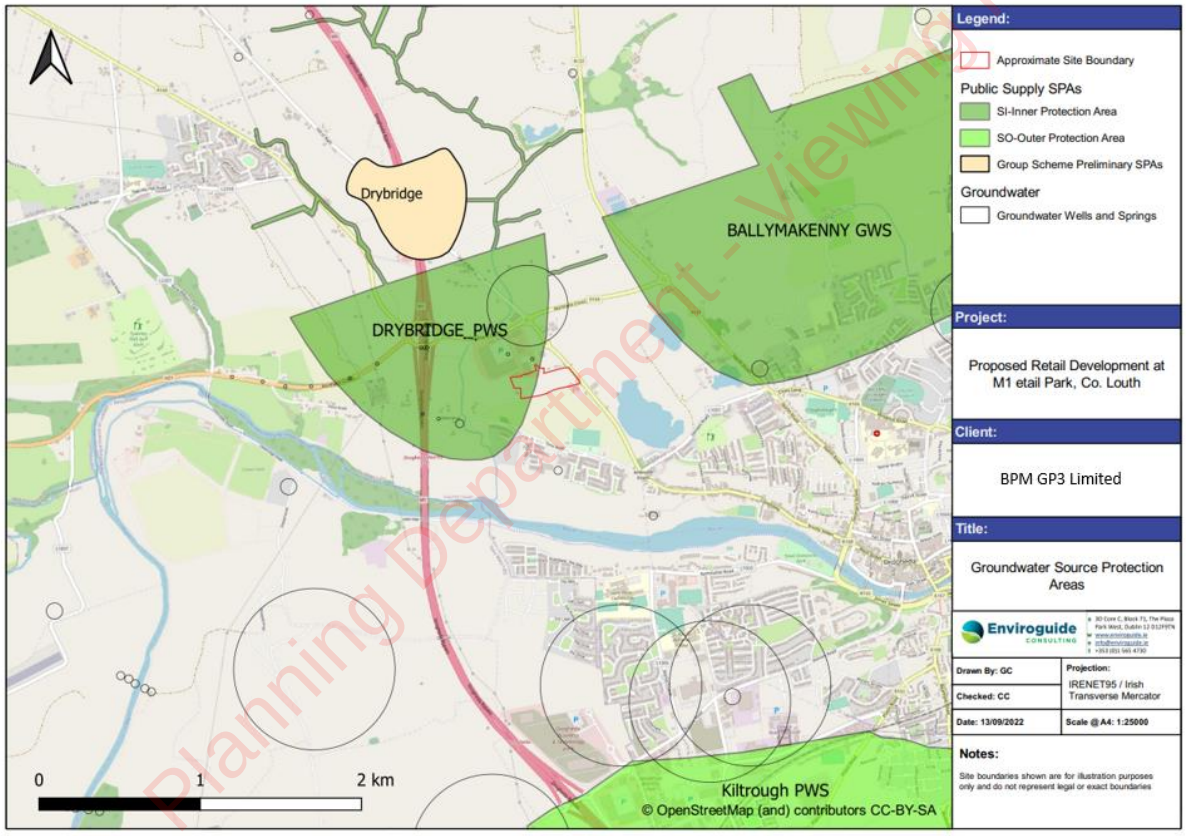

Figure 7-6- Public Supply Source Protection Area & GSI Wells and Springs

7.3.12 Water Framework Directive Status

The WFD waterbody status for river, groundwater and coastal water bodies that have a potential hydraulic connection to the Site as recorded by the EPA (2022) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 7-9 and shown in Figure 7-5.

Table 7-9: WFD Risk and Water body Status

Waterbody Name	Water body: EU code	Location from Site	Distance from Site (km)	WFD water body status (for the period of 2013-2018)	WFD 3rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
Tullyeskar_010 *	IE_EA_07T270880	West	0.32	Poor	Review	Yes, downgradient of Site
Stagrennan_010	IE_EA_07S320550	South	0.27	Moderate	Review	No direct connection identified with the Site
Groundwater Bodies						
Drogheda Groundwater Body	IE_EA_G_025	N/A	N/A	Good	Not at Risk	Yes, underlying groundwater-body
Transitional Water Bodies						
Boyne Estuary	IE_EA_010_0100	South	0.9	Moderate	At Risk	Yes, downstream of the Tullyeskar River
Coastal Water Bodies						
Boyne Estuary Plume Zone	IE_EA_010_0000	East	8.5	Moderate	At Risk	Downstream of the Boyne Estuary
*The Tullyeskar_010 is the WFD delineated catchment in which the Mell stream is located.						

7.3.13 Designated and Protected Sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 sites). The basic designation for wildlife is the Natural Heritage Area (NHA and proposed NHA). This is an area considered nationally important for the habitats present or that holds species of plants and animals whose habitat needs protection. They are protected under the Wildlife (Amendment) Act of 2000.

The relevant designated and protected sites (SACs, SPAs, NHAs and pNHAs) that are potentially connected to the site or within same catchment of the Site are presented in Figure 7-7 and listed in Table 7-10. The designated and protected sites with a potential hydraulic connection with the Proposed Development Site are indicated in Table 7-10.

The characteristics of the identified designated and protected sites and any potential impacts are described and assessed in Chapter 5 of this EIAR.

Table 7-10: Designated and Protected Sites

Protected or Designated Classification	Site Name	Site Code	Distance to Site and direction(km)	Hydraulic Connection with the Site
Special Protection Area (SPA)	River Boyne And River Blackwater SPA	004232	0.9 km southwest	Yes
	Boyne Estuary SPA	004080	3.9 km southeast	Yes
	River Nanny Estuary and Shore SPA	004158	9.5 km southeast	No
Special Area of Conservation (SAC)	River Boyne and River Blackwater SAC	002299	0.4 km south	Yes
	Boyne Coast and Estuary	001957	5 km southeast	Yes
	Clogher Head SAC	001459	12.1 northeast	No
Proposed National Heritage Area (pNHA)	Boyne River Islands	001862	0.5 km southwest	Yes
	King Willian's Glen	001804	1.8 km west	No
	Dowth Wetland	001861	2.5 km southwest	No
	Boyne Coast and Estuary	001957	5 km southeast	Yes
	Duleek Commons	001578	6.8 km southwest	No
	Crewbane Marsh	000553	7.4 km southwest	No
	Mellifont Abbey Woods	001464	7.7 km northwest	No
	Rossnaree Riverbank	001589	7.8 km southwest	No
	Blackhall Woods	001293001293	8.4 km northeast	No
	Laytown Dunes/Nanny Estuary	000554	8.8 km southeast	No
	Thomastown Bog	001593	9 km southwest	No
	Boyne Wood	001592	9.9 km southwest	No
	Castlecoo Hill	001458	10 km northeast	No
	Slane Riverbank	001591	10.3 km southwest	No
	Barmeath Woods	001801	11.3 km northeast	No
	Cromwell's Bush Fen	001576	11.7 km southeast	No
	Balarth Woods	001579	11.9 km southwest	No
	Clogher Head	001459	12 km northeast	No
	Kildermock March	001806	14.8 km northwest	No

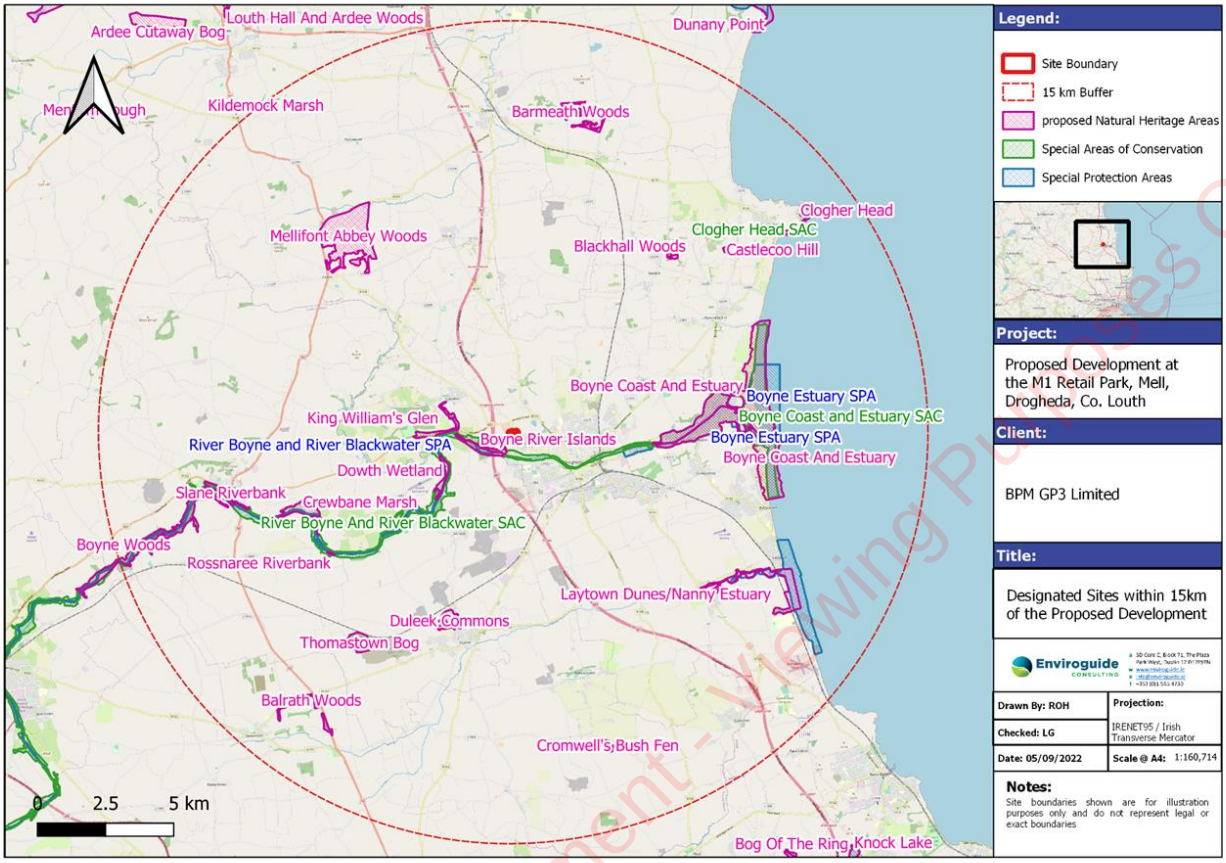

Figure 7-7: Designated and Protected Areas

7.3.14 Importance of the Receiving Environment

The bedrock aquifer beneath the Site is classified as a Regionally Important aquifer (Rkd) with thirty sources identified in the GSI wells and Springs database (GSI, 2022), two inner source protections zones and one group water scheme preliminary source protection area within 2km of the Site. Based on the average daily water usage per household set out in Irish Water Resources Plan – draft framework plan (Irish Water, 2020) and the yield provided in the water supply zone reports (EPA, 2011 and Louth County Council, 2014) the daily household served per supply is calculated.

The Drybridge Water Supply Scheme was supplying approximately 777 households in 2010 with an available yield to supply up to 989 households. The Site is within the "SI/L" of the inner source protection zone for Drybridge Water Supply Scheme. The Ballymakenny group water scheme was supplying approximately 1,695 households in 2011 with the available yield to supply up to 3,107 households. There is no report available for the Drybridge Group Water Scheme preliminary source protection area.

The WFD Status has been assigned as "Good" to the Drogheda GWB. The WFD status has been assigned as "Poor" for the Tullyeskar River (in which the Mell stream is part of). The WFD status has been assigned as "Moderate" for the Boyne Estuary transitional water and the Boyne Plume Zone coastal water body.

There is an identified indirect hydraulic connection between the Proposed Development Site and designated and protected sites within the Boyne Estuary via surface water overland flow from the existing Site.

In accordance with Table 7-1 the hydrological and hydrogeological features associated with the Site are deemed to be of “very high” importance. The Site is a regionally important aquifer with multiple wellfields including the Drybridge Water Supply Scheme inner source protection zone (within the SI/L) extending within the Site boundary.

7.4 Characteristics of the Proposed Development

The construction characteristics required to carry out the Proposed development as described in Section 7-1-2 are detailed in Section 7.4.1 and Section 7.4.2.

7.4.1 Construction Phase

The construction phase of the Proposed Development will require:

- Groundworks and excavation to reduce levels to construct the foundations, foundation design will form part of the detailed design.
- Piling for construction of foundations, requirement to confirmed as part of the detailed design.
- Surface water sewer network connection (with new head wall) via public road to be agreed with Louth County Council, should a Grant of Planning be forthcoming.
- Construction of new foul drainage system for the Proposed Development Site.
- Connection of this foul drainage system to the existing 225mm sewer pipe laid parallel to Barrack Lane.
- Construction of a new water main connection for the Proposed Development from the 450mm diameter watermain on the Collon Road.
- Cut and fill of material to reach the required floor level.
- Construction of SuDs including large permeable pavements, attenuation tank, bio-retention, and filter trenches. The attenuation tank is a buried tank created below-ground with a void space for temporary storage of surface water before infiltration. Tank will be constructed using stormtech type systems with final depth and size tailored to suit site characteristics.

7.4.2 Operational Phase

All surface water from roofs, paved areas including roads and carparking will be collected in a new surface water drainage system designed in accordance with SUDS and GDSDS. Surface water will be treated and attenuation through SuD measures including permeable paving, attenuation devices (buried tank), bio-retention & tree pits, filter trenches and a petrol interceptor. Treated water will be discharge from the attenuation tank via a hydrobrake (at 24.1 l/s) to the 225mm sewer on Barrack Lane. Surface water connection via the public road will be agreed with Louth County Council, should a Grant of Planning be forthcoming, to the Mell stream (*Exact outfall will be agreed with County Council following pre-construction ecology survey, should a Grant of Planning be forthcoming*).

The SuDs have been designed to intercept the first 5 to 10mm of rainfall, the total interception storage will be 320m^3.

Foul water from the Proposed Development will connect to the existing 225mm sewer pipe laid parallel to Barrack Lane that outfalls to the pumping station. The pumping station will need to be upgraded to accommodate the increase in population, the rising main infrastructure is already in place, installed as part of the original brief to future proof the Site (Barrett Mahony, 2022)

Water supply to the Proposed Development will be provided by the existing Irish Water infrastructure by adding a new connection to the existing 450mm diameter watermain along Collon road. Confirmation of feasibility was received from Irish Water on the 29th of April 2022 and can be found in Appendix 2 of the Civil Infrastructural Report, Barrett Mahony 2022. The water connection is feasible subject to upgrades as detailed in the Site-specific comments.

7.5 Potential Impact of the Proposed Development

7.5.1 Construction Phase

7.5.1.1 Hydrogeological Flow Regime

The Site is currently undeveloped land. The construction of the Proposed Development will convert approximately 66% of the surface cover to impermeable surfaces due to the construction of buildings, roads and other infrastructure.

During the Construction Phase soil and subsoil will be exposed and excavated with temporary increase in the potential of infiltration rainfall to the underlying aquifer. This will be reduced over the course of the construction of Proposed Development with an overall increase in impermeable areas and reduced infiltration potential from surface during the Construction Phase (and maintained during the Operational Phase) of the Proposed Development. It is noted that the GSI have identified that diffuse recharge potential to the bedrock aquifer is a low due the presence of low permeability Irish Till overlying the Site. The GSI Drogheda groundwater body description (GSI, 2022) (refer to Section 7.3.7.1) states recharge to the waterbody will be from point and diffuse. Diffuse recharge occurs where soils are thin and comprise limestone derived subsoils or gravel, the Site is underlain by till derived from sandstones and shales. Point discharge occurs at enclosed depressions and swallow holes. There are no enclosed depressions or swallow holes within the Site boundary. Therefore, there will be no overall significant impacts anticipated on the groundwater recharge with the Drogheda GWB.

The subsoils on Site are comprised of low permeability clay and silt (Louth County Council, 2011). Expected ground conditions in the vicinity of the Site is addressed in Chapter 6-4. The subsoils generally comprise silt/clay overlying gravelly clays with occasional sand lenses. Localised discontinuous water strikes may occur within the permeable sand lenses. Localised dewatering will be required if these perched aquifers are encountered.

The underlying Tullyallen formation, which is defined as regionally important aquifer (GSI,2022) is confined under the thick subsoils. The depth to bedrock is greater than 9.7m below ground level in the north centre of the Site and is assumed to decreases eastwards as the groundwater vulnerability increases. Depth to bedrock is highly variable in the region and described further in Chapter 6 – Land and Soils.

The Ballymakeeny group water scheme report (EPA, 2014) notes the Mell Quarry may exercise a regional control on groundwater level in the Drogheda area. The quarry became inactive in 1979, the groundwater level in the pits was between 11 and 12mOD in 2011. The

report notes how the quarry likely acts as recharge mounds. Google earth imagery was reviewed between 2011 and 2022 (Google Earth, 2022). Groundwater level appear highest in the 2011 imagery i.e., the quarry had fully recorded from dewatering and mining activity by 2011. Conservatively, groundwater level beneath the Site is assumed to equal the quarry levels at its maximum recorded, 12mOD.

Overall, it is considered that any impact on the hydrogeological regime within the aquifer is unavoidable and will be 'negative', 'imperceptible' and 'permanent' within a very localised zone of the aquifer only and there will be no impact on the overall hydrogeological regime of the receiving groundwater body and associated downgradient receptors.

7.5.1.2 Water Quality

Sources of contamination that could impact on water quality arising from the construction of the Proposed Development Site include:

- Storage and use of fuel, oils and chemicals used during construction which in the event of an accidental release could infiltrate to the underlying groundwater or migrate via surface water runoff to offsite water bodies.
- Use of concrete and cementitious materials or other potentially hazardous materials (e.g., drilling fluids during piling) during construction in particular for below ground structures and foundations including piling where shallow groundwater may be encountered.
- Accidental release of wash-water or foul water from facilities at the Site (e.g., wheel wash, welfare facilities) and accidental release of hazardous or deleterious material including fuels, chemicals and materials required for construction;
- Release of foul water from existing foul water drainage at the Proposed Development Site during connection to live sewers;
- Discharges or leaks from temporary welfare facilities could introduce contaminants to the water environment;

The potential pathways and pollutant linkages for the construction phase are identified as:

- Infiltration of contaminates to the subsurface, bedrock aquifer and Drybridge Water Supply Scheme SI/L including infiltration via potential conduits introduced through piling and other groundworks.
    - Piled and strip foundations creating a potential vertical conduit from the ground surface through subsoils and into the underlying regionally important aquifer
    - Pad foundations will extend into the topsoil and subsoils only. Where soils are thin or top of rock is close to surface, there is a perceived vertical pathway to the underlying groundwater
- Discharge to the Mell stream during the construction of new head wall at the near stream. *Exact outfall to be agreed with the County Council following a pre-constructure ecology survey, should a Grant of Planning be forthcoming;*
    - Cementitious or fuel spills could act as a source of contamination in the stream and ultimately the downstream SPA and the underlying Drogheda GWB and Drybridge Water Supply Scheme (within the SI/L)

- Vertical and lateral migration via groundwater beneath and downgradient of the Site towards downgradient receptors;
    - The Drybridge Water Supply Scheme report (Louth County Council, 2014) provides depth to bedrock in there “Figure 4 Subsoil Geology of Study Area”. There is a borehole present in the north of the Proposed Site Boundary with the location name “DRY01”, the recorded depth to bedrock is greater than 9.7m with a subsoil k assessment of “Silt/Clay with rounded gravels”. Another borehole presented further north (approximately 100m north) highlights the depth to bedrock as 3mbgl. The depth to bedrock is highly variable across the region and where soils are thin there is potential vertical pathway.
    - The GSI maps the sub-soil as having low permeability, the aquifer vulnerability across the Site ranges from low in the centre of the Site to extreme on the east suggesting the depth to bedrock is decreasing to the east. Most of the Site is low or moderate with only a thin strip to the east considered extreme. Where the vulnerability is low, the subsoil thickness is deeper resulting in reduced risk of infiltration to the aquifer.

- Discharge to existing surface water and foul drainage during construction phase, including during the connection to live sewer (from the 100mm to 300mm rising main on Barrack Street) to receiving water courses (including the Mell stream):
    - Surface water discharges from the Proposed Development that ultimately discharge to the Mell stream via the existing surface water drainage and potentially to downstream water courses and water bodies including Boyne Estuary and Boyne Estuary Plume zone; and
    - Foul water discharge from the Proposed Development via foul drainage to the Towns sewage system (Drogheda WWTP). There will be an increased foul discharge load to the receiving plant. The effluent is discharge into the Boyne Estuary transitional waterbody. The plant has previously been non-compliant with the Emission Limit Values (ELV) set out in the discharge license (Drogheda WWTP AER, 2021). The ambient monitoring results meet the required Environmental Quality Standards (EQS). The increased load will increase the concentration into the receiving waterbody if the plant is non-compliant with the ELVs during the Site operation. Irish Water have noted in the confirmation of feasibility letter (Barrett Mahoney, 2022) that the Site connection is feasible without infrastructure upgrade by Irish Water

The three receptors of water from the site are the Mell stream, the Drogheda Groundwater body and the Drybridge Water Supply Scheme. The Drogheda groundwater body is likely receiving from the Mell stream as discussed in Section 7.3.10.3.

The worst-case scenarios associated with the pathway of discharges to ground and via drainage are assessed in Section 7.6.3. The potential risk to the receiving water is considered in the absence of standard and appropriate construction management and mitigation measures that will be in place.

Construction Works

There is a potential risk to water quality during the construction works where groundwater may be encountered during piling into the bedrock, in particular in a worst-case scenario accidental

release of contaminants (i.e. Fuels, drilling fluids or cementitious materials) transported from the ground surface into the underlying regionally important aquifer under the Site and into the Drybridge Water Supply Scheme inner source protection zone (SI/L). The Drogheda groundwater cover an area of 49km^2 with up to 30m of fractures and faults where the majority of groundwater flows will occur (Drogheda Groundwater body Descriptor, GSI 2022). The potential impact on the Drogheda Groundwater is “negative” “moderate” and “short term”.

In the worst-case scenario, the contaminates would travel laterally through the aquifer to the Drybridge Water Supply Scheme inner source protection zone (SI/L). The potential impact on the Drybridge Water Supply Scheme is “negative” “significant” and “short-term” The impact is short terms as contamination will move quickly through the aquifer system due to the high permeability bedrock and dilution. The Ballymakenny group water scheme’s source protection zones falls within a 2km radius of the Site but not within the Proposed Site Boundary. The potential impact on the Ballymakenny group water scheme is “negative”” significant” and “short term”.

Surface Water Drainage

The release of suspended solids or other contaminants to surface runoff or release of contaminants (e.g. contaminated water from dewatering to construct the attenuation tank) could enter drainage gullies or open drainage during construction. There is a potential impact on the Mell stream and downstream waterbodies including the Boyne Estuary transitional waterbody and Boyne Estuary Plume Zone.

Discharges via surface water drainage will have a ‘negative’, ‘moderate’ and ‘short term’ impact on the water quality of the Mell stream on account of dilution within the drainage network and Mell stream. The impact on water quality in downstream waterbodies and watercourse elsewhere within the catchment is “negative” “not significant” and “short term”.

Foul Drainage

There is a potential for release to groundwater from foul during drainage works or temporary connections of Site welfare drainage development works. Assuming a worst-case scenario where there is shallow subsoil, there is a pathway for the foul water into the underlying regionally important aquifer and into the Drybridge Water Supply Scheme zone (SI/L). The potential impact on the Drogheda groundwater body is “negative” “significant” and “short term”.

The inner source zone of the Drybridge Water Supply Scheme is within the Proposed Site Boundary (within the SI/L). The inner source zone is designed to protect a source against the effects of human activities that may have an immediate effect on a source, particularly in relation to microbial contamination (EPA, 2011a). The potential impact of the foul water on the Drybridge Water Supply Scheme zone is “negative” “significant” and “short term”.

Imported Contaminated Materials

The potential importation of contaminated materials could result in the leaching or runoff of contaminants to the underlying groundwater bodies, inner source protection zones and receiving water courses water courses. In the unlikely event that contaminated materials are introduced directly to the Site of the Proposed Development there is a potential for a ‘negative’, ‘significant’ and ‘long-term’ impact on the receiving water environment.

7.5.2 Operational Phase

7.5.2.1 Hydrogeological Flow Regime

The potential impacts on groundwater flow regime associated with the Proposed Development including the increased hardstand cover and other subsurface structures are the same for the Construction Phase and Operational Phases and have been assessed and detailed in Section 7.5.1.1.

Discharge to ground from the on-site attenuation features will increase recharge from the Site. Rainfall will enter the ground from slow infiltration from the permeable paving and through permeable geotextile material from the bio-retention/tree pits. The impact of the Site Development on the recharge regime will be “neutral” “imperceptible” and “long term”.

7.5.2.2 Drainage and Flood Risk

The flood risk assessment notes that the Proposed Development Site is not considered to be within a flood risk zone (Barrett Mahoney, 2022) concluding:

There is no significant risk of flooding on the Proposed Development Site or no significant increased flooding risk to surrounding areas from the development. Therefore, the development is deemed acceptable from a flood risk assessment perspective

The potential impact on flooding from the Proposed Development is “neutral”, “Imperceptible” and “long term”.

7.5.2.3 Water Quality

The Consolidated Louth County Development Plan for 2021 to 2027 states the following in relation to water quality:

“*The council shall, promote an Ecosystem Services Approach, … in its decision-making processes, in its decision-making processes, including those relating to the preparation of statutory land use plans. In recognition of the need to manage natural capital, provisions have been integrated into the Plan that will contribute towards management of air quality, noise pollution, light pollution, water quality and integrated catchment management.”*

The documents outlined objectives in relation to water quality in Section 10.8 of the Louth County Development Plan summarised in Table 7-11.

Table 7-11: Louth County Development Plan 2021- 2027 Water Quality Objectives

No	Objective
IU 19	To require the use of Sustainable Drainage Systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality.
IU 20	To require all development proposals, meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse.
IU 22	To ensure all new development incorporates appropriate measures to protect existing water bodies, through appropriate treatment of runoff. In particular, discharges from car parks shall be appropriately treated so as to remove pollutant materials.
IU 23	To ensure all new developments provide for separated drainage systems
IU 24	To encourage particularly in buildings of increased height the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS) and which provide benefits for biodiversity, wherever possible.
ENV 15	To implement the recommendations contained in the River Basin District Management Plans for Ireland 2018-2021 or any subsequent plan. Proposed plans, programmes and projects shall not have an unacceptable impact on the water environment, including surface waters, groundwater quality and quantity, river corridors and associated woodlands. Also, to have cognisance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.
ENV 17	To implement the recommendations contained in any Groundwater Protection Scheme prepared under EU Ground Water Directives and to protect ground water resources in County Louth, nutrient sensitive areas and the designated shellfish growing areas within Carlingford Lough and Dundalk Bay.
ENV19	To implement the requirements of the Groundwater Protection Scheme to protect known and potential ground water reserves.

The identified potential impacts to water quality are considered in the absence of any mitigation measures that will prevent and limit any potential impact to water quality. The embedded design and avoidance measures (Refer to Section 7.6) will prevent and limit any potential impact on water quality within the receiving water environment and river basin district hydraulically connected with the Proposed Development.

There will be no significant sources of contamination at the Site during the operational phases taking account of the following design considerations:

- The Site will be paved/covered (with 66% total impermeable cover) and therefore there will be limited infiltration and potential to mobilise surface contamination to the underlying groundwater.
- There will be no bulk storage of petroleum hydrocarbon-based fuels or other hazardous materials during the Operational Phase, thereby removing any associated potential contaminant sources.

- There will be no discharges to ground other than rainfall on unpaved landscaped areas and via recharge from SuDs (Bioretention and tree pits):
    - The civil infrastructure report (Barrett Mahony, 2022) states the GDSDs require interception storage to ensure the first 5 to 10mm of rainfall will be intercepted on Site. Interception storage can be attained using SuDs features which allow rainwater to infiltrate into the ground, evaporate into the atmosphere or transpire through vegetation (Section 2.3.3, Barrett Mahony 2022)
    - Additional surface water (after the initial 5 to 10mm) will be managed within the proposed surface water drainage network with discharge to the public mains surface water drainage network. Surface water drainage has been designed in accordance with GDSDS and SuDS.
- Foul water discharge from the Site will be to mains sewer and discharge to be treated at Drogheda Wastewater Treatment Plant (WWTP).

The proposed surface drainage design in accordance with GDSDS and SuDS strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments mobilised from contaminated soils) in surface water runoff from roads and the impermeable areas that could potentially otherwise discharge to the receiving water environment.

The measures incorporated in the SuDS design include permeable paving, attenuation tanks, bio-retention and tree pits in the drainage and SuDs system. The surface water to the attenuation tanks will enter through a petrol interceptor (unit type: NSBP004). The bioretention areas will be effective in treating and removal of any contaminants (metals, hydrocarbons and suspended solids) entrained in surface water runoff as documented in TII guidance (TII,2014) and the SuDS Manual (C753).

There will be no risk to water quality during the Operational Phase taking account of these embedded design avoidance measures.

In the absence of the embedded design, avoidance and mitigation measures (i.e., petrol interceptor and SuDS measures) there would be a potential impact on the receiving water of the Mell stream. Taking account of assimilation within the drainage network, a worst-case unmitigated discharge of surface water drainage could result in a ‘negative’, ‘moderate’ and ‘medium-term’ impact on water quality within the Mell stream. There is no identified impact to the Boyne Estuary or Boyne Estuary Plume Zone.

Foul drainage from the Site will ultimately be treated in the Drogheda WWTP. The Drogheda WWTP discharges to the Boyne Estuary transitional waterbody. There will be no impact on the receiving water environment, Irish Water have confirmed the Proposed Development wastewater connection is feasible without infrastructure upgrade. The foul and surface water drainage for the Proposed Development will result in an overall ‘neutral’, ‘imperceptible’ ‘permanent’ impact on receiving surface water quality and groundwater quality compared to the baseline.

7.5.3 Potential Cumulative Impacts

7.5.3.1 Existing Planning Permissions

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects

which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

Table 7-12: Potential Cumulative Impacts

Planning Ref No.	Applicant Name	Summary of Development
211283 09/02/2022	Loughdale Properties Limited	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works. ABP-311678-21
211046 14/12/2021	Louth County Council	Part 8 application for permission to carry out the development of 20 No. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda Co Louth the development will comprise of the following: Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling new pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e., 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores new pedestrian route from Boice Court Phase 2 to Cement Road All associated landscaping and ancillary/site development works.
LB191735 (Meath County Council) 21/02/2020	CAP Developments LLC	Alterations to existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.m; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A new main entrance and access

		control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq.m.; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring 19.46 hectares. An EIAR has been submitted with this application.
19880 18/12/2019	Wogans Build Centre	Permission for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works.
18667 11/10/2018	Moffett Investment Holdings ULC	Extension of Duration Parent Ref: (08/101) 10-year permission - for a mixed-use development comprising a total of 527 no. dwellings (terraces, semi-detached, duplex and apartments and a civic/commercial neighbourhood centre of c 5,823sqm
1858 21/03/2018	Simon Paler Elmsont Limited	FURTHER EXTENSION OF DURATION REF: 12510022 which consists of Permission for Residential development of 190 units & a 430 sq.m. creche which, shall comprise of 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services & all associate works. PARENT PERMISSION REF: 06510077
17310 17/01/2018	North Drogheda Development Partnership	Permission for development to consist of amendments to a permitted residential development (Ref. 071507) to alter dwelling unit types, and to amend conditions 6(ii) and 51 (i)(a). The total permitted number of units of 1056 no. will remain unchanged

Capacity within the existing foul sewer network has been confirmed by Irish Water (COF: CDS220018777 dated the 29th April 2022 in Appendix 2 in Barrett Mahony Civil Infrastructure Report, 2022). The connection to the Irish Water foul network is “feasible without infrastructure upgrade by Irish Water” The foul water from the Proposed Development will ultimately be treated at Drogheda WWTP. Therefore, there will be no cumulative impacts associated with the Proposed Development from foul water generation.

The Proposed Development will be connected to the existing mains water supply. Confirmation of capacity was confirmed by Irish Water (COF: CDS220018777 dated the 29th of April 2022). The feasibility is subject to updates. The comment provided by Irish water on feasibility was:

"*In order to accommodate the proposed connection to Irish Water water network at the Premises, upgrade works are required to extend the length of the network by approximately 240m of new 100mm diameter main" . . ." to be laid to link up connection main and existing 150mmuPVC main. Should you wish to progress with the connection you will be required to fund this network extension"*

A new 450mm diameter watermain was installed along Collons road to connect to the towns systems, a new connection will be taken from pipe. The mains water supply is operated in accordance with relevant existing statutory consents therefore there will be no cumulative impacts associated with the Proposed Development on water resources.

The transport of material to and from the Site if not appropriately managed could result in sediment and debris being tracked offsite on trucks and other Site vehicles from the Proposed Development and other development Sites in the area. There is risk of impact to water courses at offsite locations in the immediate vicinity of the Site due to sediment entrained in road runoff entering the surface water drainage system and out falling at offsite locations (i.e., Mell stream).

There are no other cumulative impacts associated with the construction or operational phase of the Proposed Development.

7.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario it is considered that the Proposed Development did not proceed and the potential impact on the receiving hydrological and hydrogeological environment is considered.

If the Proposed Development did not proceed the Proposed Development Site would remain as an undeveloped Site. There would be no change to the drainage at the Site or to the hydrological and hydrogeological regime at the Proposed Development Site.

7.6 Avoidance, Remedial & Mitigation Measures

The mitigation measures, as outlined below, will ensure that there will be no significant impact on the receiving groundwater and surface water environment. Hence, the Proposed Development Site will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

7.6.1 Construction Phase

The Construction Environmental Management Plan (CEMP) (Enviroguide,2022) and a Construction and Demolition Waste Management Plan (CDWMP) (Enviorguide, 2022) will be implemented by the appropriate contractor to ensure, site-specific procedures and mitigation measures to monitor and control environmental impacts throughout the Construction Phase of the project and ensure the construction activities do not adversely impact the environment. The CEMP will be submitted with the planning application for the Proposed Development.

Mitigation measures will be adopted as part of the construction works on the Proposed Development Site. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff.
- Control of Management of works nears water courses.
- Management and control of materials from off-site sources.
- Appropriate piling material (water-based, biodegradable non-hazardous substances) and best practice methodology to prevent creating vertical migration pathways.
- Appropriate fuel and Chemical handling, transport and storage; and
- Management of accidental release of contaminants at the Site.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice; good construction management practices will minimise the risk of pollution from construction activities at the Site including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- BPGCS005, Oil Storage Guidelines.
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA 697, The SuDS Manual, 2007.
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004; and
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006).

7.6.1.1 Control and Management of Works Near Water Courses

All necessary works carried out adjacent to the Mell stream for the construction of the new headwall (*Exact outfall to be agreed with County Council following a pre-construction ecology survey*) will follow the guidelines published by Inland Fisheries Ireland (IFI) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters* (2016) and The National Roads Authority (now Transport Infrastructure Ireland) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. All works will be carried out in accordance with an approved method statement prepared by an appropriately qualified Environmental /Ecological Clerk of Works employed by the Contractor.

A watching brief by an Environmental /Ecological Clerk of Works will be required during critical stages in particular near stream works for the headwall and outfall at the Mell stream. An NIS has been prepared for the Site.

Field parameters (pH, temperature, and conductivity) are required to be collected directly downstream of the works prior to commencing works to confirm baseline and then at regular intervals during the works. The Environmental Clerk of works will visually inspect the water quality during the works, observant for release of suspended sediment or contaminations to

the stream. Silt fences are required to be installed for the duration of works. Works for the headwall and surface water sewer will not occur during periods of high rainfall.

7.6.1.2 Control and Management of Water

There will be no discharges to groundwater or surface water during the Construction Phase. The Contractor is to ensure that no contaminated water/ liquids leave the Proposed Development Site (as surface water and run-off or otherwise) and enter the existing drainage at the Site or local drainage gullies on the adjoining roads including Barrack Lane.

There may be a requirement for localised dewatering or sump pumping on a temporary basis during excavation and management of water from these excavations will include control of surface water runoff and pumping of water from excavations.

7.6.1.3 Control and Management of Soil

As outlined in Section 12.4.8 of the Chapter 12 – Material Assets: Waste and Utilities. The Proposed Development Site is currently a greenfield Site and therefore has no waste management requirements.

7.6.1.4 Importation of Soil and Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with a By-Product Notification under Article 27 of the European Communities (Waste Directive) Regulations 2011. Therefore, any unsuitable material will be identified, avoided, and not imported to the Site.

7.6.1.5 Concrete Works

The use of cementitious grout used during the construction of foundations and piles will be required and any potential impact to water quality will be avoided through the use of appropriate design and methods that will be implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

The piling methodology (specified at detailed design stage) where required, will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or

additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions.

*7.6.1.6 **Foundations and Piling***

The design for foundations will include strip, pad or piled foundation solutions. Where piled foundations are required, the proposed piling methodology will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater, if encountered. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions.

7.6.1.7 Handling of Fuels and Hazardous Materials:

Fuel, oils and chemicals used during construction are classified as hazardous. Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station to be determined by the contractor by mobile road tanker brought to the Site as required. Each station will be fully contained equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works onsite.

There will be appropriate storage areas for any fuel, oils and chemicals. Storage will be within a clearly marked bund on an impervious base remote from any surface water features such as oil. Temporary oil interceptors will be installed for period of the construction phase. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

There will be no bulk storage of fuels, oils or other chemicals. Any required quality of these materials will be stored in bunded storage tanks. Bunds will have regard to Environmental Protection Agency guidelines ‘Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2004 as amended) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Only emergency maintenance will be carried out on Site.

Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.

Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.

In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has

been removed. This procedure will be undertaken in accordance with current industry best practice procedures and EPA guidelines.

Site staff will be familiar with emergency procedures in the event of accidental fuel spillages and all staff on-site will be fully trained on the use of equipment to be used on-site.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite and will be from a road tanker brought to Site as required. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the contractor before the commencement of works onsite.

7.6.1.8 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from Irish Water) which will be constructed in accordance with Irish Water guidelines or by tankering of waste offsite by an appropriately authorised contractor in compliance with all legislative requirements.

7.6.1.9 Wheel-Wash and Water Treatment Facilities

The use of wheel-wash and water treatment facilities and water treatment facilities will be used as required on Site. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm or impact to the receiving water environment.

To prevent tracking of dust and debris on haul routes offsite the following will be undertaken:

- Implement a wheel washing system where required.
- Use of dedicated internal haul routes and set down areas that will be covered with hardcore or similar; and
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.

To prevent fugitive runoff from the Site the following will be implemented:

- Silt traps, silt fences will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage.
- Where localised shallow water is encountered in excavations during the construction phase, surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network.
- Onsite water treatment system will be used if required to remove suspended solids and hydrocarbons; and
- All sludges and other waste from wheel-wash and water treatment infrastructure will be removed from the Site by the approved contractor in accordance with all legislative requirements.

7.6.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development.

With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Mell stream, the potential for surface water generated at the Site of the Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SuDS measures and interceptor incorporated in the Project Design. Project specific SuDS measures are described in Section 7.4.2.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development

7.6.3 "Worst Case" Scenario

During the Construction Phase or Operational Phases there is a potential risk of accidental release of petroleum hydrocarbons (e.g., a fuel spill) that could migrate to groundwater or offsite to surface water via Site drainage could result in in a 'negative', 'significant', 'medium-term' impact on the quality of the receiving water (including the two groundwater supplies at Ballymakenny Group Water Scheme and Drybridge Water Supply Scheme) depending on the nature of the incident.

In the event of a worst-case scenario such as a fuel spill or release of other hazardous compounds occurring near the stream works, this could result in a potential impact on groundwater or surface water in the absence of appropriate control and mitigation measures. Standard construction measures will be incorporated in the CEMP to be prepared by the Enviroguide taking cognisance of Natura Impact Statement (Enviroguide, 2022) which is submitted with this EIAR.

However, taking account of the avoidance and mitigation measures the worst-case scenario is deemed to be an unlikely scenario.

7.6.4 Human Health

There are recorded groundwater sources located within a 2km radius of the Site including the Drybridge Water Supply Scheme inner source protection zone that extends through the Site Boundary (within the SI/L). However, taking account of the design of the Proposed Development and the avoidance and mitigation measures there will be no potential risk to any drinking water sources associated with the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of Site workers.

The water supply for the Proposed Development will be via connection to the public supply. The feasibility of the connection was confirmed (subject to upgrades) by Irish Water in April 2022 (Appendix 2, Barrett Mahony, 2022) and detailed in Section 7.4.2.

7.7 Water Framework Directive

The findings of the hydrology assessment through the EIAR of the potential impact on the WFD status of the water bodies hydraulically connected to the Proposed Development Site concludes:

The Proposed Development will not cause a deterioration in status of water bodies hydraulically connected with the Proposed Development Site including the Tullyeskar_010 (of which the Mell stream is part of), Boyne Estuary, Boyne Estuary Plume Zone and Drogheda GWB taking account of design avoidance and mitigation measures that will be implemented. The Proposed Development will not jeopardise objectives to achieve good surface water status or good ecological potential and the attainment of good surface water chemical status. The Proposed Development will not permanently exclude or compromise the achievement of the objectives of the WFD in other bodies of water within the same river basin district as the Site.

Therefore, the potential impact on WFD status is ‘negligible’, ‘neutral’ and ‘permanent”.

7.8 Residual Impacts

Residual Impacts are defined as ‘effects that are predicted to remain after all assessments and mitigation measures. They are the remaining ‘environmental costs’ of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in Section 7.5 and summarised in Table 7-13 in terms of quality, significance, extent, likelihood, and duration and the residual impacts which take account of the avoidance, remedial and mitigation measures.

There are no likely significant adverse residual impacts on hydrology and hydrogeology anticipated regarding this Proposed Development.

Table 7-13 Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Use of potentially hazardous materials cementitious materials.	Water Quality / Groundwater Supply	Potential release of cementitious material during the construction of foundations, pavements and other structures.	Negative	Significant	Medium Term	Direct	The design will incorporate the use of pre-cast concrete structures where appropriate. The Contractor will carry out works in accordance with industry standards. Detailed design for piling to include methods to prevent impact water quality.	Imperceptible
Earthworks – release of suspended solids	Groundwater Supply	Potential for release of sediment to surface water entering Groundwater supply during head work construction	Negative	Significant	Short-term	Direct	Appropriate measures including silt fences and buffer zones to be used to prevent fugitive runoff	Imperceptible
Importation of aggregate and materials	Water quality	Importation of potentially contaminated materials resulting in leaching and runoff to the underlying groundwater bodies and receiving water course	Negative	Significant	Long-term	Direct	All aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.	Imperceptible
Accidental release of deleterious materials including fuel and other materials being used on-Site.	Groundwater / Surface Water/ Groundwater Supply	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary and tertiary	Negative	Significant	Medium-Term	Direct / Worst Case	Procedures for the use and handling of all potentially hazardous compounds to be included in the CEMP to be prepared by the Contractor.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
		containment or a materials handling accident.						
Piling Works	Introduce preferential pathway and impact on water quality	Potential for migration of contaminants during piling works via direct conduit to subsurface.	Negative	Significant	Short-Term	Direct	Detailed design piling and method will be prepared by the appointed contractor. Use of water-based, biodegradable non-hazardous substances to be used.	Imperceptible
Operational Phase								
Recharge/ Discharge to Ground	Hydrogeological Flow Regime	There is no identified impact on the overall hydrogeological flow regime of the Drogheda GWB or drinking water supply wells	Neutral	Imperceptible	Long-term	Direct	Maintenance of SuDs	Imperceptible
Surface Water Drainage	Water Quality	Rainfall (first 5mm to 10mm) will be collected and intercepted through SuDs including permeable paving, bio-retention and tree pits, filter trenches and attenuation tanks.	Negative	Moderate	Medium-term	Direct	Surface water drainage at the Proposed Development Site has been designed in accordance with SuDS and includes treatment by Petrol interceptor therefore it is anticipated that water quality will not be impacted	Imperceptible
Proposed Development Drainage	Flood Risk and surface water regime	There is no identified flood risk associated with the Proposed Development	None	Imperceptible	Long-term	Direct	Maintenance of the SuDS	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Discharge to foul sewer	Receiving water at Drogheda WWTP	Confirmation of Feasibility received from Irish Water	Neutral	Imperceptible	Long-term	Indirect / Cumulative	None Required.	Imperceptible

7.9 Monitoring

7.9.1 Construction Phase

During the construction phase the following monitoring measures will be considered:

- The Contractor will carry out inspections and monitoring during excavations, piling and other groundworks to ensure that measures protective of water quality outlined in this EIAR, CEMP (Enviroguide, 2022) and CDWMP (Enviroguide Consulting, 2022) are fully implemented and effective.
- Groundwater monitoring will be undertaken by a competent hydrogeologist appointed by the Contractor prior to construction commencing and for the duration of the Construction Phase to verify that there is no impact on the groundwater beneath the Site and no unacceptable risk to downgradient receptors including the identified Drybridge Water Supply Scheme, Groundwater monitoring from the Drybridge Water Supply Scheme should be included to verify, if any impact to groundwater onsite is potentially migrating offsite and impacting the Drybridge Water Supply.
- Routine monitoring and inspections during refuelling and concrete works to ensure no impacts and compliance with ameliorative, remedial, and reductive measures.
- Materials management and waste audits will be carried out at regular intervals by the appointed contractor.
- The near stream works will be overseen by an appropriately qualified Environmental/ Ecological Clerk of Works (ECOW) engaged by the appointed contractor. Water quality monitoring of up and downstream locations is also recommended to determine whether any potential risk to water quality in the Mell stream and downstream associated water bodies during the near stream works.

There are no other specific monitoring or sampling requirements in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

7.9.2 Operational Phase

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

7.10 Interactions

7.10.1 Population and Human Health

It is noted the inner source protection zone of the Drybridge Water Supply Scheme is delineated within the Site boundary (within the SI/L). There is potential for contamination during construction due to use of release of cementitious material or earthworks reaching groundwater causing contamination at the source The risk is the worst-case scenario given the low permeability sub-soils on Sites. All works will be carried out in accordance with industry standards. With the mitigation measures set out in Section 7.6, the risk is considered to be “unlikely”.

No other public health issues associated with the water (hydrology and hydrogeology) conditions at the Proposed Development Site have been identified for the Construction Phase or Operational Phase of the Proposed Development.

Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.

It is noted that specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.

7.10.2 Material Assets - Water

Any discharges to the public foul sewer and abstractions from water supply from the Proposed Development will be under consent from Irish Water. An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR.

7.10.3 Land, Soil, Geology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology.

7.10.4 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

7.11 Difficulties Encountered When Compiling

There was not site-specific ground investigation data available for the Site. However, this is not considered to have been a difficulty for this assessment taking account of the design for the Proposed Development including design avoidance and mitigation measures that will be implemented and the fact that worst-case scenario has been assessed.

7.12 References

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8 AIR QUALITY AND CLIMATE

8.1 Introduction

This Chapter will describe and assess the potential impacts on air quality and climate associated with the Proposed Development lands adjoining the M1 Retail Park County Louth.

Taking into account Ambient Air Quality Standards, the baseline air quality will be examined along with the potential for release of emissions to the atmosphere and associated effects prior to and following mitigation measures. This Chapter will also describe and assess the potential impacts on micro and macro-climate as a result of the Proposed Development. Attention will be focused on Ireland's obligations under the Kyoto Protocol and the Paris Agreement in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.1.1 Quality Assurance and Competence

This Chapter was prepared by Laura Griffin, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Climate Change from Maynooth University and a Bachelor of Arts (Hons) in English and Geography from Maynooth University. Laura has worked as an Environmental Consultant with Enviroguide since 2021 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Air Quality and Climate, Noise and Vibration, and Archaeology and Cultural Heritage Chapters of EIARs.

8.1.2 Ambient Air Quality Standards

For the protection of health and ecosystems, EU directives apply air quality standards in Ireland and other EU member states for a range of pollutants. These rules include requirements for monitoring, assessment and management of ambient air quality. The first major instrument in tackling air pollution was the Air Quality Framework Directive 96/62/EC and its four daughter Directives. Each of these instruments was repealed with the introduction of Directive 2008/50/EC on ambient air quality and cleaner air for Europe in 2008 (as amended by Decision 2011/850/EU and Directive 2015/1480/EC) (the CAFE Directive), save for the "Fourth Daughter Directive" (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air).

The CAFE Directive lays down measures aimed at:

1) defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
2) assessing the ambient air quality in Member States on the basis of common methods and criteria and, in particular, assessing concentrations in ambient air of certain pollutants;
3) providing information on ambient air quality in order to help combat pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures;
4) ensuring that such information on ambient air quality is made available to the public;
5) maintaining air quality where it is good and improve it in other cases;

6) promoting increased cooperation between the Member States in reducing air pollution.

Ambient air quality monitoring and assessment in Ireland is carried out in accordance with the requirements of the CAFE Directive. The CAFE Directive has been transposed into Irish legislation by the Air Quality Standards Regulations (S.I. No. 180 of 2011). The CAFE Directive requires EU member states to designate 'Zones' reflective of population density for the purpose of managing air quality. Four zones were defined in the Air Quality Standards Regulations (2011) and subsequently amended in 2013 to account for 2011 census population counts and to align with coal restricted areas in the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012. (S.I. No. 326 of 2012) (the 2012 Regulations).

The main areas defined in each zone are:

- **Zone A:** Dublin Conurbation
- **Zone B:** Cork Conurbation
- **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in Co. Louth and falls under the 'Zone C' category based on the EPA CAFE Directive.

The CAFE Directive outlines certain limit or target values specified by the five published directives that apply limits to specific air pollutants. These limits, outlined in Table 8-1, will be referred to as part of the Proposed Development assessment with respect to air quality.

Table 8-1: Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA, 2020)

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m3	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
SO_2	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1 Jan 2005
SO_2		24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO_2	Protection of vegetation	Calendar year	20	7.5	Annual mean	19 July 2001
SO_2		1 Oct to 31 Mar	20	7.5	Winter mean	19 July 2001
NO_2	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1 Jan 2010
NO_2		Calendar year	40	21	Annual mean	1 Jan 2010
NO + NO_2	Protection of ecosystems	Calendar year	30	16	Annual mean	19 July 2001
PM10	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1 Jan 2005
PM10		Calendar year	40	-	Annual mean	1 Jan 2005
PM2.5 - Stage 1		Calendar year	25	-	Annual mean	1 Jan 2015
PM2.5 - Stage 2		Calendar year	20	-	Annual mean	1 Jan 2020
Lead		Calendar year	0.5	-	Annual mean	1 Jan 2005
Carbon Monoxide		8 hours	10,000	8,620	Not to be exceeded	1 Jan 2005
Benzene		Calendar year	5	1.5	Annual mean	1 Jan 2010

The EPA is the competent authority for the purpose of the CAFE Directive and is required to send an annual report to the Minister for Environment and the European Commission. The regulations further provide for the distribution of public information. This includes information on any exceedances of target values, the reasons for exceedances, the area(s) in which they occurred, and the relevant information regarding effects on human health and environmental impacts.

8.1.3 Climate Agreements

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, and extreme weather events.

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National Greenhouse Gas Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, during the period 2008 to 2012.

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted *in extremis* on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment will be assessed based on the GHG inventory submission in 2022 for 1990-2020 data. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted comprehensive national climate action plans (nationally determined

contributions, NDCs). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020. There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources;
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy;
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the Commission proposed in September 2020 to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

8.1.3.1 National Policy Position in Ireland

National climate policy in Ireland recognises the threat of climate change to humanity and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was enacted in 2021 and sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change.

The Irish Government published its Climate Action Plan (2021) which provides a detailed framework for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting Ireland on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and as required by the Climate Act 2021. The Plan lists the actions needed to deliver on national climate targets and sets indicative ranges of emissions reductions for each sector of the economy. It will be updated annually, next in 2022, to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings.

Later this year, Ireland will publish its updated Climate Action Plan, reflecting the approved Carbon Budgets and Sectoral Emission Ceilings, which set out legally binding emissions reduction targets for 2030 and 2050.

Ireland's latest greenhouse gas (GHG) emissions 1990-2021 are provisional figures based on the SEAI's final energy balance released in June 2022 (EPA, 2022). In 2021, Ireland's GHG emissions are estimated to be 61.53 million tonnes of carbon dioxide equivalent (Mt CO2eq) which is 4.7% higher (or 2.76 Mt CO2 eq) than emissions in 2020 (58.77 Mt CO2 eq). There was a decrease of 3.4% in emissions reported for 2020 compared to 2019. Emissions are over 1% higher than pre-pandemic 2019 figures. In 2021, the energy industries, transport and agriculture sectors accounted for 71.9% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 37.5%. Transport, energy industries and the residential sector are the next largest contributors, at 17.7%, 16.7% and 11.4%, respectively (EPA, 2022).

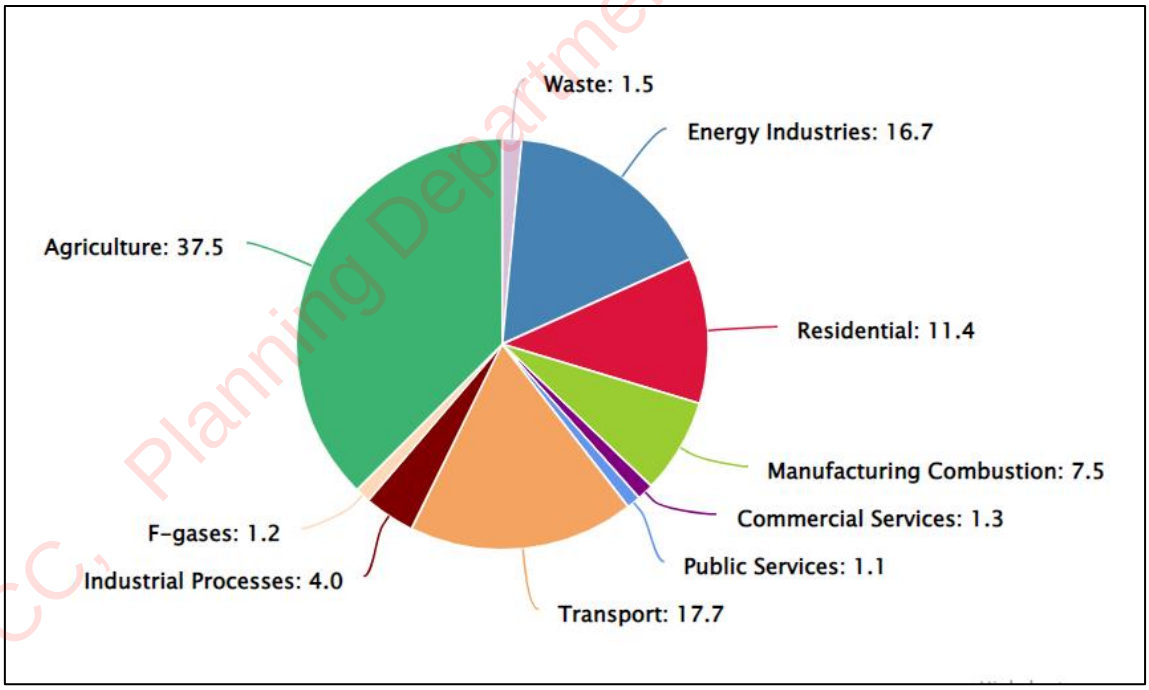

Figure 8-1: Ireland's Greenhouse Gas Emissions by Sector for 2021 (Source: EPA, 2022)

8.2 Study Methodology

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data was carried out in order to compile this Chapter. Furthermore, a semi-quantitative assessment of fugitive dust emissions from operations of the Proposed Development was undertaken and sets out to:

- Assess the existing PM_{10} concentrations and dust deposition rates
- Identify the potential sources of impacts on air quality and climate
- Identify the local sensitive receptors
- Identify the pathway and distance of sensitive receptors relative to the site
- Analysis of weather data to assess impacts caused by weather events

The impact of dust is generally monitored by measuring rates of dust deposition. According to the EPA Guideline Document *Environmental Management in the Extractive Industry* (2006), there are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust. There are a number of methods to measure dust deposition, however only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – The Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance. It is the only enforceable method available. On this basis, it is recommended that the following TA Luft dust deposition limit value be adopted at site boundaries associated with quarry developments:

- Total dust deposition (soluble and insoluble): **350 mg/m^2/day** when averaged over a 30-day period.

Table 8-2: Dust Deposition Limit Values

Measures	Monitoring Frequency	Standard
Dust Emissions	Monthly	350 mg/m^2/day – Bergerhoff Method

8.3 The Existing and Receiving Environment (Baseline Situation)

The site is located on lands adjoining the existing M1 Retail Park in Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban (the existing Retail Park lies adjacent to the northern boundary of the site), with the remaining surrounding landscape agricultural in nature. There are a number of residential dwellings located close to the site boundary.

8.3.1 Air Quality

According to the 2012 Regulations (S.I. No. 326 of 2012) the proposed site falls into 'Zone C' of Ireland which is described by the EPA as 'Other cities and large towns'. It is expected that existing ambient air quality in the vicinity of the site is characteristic of a rural location with the primary source air emissions (such as particulate matter (dust), NO_2, and hydrocarbons) likely

to be of local domestic and agricultural origin. Local agricultural activities may exert a higher or lower influence on dust generation in the vicinity of the site on a seasonal basis.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality in Ireland, 2021' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2021.

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO_2 for the years 2020 and 2021 are presented in Table 8-3 for Zone C monitoring stations. These results show that current levels of NO_2 are well below the annual mean and 1-hour maximum limit values. In the year 2020, annual mean concentrations of NO_2 ranged from 4 - 19 ug/m^3 across all Zone C stations, with no exceedance of the maximum hourly limit (EPA, 2021). In the year 2021, annual mean concentrations of NO_2 ranged from 4.2 - 21.9 ug/m^3 across all Zone C stations, with no exceedance of the maximum hourly limit (EPA, 2022).

During 2020, the restriction of movement in Ireland due to the COVID-19 Pandemic had an impact on air quality nationally with a large-scale reduction in vehicular traffic. It is noted that the decrease in NO_2 levels during that year is a direct result of the restrictions placed on movements and construction due to COVID-19.

The closest representative background monitoring station to the site which continuously monitors for concentrations of nitrogen oxides (NO_2) is located in Dundalk (ca. 30km to the north). Air quality monitoring carried out at this location is likely to be broadly representative of conditions that may be experienced at the site. Concentrations of NO_2 are also well below the threshold limits contained within the regulations at Dundalk monitoring station, with an annual mean of 10 ug/m^3 and 10.73341 ug/m^3 measured in 2020 and 2021, respectively (EPA, 2021; EPA, 2022).

Table 8-3: Concentrations of NO_2 at Zone C Monitoring Stations

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2020	2021	
Meath Navan	Annual Mean NO_2	19	21.9	40 µg/m³
	Days >200µg/m³	0	0	35 days
Waterford Brownes Road	Annual Mean NO_2	7	6.6	40 µg/m³
	Days >200µg/m³	0	0	35 days
Sligo	Annual Mean NO_2	17	16.6	40 µg/m³
	Days >200µg/m³	0	0	35 days
Limerick Peoples Park	Annual Mean NO_2	10	9.8	40 µg/m³
	Days >200µg/m³	0	0	35 days
Limerick Henry Street	Annual Mean NO_2	--	14	40 µg/m³
	Days >200µg/m³		0	35 days
Kilkenny Seville Lodge	Annual Mean NO_2	4	4.2	40 µg/m³
	Days >200µg/m³	0	0	35 days
Portlaoise	Annual Mean NO_2	11	7.9	40 µg/m³
	Days >200µg/m³	0	0	35 days
Dundalk	Annual Mean NO_2	10	10.733341	40 µg/m³
	Days >200µg/m³	1	0	35 days

Measured concentrations of PM_{10} for the years 2020 and 2021 are presented in Table 8-4 for Zone C monitoring stations. As is evident from these results, current levels of PM_{10} are well below the annual mean limit value. In the year 2020, annual mean concentrations of PM_{10} ranged from 11 – 20 ug/m³ across all Zone C stations, with no exceedance of short-term limit values (EPA, 2021). In the year 2021, annual mean concentrations of PM_{10} ranged from 10.4

– 19 ug/m^3 across all Zone C stations, with no exceedance of short-term limit values (EPA, 2022).

The nearest air monitoring station which measures PM_{10} is Drogheda monitoring station (ca. 4.2km east of the site), however, this station was commissioned in April 2021 and therefore, no long-term dataset is available. The suburban background monitoring site of Dundalk is located ca. 30km from the site of the Proposed Development and therefore is broadly representative of background concentrations in the vicinity of the Proposed Development. This station has long-term datasets available for concentrations of PM_{10}. Concentrations of PM_{10} at Dundalk monitoring station are well below their respective limit values in 2020 and 2021, with an annual mean of 13 ug/m^3 and 11.7 ug/m^3, respectively, and with no exceedances of the PM_{10} daily limit for the protection of human health (EPA, 2021; EPA, 2022).

Table 8-4: Concentrations of PM_{10} at Zone C Monitoring Stations

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2020	2021	
Portlaoise	Annual Mean PM_{10}	12	11.4	40 µg/m³
	Days >50µg/m³	0	1	35 days
Ennis	Annual Mean PM_{10}	20	19	40 µg/m³
	Days >50µg/m³	19	17	35 days
Sligo	Annual Mean PM_{10}	16	18.3	40 µg/m³
	Days >50µg/m³	2	20	35 days
Galway Ra-hoon	Annual Mean PM_{10}	13	11.4	40 µg/m³
	Days >50µg/m³	1	1	35 days
Clonmel	Annual Mean PM_{10}	12	10.6	40 µg/m³
	Days >50µg/m³	1	0	35 days
Dundalk	Annual Mean PM_{10}	13	11.7	40 µg/m³
	Days >50µg/m³	2	0	35 days
Carlow Town	Annual Mean PM_{10}	11	10.4	40 µg/m³
	Days >50µg/m³	1	0	35 days
Waterford Browne's Road	Annual Mean PM_{10}	14	13.7	40 µg/m³
	Days >50µg/m³	3	2	35 days
Navan	Annual Mean PM_{10}	14	13.5	40 µg/m³
	Days >50µg/m³	0	9	35 days
Kilkenny Se-ville Lodge	Annual Mean PM_{10}	19	16.7	40 µg/m³
	Days >50µg/m³	1	2	35 days

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2020	2021	
Letterkenny	Annual Mean PM_{10}	15	14.7	40 µg/m³
	Days >50µg/m³	9	0	35 days
Wexford Town	Annual Mean PM_{10}	12	13.5	40 µg/m³
	Days >50µg/m³	0	2	35 days
Limerick Henry Street	Annual Mean PM_{10}	-	11.1	40 µg/m³
	Days >50µg/m³	-	0	35 days
Limerick Peo-ple's Park	Annual Mean PM_{10}	13	12.6	40 µg/m³
	Days >50µg/m³	1	2	35 days
Athlone	Annual Mean PM_{10}	16	12.1	40 µg/m³
	Days >50µg/m³	3	2	35 days
Tralee	Annual Mean PM_{10}	16	17.1	40 µg/m³
	Days >50µg/m³	7	10	35 days
Drogheda	Annual Mean PM_{10}	-	10.7	40 µg/m³
	Days >50µg/m³	-	0	35 days
Naas	Annual Mean PM_{10}	-	10.5	40 µg/m³
	Days >50µg/m³	-	0	35 days
Greystones	Annual Mean PM_{10}	-	9.7	40 µg/m³
	Days >50µg/m³	-	0	35 days

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a

similar latitude. Mean annual temperatures generally range between 9°C and 10°C. Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground; and generally, decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station in Dunsany, Co. Meath is located approximately 29km south-west of the Proposed Development; and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the subject site.

The weather in the area of the Proposed Development site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Dunsany over the last 3 years, the mean January temperature is 4.8°C, while the mean July temperature is 15.8°C. The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The expected annual rainfall for the eastern half of the country ranges between 750 and 1000mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

8.3.3.1 Rainfall

Rainfall is a key indicator of changes in climate, as measurements of rainfall are fundamental to assessing the effects of climate change on the water cycle and water balance.

Table *8-5* illustrates the monthly and annual rainfall data collected over a 3-year period (2019-2021) at Dunsany Weather Station. The annual rates of precipitation ranged from 952.6 mm in 2019 to 815.8 mm in 2021 with distribution of the highest monthly rainfall values falling in the autumn and winter months. The long-term average annual rainfall is 869.7mm; this is within the expected range of the eastern half of the country.

Table 8-5: Monthly Rainfall Values (mm) for Dunsany Weather Station from January 2019 to December 2021 (Source: Met Eireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	104.7	100.4	46.0	11.8	106.7	12.6	96.1	53.3	37.7	101.7	30.2	114.6	**815.8**
2020	55.1	157.1	47.1	19.3	14.2	76.9	130.9	99.2	69.0	86.1	73.4	89.0	**917.3**
2019	38.2	34.5	109.7	73.1	39.8	78.1	35.3	123.9	125.0	75.0	154.0	66.3	**952.6**
LTA[7]	**80.2**	**59.7**	**63.4**	**61.1**	**65.1**	**71.5**	**61.4**	**77.7**	**71.8**	**90.6**	**84.0**	**83.2**	**869.7**

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Dunsany synoptic weather station over a period of 11 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.

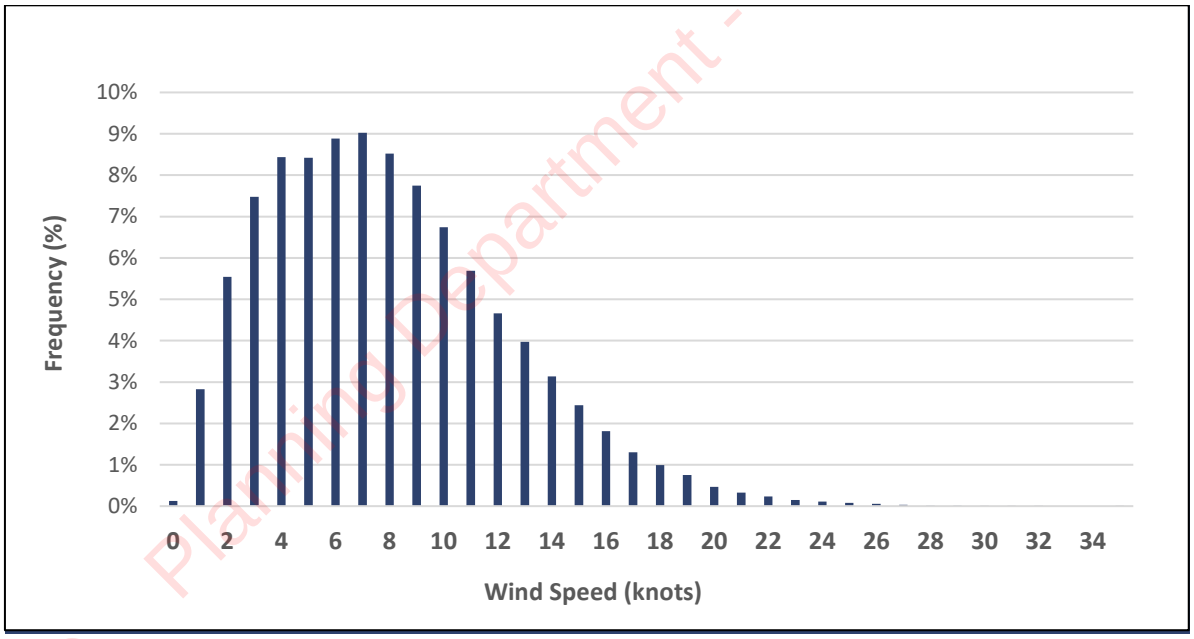

Figure 8-2: Wind Speed Frequency Distribution at Dunsany Synoptic Weather Station over 11 years (2010-2020)

Figure 8-3 provides a wind rose of the predominant wind directions and associated wind speeds at Dunsany. As is visible from Figure 8-3, the prevailing wind is from a south-westerly direction with an annual incidence of 34.29% for winds between 200 and 250 degrees. The

[7] The 'LTA' is average for the climatological long-term-average (LTA) reference period 1981-2010

most frequent wind speed associated with this wind direction is between 7 and 10 knots which is considered a 'gentle breeze' in terms of the Beaufort scale, this wind direction and wind speed occurs in combination approximately 11.30% of the time. The overall most common windspeed is between 7 and 10 knots, occurring in 31.78% of incidences, and wind speeds of between 11 and 16 knots occurring in 21.66% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 3.61% of the time. The incidence of wind between 1 and 6 knots is about 41.78% with wind speeds of above 17 knots (8.7 m/s) occurring in just 4.59% of incidences. This wind rose is broadly representative of the prevailing conditions experienced at the Proposed Development site.

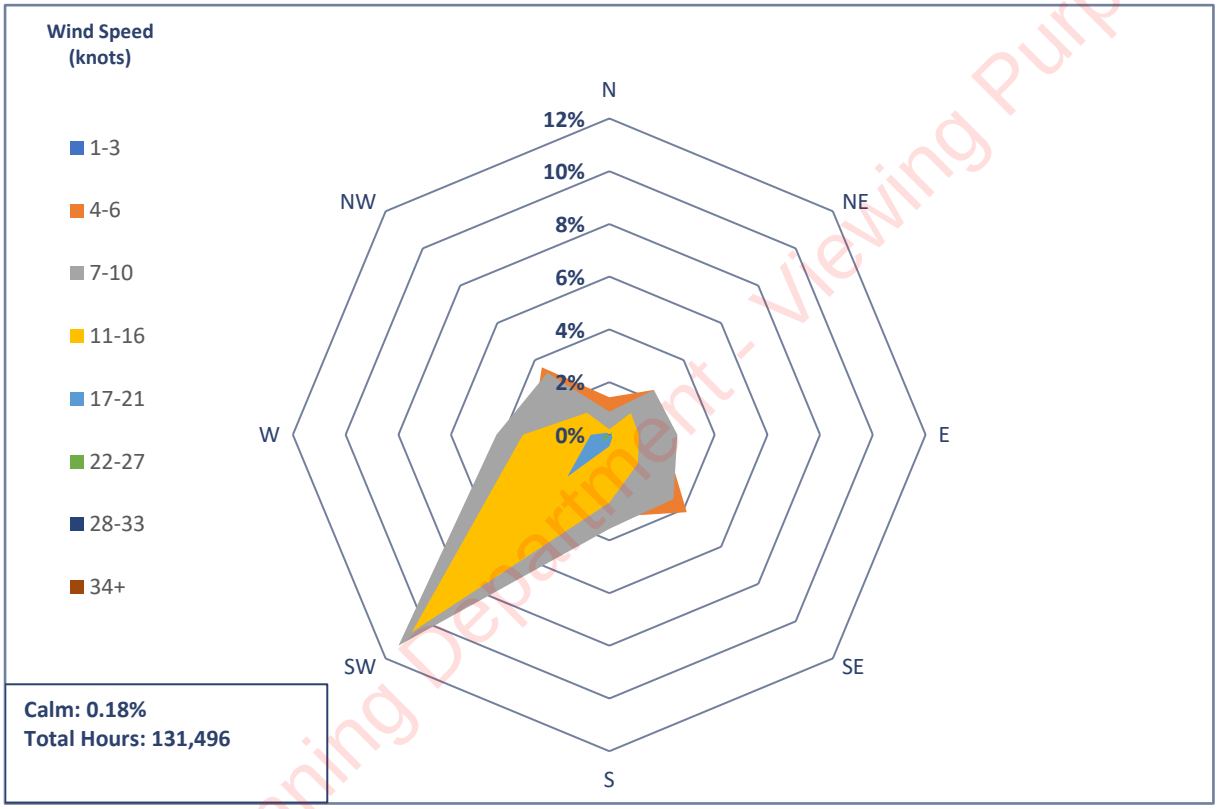

Figure 8-3: 9-year Windrose at Dunsany Weather Station 2007-2021 (Developed using Met Eireann Hourly Data)

8.4 Characteristics of the Proposed Development

The Proposed Development will consist of the construction of a retail development comprising:

> *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to*

the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

8.5 Potential Impact of the Proposed Development

8.5.1 Potential Impacts on Air Quality

8.5.1.1 Construction Phase

There is potential for construction related air emissions to impact on local air quality as a result of the Proposed Development. Potential impacts are expected to be short-term and of a temporary nature. The main air quality impacts that may arise during construction activities are:

- Dust deposition;
- Elevated particulate matter concentrations (PM_{10} and $PM_{2.5}$) as a result of dust generating activities on site; and
- An increase in concentrations of airborne particles, volatile organic compounds, nitrogen oxides, and sulphur oxides due to exhaust emissions from diesel powered vehicles and equipment on site (non-road mobile machinery) and vehicles accessing the site.

The greatest potential impact on air quality during this phase is from construction dust emissions and the potential for nuisance dust. The dust emissions from a construction site that may result in air quality impacts generally depend on:

- Site activities and duration;
- The size of the site;
- The meteorological conditions;

- The proximity of receptors to the activities;
- The adequacy of applied mitigation measures; and
- The sensitivity of receptors to dust.

The primary sources of dust identified include soil excavation works, demolition, bulk material transportation, loading and unloading, stockpiling materials, cutting and filling, and vehicular movements (HGVs and on-site machinery).

According to Transport Infrastructure Ireland guidelines (TII, 2011), it is difficult to accurately quantify dust emissions arising from construction activities. Therefore, it is not possible to easily predict changes to dust soiling rates or PM_{10} concentrations. TII recommend a semi-quantitative approach to determine the likelihood of significant impact in this instance. This should also be combined with an assessment of the proposed mitigation measures. The following table outlines the distance criteria which is recommended for use in assisting a semi-quantitative assessment:

Table 8-6: Assessment Criteria for the Impact of Dust Emissions from Construction Activities, with Standard Mitigation in Place

Source		**Potential Distance for Significant Effects (Distance from source)**		
Scale	Description	Soiling	PM10	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

In order to account for a worst-case scenario, the Proposed Development can be considered moderate in scale due to the size of the site and the duration of construction activities. Therefore, it can be assumed that there is potential for significant dust soiling 50m from the site.

There are a number of high-sensitivity receptors (residential dwellings) located within 50m of the site boundary; these are situated to the north, west and south of the Proposed Development site. Therefore, in the absence of mitigation, it is considered that there is potential for dust impacts to occur at these locations. Sensitive receptors within 100m of the Proposed Development are identified in Table 8-7:

Table 8-7: Sensitive Receptors

Name	Type	Coordinates		Orientation Relative to Site Boundary
		X	Y	
Trinity Street	Residential	53.726325	-6.383901	North
Barrack Lane	Residential	53.724920	-6.387950	West
Barrack Lane	Residential	53.725085	-6.382481	South

According to IAQM Guidance (2016), the primary factor influencing the Pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned then would be the case based on distance alone. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and
- Topography, terrain and physical features.

Meteorological conditions greatly affect the level of dust emissions and subsequent deposition downwind of the source; the most predominant being rainfall and wind speed. Adverse impacts can occur in any direction from a site; however, they are more likely to occur downwind of the prevailing wind direction and/or close to the site. Relatively high levels of moisture in the surrounding air, soils, and precipitation helps to suppress dust due to the cohesive properties of water between dust particles. The least favourable meteorological conditions for dust generation would typically be warm days with strong winds and low precipitation. Due to the variability of weather, it is impossible to predict the conditions that will occur during the Construction Phase of the development. However, wind direction is most likely to prevail from the southwest.

Table 8-8 outlines the hourly percentage distribution of wind speed and direction at Dunsany synoptic weather station over a 13-year period (2007-2021). This data is consistent with Figure 8-3 of this chapter and shows that the most frequent wind direction prevails from the southwest (29.40% frequency). The corresponding most frequent wind speed is between 7 and 10 knots which is considered a ‘gentle breeze’ in terms of the Beaufort scale; this wind direction and wind speed occurs in combination approximately 9.76% of the time.

Table 8-8: Percentage Distribution of Wind Speeds and Direction at Dunsany (2007-2021)

Wind speed (Knots)		<1	1 - 3	4 - 6	7 - 10	11-16	17-21	22-27	28-33	34+	% Dry Days
Wind Direc-tion	Degrees										
North	350 - 10	0.18	1.86	1.43	0.88	0.21	0.01	0.00	0.00	0.00	32.5%
North-east	20 - 70		1.86	2.40	2.40	1.17	0.15	0.03	0.00	0.00	
East	80 - 100		0.92	2.07	2.58	1.12	0.09	0.00	0.00	0.00	
South-east	110 - 150		2.32	4.16	3.44	1.54	0.16	0.02	0.00	0.00	
South	170 - 190		1.74	3.12	3.57	2.57	0.44	0.05	0.00	0.00	
South-west	200 - 250		3.49	6.22	11.30	10.58	2.25	0.43	0.02	0.00	
West	260 - 280		1.60	2.95	4.28	3.28	0.70	0.13	0.01	0.00	
North-west	290 - 340		2.79	3.62	3.33	1.19	0.11	0.00	0.00	0.00	

Dry days with moderate to high windspeeds (above 5m/s (7-10 knots)) are the conditions which are most likely to result in fugitive dust emissions. Sensitive receptors within 50m of the Proposed Development have been identified as residential dwellings which are located to the north, south and the west of the site.

Receptors located to the north of the site would require prevailing winds from the south to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 2.2%. Receptors located to the west of the site would require prevailing winds from the east to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 1.2%. Receptors located to the south of the site would require prevailing winds from the north to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 0.36%. Therefore, appropriate conditions for fugitive dust emissions at these receptors are highly infrequent and it is expected that adequate mitigation measures, as outlined in Section 8.6.1, will prevent nuisance dust from resulting in any adverse impacts. Furthermore, the trees and hedgerows which are currently present on the southern boundary of the Proposed Development will act as a natural buffer for dust deposition in some cases.

Appropriate mitigation and monitoring measures have been recommended and will be implemented at the site in order to minimise the risk of dust emissions arising during the Construction Phase. These mitigation measures have been outlined in the Construction Environmental Management Plan (CEMP) for the site, and provided such measures are adhered to, it is not considered that significant air quality impacts will occur.

Construction vehicles and machinery during this phase will temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (dust). Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials from ground disturbance. According to the IAQM (2014), experience from the assessment of exhaust emissions from on-site machinery and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed.

Air pollutants may increase marginally due to construction-related traffic and machinery from the Proposed Development. However, any such increase is not considered significant and will be well within relevant ambient air quality standards. According to TII (2011), the significance of impacts due to vehicle emissions during the Construction Phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to site access routes. If construction traffic would lead to a significant change (> 10%) in Annual Average Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ should be predicted in line with the methodology as outlined within TII guidance. Construction traffic is not expected to result in a significant change (> 10%) in AADT flows near to sensitive receptors. Therefore, a detailed air quality assessment is not required. The assessment of potential traffic impacts has been completed within Chapter 12, *Traffic*. Construction traffic is expected to exceed 10% of the traffic flow on the adjoining roads; therefore, concentrations of NO_2 and PM_{10} have been predicted in the Opening Year (2024) in the following section 8.5.1.2.

8.5.1.2 Operational Phase

The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions.

Operational traffic will use regional and local roads to access the facility with potential increases of traffic flow on some roads and subsequent associated emissions of VOCs, nitrogen oxides, sulphur dioxides and increased particulate matter concentrations.

In terms of associated impacts on air quality, Table 8-9 outlines the criteria that are prerequisite for an air quality assessment. According to IAQM guidance (2017), if none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect.

Table 8-9: Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)

Potential Change resulting from Proposed Development	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors	A change of LDV flows of more than 1000 Annual Average Daily Traffic (AADT)
Cause a significant change in Heavy Duty Vehicle (HGV) flows on local roads with relevant receptors	A change of HGV flows of more than 100 Annual Average Daily Traffic (AADT)
Realign roads, i.e., changing the proximity of receptors to traffic lanes	Where the change is 5m or more
Cause a change in Daily Average Speed (DAS)	Where the DAS will change by 10 km/h or more
Cause a change in peak hour speed	Where the peak hour speed will change by 20km/h or more.

The UK Highways Agency Design Manual for Roads and Bridges (DMRB) air quality guidance (LA 105) provides a framework for assessing, mitigating, and reporting the effects of road schemes on air quality; however, this can be adapted to any development which results in a change in traffic.

The criteria as set out in Table 8-10 have been used to determine the project's risk potential to the receiving environment, and whether a simple or detailed air quality assessment is required:

Table 8-10: Receiving Environment Sensitivity (Source: DMRA LA 105)

Sensitivity	Features of receiving environment
High	1) Large number of receptors (human and / or ecological) within 50m of roads triggering traffic screening criteria; 2) Baseline monitoring data indicates concentrations above the AQS Objective / EU limit value; 3) Monitoring indicates exceedances of short term AQS Objectives / EU limit value; 4) Projecting forward monitored concentrations to the opening year, indicates exceedances of AQS Objectives / EU limit value; 5) AQMAs or reported EU limit value exceedances within project's study area.
Medium	1) Receptors (human or ecological) within 50m of roads triggering traffic change criteria; 2) Baseline monitoring data illustrates annual mean NO2 concentrations >36µg/m³; 3) Projections indicate annual mean NO2 concentrations>36µg/m³ in opening year; 4) AQMAs or EU limit value exceedances within project's study area.
Low	1) Few receptors located close to roads triggering traffic change criteria; 2) Baseline monitoring data illustrates concentrations in base year below an annual mean of 36µg/m³; 3) No AQMAs or EU limit value exceedances within project's study area.

As outlined in the following sections, there are a number of high-sensitivity receptors located within 200m of the affected road network. However, baseline pollutant concentrations are well below an annual mean of 36 µg/m³ and there are no exceedances of EU limit values within the study area. Therefore, in accordance with Table 8-10, it is considered that the receiving environment of the Proposed Development is of a 'Low Sensitivity' and the inclusion of the Proposed Development can be considered low risk. Therefore, in line with DMRB LA 105 guidance, it has been determined that simple air quality assessment is required in this case.

8.5.1.2.1 UK Design Manual for Roads and Bridges Screening Model (V. 103c 2007)

The impact of the Operational Phase of the Proposed Development has been assessed by use of the UK DMRB screening model (Version 1.03c 2007). The DMRB screening model provides a simple and straightforward means of predicting pollutant concentrations associated with road traffic emissions from the Proposed Development. According to Transport Infrastructure Ireland Guidelines (TII, 2011), this method is a suitable approach in circumstances where the predicted environmental concentrations (i.e., ambient background + predicted concentration) lie sufficiently below the air quality standards (<90% of the standard). Where predicted concentrations approach or exceed the air quality standards/limit values, a detailed air quality assessment must be carried out.

The DMRB modelling tool requires the following inputs to complete the assessment: road types, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual traffic speeds and background pollutant concentrations. This input data is utilised by the model in predicting the Proposed Development's road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptor. The DMRB modelling tool predicts annual mean concentrations of NO_x and PM_{10}. The road NO_x concentration is then converted to NO_2 using the latest-available version of the UK Department for Environment, Food and Rural Affairs (DEFRA) NO_x to NO_2 conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO) and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air Quality Reports).

As the tool does not account for electric or hybrid vehicle use, vehicle emissions applied in this study are likely to overestimate the actual vehicle emissions experienced from the Proposed Development. The worst-case contributions predicted by the tool are added to the existing background concentration to provide a worst-case predicted ambient concentration. The compliance of the Proposed Development with the relevant ambient air quality standards is subsequently assessed by comparison with the worst-case ambient concentrations.

8.5.1.2.1.1 Sensitive Receptors

TII (2011) define 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. According to the DMRB LA 105 guidance, sensitive receptors will be chosen within 200m of the Affected Road Network (ARN) and include residential properties, schools and hospitals for the assessment of annual mean air quality thresholds. Where there is a risk of the short-term air quality thresholds being exceeded, then sensitive receptor locations including gardens and playing fields will be assessed. In the current assessment, a number of high-sensitivity receptors (residential properties) were identified within 200m of the ARN.

According to the DMRB LA 105 guidance, it is not necessary to model all receptors within 200m or an excessive number of receptors in the same area to determine whether there is likely to be any exceedances in the do nothing or do something scenarios.

For the purpose of determining local air quality impacts, eight (8 No.) receptors were included in this modelling assessment, and these have been identified in Table 8-11. The receptors modelled will represent the worst-case locations in the vicinity the Proposed Development and were chosen based on proximity (within 200m) to the road links affected by the Proposed Development:

Table 8-11: Sensitive Receptors

Name	Type	ITM Coordinates	
		X	Y
R1	Residential	707041	775748
R2	Residential	707181	775665
R3	Residential	707162	775790
R4	Residential	707116	775784
R5	Residential	706782	776278
R6	Residential	706674	776403
R7	Residential	706547	776614
R8	Residential	706265	776797

Designated sites of ecological conservation importance within 200m of the ARN are required to be included in the air quality assessment. This includes Special Protection Areas, Special Areas of Conservation, Natural Heritage Areas, and nature reserves. Only sites that are sensitive to nitrogen deposition should be included in the assessment, it is not necessary to include sites such as those which have been designated as a geological feature or water course. No Sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment.

8.5.1.2.1.2 Traffic Data

The traffic data used in this assessment has been provided by Barret Mahony Consulting Engineers and is shown in Table 8-12:

Table 8-12: Traffic Data Applied to the DMRB Model

Link Number	Road Name	Base Year (2022)	Opening Year (2024)		Design Year (2039)		Speed (Km/h)
			Do Nothing	Do Something	Do Nothing	Do Something	
		AADT	AADT	AADT	AADT	AADT	
1	R168 (North)	2504 (1.93%HGV)	2584	5076	3027	5519	60kph
2	R168 (South)	1705 (0.47%HGV)	1760	3422	2061	3723	60kph
3	N51 (West)	4261 (4.15%HGV)	4261	6006	4992	6737	80kph

8.5.1.2.1.3 Pollutants and Background Concentrations

The DMRB modelling tool predicts annual mean concentrations of NO_x and PM_{10}. The road NO_x concentration has then been converted to NO_2 using the latest published version of DEFRA's NO_x to NO_2 conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO), and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air Quality Reports). According to the DMRB LA 105 guidance, it is only necessary to model PM_{10} for the base year to demonstrate that there is no impact on achievements of the PM_{10} air quality thresholds as a result of the project. Where air quality monitoring indicates exceedances of the PM_{10} air quality thresholds in the base year, PM_{10} should then be included in the model for both the 'do nothing' and 'do something' scenarios. As Ireland currently meets its legal requirements for the achievement of the $PM_{2.5}$ air quality thresholds, there is no requirement to model this parameter. Additionally, the modelling of PM_{10} can be used to demonstrate that the project does not impact on the $PM_{2.5}$ air quality threshold.

Annual mean concentrations of NO_2 and PM_{10} for the years 2019-2020 have been obtained for Zone C stations (see Section 8.3.1). The suburban background monitoring site of Dundalk is located ca. 30km from the site of the Proposed Development and therefore is broadly representative of background concentrations in the vicinity of the Proposed Development. This station has long-term datasets available for concentrations of PM_{10} and NO_2.

For both parameters, annual limits are well below the threshold limits contained within the regulations. During 2020, the restriction of movement in Ireland due to the COVID-19 Pandemic had an impact on air quality nationally with a large-scale reduction in vehicular traffic. It is noted that the decrease in NO_2 levels during that year is a direct result of the restrictions placed on movements and construction due to COVID-19. Therefore, measured concentrations of PM_{10} and NO_2 in 2019 have been used in combination with TII (2011) correction factors to estimate the baseline year (2022) concentrations.

Background concentrations for the Opening Year (2024) and Design Year (2039) have been predicted for the air quality assessment. Predicted baseline year (2022) background concentrations have been used in combination with correction factors to estimate annual average NO_2 concentrations in future years. These factors have been adapted from both TII (2011) and DEFRA roadside NO_2 projection factors.

Adjustments to the verified modelled NO_2 concentrations are required to be made in order to account for future roadside NO_2 concentrations. An additional scenario known as the projected base year is to be included in the air quality modelling to enable a gap analysis to be completed. The gap analysis is the application of adjustment factors which take into consideration the assumed roadside rates of reduction in NO_x and NO_2 by DEFRA's modelling tools compared to observed roadside monitoring trend i.e., the gap between the predicted reductions and those observed (DMRB LA 105 guidance). This methodology has been applied to the current assessment in order to predict future NO_2 concentrations as a result of the Proposed Development and ensure that these concentrations are not under-estimated.

8.5.1.2.1.4 Determining the Impact

The TII guidance document 'Guidelines for the Treatment of Air Quality during the Planning and Construction of Road Schemes (2011)' outlines a clear methodology for determining the magnitude and significance of air quality impacts associated with road schemes; however, this remains applicable to any project which results in a change to traffic volumes. The TII significance criteria have been applied to the Proposed Development and adapted as necessary within tables 8-13 to 8-16.

Tables 8-13 to 8-16 have been designed to assist in describing the air quality impacts at each receptor. They are applicable to the pollutants which are relevant to the Proposed Development and the standards or limit values against which they are being assessed (TII, 2011). The criteria focus on NO_2 and PM_{10} as these pollutants are most likely to exceed the annual mean limit values (40 µg/m^3).

The definition of 'impact magnitude' is exclusively related to the degree of change in pollutant concentrations, expressed as micrograms per cubic metre (µg/m^3). 'Impact description' takes account of the impact magnitude and of the absolute concentrations and how they are linked to the air quality standards or limit values. The descriptors for the magnitude of change due to the Proposed Development are set out in Table 8-13:

Table 8-13: Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations (Source: Adapted from TII, 2011)

Magnitude of Change	Annual Mean NO_2/PM_{10}	No. days with PM10 concentration greater than 50 µg/m^3
Large	Increase/decrease ≥4 µg/m^3	Increase/decrease >4 days
Medium	Increase/decrease 2 - <4 µg/m^3	Increase/decrease 3 or 4 days
Small	Increase/decrease 0.4 - <2 µg/m^3	Increase/decrease 1 or 2 days
Imperceptible	Increase/decrease <0.4 µg/m^3	Increase/decrease <1 day

The subsequent impact descriptors are set out in Table 8-14 and Table 8-15:

Table 8-14: Air Quality Impact Descriptors for Changes to Annual Mean NO_2 and PM_{10} Concentrations at Receptors (Source: Adapted from TII, 2011)

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration[8]		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (≥40 µg/m³ of NO_2 or PM_{10})	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (36-<40 µg/m³ of NO_2 or PM_{10})	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (30-<36 µg/m³ of NO_2 or PM_{10})	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<30 µg/m³ of NO_2 or PM_{10})	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (≥40 µg/m³ of NO_2 or PM_{10})	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme (36-<40 µg/m³ of NO_2 or PM_{10})	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (30-<36 µg/m³ of NO_2 or PM_{10})	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme (<30 µg/m³ of NO_2 or PM_{10})	Negligible	Negligible	Slight Beneficial

[8] Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible.

Table 8-15: Air Quality Impact Descriptors for Changes to Number of Days with PM10 Concentration Greater than 50 µg/m^3 at a Receptor (Source: TII, 2011)

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration[9]		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Beneficial

In terms of 'significance of effects', professional judgment has been applied in making this determination. The TII Guidance (2011) outlines that the overall air quality impact of the Proposed Development should be described as either 'insignificant', 'minor', 'moderate', or 'major'; and a number of factors, as listed in Table 8-15, are set out which should be taken into account:

[9] Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible.

Table 8-16: Factors to Consider when Determining Air Quality Significance (Source: Adapted from TII, 2011)

Factors
Number of people affected by increases and/or decreases in concentrations and a judgement on the overall balance.
The number of people exposed to levels above the objective or limit value, where new exposure is being introduced.
The magnitude of the changes and the descriptions of the impacts at the receptors i.e., using the findings based on Boxes Tables 8-13 to 8-15.
Whether or not an exceedance of a standard or limit value is predicted to arise in the study area where none existed before or an exceedance area is substantially increased.
Whether or not the study area exceeds a standard or limit value and this exceedance is removed, or the exceedance area is reduced.
Uncertainty, including the extent to which worst-case assumptions have been made
The extent to which a standard or limit value is exceeded, e.g., an annual mean NO_2 of 41 µg/m^3 should attract less significance than an annual mean of 51 µg/m^3

8.5.1.2.1.5 Modelling Results

The impact of the Proposed Development has been determined by modelling traffic-related air emissions resulting from the presence or absence of Proposed Development.

Concentrations of NO_2 and PM_{10} were modelled for the baseline year of 2022. As is evident from Table 8-17, the model has indicated that concentrations for all pollutants are well below the annual limit of 40 µg/m^3. Therefore, in line with DMRB LA 105 guidance, further modelling of PM_{10} for the Opening and Design Years is not required. The highest road increment of PM_{10} experienced at receptors was 0.12 µg/m^3. When this is assessed in combination with the predicted 2022 background concentration of 15.26 µg/m^3, an overall impact of 38.5% of the annual limit is experienced at the worst-case receptor.

The impact of NO_2 was predicted for the Opening and Design Years at the nearest receptors to the affected road network (ARN). The degree of impact has been determined based on both the absolute and relative impact of the Proposed Development. A 'Do-Nothing Scenario', which assumes that the Proposed Development does not exist in future years, has also been assessed within the model and results have been compared in order to determine the degree of impact.

Table 8-17: Modelled Baseline NO_2 and PM_{10} Concentrations (2022)

Receptor	ITM Coordinate	Receptor Type	Parameter	Total (µg/m³)	Road Traffic Component
R1	707041, 775748	Residential	PM_{10}	13.91	0.01
			NO_2	15.31	0.05
R2	707181, 775665	Residential	PM_{10}	13.91	0.01
			NO_2	15.31	0.05
R3	707162, 775790	Residential	PM_{10}	13.96	0.06
			NO_2	15.51	0.25
R4	707109, 775762	Residential	PM_{10}	13.98	0.08
			NO_2	15.63	0.37
R5	706782, 776278	Residential	PM_{10}	14.01	0.11
			NO_2	15.73	0.47
R6	706674, 776403	Residential	PM_{10}	14.01	0.11
			NO_2	15.72	0.46
R7	706547, 776614	Residential	PM_{10}	14.02	0.12
			NO_2	15.8	0.54
R8	706265, 776797	Residential	PM_{10}	13.91	0.01
			NO_2	15.34	0.08

The impact of the Proposed Development on annual mean NO_2 concentrations in the Opening Year (2024) and Design Year (2039) has been assessed relative to the 'Do Nothing' levels. The results shown in Table 8-17 and 8-18 determine that there may be some 'imperceptible' and 'small' increases in concentrations of NO_2 at worst-case receptors assessed when compared with 'Do Nothing' levels; with the highest predicted increase of 0.65 µg/m³ and 0.7 µg/m³ measured at R7 in the Opening Year and Design Year 'Do Something' scenarios, respectively.

In accordance with Table 8-14, when assessing the Proposed Development contribution in relation to the NO_2 objective/limit value, concentrations of NO_2 at all sensitive receptors are less than 17 µg/m³ with the inclusion of the Proposed Development in both the Opening and Design Years, and as such, are well below the objective/limit value of 40 µg/m³. Therefore, it is considered that the impact of the Proposed Development is minor at sensitive receptors and insignificant in terms of overall ambient air quality standards.

Having regard to the assessment criteria set out in Section 8.5.1.2.1.4 and the modelling results outlined in Table 8-18 and Table 8-19, the impact of the Proposed Development on NO_2 concentrations in the locality is likely to be 'long-term', 'negative' and 'imperceptible'.

Table 8-18: Predicted Annual Mean Concentrations of NO_2 (Opening Year 2024)

Recep-tor	Parame-ter	Back-ground (µg/m³)	Opening Year 2024				
			Do Noth-ing	Do Some-thing	Proposed Develop-ment Con-tribution	Magnitude	Impact descrip-tion
R1	NO_2	14.23	15.28	15.32	0.04	Imperceptible	Negligible Increase
R2	NO_2		15.28	15.33	0.05	Imperceptible	Negligible Increase
R3	NO_2		15.49	15.75	0.26	Imperceptible	Negligible Increase
R4	NO_2		15.63	16	0.37	Imperceptible	Negligible Increase
R5	NO_2		15.74	16.23	0.49	Small	Negligible Increase
R6	NO_2		15.74	16.22	0.48	Small	Negligible Increase
R7	NO_2		15.8	16.45	0.65	Small	Negligible Increase
R8	NO_2		15.26	15.27	0.01	Imperceptible	Negligible Increase

Table 8-19: Predicted Annual Mean Concentrations of NO_2 (Design Year 2038)

Recep-tor	Parame-ter	Back-ground (µg/m³)	Design Year 2039				
			Do Noth-ing	Do Some-thing	Proposed Develop-ment Con-tribution	Magnitude	Impact descrip-tion
R1	NO_2	13.27	15.32	15.37	0.05	Imperceptible	Negligible Increase
R2	NO_2		15.33	13.39	0.06	Imperceptible	Negligible Increase
R3	NO_2		15.6	15.86	0.26	Imperceptible	Negligible Increase
R4	NO_2		15.8	16.17	0.37	Imperceptible	Negligible Increase
R5	NO_2		15.9	16.41	0.51	Small	Negligible Increase
R6	NO_2		15.9	16.4	0.5	Small	Negligible Increase
R7	NO_2		16	16.7	0.7	Small	Negligible Increase
R8	NO_2		15.3	15.31	0.01	Imperceptible	Negligible Increase

8.5.2 Potential Impacts on Climate

8.5.2.1 Construction Phase

There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of CO_2 and N_2O to be emitted during the construction phase of the development. However, due to the size and duration of the construction phase, and the mitigation measures proposed, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and therefore will have no considerable impact on climate. Overall, climatic impacts are considered to be short-term and imperceptible.

8.5.2.2 Operational Phase

8.5.2.2.1 Flood Risk

There is growing scientific consensus that the warming of the climate is expected to increase the risk of floods. Rising sea levels and more frequent and sever coastal storms will increase the risk of coastal and estuarial flooding as well as coastal erosion. According to the Planning System and Flood Risk Management (DECLG & OPW, 2009), where the floodplain or coastal plain is well defined, climate change is expected to change the probability of flooding and the depth for a particular event with little change in spatial extent. Only where extensive areas of land rise gently from the river or the sea is climate change expected to significantly increase the area affected by flooding.

There is a great deal of uncertainty in relation to the potential effects of climate change; therefore, a precautionary approach should be adopted, where necessary, to reflect uncertainties in flooding datasets and the ability to predict the future climate. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change so that future occupants are not subject to unacceptable risk (OPW, 2009).

A Flood Risk Assessment (FRA) was undertaken by Barrett Mahony Consulting Engineers on behalf of The Applicant for the Proposed Development. This assessment identifies the risk of flooding at the site from various sources and sets out possible mitigation measures against the potential risks of flooding. Sources of possible flooding include coastal, fluvial, pluvial/surface water flooding and groundwater flooding (direct heavy rain), groundwater. This report provides an assessment of the subject site for flood risk purposes only.

The FRA concluded the site of the Proposed Development is located within Flood Zone C and that there is no significant risk of flooding on the Proposed Development site or no significant increased flooding risk to surrounding areas from the development. Therefore, the development is deemed acceptable from a flooding perspective.

8.5.2.2.2 GHG Emissions

8.5.2.2.2.1 Traffic

Increased LDV and HGV traffic flow as a result of the Proposed Development is likely to contribute to increases in GHG emissions such as CO_2 and N_2O. However, these contributions are likely to be marginal in terms of overall national GHG emission estimates and Ireland's obligations under the Kyoto Protocol and the Paris Agreement, and therefore unlikely to have an adverse effect on climate.

8.5.2.2.2.2 Building Energy

8.5.2.2.2.2.1 Planning Part L & NZEB Compliance Report

A Planning Part L & NZEB Compliance Report has been prepared for the Operational Phase of the Proposed Development by Lawler Sustainability which outlines the current building regulations framework and the requirement to achieve Nearly Zero-Energy Buildings (NZEB) standard for all new developments and provides details on how the buildings comply with the regulations, and the mechanical and electrical services that will be installed at the Proposed Development. The report describes how the NZEB standard is demonstrated using SBEMie v5.5.h.2 within the IES Virtual Environment 2021 VE Compliance software. This software has been validated and approved by the SEAI.

Building energy has been long understood as contributing a major component of GHG emissions which was acknowledged within the 2030 Communication published by the European Commission (2014) which stated that "the majority of the energy-saving potential (for the EU) is in the building sector. The EU Energy Performance of Buildings Directive set out the target that all new developments should be Nearly Zero-Energy Buildings (NZEB) by the end of 2020.

In developing the energy strategy for the Proposed Development, the incorporation of energy efficient strategies into the project deliverables will encourage the commitment to sustainable design at a very early stage and ensure that the Proposed Development will meet the principles of the Government's 'National Climate Change Policy' and the NZEB criteria as set out in the Part L Regulations 2021 and will maximise the reduction in Carbon Dioxide (CO2) emissions thus demonstrating the commitment to Climate Change.

8.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

Cumulative air quality impacts have the potential to arise locally when construction activities associated with the Proposed Development take place at the same time as other developments in a specific location.

All planning applications which have been granted permission and are already developed have been incorporated into the baseline assessment of this application. A planning search has revealed that there have been a number of planning applications in the vicinity of the Proposed Development site which have been granted permission, that could potentially be constructed at the same time as the Proposed Development.

Table 8-20 details the existing, proposed and granted planning permissions on record in the area:

Table 8-20: Potential Cumulative Impacts

Planning Ref No.	Applicant Name	Summary of Development
211283 09/02/2022	Loughdale Properties Limited	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works. ABP-311678-21
211046 14/12/2021	Louth County Council	Part 8 application for permission to carry out the development of 20 No. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda Co Louth the development will comprise of the following: Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling new pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e., 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores new pedestrian route from Boice Court Phase 2 to Cement Road All associated landscaping and ancillary/site development works.
LB191735 (Meath County Council) 21/02/2020	CAP Developments LLC	Alterations to existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas, screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.m; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A new main entrance and access control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq.m.; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application

		site area measuring 19.46 hectares. An EIAR has been submitted with this application.
19880 18/12/2019	Wogans Build Centre	Permission for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works.
18667 11/10/2018	Moffett Investment Holdings ULC	Extension of Duration Parent Ref: (08/101) 10-year permission - for a mixed-use development comprising a total of 527 no. dwellings (terraces, semi-detached, duplex and apartments and a civic/commercial neighbourhood centre of c 5,823sqm
1858 21/03/2018	Simon Paler Elmsont Limited	FURTHER EXTENSION OF DURATION REF: 12510022 which consists of Permission for Residential development of 190 units & a 430 sq.m. creche which, shall comprise of 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services & all associate works. PARENT PERMISSION REF: 06510077
17310 17/01/2018	North Drogheda Development Partnership	Permission for development to consist of amendments to a permitted residential development (Ref. 071507) to alter dwelling unit types, and to amend conditions 6(ii) and 51 (i)(a). The total permitted number of units of 1056 no. will remain unchanged

The cumulative effects on the air quality and climate of the current Proposed Development and other permitted or existing developments have been considered, in particular through the generation of air pollutants and GHG emissions. The potential impacts on air quality and climate are assessed in Section 8.1.5 and it is considered that there are no other potential significant cumulative impacts associated with the Proposed Development and considered offsite permitted developments.

In terms of dust, no significant impacts are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the Proposed Development site. Due to the implementation of good construction practices at the site of the Proposed Development and these offsite permitted developments, it is not anticipated that significant cumulative impacts will occur.

Assessment of operational stage impacts on air quality involved traffic data which is inclusive of traffic associated with other existing and permitted developments on the road networks surrounding the site both in current and future years. Therefore, cumulative impacts have been assessed in this regard and the impact on ambient air quality has been determined as insignificant.

8.5.4 "Do Nothing" Impact

The Do-Nothing impact has been considered in terms of air quality in this chapter. If the Proposed Development did not proceed, the Proposed Development site would remain as an undeveloped, agricultural field. The existing ambient air quality would remain unchanged onsite and at nearby sensitive receptors.

Greenhouse gas emissions as a result of the Proposed Development are also likely to be marginal in terms of overall national GHG emission estimates and Ireland's obligations under the Kyoto Protocol and the Paris Agreement when compared to a Do-Nothing scenario.

8.6 Avoidance, Remedial, and Mitigation Measures

8.6.1 Air Quality

8.6.1.1 Construction Phase

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures will be employed as necessary to further prevent such impacts occurring:

- Vehicle and wheel washing facilities will be provided at site exit where practicable. If necessary, vehicles are to be washed down before exiting the site.
- Netting is to be provided to enclose scaffolding to mitigate escape of air borne dust from the existing buildings.
- Shroud piling machinery when operating near to boundaries.
- Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Dust emission over the site boundary will be minimised using static sprinklers or other watering methods as necessary.
- No burning of materials to be permitted on site.
- Water sprays for dust suppression will be affixed to mechanical excavators/munchers involved in demolition works.
- Water sprays and cannons will be used where possible during cutting, with protective measures applied to retained finishes local to the cutting.
- Prior to commencement, the Main Contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions.
- In areas of poor natural ventilation, dust capture/extraction methods will be employed by the Main Contractor.

- The Main Contractor will allocate suitably qualified and experienced personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

- The Main Contractor will be required to appoint a senior member of its site management team to act as the liaison with third parties in respect of complaints regarding dust and or site activities.

- Monitoring of dust deposition will be undertaken at nominated boundary locations to ensure that dust levels comply with the TA Lift limit value of 350mg/(m²/day) based on a 30-day average using Bergerhoff gauges (Limits to be agreed with local authority).

8.6.1.2 Operational Phase

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

8.6.2 Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

8.6.3 "Worst Case" Scenario

Worst case scenario would involve failures of mitigation measures for the Proposed Development. In such events, it is not considered that dust nuisances will occur.

A worst-case scenario has been applied to the Construction Phase air quality assessment in terms of the scale of the source and potential dust nuisances. It is expected that adequate mitigation measures, as outlined in Section 8.1.6.1.1, will assist in preventing nuisance dust from resulting in any significant effects. In the event of a failure of such measures, it is not considered that significant dust related effects will occur.

A worst-case scenario has been applied to the Operational Phase air quality assessment in terms of traffic volumes experienced on the surrounding road network and associated air emissions. As the DMRB modelling tool does not account for electric or hybrid vehicle use, vehicle emissions applied in this study are likely to overestimate the actual vehicle emissions experienced from the Proposed Development. The worst-case contributions predicted by the tool are added to the existing background concentration to provide a worst-case predicted ambient concentration. The compliance of the Proposed Development with the relevant ambient air quality standards is subsequently assessed by comparison with the worst-case ambient concentrations. Associated impacts have been determined as insignificant in this case.

8.7 Residual Impacts

Residual Impacts are defined *as 'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

The Proposed Development is likely to result in a long-term increase in traffic on the roads surrounding the Proposed Development site; however, this increase in traffic has been determined to have an overall insignificant impact in terms of local air quality. Furthermore, the increase in traffic has been determined as marginal with regard to climatic impacts. Therefore, no adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.

8.8 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at a strategic locations along the site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in $mg/m^2/day$ in accordance with the relevant standard.

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

8.9 Interactions

Interactions between Air Quality and Climate and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

8.9.1 Population and Human Health

Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.

8.9.2 Biodiversity

Interactions between Air Quality and Biodiversity have been considered as the Construction Phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.

8.9.3 Traffic

There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.

8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this chapter.

8.11 References

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9 NOISE & VIBRATION

9.1 Introduction

This chapter assesses the potential noise and vibration impacts from the Proposed Development.

9.1.1 Quality Assurance and Competence

This report was completed by Amplitude Acoustics, an acoustic consultancy that specialises in noise and vibration. Amplitude's team have successfully completed a large number of projects throughout Ireland, Europe, the Middle East, Australasia and North America. Our approach to the provision of services is based upon experience gained on many projects, underpinned by a deep understanding of the technical and social principles behind government noise policy.

This noise assessment was completed by Benny Cryan and overseen by James Cousins who have extensive experience in assessing commercial developments.

Benny Cryan was project manager, responsible for acoustic modelling and production of the report. Benny has a degree in Computer and Electronic Engineering, has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control, and is a member of the Engineers Ireland (MIEI).

9.2 Study Methodology

Guidance documents relating specifically to noise and vibration are set out in the following subsections. The general methodology for this assessment is as follows:

1. Characterise the receiving environment through baseline noise data obtained from baseline monitoring.
2. Review of the most applicable standards and guidelines to set acceptable noise and vibration criteria for the construction and operational phases of the Proposed Development.
3. Undertake predictive acoustic modelling to assess the potential impacts associated with the construction and operational phases of the Proposed Development at nearby noise sensitive locations (NSL's).
4. Identify whether mitigation measures are required and, if so, specify options.
5. Describe the significance of the residual noise and vibration effects associated with the Proposed Development in accordance with the guidance provided in EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports Draft August 2017.

9.2.1 Construction Noise Criteria

British Standard BS 5228-1 and 2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Noise and Vibration*[10] provides guidance on methods for predicting and measuring noise from construction sites and assessing the impact on those exposed to it.

The ABC method detailed in Annex E.3.2 of BS 5228 can be used for the control of decommissioning noise. Table E.1 summarises the ABC method and is reproduced in Figure 9-1.

Table E.1 **Example threshold of significant effect at dwellings**

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Night-time (23.00–07.00)	45	50	55
Evenings and weekends [D]	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

[A] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[B] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[C] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

[D] 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Figure 9-1: Table E.1 from BS 5228 detailing ABC method.

Using the ABC method, and existing ambient noise levels at the sites, the nearby noise sensitive locations are deemed to be Category A and the limits outlined in Table 9-1 apply.

Table 9-1: Construction Noise limits.

Noise Sensitive Locations	Threshold Value, $L_{Aeq,T}$ dB
Daytime(1)	65
Evenings and Weekends(2)	55
Night-time(3)	45

(1) 07:00hrs – 19:00hrs weekdays and 07:00 -13:00hrs Saturdays.
(2) 19:00hrs - 23:00hrs weekdays, 13:00hrs - 23:00hrs Saturdays and 07:00hrs - 23:00hrs Sundays.
(3) 23:00hrs - 07:00hrs.

[10] BS 5228-1 and 2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Noise and Vibration*

9.2.2 Construction Vibration Criteria

Vibration criteria have been developed based on the guidance on construction vibration prediction, assessment and control contained within:

- BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Vibration*;
- BS 7385-2:1993 *Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration*[11];
- Transport Infrastructure Ireland (TII, formerly NRA) (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*[12]; and,
- TII (2004) *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*[13].

People are sensitive to vibration and can feel vibration long before it becomes an issue in terms of cosmetic damage or structural damage to buildings. Vibration causes nuisance as it is assumed that if vibration can be felt then damage is inevitable. However, it requires greater levels of vibration to cause damage to buildings and structures. Some people are more sensitive to vibration than others.

Table 9-2 describes likely effects of the listed vibration levels given in peak component particle velocity (PPV).

Table 9-2: Guidance of effects of Vibration Levels on residents.

Vibration Level (PPV)	Description
0.14mm/s	Vibration might just be perceptible for frequencies normally associated with construction vibration. People are less sensitive to lower frequency vibration.
0.3mm/s	Vibration might just be perceptible in residential environments.
1.0mm/s	It is likely that vibration at this level in a residential environment will cause complaint. It is usually tolerated if prior warning and explanation is given to residents.
10.0mm/s	Vibration is likely to be intolerable for any more than a brief exposure to this level.

The response of a building to ground borne vibration is affected by the type of foundation, underlying ground conditions, the building construction and the state of repair of the building. Limits for transient vibration, above which cosmetic damage could occur, are provided in Table 9-3. Minor damage is possible at vibration magnitudes which are greater than twice those

[11] BS 7385-2:1993 *Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration*

[12] Transport Infrastructure Ireland (TII, formerly NRA) (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*

[13] TII (2004) *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*

given in Table 9-2, and major damage to a building structure can occur at values greater than four times the tabulated values.

Table 9-3: Transient vibration guide for cosmetic damage.

Type of Building	Peak component particle velocity	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures/ industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50mm/s at 4Hz and above
Unreinforced or light framed structures. **Residential or light commercial buildings(1)**	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz	20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above

(1) At frequencies <4Hz a maximum displacement of 0.6mm is not to be exceeded.

9.2.3 Operational Noise Criteria

Noise limits for industrial and commercial developments in Ireland are typically based on the guidance and procedures of:

- BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*[14], and
- EPA (2016) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*[15].

BS 4142: 2014 describes a method for assessing industrial, commercial and background noise levels in order to assess the likely effects on people who might be inside or outside a dwelling or premises used for residential purposes. BS4142 is referred to within *EPA NG4 Guidance Note for Noise* as the appropriate method to be adopted for complaints investigation. Notably, the standard outlines subjective and objective methods for assessing tonal and impulsive audibility. This involves applying a correction to the measured noise level of the source (L_{Aeq}) to give the rating level ($L_{Ar,T}$).

In addition, BS4142 states that the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. Put simply, if the rated source noise level exceeds the existing background level by +10 dB a significant adverse impact is likely. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Typically, this is presented by local councils in the following form:

[14] BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*

[15] EPA (2016) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*

"Noise created due to the operation of a premises/facility shall not cause a noise nuisance to nearby noise sensitive location and should not exceed the background level by 10 dB(A) or more or exceed the typical NG4 limits outlined below - whichever is the lesser."

- Daytime (07:00 to 19:00 hrs) – 55dB $L_{Ar,T}$
- Evening (19:00 to 23:00 hrs) – 50dB $L_{Ar,T}$
- Night-time (23:00 to 07:00 hrs) – 45dB $L_{Aeq,T}$

Where tonal noise is objectively assessed to be present, either using the method contained in (i) Section 5.1 of NG4 or (ii) BS 4142: 2014: Annex D (normative): Objective method for assessing the audibility of tones in sound, then a penalty is applied to the measured noise level. NG4 specifies penalties which should be applied during the daytime and evening, while also stating that tonal noise detectable by these objective methods should not be present during the night-time, at any NSL. Similarly, NG4 specifies penalties for impulsive noise during the daytime and evening, and states that clearly audible impulsive characteristics should not be present during the night-time, at any NSL.

9.2.4 Acoustic Modelling

An acoustic model has been constructed in SoundPLAN 8.2 software, which implements the algorithms contained in ISO 9613 Attenuation of sound during propagation outdoors. The ISO-9613 prediction methodology predicts noise downwind from the source and therefore is considered a worst-case scenario. ISO 9613 has a prediction tolerance of +/- 3 dB.

The model accounts for the following factors:

- Source sound power levels.
- Source directivity and orientation.
- Distance attenuation, including source and receptor heights.
- Barrier effects due to walls and structures.
- Ground effects and absorption.
- Atmospheric attenuation.
- Meteorological effects.
- Topographical elevation data sourced from OPW NASC[16] and planned site levels.

9.3 The Existing and Receiving Environment (Baseline Situation)

The site of the Proposed Development adjoins the existing M1 Retail Park to the north. The M1 motorway lies approximately 0.55km to the west of the site with Barrack Lane on the south perimeter and Trinity Street (R168) bounding the east perimeter as shown in Figure 9-2. The local topography is complex with the site of the Proposed Development at a lower elevation than the existing M1 Retail Park.

There are three residential noise sensitive locations (labelled 1 – 3 in Figure 9-2) immediately adjacent to the development site, two of these with multiple residences. The residential

16 https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b7c4b0e763964070ad69bf8c1572c9f5

locations have been identified using aerial photography[17] and the Eircode database[18]. It is appropriate to assess the noise impacts of the Proposed Development on these three locations, since more distant NSLs will naturally receive lower noise emissions from the site due to distance attenuation etc.

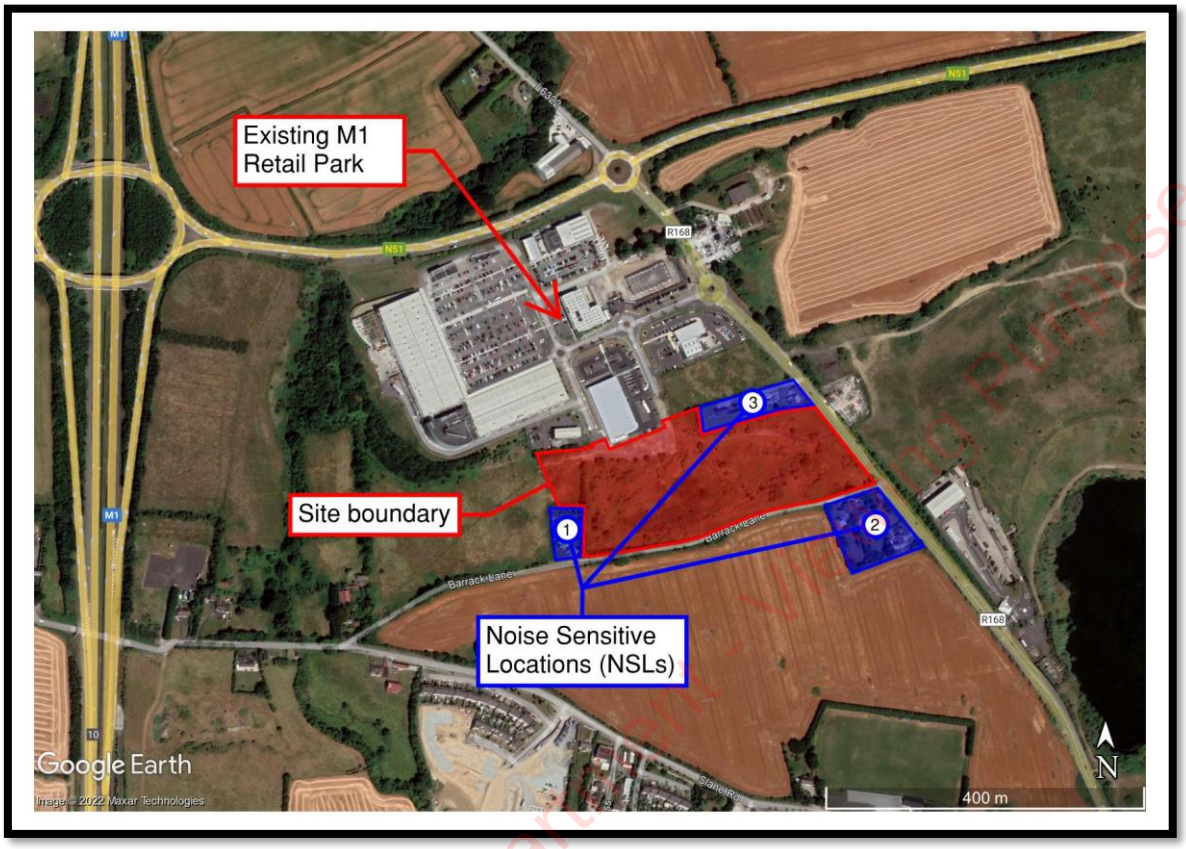

Figure 9-2: Aerial view showing vicinity of the Proposed Development.

9.3.1 Baseline Noise Measurements

Three baseline noise monitoring locations were chosen within the bounds of the development site as shown in Figure 9-3. Each monitoring location was chosen for the purpose of characterising the existing ambient noise environment at each of the three noise sensitive locations as follows:

(1) Attended and unattended noise monitoring conducted to characterise existing ambient noise environment of NSL1.
(2) Attended noise monitoring conducted to characterise existing ambient noise environment of NSL2.
(3) Attended noise monitoring conducted to characterise existing ambient noise environment of NSL3.

[17] *Google Maps – https://www.google.com/maps/*
[18] https://finder.eircode.ie/

Attended measurements at all 3 positions were conducted on 15th June 2022 with unattended noise monitoring conducted at position 1 from 13th to 15th June 2022.

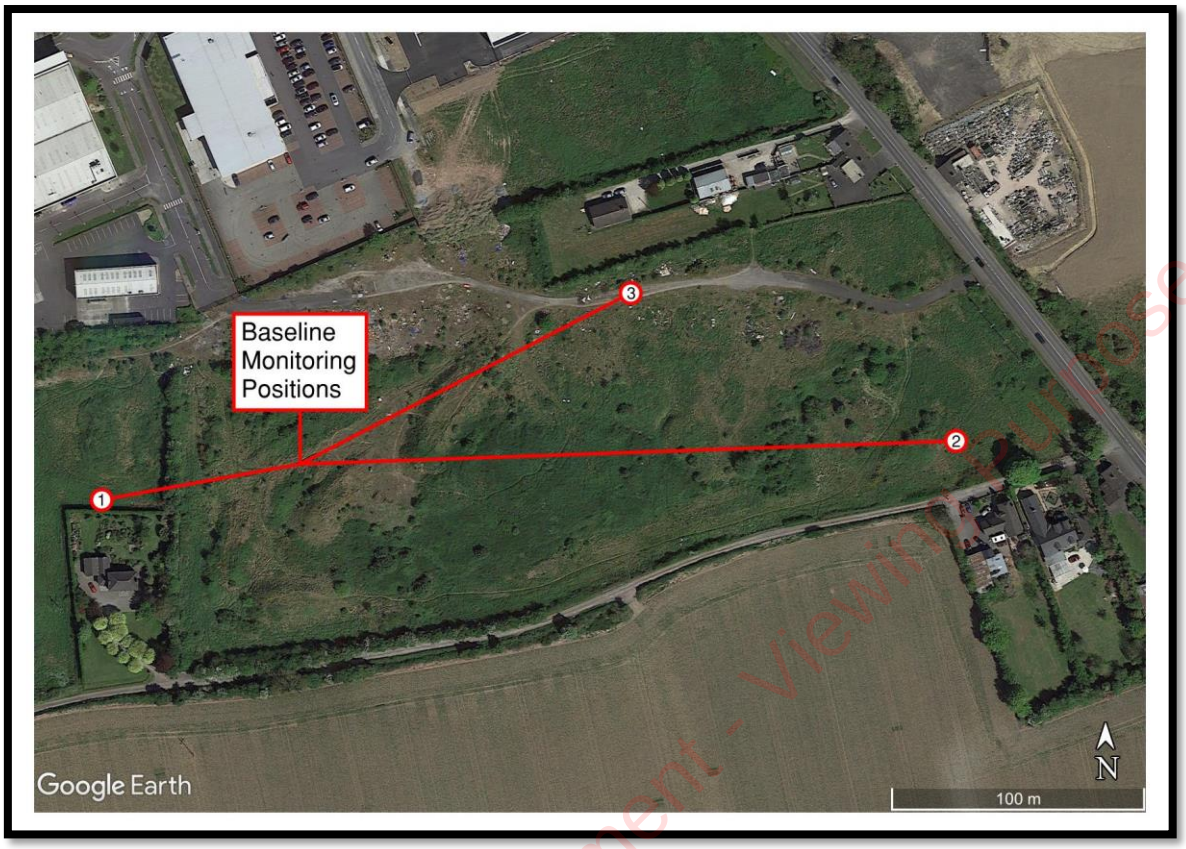

Figure 9-3: Aerial photograph showing the baseline noise monitoring locations.

9.3.1.1 Instrumentation

A Class 1 sound level meter/noise logger in accordance with IEC 61672-1:2013 was used for all measurements. Table 9-4 summarises the measurement equipment used.

Table 9-4: Measurement Equipment

Description	Manufacturer	Model	Serial Number
Noise Logger	Sonitus Systems	EM2030	01323
Sound Level Meter	Svantek	Svan971	77789
Acoustic Calibrator	Larson Davis	CAL200	13592

All equipment has calibration certificates traceable back to the relevant Standard. A calibration check of the sound level meter was conducted prior to and following the assessment using an external acoustic calibrator, with no significant drift in calibration measured.

9.3.1.2 Procedure

Noise measurements were undertaken in accordance with the following:

- For attended noise measurements the microphone of the sound level meter was at a height of approximately 1.2 metres.
- The microphone of the unattended noise monitor was placed at a height of 2.5 metres.
- The noise levels were measured for the reference time interval of 15 minutes.
- Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration or electrical interference.
- A wind shield was used during all measurements, and the measurements were undertaken during calm, still weather (for which the wind velocity did not exceed 5 m/s).
- Measurements were paused for all passing traffic.

9.3.1.3 Weather Conditions During Survey

Weather conditions during the attended survey were as follows:

- Wind: little to no wind observed/measured.
- Precipitation: none.
- Other: no additional weather effects noted.

Weather conditions during the unattended survey have been assessed based on data from the MET Eireann Dunsany monitoring station which is approximately 29km from the site:

- Monday 13th June 2022 – dry and low winds recorded.
- Tuesday 14th June 2022 – dry and low winds recorded.
- Wednesday 15th June 2022 – dry and low winds recorded.

9.3.2 Attended Survey Results

A summary of the attended survey results is presented in Table 9-5.

Table 9-5: Attended survey results.

Start date	Time	Position	Measured 15-minute Noise Levels (dB re. 20µPa)		
			L_{Aeq}	L_{AFmax}	L_{90}
15/06/2022	10:32	2	51	67	45
15/06/2022	10:52	3	46	65	43
15/06/2022	11:12	1	46	63	43
15/06/2022	11:37	2	52	66	46
15/06/2022	11:57	3	51	68	44
15/06/2022	12:17	1	48	60	46

Observations during the attended survey included:

- Road traffic noise from the M1 motorway and Trinity Street clearly audible at all 3 locations.
- Vehicle noise from M1 Retail Park occasionally audible at low levels.
- Bird song dominant at position 3.
- M1 road traffic noise dominant at position 1.
- Commercial noise from M1 Retail Park (air tools or similar at BestDrive Tyres) audible at position 1.
- Road traffic on Trinity Street sometimes dominant at positions 2 and 3.
- Occasional aircraft fly overs.

In summary, the attended baseline survey results are considered to be characteristic of a medium noise environment influenced by major roadways. The existing ambient noise conditions were broadly similar at all three positions during the attended noise survey.

9.3.3 Unattended Monitoring Results

The results of the unattended monitoring are summarised in Table 9-6. The results are considered to be characteristic of a medium noise environment, as would be expected given the proximity to the M1 motorway and Trinity Street.

Table 9-6: Unattended monitoring results.

Day	Date	Daytime L_{Aeq}(07:00 – 23:00) (dB)	Average daytime L_{A90} (dB)	Night-time L_{Aeq} (L_{night}) (23:00 – 07:00) (dB)	Average night-time L_{A90} (dB)	Comment
Monday	13/06/2022	54(1)	50(1)	48(2)	42(2)	data incomplete
Tuesday	14/06/2022	53(1)	49	51	44	dry
Wednesday	15/06/2022	53(1)	51(1)	50(2)	45(2)	data incomplete

(1) Partial day.
(2) Partial night.
(3) Due to evidence of extraneous noise (possibly lawn mowing or similar) during the 1-hour period 17:30 – 18:30, data for the same time period on Monday 13th June was substituted to avoid effects on results.

9.3.4 Receiver Sensitivity

The site of the Proposed Development is within the Drogheda Urban Area as detailed in the Louth County Development Plan 2021-2027 zoning map. There is considerable existing commercial activity in the area and the M1 Motorway lies approximately 0.55km west of the site. To summarise expected receiver sensitivity for the different types of noise potentially introduced by the Proposed Development:

- Road traffic noise: low sensitivity due to existing road traffic noise from the nearby M1 motorway and Trinity Street.
- Construction noise: medium sensitivity due to mixed use nature of locality with increasing urbanisation and construction.
- Commercial noise: moderate sensitivity since commercial noise is a part of the existing soundscape in the area.

9.4 Characteristics of the Proposed Development

9.4.1 Construction Noise Emissions

Construction noise levels have been predicted, based on the expected equipment on the site developed with input from the development project design team. A summary of the plant list and plant noise levels (based on data in BS 5228) is shown in Appendix 9-A.

The noise sources have been modelled in SoundPLAN 8.2 as area sources to reflect dispersed activity across the development site. The prediction methodology in BS5228 has been used to calculate the noise level over a typical day for each of the main construction stages.

9.4.2 Operational Noise Emissions

During the operational phase of the Proposed Development, the following are expected to generate noise emissions:

- External mechanical and electrical (M&E) plant:
  - Heating/cooling plant,
  - Electrical substations, and
  - Kitchen extraction.
- Deliveries:
  - Delivery vehicles driving on internal roads,
  - Engines running while stationary,
  - Reversing alarms,
  - Loading/unloading, and
  - Forklifts, cages etc.
- Retail road traffic:
  - Vehicular traffic accessing/egressing the car park.
  - Increase in external road network traffic due to the development.

9.4.2.1 External M&E Plant

Details of external M&E plant have been provided by Lawlor Consulting[19]. Locations of rooftop and ground mounted plant have been provided together with broadband plant noise levels at specified distances. The supplied noise levels have been used to calculate indicative sound power levels and the various sources have been entered into the SoundPLAN 8.2 noise model in order to predict M&E plant noise from the development at the nearest NSLs.

9.4.2.2 Deliveries

Loading/unloading of HGV trailers produces noise emissions which can include low frequency rumble (rolling noise of pallet trucks, forklifts and cages on trailer bed) and impulsive noise components, generally from impact noise from pallet trucks on uneven ground or loads crossing certain types of loading bridges (edge-of-dock levellers) with sprung hinge design.

To assess deliveries noise a worst-case scenario has been examined of all 8 delivery bays in use unloading/loading HGVs during a 1-hour period with all 8 HGVs arriving and departing on

[19] Lawlor Consulting: Drawing no. 5208-ND100

the service route within the same 1-hour period. A speed limit of 50km/hr has been assumed for the delivery vehicles and service roads have been modelled using the CoRTN [20] SoundPLAN 8.2 implementation.

Loading/unloading of HGVs has been modelled using point sources at a height of 1m with the SoundPLAN system library entry "Truck: loading general cargo"[21], which gives an A-weighted sound power level (L_{wA}) of 80dB and includes no penalties or allowances for impulsive or tonal noise characteristics.

Delivery yard activity has the potential to produce noise with impulsive components which can be addressed through design guidance.

9.4.2.3 Retail Road Traffic

Retail road traffic projections have been provided by Barret Mahony Consulting Engineers. Figure 9-4 shows information provided regarding network traffic flows while Figure 9-5 shows the information provided regarding retail road traffic flows within the Proposed Development.

R168 / Retail Park roundabout junction	Network Flows		Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2025)	1038	1597	313	522	1351	2119	23.2	24.6
Design Year 1 (2030)	1123	1729	313	522	1436	2251	21.8	23.2
Design Year 2 (2040)	1204	1854	313	522	1517	2376	20.6	22.0

Figure 9-4: Information provided on existing and predicted road network flows.

		Weekday AM		Weekday PM	
	GFA	IN	OUT	IN	OUT
Retail units	6680	180	158	258	274

Table 2-4: Peak hour flows generated by proposed retail units within development site

Figure 9-5: Information provided on predicted retail road traffic flows within the Proposed Development.

To examine potential noise impacts, peak hour retail traffic flows on roads within the Proposed Development have been modelled by distributing the total flows along access routes.

9.4.3 Operational Vibration Emissions

Potential operational vibration emissions are expected to be limited to those generated by vehicular movements such as HGVs.

[20] UK Dept. of Transport 1988 Calculation of Road Traffic Noise (CoRTN)

[21] forum SCHALL, Emissionsdatenkatalog, November 2006 - Original title:"Lkw: Verladen von Stückgut z.B.. im Lebensmittelhandel"

9.5 Potential Impact of the Proposed Development

9.5.1 Construction Phase

The construction phase of the development would include emission of construction noise and vibration.

9.5.1.1 Construction Noise Criteria

British Standard 5228:PT1 Code of practice for noise and vibration control on construction and open sites provides guidance on methods for predicting and measuring noise from construction sites and assessing the impact on those exposed to it.

One method for assessing the impact of construction noise is the noise generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to a lower cut-off value of 65 dB L_{Aeq}. This is for the daytime period only and based on the noise lasting for a duration of one month or more.

Where site noise levels are expected to exceed 65dBA, BS5228 states that 75dBA $L_{eq,10\ hours}$ is the level at which noise insulation, or the reasonable costs thereof, should be offered to the nearest sensitive receptors. The standard states that noise insulation should be provided where the 75dBA level is exceeded for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.

Based on the noise measurements, the construction noise criteria for the site have been set, as shown in Table 9-7.

Table 9-7: Construction noise limits.

Construction Noise Limits			
Location	**Ambient Noise dB(A)**	**BS5228 Construction Noise Threshold for on-set of Significant Effects, dB L_{Aeq}**	**BS5228 Construction Noise Limit at which Additional Mitigation Measures should be Provided, dB L_{Aeq}**
NSL1	53	65*	75
NSL2	53	65*	75
NSL3	53	65*	75

* 65dB (A) lower threshold limit.

Where possible, significant adverse effect should be avoided. Given the close proximity of the Proposed Development to the receptor locations, it may be difficult to achieve a construction noise level of 65dBA. Where it is not possible to achieve site noise levels below the BS 5228 threshold level of 65dBA, it is recommended that construction noise is limited to below the point at which provision of additional mitigation measures is required, i.e., 75dBA.

75dBA $L_{eq,10\ hours}$ is therefore deemed to be the highest acceptable limit at the nearest receptors above which additional mitigation measures would be required in the form of noise insulation provided to the receptors, or temporary rehousing of residents. Noise insulation generally consists of secondary glazing with alternative means of ventilation where required.

9.5.1.2 Construction Phase Noise

Predicted noise levels over an average day for the main construction stages without mitigation are shown in Table 9-8. It can be seen that the predicted construction noise levels are generally within noise limits, with the exception of the substructure stage noise levels at NSL1. It should be noted that the predictions do not account for concentration of construction activity in areas of the site close to the NSLs and that noise levels would be expected to exceed predictions on certain days or during shorter time periods.

Table 9-8: Predicted noise level for the main construction stages without mitigation.

Construction Stage	Predicted noise level (construction noise + ambient) With no mitigation, L_{Aeq}, dB		
	NSL1	NSL2	NSL3
Noise Limit	65	65	65
Site Setup	63	62	62
Earthworks	65	65	65
Pavement Works Granular Fill 3	65	65	65
Batching Plant	65	65	65
Laying Concrete Pavement	57	57	57
Laying Bituminous Pavement	65	65	65
Drainage Works	65	65	65
Substructure	67	65	65
Superstructure	63	62	62
External finishes	55	55	55
Internal finishes	N/A	N/A	N/A

For most phases, predicted noise levels at sensitive receivers are at or below the 65dBA limit and the predicted significance of construction noise effects is slight. The exception to this is the substructure phase which has a predicted level of 67dBA at NSL1, a marginal exceedance of the 65dBA limit. Mitigation measures, as detailed in Section 9.6.1 will be employed to reduce the noise levels to below the 65dBA limit.

9.5.1.3 Construction Phase Vibration

BS5228 Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration provides methods for prediction of vibration from construction operations including piling, dynamic compaction, vibration of stone columns and tunnel boring operations. Continuous vibrations at a low level could be expected from the prime movers. The vibration generating activities levels that would be anticipated on this site are as follows:

- Tracked loader
- Excavator
- Grader
- Lorries (for deliveries to/from site)

Table 9-10 shows typical vibration levels at specific distances from the plant listed. The vibration levels have been based on vibration levels measured at similar sites. Note that there are factors such as ground properties that will affect the in-situ vibration levels measured at a site, but the measurements within a similar situation will give a good indication as to the vibration levels likely for this type of activity.

Table 9-9: Typical vibration levels at specific distances from plant vibration generating activity.

Plant	Vibration Level (PPV) in mm/s at distance in metres				
	10m	20m	40m	80m	100m
Tracked loader with hydraulic pulveriser or bucket	2	1	<0.2	<0.2	<0.2
Tracked loader with hydraulic hammer	3.5	1.2	<0.2	<0.2	<0.2
Excavator	1.2	0.5	<0.2	<0.2	<0.2
Grader	0.6	0.3	<0.2	<0.2	<0.2
Trucks/Trailers for deliveries	0.6	0.3	<0.2	<0.2	<0.2

Table 9-11 shows potential vibration levels at the nearest noise sensitive locations based on the levels detailed in Table 9-10.

Table 9-10: Predicted Vibration Levels at Sensitive Locations.

Reference	Distance	Predicted peak vibration level (mm/s)
NSL1 (VSL1)	25m	<1.0
NSL2 (VSL2)	25m	<1.0
NSL3 (VSL3)	25m	<1.0

Based on Table 9-2: Guidance of effects of Vibration Levels on residents, for the above predicted peak vibration levels of <1.0mm/s “It is likely that vibration at this level in a residential environment will cause complaint. It is usually tolerated if prior warning and explanation is given to residents”. If this guidance is followed the predicted significance of effects due to construction vibration is slight.

9.5.2 Operational Phase

9.5.2.1 External M&E Plant Noise

Figure 9-6 shows predicted noise contours with all external M&E plant operating. It can be seen that the predicted levels with all plant operating are below 40dBA at NSL1 and NSL2 and below 30dBA at NSL3.

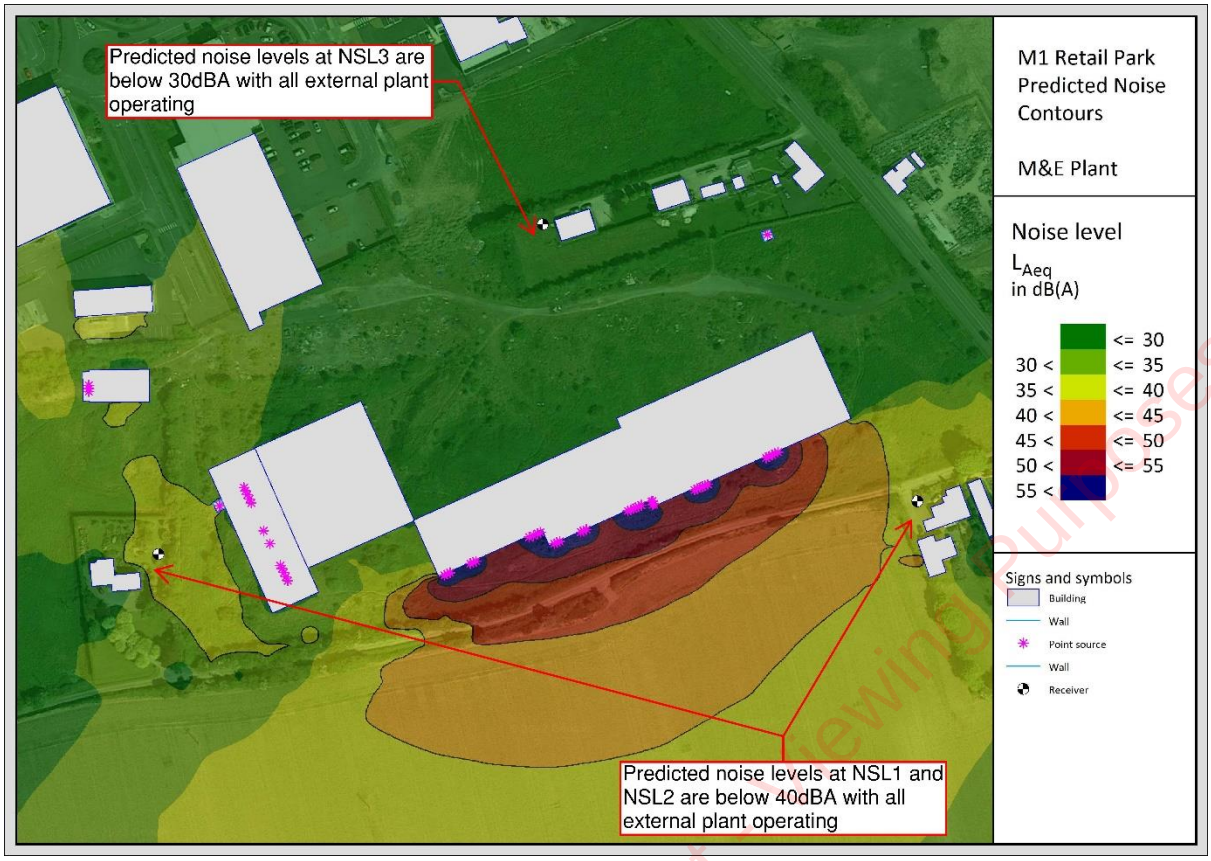

Figure 9-6: Predicted M&E Plant noise contours with all external plant operating.

Predicted noise levels with all plant operating do not exceed 40dBA (5dB below the night-time noise limit) at any NSL and, additionally, it is highly unlikely that all plant would be operating during the quietest time of night, 2 – 3am. It is likely that plant noise would be inaudible during the daytime at most NSLs since the predicted levels are well below the measured existing ambient levels.

Predicted noise levels at NSLs from the electrical substations are extremely low making it highly unlikely that tonal noise would be audible at NSLs during the night-time.

The magnitude of noise effects due to M&E plant noise from the development has been assessed as low and sensitivity of receivers is low due to high baseline noise conditions. Therefore, the predicted significance of M&E Plant noise effects is slight.

9.5.2.2 Deliveries Noise

Figure 9-7 shows predicted noise levels at each NSL with all delivery bays in use. It can be seen that the predicted levels with all delivery bays (worst-case) in use during the same 1-hour period are in excess of 50dBA at NSL1 and NSL2.

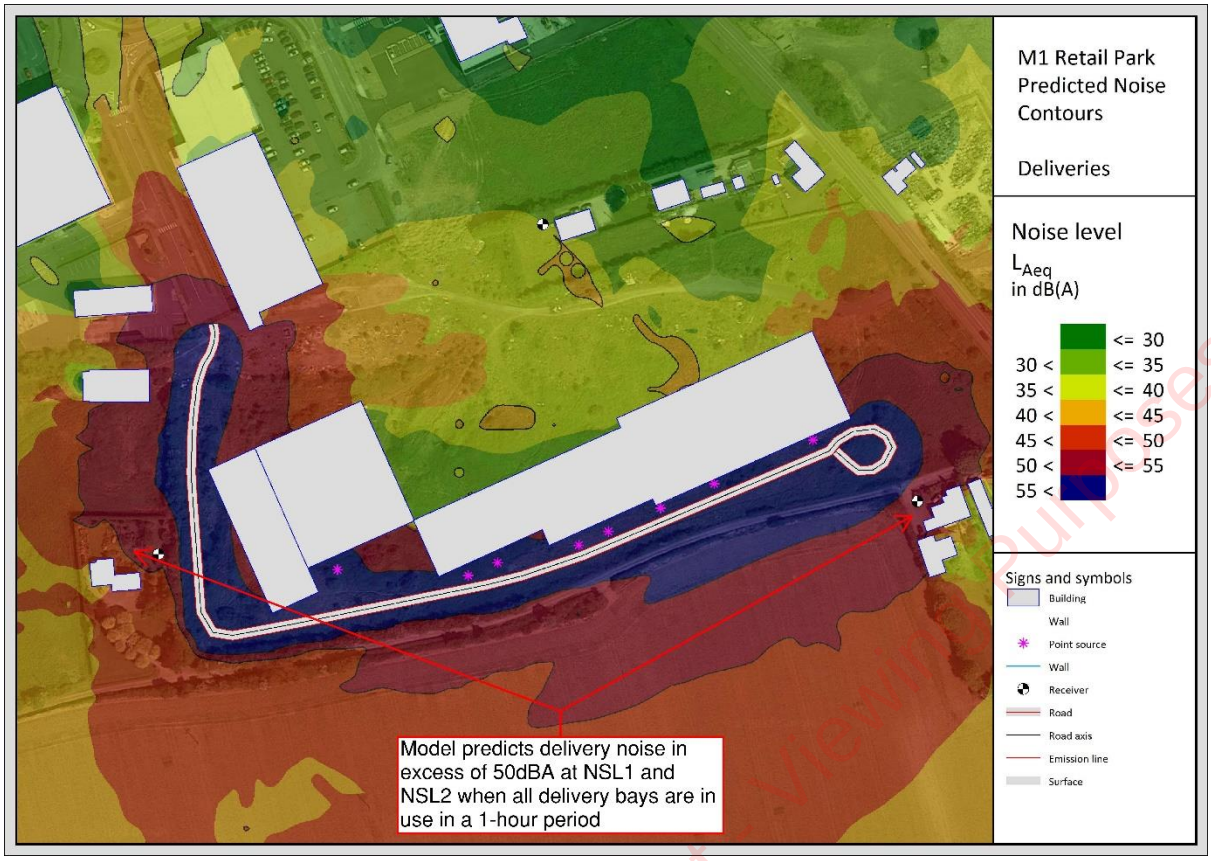

Figure 9-7: Predicted deliveries noise contours with all delivery bays in operation.

The predicted noise level of >50dBA at NSL1 and NSL2 would represent an exceedance of the 45dBA night-time noise limit. Table 9-14 shows baseline noise levels measured at NSL1 on 14th June 2022 with background noise levels after 05:45 hrs highlighted yellow. Noise levels after 05:45 are highlighted since early morning deliveries generally occur after this time.

Table 9-11: Measured night-time baseline noise levels at NSL1 on Tuesday 14th June 2022.

Tuesday 14th June - Night-time				
Date	**Start time**	**L_{Aeq} (dB)**	**L_{AFmax} (dB)**	**L_{90} (dB)**
14/06/22	23:00	45	54	42
14/06/22	23:15	46	58	42
14/06/22	23:30	49	57	46
14/06/22	23:45	48	53	46
14/06/22	23:55	50	58	45
14/06/22	00:15	48	58	42
14/06/22	00:30	48	55	43
14/06/22	00:45	48	56	44
14/06/22	01:00	47	57	38
14/06/22	01:15	47	55	43
14/06/22	01:30	46	52	41
14/06/22	01:45	44	54	38
14/06/22	02:00	43	55	31
14/06/22	02:15	46	58	39
14/06/22	02:30	47	55	42
14/06/22	02:45	46	56	39
14/06/22	03:00	47	56	38

Tuesday 14th June - Night-time				
Date	**Start time**	**L_{Aeq} (dB)**	**L_{AFmax} (dB)**	**L_{90} (dB)**
14/06/22	03:15	46	56	38
14/06/22	03:30	45	53	40
14/06/22	03:45	46	56	37
14/06/22	04:00	47	57	41
14/06/22	04:15	49	58	44
14/06/22	04:30	48	58	44
14/06/22	04:45	51	61	45
14/06/22	05:00	51	60	46
14/06/22	05:15	51	59	47
14/06/22	05:30	52	60	48
14/06/22	05:45	55	72	51
14/06/22	06:00	56	63	53
14/06/22	06:15	56	71	54
14/06/22	06:30	56	65	55
14/06/22	06:45	56	67	55

The high levels of existing background noise after 05:45 hrs indicates that early morning deliveries may be tolerated as predicted levels are close to background. However, impulsive noise characteristics would change this result and therefore significant noise impacts would be expected at NSL2 without mitigation of delivery noise.

9.5.2.3 Retail Road Network Traffic Noise

Using the predicted development traffic flows, the predicted change in traffic noise levels at the R168 / Retail Park roundabout junction has been calculated with results detailed in Table 9-16.

Table 9-12: Predicted change in network traffic and road traffic noise levels.

R168 / Retail Park roundabout junction	Network Flows		Development Flows		Total Flows		Development flows as % of total flows		Predicted Change (dB)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2025)	1038	1597	313	522	1351	2119	23.2	24.6	1.1	1.2
Design Year 1 (2030)	1123	1729	313	522	1436	2251	21.8	23.2	1.1	1.1
Design Year 2 (2040)	1204	1854	313	522	1517	2376	20.6	22	1.0	1.1

Changes in network road traffic noise levels at other locations will be less than those shown in Table 9-12 as traffic will be further distributed throughout the network. A change of less than 3dB in environmental noise levels is generally considered to be imperceptible and consequently the predicted change (1.2dB or less) is considered to be insignificant and the significance of impacts due to changes in road network traffic noise is predicted to be not significant.

9.5.2.4 Retail Site Internal Road Traffic Noise

Table 9-8 shows predicted noise contours for peak hour flows on site internal roads. It can be seen that the predicted levels are in the range 50 – 55dBA at NSL3.

Figure 9-8: Predicted peak hour internal road traffic noise contours.

Table 9-18 shows measurement results around peak hour at NSL1. It can be seen that the existing ambient noise levels, primarily attributed to road traffic noise, are in the region of 55dBA. The addition of site internal road traffic noise from the development would lead to a change in ambient noise levels of 1 – 3dB based on predictions. A 1 – 3dB change is not generally considered to be perceptible and is therefore not considered to be significant. In addition, the predicted noise levels are below the daytime noise limit of 55dB and effects due to internal road traffic noise are expected to slight.

Table 9-13: Daytime noise measurements at NSL1 close to peak hour.

Monday 13th June - daytime				
Date	**Start time**	**L_{Aeq} (dB)**	**L_{AFmax} (dB)**	**L_{90} (dB)**
13/06/22	16:30	58	87	53
13/06/22	16:45	55	62	53
13/06/22	17:00	56	66	54
13/06/22	17:15	55	66	53
13/06/22	17:30	55	62	54
13/06/22	17:45	55	62	53
13/06/22	18:00	56	65	54
13/06/22	18:15	55	61	53
13/06/22	18:30	55	64	53
13/06/22	18:45	55	67	53
13/06/22	19:00	54	61	52
13/06/22	19:15	53	62	50
13/06/22	19:30	53	63	51

9.5.2.5 Operational Phase Vibration

There are no operational phase vibration impacts predicted.

9.5.3 Potential Cumulative Impacts

Cumulative effects in combination with the existing M1 Retail Park and nearby roads can be examined by assessing the cumulative change in noise levels with predicted noise levels from the Proposed Development. Baseline noise measurements conducted onsite already include the existing noise from these sources and assessment of potential change in ambient noise levels have been assessed.

9.5.4 "Do Nothing" Impact

An alternative 'do-nothing' land-use option to the Proposed Development would be for the site to remain in the existing brown-field state or to restore the lands to agricultural use. Restoring the lands to agricultural use would require significant earthworks with consequent short-term noise and vibration effects and, following the restoration phase, long-term operational agricultural noise.

9.6 Avoidance, Remedial & Mitigation Measures

9.6.1 Construction Phase

Various mitigation strategies will be employed to reduce construction noise, including the following:

- Limiting operation of noisiest activities to exclude periods identified as important to residential amenity.
- Selection of items of plant with lower noise levels.
- Engagement and dialogue between construction contractor and local community.
- Monitoring of site noise levels to ensure compliance with limits.
- Assign responsibility for issues relating to noise to a competent member of site staff.

- If necessary, install local noise barriers with absorptive linings near to specific sources, during construction works.
- Provide enclosures around generators.
- Switch off engines and equipment when not required.
- Warning reversing alarms should give adequate warning but have minimum impact on people outside site.
- Plant and activities should be reviewed so they are the quietest available (and therefore demonstrate use of best practicable means).

A key for minimising impact on neighbours is development of good community relations with local residents. It is good practice to:

- advise residents when works are due to start.
- provide site contact details if neighbours want to complain about the noise.
- establish a site point of contact for dealing with noise complaints.
- have an established procedure for dealing with complaints, recording time/details and responding within a certain time period.

Further guidance on construction noise reduction is available in BS5228. The guidance of BS5228 will be implemented as necessary for control of decommissioning noise from the Proposed Development.

9.6.2 Operational Phase

9.6.2.1 External M&E Plant Noise

Noise from external M&E plant has been assessed to have slight impacts upon nearby NSLs. In the unlikely event of a significant adverse effect being identified, various mitigation strategies may be employed. These include:

- Partial enclosure of plant with noise barriers,
- Acoustic attenuators on fans, outlets and ventilation louvres,
- Replacement with lower noise output models, and
- Removal of items of plant to alternative locations.

9.6.2.2 Deliveries Noise

Deliveries to loading bays at the rear of the Proposed Development are predicted to have significant adverse noise impacts due to proximity of the loading bays to NSL2. Avoidance and mitigation strategies include:

- Replacement of tonal reversing alarms with white noise alarms which have the added benefit of improved directional localisation by human listeners.
- Setting tonal reversing alarms to their lowest practicable level within safe limits.
- Avoidance of sprung hinge type loading bridges (edge-of-dock levellers) which produce impulsive impact noise when traversed.
- Avoidance of metal cages by using plastic cages which produce low noise levels when rolled.
- Exclusive use of “silent” pallet trucks which are designed to produce low noise levels for situations where noise sensitive locations are nearby.

- Instructing drivers to switch off engines when vehicles are stationary.
- Careful design and construction of loading bays, ramps and thresholds to avoid sharp transitions which could bump loads, thereby producing impulsive noise.
- Manoeuvring HGVs at idling revs during early morning deliveries.
- Avoidance of parking refrigerated vehicles close to NSLs.
- Noise barriers of sufficient height to block line of sight to sensitive receivers.
- Acoustic absorption on vertical surfaces close to noise generating activities.

Figure 9-9 shows predicted noise levels for a 1-hour period in which all delivery bays are in operation and noise barriers protecting NSL1 and NSL2 with heights and extents as indicated.

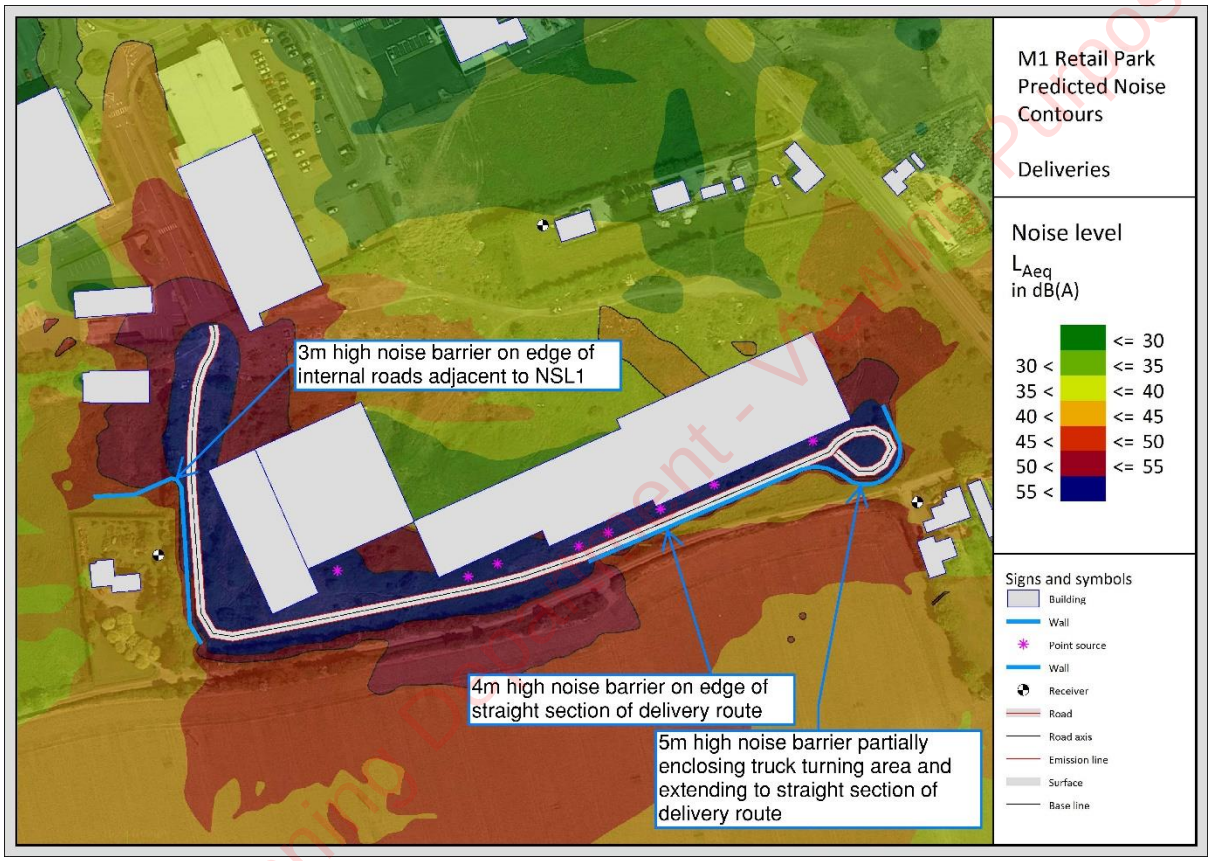

Figure 9-9: Predicted deliveries noise contours with all delivery bays in operation and noise barriers with heights and extents as shown.

All of the above measures are recommended to reduce deliveries noise at NSL1 and NSL2, and, if fully implemented, should be sufficient to avoid significant adverse noise impacts from deliveries. Should the above measures prove insufficient, the following operational control measure, following appropriate acoustic assessment, may be employed:

- Avoidance of goods deliveries before 7am.

9.6.2.3 Retail Road Network Traffic Noise

Noise from retail road network traffic has been assessed to have imperceptible impacts. In the unlikely event that adverse effects are identified, measures such as encouragement of alternative transport modes may be employed.

9.6.2.4 Retail Site Internal Road Traffic Noise

The significance of internal road traffic noise effects have been assessed to be slight. In the unlikely event that a significant adverse effect is identified, local noise barriers may be employed to reduce vehicle noise impacts on affected receptors.

9.6.3 "Worst Case" Scenario

Noise from deliveries has been assessed to be of highest risk for the site due to proximity of NSL2. A worst-case scenario would involve use of equipment which generates impulsive noise and caused significant noise nuisance to residents at NSL1 and NSL2, potentially including sleep disturbance due to early morning deliveries.

Sufficient guidance has been provided in previous sections to avoid significant delivery noise impacts.

9.7 Residual Impacts

9.7.1 Construction Phase

Following implementation of construction noise avoidance/mitigation measures some impacts will remain. Construction noise is generally tolerated since it is temporary in nature.

Table 9-14: EPA description of effects: Construction Noise Residual Effects

Quality	Significance	Duration/Frequency
Negative	Slight	Short-term

9.7.2 Operational Phase

Following implementation of operational noise avoidance/mitigation measures some impacts may remain.

Table 9-15: EPA description of effects: M&E Plant Noise Residual Effects

Quality	Significance	Duration/Frequency
Negative	Not significant	Long-term

Table 9-16: EPA description of effects: Deliveries Noise Residual Effects

Quality	Significance	Duration/Frequency
Negative	Slight	Long-term/frequent

Table 9-17: EPA description of effects: Retail Site Internal Road Traffic Noise Residual Effects

Quality	Significance	Duration/Frequency
Negative	Slight	Long-term

9.8 Monitoring

9.8.1 Construction Phase Noise Monitoring

It is recommended that noise monitoring of works is conducted when each stage of the construction commences. Noise can be measured for individual items of plant, in addition to measurements at the nearest noise sensitive locations to confirm if site limits are met and recommend improvements to the noise mitigation scheme. Alternatively, wireless access noise monitors may be installed at boundary locations close to the NSLs. One noise monitor at each NSL boundary (for a total of three monitors) would be sufficient and access to data provided via online portal.

Construction noise by its nature is irregular and variable in nature. The BS5228 noise prediction methodology tends to over predict the noise and is based on generic data for the type of plant used. By monitoring noise during the start of the main stages of work more appropriate noise control methods will be advised.

9.8.2 Construction Phase Vibration Monitoring

It is not anticipated that vibration monitoring would be required provided that adequate setback distances of vibration inducing equipment from sensitive locations are observed.

9.8.3 Operational Phase Noise & Vibration Monitoring

It is not expected that operational noise and vibration monitoring would be required for the Proposed Development. If, however, adverse noise impacts were to be identified at one of the noise sensitive locations, a boundary noise monitor may be installed to monitor noise and inform avoidance/mitigation efforts.

9.9 Interactions

Potential interactions include increased footfall to the existing M1 Retail Park and increased development in the surrounding area in response to the increase in local amenities. Expected impacts would be slight or moderate since changes to the ambient noise environment would be small in magnitude and would not be expected to be involve changes in character.

9.10 Difficulties Encountered When Compiling

Difficulties encountered during the assessment included effects of weather on scheduling of surveys and minor equipment faults which did not prevent gathering of valid survey data.

9.11 References

1. BS 5228-1 and 2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise and Vibration
2. BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration
3. Transport Infrastructure Ireland (TII, formerly NRA) (2014) Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes
4. TII (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes
5. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound
6. EPA (2016) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)
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10 LANDSCAPE AND VISUAL ASSESSMENT

10.1 Introduction

This Landscape and Visual impact Assessment chapter has been prepared in respect of Proposed Retail Development at lands adjoining the *M1 Retail Park*, in County Louth.

This Chapter assesses the effects of the Proposed Development on the landscape and visual amenities of the area and details the potential direct and indirect effects of the Proposed Development on landscape fabric, character and quality, and the resulting impact on visual amenity.

The aim of a landscape and visual assessment is to identify the elements of the landscape which make it unique and the extent to which it is possible to alter these landscapes before unacceptable consequences arise. Landscape character represents the individuality of an area based on its particular combination of features and elements. The purpose of this assessment is to evaluate the existing landscape character of the site and surroundings, to assess the visual impact of the Proposed Development and to identify landscape designations and planning policies that may concern the subject site and its environs.

Landscape Impact Assessment (LIA) relates to assessing effects on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual effects may occur from: Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the Proposed Development in conjunction with other developments, or actions that occurred in the past, present or are likely to occur in the foreseeable future.

10.1.1 Quality Assurance and Competence

This Chapter was prepared by Enviroguide Environmental Consultant Nuno Costa. Nuno has a M.Sc. in Landscape Architecture from *University of Porto*, a Postgraduate Diploma in Advanced Studies in Territory, Environment and Sustainable Development from *Nova University Lisbon*, and is a PhD student in Landscape Architecture and Urban Ecology. Nuno has 13 years professional experience as a Landscape Architect.

10.2 Methodology

This section sets out the methodology for the LVA as result of the Proposed Development.

10.2.1 Guidelines and other information used in the LVA

The assessment has been undertaken in accordance with best practice, legislation and guidance notes. The methodology used is based on the Environmental Protection Agency Documents: The *Guidelines on the Information to be contained in Environmental Impact Assessment Report (2022)* and subsequent Advice Notes, and their precursor *The Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice notes on current practise in the preparation of Environmental Impact Statements (2003).* It is also based on the Department of the Environment, Heritage and Local Governments Document; *Architectural Heritage Protection, Guidelines for Planning Authorities, 2004* and the Landscape Institute and Institute of Environmental Management & Assessment Document *Guidelines for Landscape and Visual Impact Assessment* (2013).

The aforementioned documents recommend baseline studies to describe, classify and appraise the existing landscape and visual properties, focusing on any sensitive receptors in the area and the ability of the landscape to accommodate the Proposed Development changes that will occur at the Proposed Development site. This is established through a collective process of desktop study and onsite survey work. Once the baseline conditions are established it allows for the identification of impacts, and an assessment of their magnitude and significance on the landscape character and visual amenities of the area.

A judgement on the sensitivity of the landscape is made from a combination of the susceptibility of the landscape to development, and therefore change, and the value attached to that landscape. This is determined by way of existing designations, both legislative and non-legislative for scenic beauty, landscape quality, recreational value, significant importance, rarity etc. Visual sensitivity is determined by a combination of judgements about the susceptibility of visual receptors such as dwellings, roads, scenic spots etc. to changes in visual amenity and the value attached to these views. The *Guidelines for Landscape and Visual Impact Assessment* state that the aim is "*to establish the area in which the development will be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points*".

The assessment of the landscape and visual impacts for this development was informed by the guidance documents indicated on the References Chapter. However, documents: "*Louth County Development Plan 2021-2027*" and "*The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013*" had a special relevance in this analysis.

10.2.2 Desktop Study

The desktop study comprised the following:

- Establishing an appropriate Study Area from which to study the landscape and visual effects of the Proposed Development;

- Review of Viewsheds, which indicates areas from which the Development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly regarding sensitive landscape and scenic view/route designations;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

10.2.3 Fieldwork

Site visits were carried in order to:

- Select a refined set of VRP's for assessment.
- Record a description of the landscape elements and characteristics within the Study Area generally and also within view from each VRP.
- Capture high quality base photography by *Digital Dimensions*, from which to prepare photomontages of the proposal.

10.2.4 Landscape and Visual Assessment Criteria

The assessment of landscape and visual effects involves a description of the geographic location and landscape context of the Proposed Development as well as a general landscape description concerning essential landscape character and salient features of the wider Study Area. This is discussed with respect to: landform and drainage; vegetation and land use; centres of population and houses; transport routes and; public amenities and facilities. Consideration of design guidance, the planning policy context and relevant landscape designations are also considered.

Once the baseline environment was established, an assessment of the likely potential significant effects associated with the Proposed Development was carried out. This included the following:

Appraisal of salient landscape character.
Appraisal of predicted landscape effects.
Appraisal of predicted visual Viewsheds maps as well as photomontages prepared from selected VRP locations.
Appraisal of predicted cumulative effects.
Discussion of mitigation measures.
Assessment of residual effects following mitigation.

10.2.5 Assessment of Effects

The landscape and visual impact assessment seeks to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. The assessment acknowledges that landscape and visual effects change over time as the existing landscape evolves and proposed planting establishes and matures. The assessment therefore reports on potential effects during both the construction phase and the operational phase of the Proposed Development. The

prominence of the Proposed Development in the landscape or view will vary according to the existing screening effects of local topography, structures and buildings, intervening existing vegetation and type and height of the proposed structures.

10.2.5.1 Landscape Effects

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character. The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following: Individual landscape elements or features; Specific aesthetic or perceptual aspects; and Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another. The assessment will identify the interaction between these components and the Proposed Development during construction and operational phases. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

Landscape Value

Landscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition is also considered in the determination of the value of a landscape. The evaluation of landscape value is undertaken with reference to the definitions stated in Table 10-1.

Table 10-1: Landscape Sensitivity Criteria

Landscape Value	Classification Criteria
High	Nationally designated or iconic, unspoilt landscape with few, if any, degrading elements.
Medium	Regionally or locally designated landscape, or an undesignated landscape with locally important landmark features and some detracting elements.
Low	Undesignated landscape with few if any distinct features or with several degrading elements.

The landscape of the site of the Proposed Development is considered to have a Medium to Low Landscape Value.

Landscape Susceptibility

Landscape susceptibility relates to the ability of a particular landscape to accommodate the Proposed Development. Landscape susceptibility is appraised through consideration of the baseline characteristics of the landscape, and in particular the scale or complexity of a given landscape. The evaluation of landscape susceptibility is undertaken with reference to a three-point scale, as outlined in Table 10-2:

Table 10-2: Landscape Susceptibility Criteria

Landscape Susceptibility	Classification Criteria
High	Small scale, intimate or complex landscape considered to be intolerant of even minor change.
Medium	Medium scale, more open or less complex landscape considered tolerant to some degree of change.
Low	Large scale, simple landscape considered tolerant of a large degree of change.

The landscape of the site of the Proposed Development is considered to have a Medium Landscape Susceptibility.

Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified landscape value, quality and susceptibility and is defined with reference to the scale outlined in Table 10-3:

Table 10-3: Landscape Sensitivity Criteria

Class	Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is neutral or mixed character.
Medium - Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

The landscape of the site of the Proposed Development is considered to have a Medium-Low Landscape Sensitivity.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character;
- The geographic area over which the landscape effects will be felt (within the Project Development site itself; the immediate setting of the Project Development site; at the scale of the landscape type or character area; on a larger scale influencing several landscape types or character areas); and
- The duration of the effects (short term, medium term, or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. Direct change occurs where the Proposed Development will result in a physical change to the landscape within or adjacent to the Project Development site. Indirect changes are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Proposed Development site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems e.g. littering). They may be separated by distance or in time from the source of the effects.

The magnitude of change affecting the baseline landscape resource is based on an interpretation of a combination of the criteria set out in Table 10-4.

Table 10-4: Magnitude of Landscape Change Criteria

Magnitude of Landscape Change	Classification Criteria
None	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements
Negligible	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent or a landscape with highly valued features locally. Good example in the area of a well-cared for landscape or set of features that combine to give a clearly defined sense of place.
Low	Landscape characteristics or features which are reasonably tolerant of change without determent to their present character. No designation present or of little local value. An example of an un-stimulating landscape or set of features; with some areas lacking a sense of place and identity.
Medium	Noticeable change, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements
High	Noticeable change, affecting many key characteristics and the experience of the landscape; and Introduction of many incongruous developments
Very High	Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and Introduction of highly incongruous development

It's considered that the Proposed Development changes to landscape characteristics are Low to Medium**.**

10.2.5.2 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how a development is seen within the landscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point. Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view

or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

Receptors

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the Proposed Development depends on a number of factors.

Value of the View

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey of tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in Table 10-5:

Table 10-5: Value of the View

Value	Classification Criteria
High	Nationally recognised view of the landscape, with no detracting elements.
Medium	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
Low	Typical or poorly composed view often with numerous detracting elements.

Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in Table 10-6.

Table 10-6: Visual Susceptibility

Susceptibility	Classification Criteria
High	Receptors for which the view is of primary importance and are likely to notice even minor change.
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change.
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change.

Visual Sensitivity

Sensitivity to change considers the nature of the receptor; for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view. A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and
- Possible local value: it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in Table 10-7:

Table 10-7 Visual Sensitivity

Visual Sensitivity	Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes. Dwellings with views orientated towards the Proposed Development.
High - Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the Proposed Development.
Medium - Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Eg: outdoor workers – agriculture, horticulture Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development.

Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, sky lining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the Proposed Development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses;
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and

- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 10- 8:

Table 10-8 Magnitude of Visual Change (Visual effects)

Magnitude	Criteria
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area.
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area.
Medium	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area.
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area.
Negligible	The development will cause a barely discernible change in the existing view.
None	No change in the existing view.

10.2.6 Duration and Quality of Effects

Table 10-9 provides the definition of the duration of landscape and visual effects:

Table 10-9 Definition of the duration of landscape and visual effects

Duration	Description
Temporary	Impacts lasting one year or less
Short–term	Impacts lasting one to seven years
Medium-term	Impacts lasting seven to twenty years
Long-term	Impacts lasting twenty to fifty years
Permanent	Impacts lasting over fifty years

The quality of both, landscape and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in Table 10- 10:

Table 10-10 Definition of Quality of Effects

Class	Criteria
Beneficial:	A positive impact which will improve or enhance the landscape character or viewpoint.
Neutral	A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
Negative	A negative impact which will detract from the existing landscape character or viewpoint.

10.2.7 Significance Criteria

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and the change over time. The significance of effects is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in the table below. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a landscape or visual receptor. The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in Table 10- 11.

Table 10-11 Categories of Significance of Landscape and Visual Effects

Impact Magnitude	Definition
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences
Minor Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Impact:	An impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends
Significant Impact:	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Profound Impact:	An impact which obliterates sensitive characteristics

10.2.8 Study Area

Due to the scale and nature of the Proposed Development within this receiving landscape setting, it is anticipated that the Proposed Development is not likely to give rise to significant landscape or visual impacts beyond approx. 1km.

As one moves away from any type of development in the landscape, it will become less perceptible with distance. It is common practice to consider the viewpoint distance as laid out in Table 10–12, that identifies and describes the impact of a viewpoint and the distances associated with these visual impacts.

Table 10-12 Viewpoint Distance

Viewpoint Distance	Description
0-2km	It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.
2-5km	At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Impacts at this distance are generally less than those found between 0-2km.
5-10km	Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance, developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The impact of the development diminishes as the developments becomes part of the general background/distance views.

10.2.9 Viewsheds

Viewsheds were defined in 5 different points of the site of the Proposed Development (V1-V5), as it can be seen in the images Figure 10-1 to Figure 10-5.

These Viewsheds were processed using *Google Earth Pro* software, that adjusted the view of the observer 2,00 meters above the terrain. In green, on the images, it can be seen the visibility from the considered points.

Figure 10-1: Viewshed V1. Viewing altitude: 3.50 km

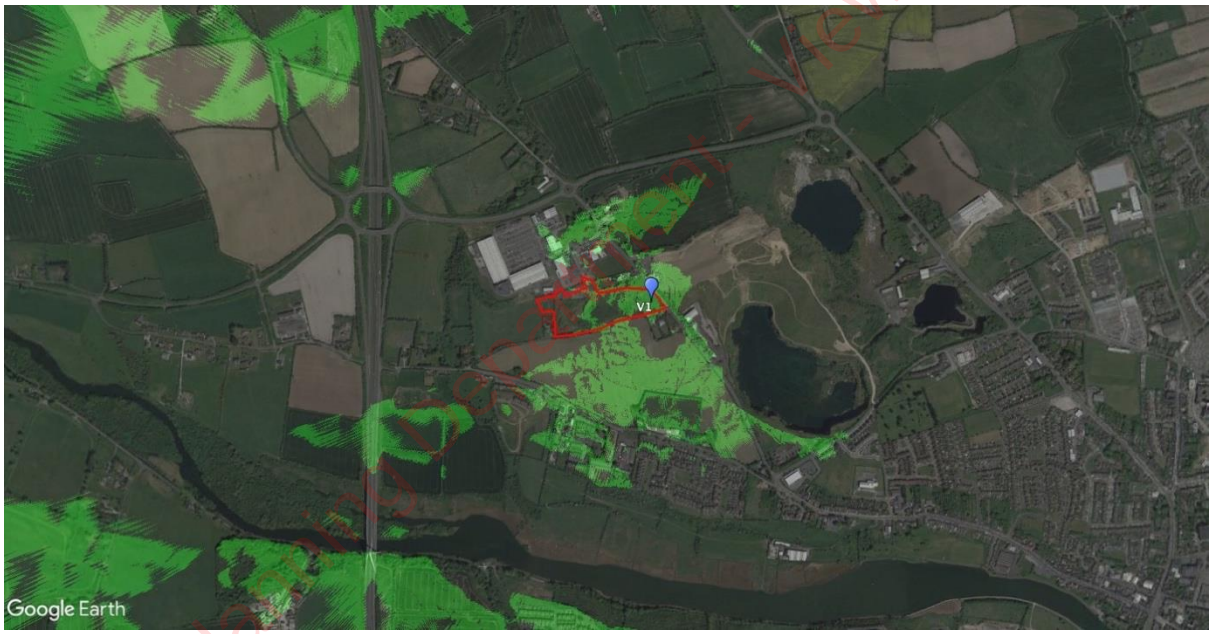

Figure 10-2: Viewshed V2. Viewing altitude: 3.50 km

Figure 10-3: Viewshed V3. Viewing altitude: 3.50 km

Figure 10-4: Viewshed V4. Viewing altitude: 3.50 km

Figure 10-5: Viewshed V5. Viewing altitude: 3.50 km

10.2.10 Potential Visual Receptors

Following the production of the Viewsheds and field study, the following possible receptors of impacts were noted.

10.2.10.1 Dwellings with views orientated towards the development

Dwellings with views orientated towards the Proposed Development are generally accepted as having a high visual sensitivity.

The landscape defined between the M1, the N51, the R168 and Barrack Lane is mostly industrial/commercial, having the existing buildings in the M1 Retail Park a great relevance.

There are some agricultural fields and some dwellings, quite dispersed. There is a dwelling leaning against the southwest limit of the site, 3 dwellings on the opposite side of the southeast limit, separated from the site by Barrack Lane, and 2 dwellings leaning against the northeast edge of the site.

In addition, there are 3 dwellings to the west at 300, 450 and 500 meters respectively.

South of Slane Road, a large cluster of dwellings are identified, with expansion planned to the southwest.

The Proposed Development will not be visible from the dwelling on the southwest limit and only partially visible from the dwellings at northeast. It is not predicted that there will be a negative impact on these dwellings as the Proposed Development is in line with the surrounding environment, and there are many vegetation barriers that prevent full visibility to the site. It is therefore predicted neutral impact from these types of visual receptors.

The only dwellings that result in a negative visual impact, in the short/medium term, are located southeast of the Proposed Development site, since they have a large visual range to the north. It is expected that with the growth of shrub and tree vegetation, this visual impact will be mitigated in the medium term.

10.2.10.2 Users of the High Amenity areas

There is a sports club, the *Oliver GAA Club Louth* about 250 meters south of the Proposed Development site. It was not identified any visibility from the Proposed Development to this area, given the large tree hedge that exists on the northern edge of the sports club field and the existing/proposed vegetation on the southern edge of the Proposed Development.

The banks of the River Boyne are also identified as high amenity areas in the vicinity, with the left bank of the river situated half a mile away from the site. The right bank has a pedestrian path, and so a more recreational occupation type. This area doesn't have visibility to the site, since it's located in a lower elevation area and has dense and large riparian gallery.

Also identified are the *Killineer Pitch and Putt*, about 800 meters from the site, and the *Drogheda United Football Club*, about 1400 meters from the site. However, these sites end up not having visibility for the Proposed Development, given the existing buildings and vegetation barriers.

10.2.10.3 Outdoor workers

People engaged in outdoor work are not likely to focus on the surrounding view and are generally accepted as having medium to low visual sensitivity.

Due to the industrial/commercial nature of the surrounding landscape, it is not expected that outdoor workers will be impacted by the Proposed Development.

10.2.10.4 Road / transport users

Users of the main roads around the Proposed Development are generally accepted as having medium to low visual sensitivity.

The site can be accessed via the R168, which through a roundabout connects to the accesses inside the M1 Retail Park. The R168 originates from the N51 to the north and can be accessed via the M1, which is located to the west of the site.

Barrack Lane also limits the south of the Proposed Development site, but there is no provision for access via this road, and the vegetation barrier will be reinforced at this limit.

It is also worth mentioning the L6322, which connects further north, from Keenogue and Tullyallen Village to the N51, via the Waterunder roundabout.

10.2.10.5 Indoor workers

People engaged in work activities indoors, with limited opportunity for views of the development are generally accepted as having a low visual sensitivity.

10.3 The Existing and Receiving Environment (Baseline Situation)

10.3.1 Site Context

Figure 10-6: Aerial View with Proposed Development outlined in red in its Broader Landscape. Viewing altitude 10km. Image source: Google Earth

1 - M1
2 - N51
3 - R168
4 - L6322
5 - M1 Retail Park
6 - River Boyne
7 - Drybridge House
8 - Oliver GAA Club Louth
9 - Drogheda Rock Quarry
10 - Drogheda
11 - Tredagh
12 - Protected Structure
13 - Oldbridge House (PS)
14 - Obelisk Bridge (PS)
15 - Tullyallen
16 – Farm House (PS)
17 - Killineer House

The site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban/residential to the north, with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the site, and Barrack Lane is adjacent to the south of the site. The existing M1 Retail Park and a dwelling lie adjacent to the northern boundary of the site.

10.3.2 Designation and Zoning

According to *Louth County Development Plan 2021-2027* (LCDP) the site zoning for the area is designated "*B4 – District Centre*" and a small part as "C1 - Mixed Use", being this visible in the Figure 10-7. The LCDP has superseded the *Drogheda Borough Council Development Plan 2011-2017*. From the extract from Drogheda Composite Map, on Figure 10-7, is possible to see the classification of the adjacent areas of the site:

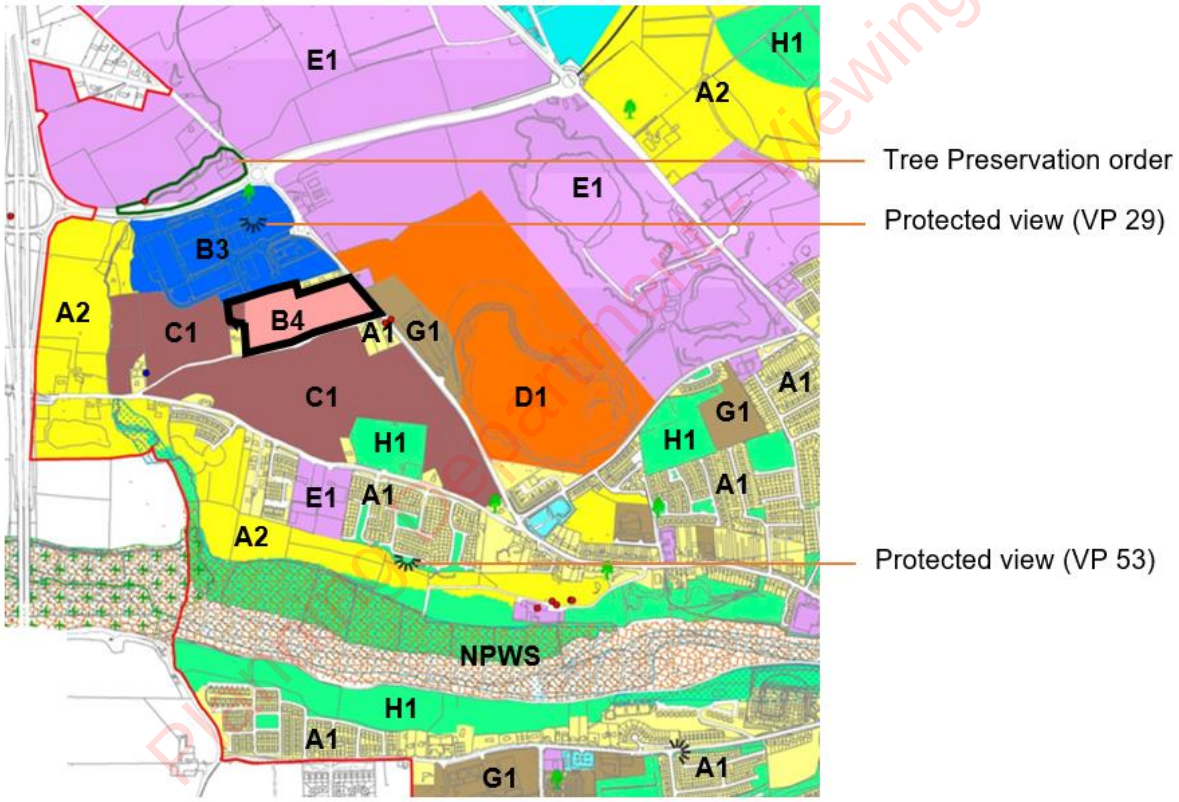

Figure 10-7 Extract from Drogheda Composite Map.
Source:County Louth Development Plan

A1 - Existing Residential
A2 - New Residential (Phase 1)
B3 - Retail Park
B4 - District Centre
C1 - Mixed Use
D1 - Regeneration
E1 - General Employment
G - Community Facilities
H1 - Open Space
NPWS - Special Area of Conservation / Proposed Natural Heritage

The Louth County Development Plan 2021-2027 includes 24 proposed Natural Heritage Areas (pNHAs). These areas have been identified by the NPWS and include sites which are of outstanding national importance for the natural environment. These sites can be integrated into a coherent green infrastructure strategy for Louth and support a resilient ecological network. The sites that are identified close to the Proposed Development Plan, and shown in figure 10-7 are:

NH1862 - Boyne River Islands

NH1804 - King Williams Glen

The LCDP currently includes details of the 6 Tree Preservation Orders made within the County in addition to a comprehensive listing of the Trees and Woodlands of Special Amenity Value. The site that is identified close to the Proposed Development Plan, and shown in figure 10-7 is:

TWSAV40 - Waterunder Cottage

The following measures, foreseen in the LCDP, must also be considered:

NBG 23 To ensure the preservation of the uniqueness of a landscape character type by having regard to its character, value and objectives in accordance with national policy and guidelines and the Louth Landscape Character Assessment and by ensuring that new development meets high standards of siting and design and does not unduly damage or detract from the character of a landscape or natural environment.

NBG 24 To ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types including the retention of important features or characteristics, taking into account the various elements, which contribute to their distinctiveness such as scenic quality, habitats, settlement pattern, historic heritage and land use.

NBG 25 Where appropriate, require that landscape and visual impact assessments prepared by suitably qualified professionals be submitted with development applications, which may have significant impact on landscape character areas, especially in highly sensitive areas.

NBG 26 To explore the designation of Landscape Conservation Areas as appropriate, in conjunction with the relevant Government Department and stakeholders to protect specific important landscapes and particularly in respect of Carlingford Mountain SAC.

NBG 27 To review and update, if necessary the Louth Landscape Character Assessment 2002 as on foot of a framework for regional and local landscape character assessments outlined in the 20152025.

NBG 28 To cooperate with adjoining local authorities, both north and south of the border, to ensure that the environment is maintained in a sustainable manner and to support the coordinated designation of sensitive landscapes and policy approaches with adjoining areas and on all aspects of environmental protection, particularly where transboundary environmental vulnerabilities are identified.

10.3.3 Landscape Capacity of the site

The site is insert in the *Boyne & Mattock Valley*, according to the Landscape Character Areas on the LCDP (a national classification) and it is close to the River Boyne, on South Louth. River Boyne is within the List of European Sites, named "*River Boyne and River Blackwater"*, with (site code 004232 – SPA Estuarine).

The site is close to an *Area of High Scenic Quality* (AHSQ) - AHSQ 3 - Boyne Valley / King Williams Glen - as shown in figure 10-8. The AHSQ adds significantly to the stock of natural scenic landscapes within the County. All the AHSQ are currently farmed, although the quality of the land for farming purposes varies considerably from area to area. The Council considers it important that AHSQ are protected from excessive development, particularly from inappropriate, one-off, urban-generated housing, in order to preserve their unspoiled rural landscapes.

In a closer perspective, the site is located within the M1 Retail Park, with Barrack Lane, to the south, making the transition from this industrial/commercial area to a more rural/agricultural one. The industrial/commercial area is limited to the north and east by the N51 and R168 respectively. To the west, an expansion of this area, with a total of 7.26 acres is also planned. The overall industrial area is limited by a hedgerow, 250 meters west of the site, which starts close to the N51 and ends close to Barrack Lane. The industrial/commercial aspect of the surroundings make it easier to absorb the Proposed Development without further landscaping or visual impacts.

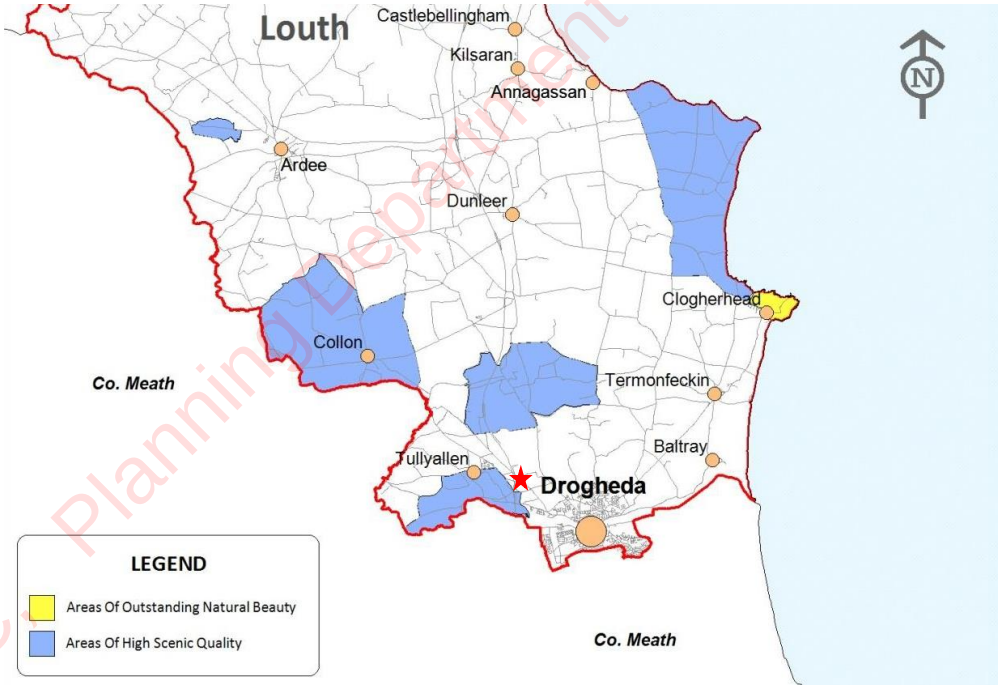

Figure 10-8: Extract from Areas of Outstanding Natural Beauty and Areas of High Scenic Quality Map. Source: County Louth Development Plan

10.3.4 Topography and Soils

The topography surrounding the site of the Proposed Development is mostly levelled, between *Drogheda* and *Tulyallen*, as presented in figure 10-9. The biggest difference of levels turns out to be south to the site, on the banks of the River Boyne.

There is a considerable difference in elevation to the southwest, towards *Donore*, where quota 110 is reached, at the highest point. Between *Tulyallen* and *Kellystown*, northwest of the Proposed Development site, there is also a higher zone, which reaches quota 100.

To the west, towards the sea which is about 9 km, the land is progressively lower, in relation to the Proposed Development site.

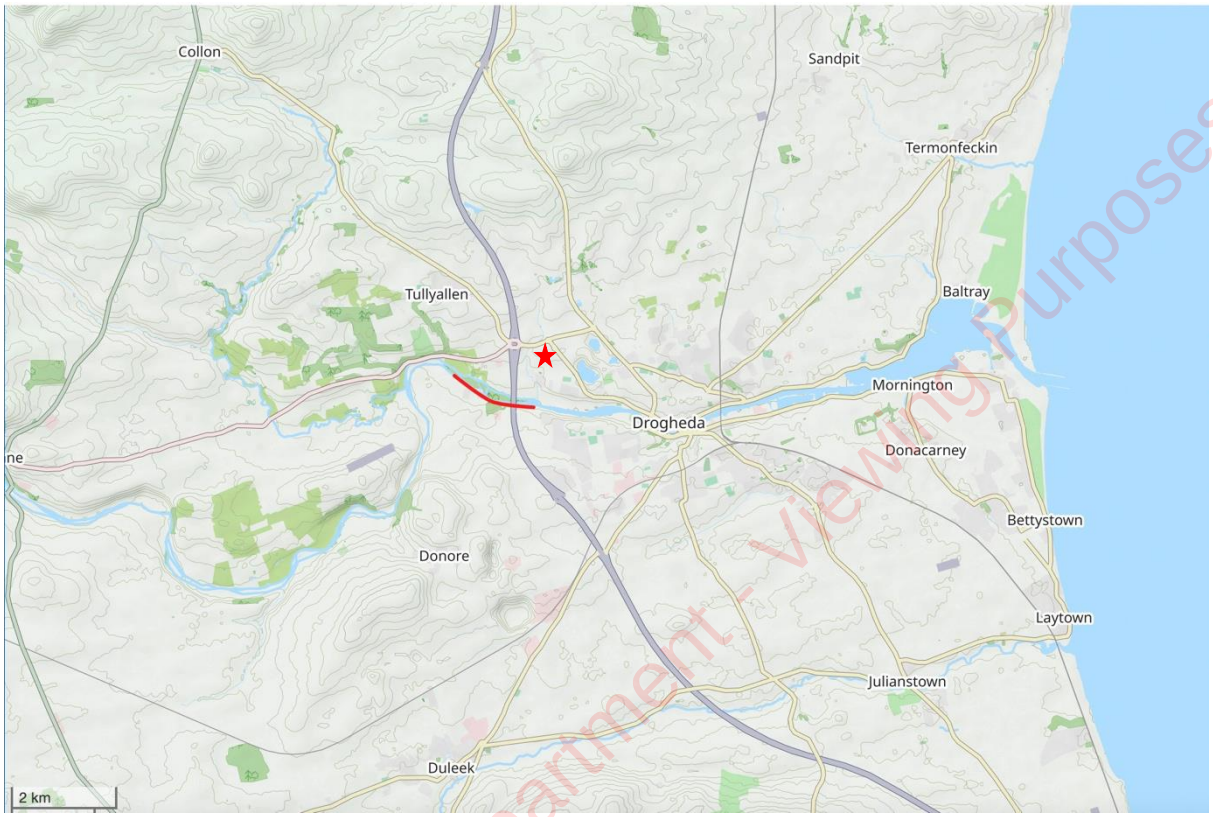

Figure 10-9: Topography on the Broader Landscape. Proposed Development site marked with a star. Source: Openstreetmap

The topographical survey of the Proposed Development site indicated that the overall topography ranges from approximately 25.5meters above ordnance datum (maOD) in the southwest to 36maOD in the ridges in the centre of the site, as shown in figure 10-10.

- The northern portion base elevation is approximately 32maOD, there are mounds C&D of materials reaching a maximum elevation of 36maOD in the centre of the site;
- The southern portion of the Proposed Development site generally falls from north (32maOD) to southwest (25maOD);
- To the west of the site boundary, the topography slopes towards the Mell Stream at approximately 14maOD.

Figure 10-10: Topography of the site of the Proposed Development. Proposed Development site outlined in red. Source: MCA Architects

10.3.5 Existing landscape

As can be seen in figure 10-6, the landscape is dominated by 4 elements: a) the M1, which has a significant impact on the landscape, in its north-south axis, west of the site, b) the Boyne River, which works as a natural barrier, south of the site, c) the Quarry, east of the site, that ends up breaking a certain uniformity in the landscape, between an agricultural and residential environment, standing out as a deterrent in this reading of the landscape, and finally d) the denser urban core of Drogheda, southeast of the site.

The desk study revealed that a number of different elements on the ground have a bearing on the visibility of the Proposed Development:

- The site currently has an arboreal hedge on its western edge;
- It also has an arboreal hedge on about half of its southern limit;
- The eastern limit is currently defined by a metal fence and scattered trees and shrubs that do not form a hedge;
- Its northern doesn't have any tree-hedge, having only some fence sections:
- The land is currently occupied by mostly herbaceous vegetation with some scattered medium to large trees and shrubs.

The site of the Proposed Development comprises an agricultural field within the administrative jurisdiction of Louth County Council. The majority of the site of the Proposed Development is located on lands which have been allocated Zoning Objective Type B4 'District Centre' with zoning objective "*To maintain and enhance retail led mixed-use district centres*". The portion

to the northwest in which the drive thru is proposed is zoned C1 Mixed Use, with zoning objective "*To provide for commercial, business and supporting residential uses*."

Figure 10-11: Aerial View of 2013, with the limits of the Proposed Development in red. Source: Google Earth

In figure 10-11 it's possible to verify that most of the vegetation that exists today is recent, since this site was used as deposit lands at the time of the construction of commercial buildings, to the north. Only the west and southwest hedgerow existed before 2013 (before 2005 inclusive, as far as can be verified).

10.3.6 Preserved / Protected Views, Scenic Routes

A. Protected Views

There are no protected views within the site of the Proposed Development. From the desk study, 4 protected views were identified in the broader landscape, as illustrated in Figure 10-12 and Figure 10-13.

1. VP 27 - Townley Hall Nature Walk

Townley Hall Nature Walk, 200m east from Townley Hall entrance along nature walking trail. *"Elevated view south east towards Battle of the Boyne site. Boyne River visible in foreground, partial view of Battle of the Boyne Visitor Centre Boyne and Oldbridge house behind copse of mature deciduous native trees."*

Distance to the site: 1800 meters

Visual Impact: The Proposed Development site is not visible from this location given the existing vegetation barriers and the physical and visual barrier that the M1 represents, east of this structure.

2. VP 28 - Drybridge Escarpment

180 degree view from the N51 at the rocky outcrop where the former Obelisk stood. "*Panoramic view over the Battle of the Boyne site. King William approached from the north & King James approached from the south at Donore Hill."*

Distance to the site: 1500 meters

Visual Impact: The Proposed Development site is not visible from this location given the existing vegetation barriers and the physical and visual barrier that the M1 represents, east of this structure.

3. VP 29 - Waterunder Plateau

View from M1 Retail Park, M1, Motorway bridge. "*View south from N51 between Mell roundabout and Motorway roundabout Junction 10. Drybridge Escarpment. View of Ravine which was the route of the Williamite army from their camp at Tullyallen Hill to cross the Boyne river.*"

Distance to the site: 200 meters. The location of this protected view in figure 10-12 is debatable because the point of view turns out to be a linear section and not a single point. In any case, at the location indicated in this figure, there is already a commercial building.

Visual Impact: The closest Protected View to the Proposed Development site. This view, and according to the information on the description of the County Development Plan, turns out to be a linear section between the *Mell roundabout* and *Motorway roundabout Junction 10*.

The visibility is always dominated by the existing buildings of the *M1 Retail Park*, as verified in viewpoints A, B, C and D (chapter 10.5.2). The Proposed Development will have almost negligible visual impact on this view.

View of Ravine is currently only visible in the most northwest part of this section, just after the M1 exit and before the beginning of the Retail Park, south of the N51.

In the viewpoints closest to the site, facing south (E and F), the Ravine site is not visible.

4. VP 53 - Views of the Boyne and the Loughboy Callows from Loughboy

Distance to the site: 680 meters

Visual Impact: The Proposed Development site is not visible from this location given this site is in a much lower elevation area and having a residential neighbourhood, at a higher elevation, that takes out much of the visibility to the north, in addition to the existing vegetation barriers. The view is also oriented to the opposite site of the Proposed Development (south) towards the River Boyne.

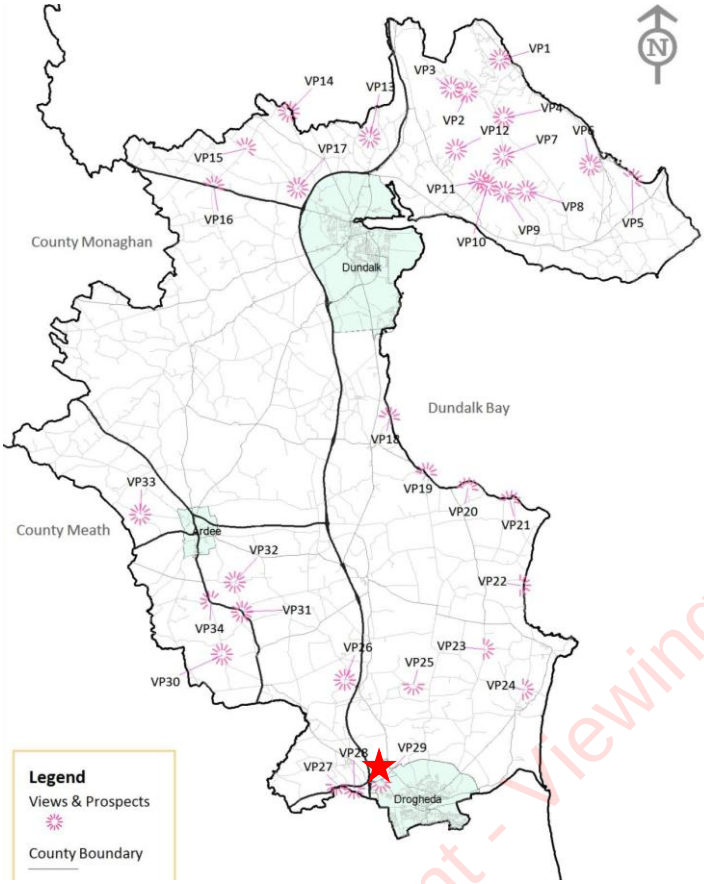

Figure 10-12: Views & Prospects County Louth Development Plan. Proposed Development site marked with a star

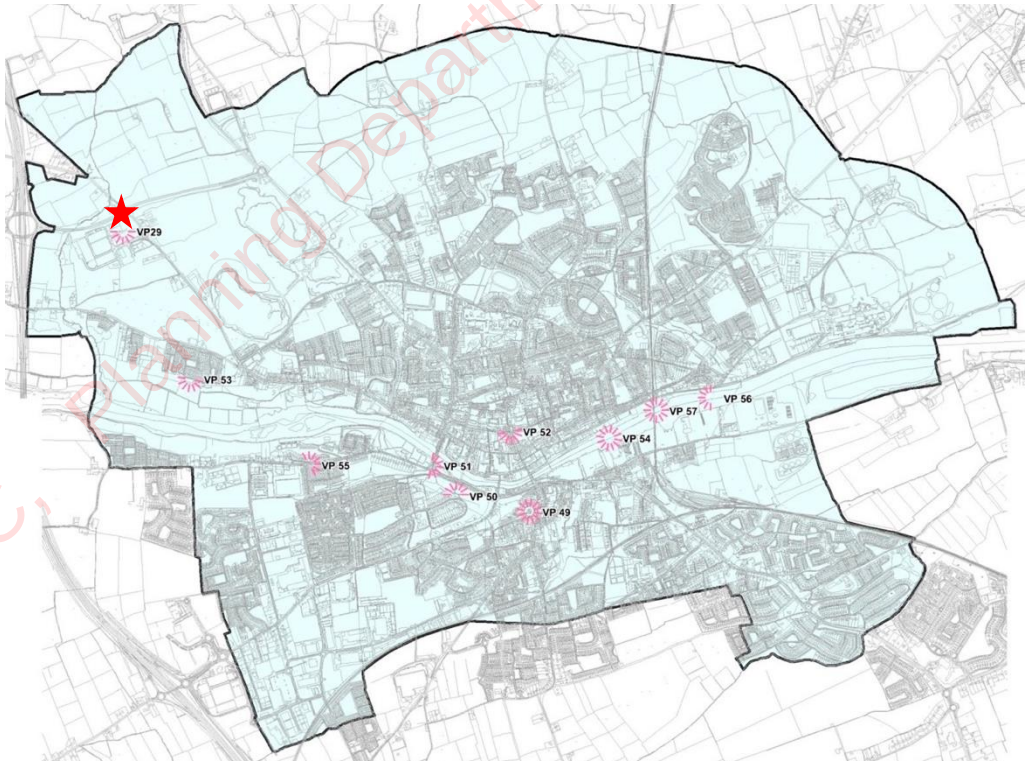

Figure 10-13: Views & Prospects Drogheda Map, County Louth Development Plan. Proposed Development site marked with a star

The following measures, foreseen in the LCDP, must be considered, regarding Protected Views:

NBG 38 - Protect and sustain the established appearance and character of views and prospects that contribute to the distinctive quality of the landscape, from inappropriate development.

NBG 39 - To improve, where necessary, public access to viewing points, subject to availability of resources.

B. Scenic Routes

Louth has many areas of high-quality landscape especially along the coast, upland areas and river valleys reflected in the *Areas of Outstanding Natural Beauty, Areas of High Scenic Quality* and *Views and Prospects*. In association with these high quality, natural landscapes a series of important Scenic Routes have been identified which are of an amenity and tourism value, and which require protection.

Applications for development must carefully consider the siting, design and landscaping of the Proposed Development to ensure that there are no significant alterations to the character of the area. Any development proposals, which would interfere with or adversely affect these Scenic Routes, will not be permitted.

The closest scenic route to the Proposed Development site is *SR 21 - King William's Glen*, located to the west, as shown in figure 10-14.

Considering County Louth Development Plan, the following objective must be considered, regarding the Scenic Routes:

Policy Objective

NBG 40	To prohibit inappropriate development which would interfere with or adversely affect the Scenic Routes as identified in Table 8.19 and illustrated on Map 8.20.

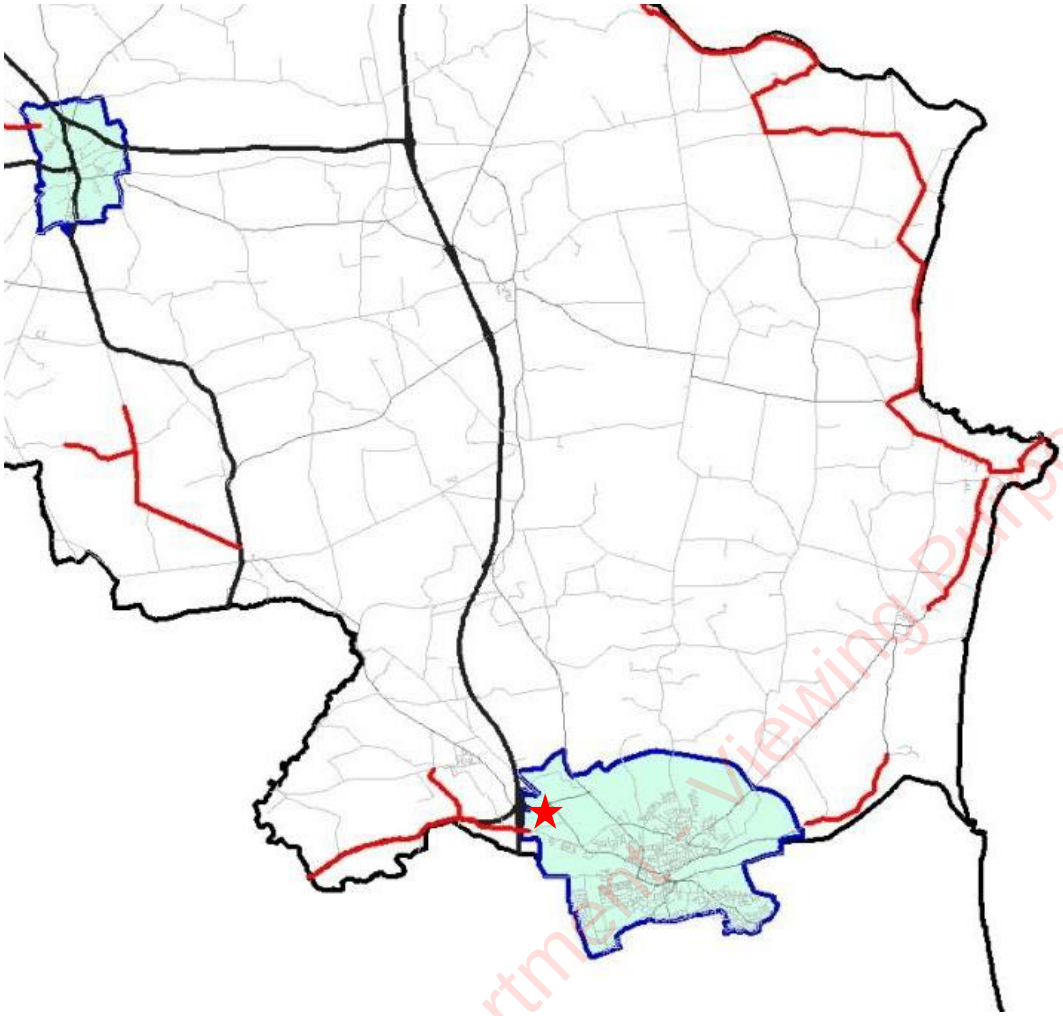

Figure 10-14: Extract from the Scenic Routes Map, County Louth Development Plan.
Proposed Development site marked with a star

The scenic route comes from the West on the N51, then turns south to an unnamed road, and passes under a tunnel under the M1, ending up 231 meters after the tunnel. The M1 turns out to be a visual barrier for this scenic route to the East, as the Proposed Development ends up having no visual impact for this route.

This scenic route can also be seen on Figure 10-15, illustrated in purple. The only part of this route more susceptible to the Proposed Development, is the section east of the M1, after the tunnel. However, there is no visibility for the Proposed Development site. The road is positioned at a lower altitude relative to the site, and visibility is blocked by the existence of hedgerows to the north of the road.

Figure 10-15: Extract from Heritage Maps. Proposed Development site marked with a star

10.3.7 Protected Structures

There are no protected structures within the Site boundary. 9 protected structures within the broader landscape were identified, as shown in figure 10-16 (blue circles). The protected structures within Drogheda were not considered, due to the closed nature of the urban context. The protected structures north of N51/ west of the M1, were not consider as well, being more than 2km away from the Proposed Development site and having these roads as a visual barrier.

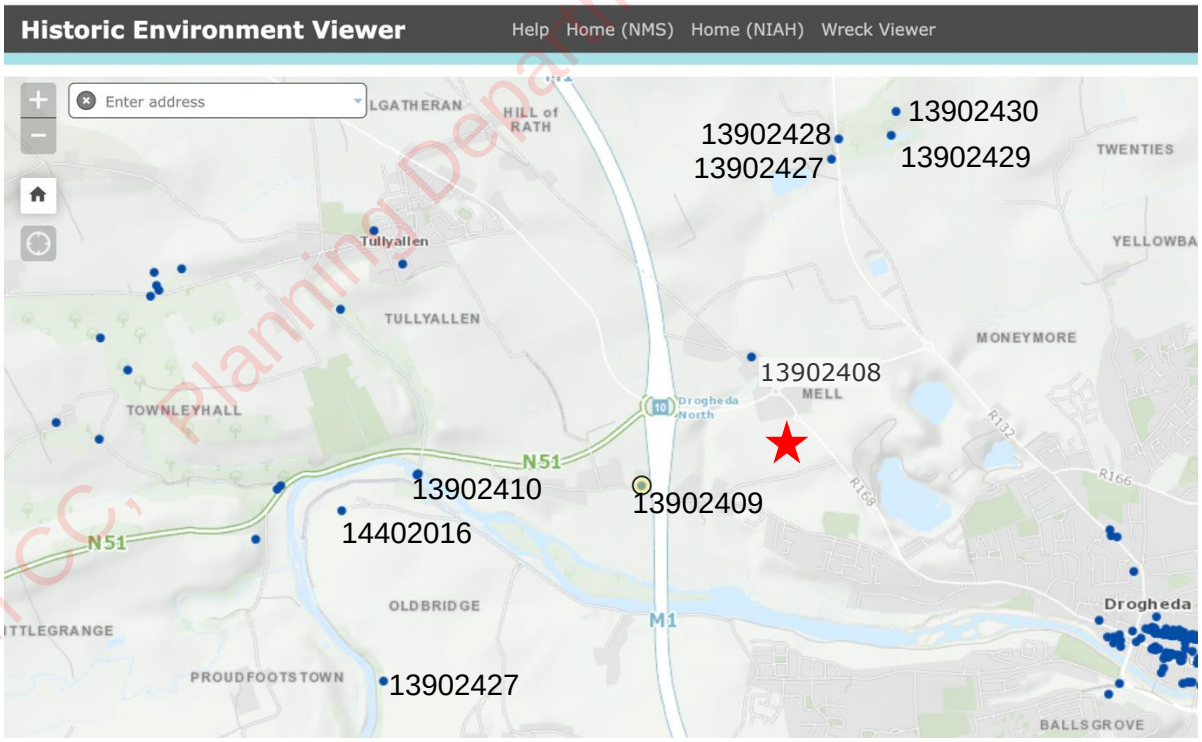

Figure 10-16: Protected Structures, National Monuments Service.
Proposed Development site marked with a star

1. Drybridge House (DB-292). Reg. No. 13902409

Figure 10-17: Drybridge House

Date: 1800 - 1840
Original Use: House
Categories of Special Interest: Architectural
Description: Detached five-bay two-storey house, built c. 1820. Attached to two-storey range of farm buildings to west and farmyard complex to west.
Distance: This is located 0.670 km West of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location given the existing vegetation barrier and the physical and visual barrier that the M1 represents, east of this structure.

2. Reg. No. 13902408

Figure 10-18: Farm House

Date: 1850 - 1890
Original Use: Farm House
Categories of Special Interest: Architectural
Description: Detached five-bay two-storey farmhouse, built c. 1870, now disused
Distance: This is located 0.5 km North of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location given the existing vegetation barriers.

3. Killineer House

Reg. No. 13902427

Figure 10-19: House

Date: 1820 - 1840
Original Use: house
In Use as: house
Rating: Regional
Distance: This is located 1.600 km Northeast of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location. This view is framed to the east towards the R132, with this road having arboreal hedges on both sides, thus having very limited visibility to the background.

Reg. No. 13902428

Figure 10-20: Gate Lodge

Date: 1835 - 1840
Original Use: gate lodge
In Use as: gate lodge
Rating: Regional
Distance: This is located 1.715 km Northeast of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location. This view is framed to the west towards the R132, with this road having arboreal hedges on both sides, thus having very limited visibility to the background.

Reg. No. 13902429

Figure 10-21: Summerhouse

Date: 1840 - 1860
Original Use: summerhouse

In Use as: summerhouse
Rating: Regional
Distance: This is located 1.775 km Northeast of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location. This view is framed by patches of large vegetation on all sides, facing the lake in the south of the property's garden.

Reg. No. 13902430

Figure 10-22: Country house

Date: 1830 - 1840
Original Use: country house
In Use as: country house
Rating: Regional
Distance: This is located 1.895 km Northeast of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location. The view is set to the southwest, in the opposite direction to the Proposed Development site, with lines of vegetation on both sides of the view and ending with a barrier of vegetation to the south of the lake that ends up being the focal point of this view.

4. Obelisk Bridge - Reg. No. 14402005

Figure 10-23: Obelisk Bridge

Date: 1860 - 1870
Original Use: bridge
In Use as: bridge
Distance: This is located 1.890 km West of the Proposed Development site.
Visual Impact: View from the bridge and its accesses, framed by the riparian gallery on the right bank of the River Boyne, which ends up hiding the elements in the background.
On the left bank, the view is directed towards the open fields in the *Drybridge* area, with a score of large trees. There is no visibility for the Proposed Development site, given the existence of these elements, and being the view more framed to the southeast.

5. Oldbridge House - Reg. No. 14402016

Figure 10-24: Oldbridge House

Date: 1750 - 1840
Original Use: country house
In Use as: country house
Rating: Regional
Distance: This is located 2.300 km West of the Proposed Development site.
Visual Impact: The view is set to the south, towards the formal gardens of the house, and with the River Boyne riparian gallery in the background, behind the garden, thus in the opposite direction from the Proposed Development site. In any case, there is no visibility for the site, given that this site is in a much lower elevation and considering the existing physical barriers.

6. Reg. No. 14402014

Figure 10-25: Pill box

Date: 1930 - 1950
Original Use: pill box
In Use as:
Rating: Regional
Distance: This is located 2.400 km Southwest of the Proposed Development site.
Visual Impact: The Proposed Development site is not visible from this location given the existing vegetation barriers and being this site in a lower elevation area.

10.4 Characteristics of the Proposed Development

10.4.1 Description of the Proposed Development

The Proposed Development will consist of the construction of a retail/commercial development comprising:

(i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,100sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and plant compound will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. A total of 312 no. car parking spaces are proposed to serve the proposed development, including 21 no. accessible parking spaces, 2 no. click and collect spaces and 15 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 90 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units.

(ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development.

(iii) internal roads, footpaths and pedestrian crossings.

(iv) trolly bays, signage, landscaping, boundary treatments, and lighting.

(v) associated site and infrastructural works are also proposed which include foul and surface water drainage, plant areas; ESB substations; and

(vi) all associated site development works necessary to facilitate the proposed development.

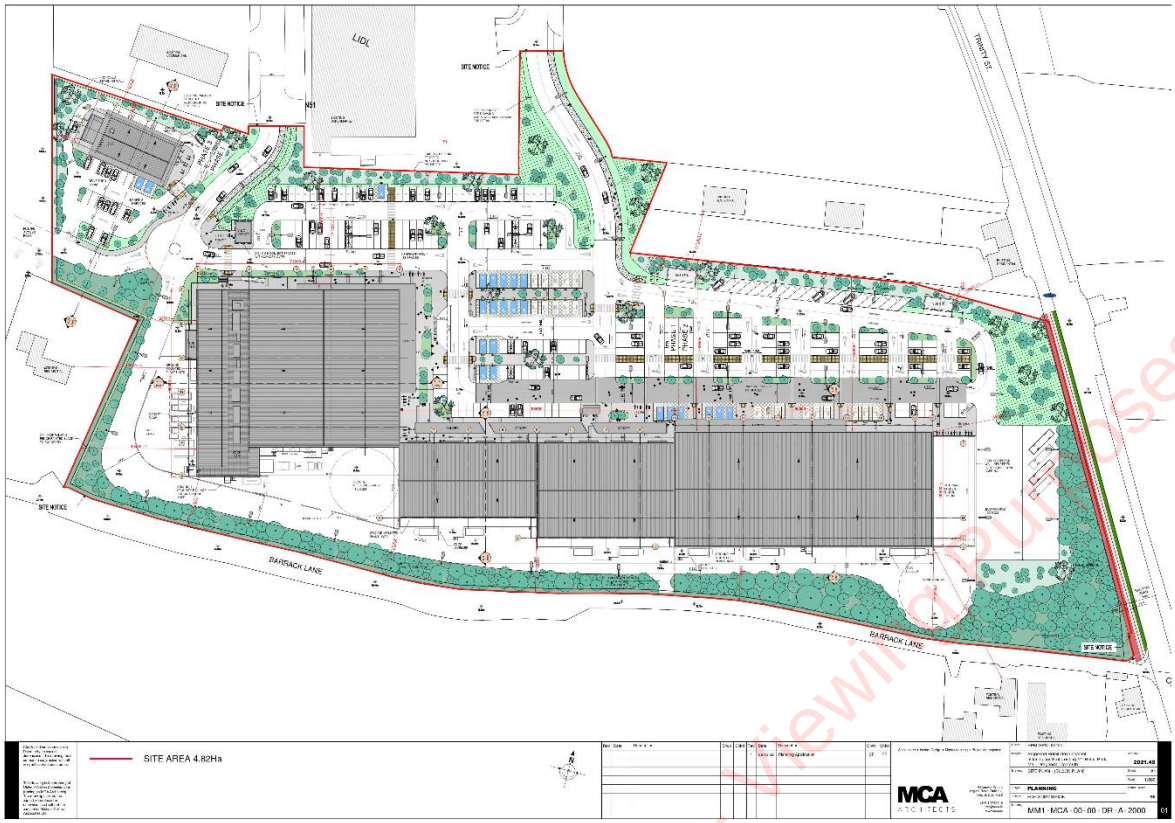

Figure 10-26: Site Layout Plan. Source: MCA ARCHITECTS

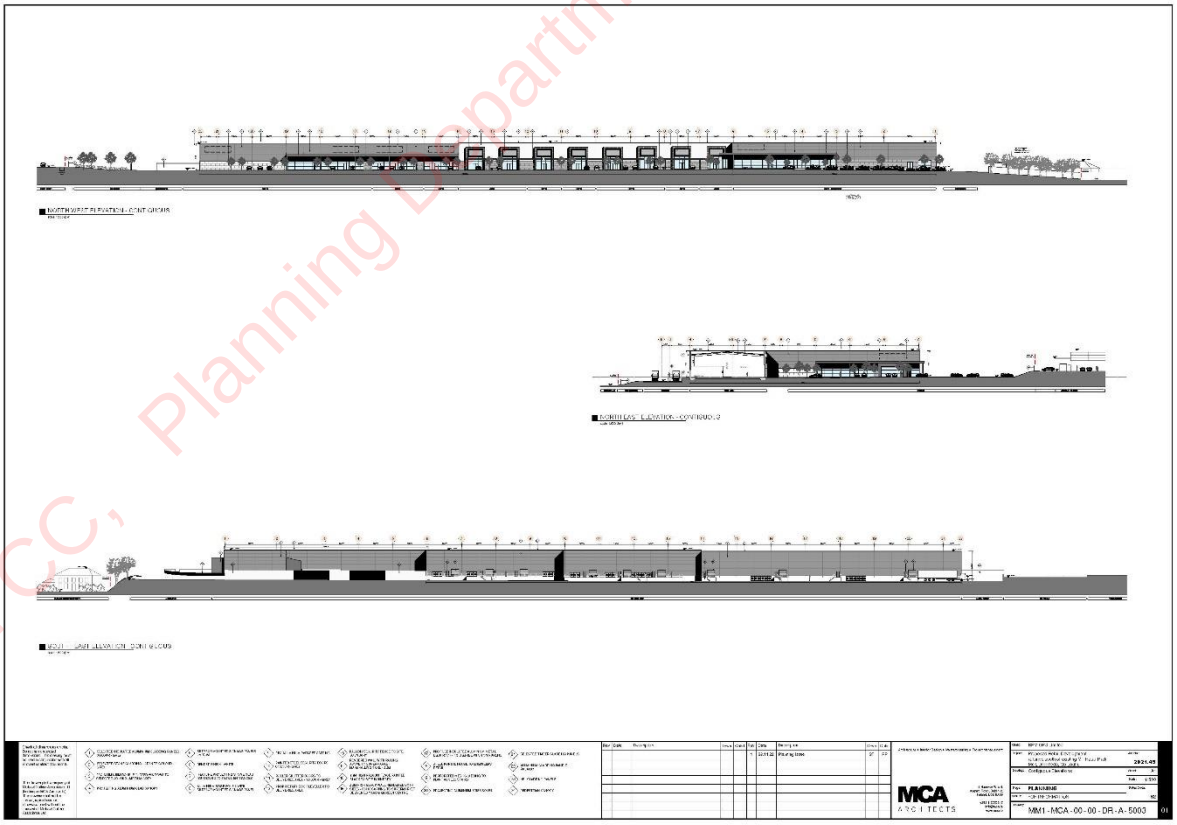

Figure 10-27: Sections. Source: MCA ARCHITECTS

Stephen Diamond Associates submitted a landscape design strategy and comprehensive and detailed proposals for consideration by the Planning Authority regarding the Proposed Development. It is stated in this project:

The proposed planting – trees, wildflower meadows, and groundcover - attempts to recreate the sensory experience of lush Irish nature. Trees and shrubs will be used to provide a counterpoint to the hard landscape and built elements to provide dynamic and sensual external spaces through the development and the car parking area. The planting material specification will improve the open spaces' micro-climate, providing shade, year-round visual interest, and improving the site's biodiversity by attracting wildlife. Inspired by the diversity of Irish nature, different biotopes such as native birch and oak have been chosen for this project.

A Native woodland mix is concentrated along the site's southern boundary as a backdrop to the proposed building. Woodland species - oak, pine, birch, mountain ash, holly, hazel, and hawthorn. On the northern boundary of the site, an intermittent open planting of narrow columnar trees (downy birch - *Betula pubescens* and columnar oak - *Quercus robur 'fastigiata'*) combined with bigger tree specimens (scots pine - *Pinus sylvestris* and Oak – *Quercus petraea*), is proposed underplanted by low-maintenance native scrub to include holly, hazel, hawthorn, blackthorn, guelder rose and privet.

Figure 10-28: Landscape Architecture MasterPlan. Source: Stephen Diamond Associates

When planted, these trees will be approximately 5-6m in height. All of the structure trees have been specified as hardy native species trees so that they will establish quickly and require little maintenance. These native trees provide a habitat for wildlife and contribute to a more biodiverse landscape.

The visual impact of the development is softened by the specification of flowering perennials, ornamental, low maintenance, and pollinator-friendly shrubs, wildflower meadows, and woodland planting. It is the intention to provide a feeling of maturity and permanence as soon as possible by planting a diverse selection of standard trees. A mix of native deciduous and evergreen trees has been specified to provide year-round visual interest, and habitat. The detailed specification of trees is inspired by the species of tree currently found in the surrounding landscape, and the suitability of the tree to the location. The design and specification of ornamental shrub planting are intended to add interest and variety as well as assist in defining spatial qualities across the site. The species which have been selected will successfully establish and grow in the local conditions as well as be sufficiently robust to survive with limited maintenance. Foxglove (*Digitalis purpurea/grandiflora*) plants are planted 2 per m2 within the shrub planting to create an element of surprise and seasonal visual interest, as the interplay of colour and billowing form will stand out as a constantly changing pattern, without obstructing the views for drivers and pedestrians navigating their way throughout the carpark and the overall site.

SOFT LANDSCAPE WORKS MAINTENANCE PROGRAMME

Bare root transplants, hedging and rootballed trees
Containerised shrubs, perennials
12 months maintenance & defects liability period, to commence on practical completion of soft landscape works. Planted beds, trees, hedges and transplant planting 16 no. maintenance visits required per annum (April- October) carried out on a fortnightly basis and 2 additional visits over winter period. 16 no. maintenance visits required per annum.
12 months maintenance & defects liability period to planted beds, trees, hedges and transplant planting to be carried out at the same time as grass cutting, 16 no. maintenance visits required.

Species	Height (cm)	Pot Size	Density	Container-grown (cg) / Bare Root (br)	Quality Specification
Trees					
All trees to be provided with 1.2m3 multi-purpose grade topsoil to BS3882 and planted as per planting details drawings, with root restrictor membrane where appropriate to ensure adjacent paving/services are not disturbed by root growth, and provided with irrigation where appropriate.					
Pinus Sylvestris (Scots Pine)	20-25 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Quercus petraea (Oak)	16-18 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Betula pubescens (Downy Birch)	18-20 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Betula pubescens (Downy Birch)	16-18 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Quercus robur 'fastigiata' (Columinar Oak)	18-20 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Quercus robur 'fastigiata' (Columinar Oak)	16-18 cmg clear stemmed to 2m height planted to Planting Detail A with root restrictor membrane near services routes/paving				
Crataegus monogyna (Common Hawthorn)	16-18 cmg multi- stemmed planted to Planting Detail A with root restrictor membrane near services routes/paving				
Crataegus monogyna (Common Hawthorn)	14-16 cmg multi-stemmed planted to Planting Detail A with root restrictor membrane near services routes/paving				

Shrubs & Perennials
Excavate to 400mm depth and backfill with 300mm multi-purpose grade topsoil to BS3882, and top with non-woven 90gs/m black geotextile landscape weed-guard type fabric and 75mm depth medium grade bark .

Species	Height (cm)	Pot Size	Density	Container-grown (cg) / Bare Root (br)	Quality Specification
Flowering Evergreen Perennial Mix		**2 plants per m²**			
Digitalis purpurea	40-60cm	2lt		cg	
Digitalis grandiflora	40-60cm	2lt		cg	
Single Species					
Excavate to 400mm depth and backfill with 300mm multi-purpose grade topsoil to BS3882, and top with non-woven 90gs/m black geotextile landscape weed-guard type fabric and 75mm depth medium grade bark .					
Shrubs		**4 per m2**			
Ilex Aquifolium (Holly)	40-60cm	2lt		cg	
Cotoneaster microphyllus	40-60cm	2lt		cg	
Sarcococca hookeriana var digyna	40-60cm	2lt		cg	
Euphorbia amygdaloides var. robbiae	40-60cm	2lt		cg	
Native woodland transplant mix in double staggered row		**2 plants per m² 100 m²**			
Pinus Sylvestris (Scots Pine)	40-60cm	Transplant 1+1		br	
Quercus petraea (Oak)	40-60cm	Transplant 1+1		br	
Betula pubescens (Downy Birch)	40-60cm	Transplant 1+1		br	
Sorbus aucuparia (Rowan)	40-60cm	Transplant 1+1		br	
Ilex Aquifolium (Holly)	40-60cm	Transplant 1+1		br	
Corylus avellana (Hazel)	40-60cm	Transplant 1+1		br	
Crataegus monogyna (Common Hawthorn)	40-60cm	Transplant 1+1		br	
Native scrub transplant mix in double staggered row		**2 plants per m² 100 m²**			
Ilex Aquifolium (Holly)	40-60cm	P9 Container Grown		cg	
Corylus avellana (Hazel)	40-60cm	Transplant 1+1		br	
Crataegus monogyna (Common Hawthorn)	40-60cm	Transplant 1+1		br	
Prunus spinosa (Blackthorn/Sloe)	40-60cm	Transplant 1+1		br	
Viburnum opulus (Guelder Rose)	40-60cm	Transplant 1+1		br	
Ligustrum vulgare (Privet)	40-60cm	Transplant 1+1		br	

Figure 10-29: Landscape Architecture Soft Landscape Works Maintenance Programme. Source: Stephen Diamond Associates

The planting proposal to the south/southeast/southwest site boundary is a woodland mix of native trees, defined on the plan drawings as T1 and in the planting schedule as highlighted below. These T1 trees would be planted as small transplants of approx. 400-600mm height at two transplants per m2. This T1 woodland mix belt will develop to an approx. height of 5m after 5 years, increasing to approx. 8m height after 10 years and 12-14m height after 15 years.

The measures foreseen in the project, together with the maintenance of the hedges to the south and west, will reinforce the visual barrier for the Proposed Development, and the green structure proposed to the centre of the site will scale and mitigate the proposed buildings, roads and parking lots.

10.5 Potential Impact of the Proposed Development

10.5.1 Potential Landscape Impact

Landscape effects – Degree of change to physical characteristics or elements of the landscape, which together form the character of that landscape, e.g. landform, vegetation, boundaries, buildings etc..

The lands on the site have been derelict for some time. There is a planted hedgerow adjacent to the northern-eastern boundary of the site. This Cherry laurel *Prunus laurocerasus* hedgerow makes up the boundary hedgerow of the back gardens of the adjacent residential dwellings and is outside the area of works for the Proposed Development. Native hedgerows at the site are dominated by Hawthorn *Crataegus monogyna*, Willow *Salix* sp, Sycamore *Acer pseudoplatanus*, Ash *Fraxinus excelsior* and Bramble *Rubus fructicosus*. The non-native Butterfly-bush *Buddleja davidii* is also dominant within the hedgerows at the Site.

Figure 10-30: Planted hedgerow along the north-eastern boundary of the Site

A short treeline lies in the southeast boundary of the Site, species found here include Ash *Fraxinus excelsior*, Sycamore *Acer pseudoplatanus*, Hawthorn *Crataegus monogyna* and Horse chestnut *Aesculus hippocastanum*. The understory is dominated by Nettle *Urtica dioica*, Bramble *Rubus fructicosus*, Herb Robert *Geranium robertianum* and Ivy *Hedera Hibernica*.

Figure 10-31: Treeline at the site of the Proposed Development

According to the Arboricultural Report submitted by *Northern Tree Services Arboricultural Contractors & Consultants*, in June 2002, within the tree survey area it can be identified:
- The only significant trees are found at the South-eastern corner at the junction of Trinity Street and Barrack Lane. These are largely of average amenity, being festooned with ivy and growing too closely together to make good specimens.

- The remaining vegetation found on site are mainly self-seeded Sally and Buddlea bushes that have pioneered the area after it was abandoned. It is estimated this vegetation is 15 years old.
- A total of 5 no. individual trees were assessed.

- Of these, 1 no. tree was classed as Category A (high value), 3 no. were classed as Category B (moderate value) and 1 no. was classed as Category U (unsuitable for retention).

The trees found on site can be easily protected during the construction of the Proposed Development as there is more than enough room to accommodate their root protection zones between the closest part of the development (the lorry turning circle and the coach park) and their stems. In fact, there seems to have been some previous attempt at tree protection as a stretch of site fencing is already in place around trees 1-4.

Table 10-13 Tree Survey – Arboricultural Report. Source: Northern Tree Services

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	CrownSpread (m)				Existing Ht Abv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1st Sig.	Can				
1	Horse Chestnut	Mature	15	48	5.76	8	4	2	6	4	0	Leaning to North and highway	None	20+	B1
2	Acer	Mature	15	38	4.56	2	3	5	3	4	3	Suppressed. Ivy clad	None	30+	B1
3	Acer	Semi-mature	13	20	2.4	3	3	3	2	4	0	Multi stemmed from ground. Some dieback to N&W. Ivy clad	None	30+	B1
4	Ash	Over-mature	14	45	5.4	4	3	3	2	3	0	Multi stemmed from 1m, with stems to South decrepit. Advanced ADB. Massed ivy. Poor specimen	Remove	<10	U
5	Acer	Mature	15	45	5.4	5	5	3	6	4	2	Multi stemmed from ground. Healthy, well balanced crown. Ivy clad	None	40+	A1

According to the Biodiversity chapter of this EIAR, the identified habitats of the site of the Proposed Development are:

- Buildings and Artificial Surfaces (BL3)
- Recolonising Bare Ground (ED3)
- Recolonising Bare Ground (ED3)
- Spoil and Bare Ground (ED2)
- Hedgerows (WL1)
- Treelines (WL2)
- Scrub (WS1)
- Dry Meadows and Grassy Verges (GS2)

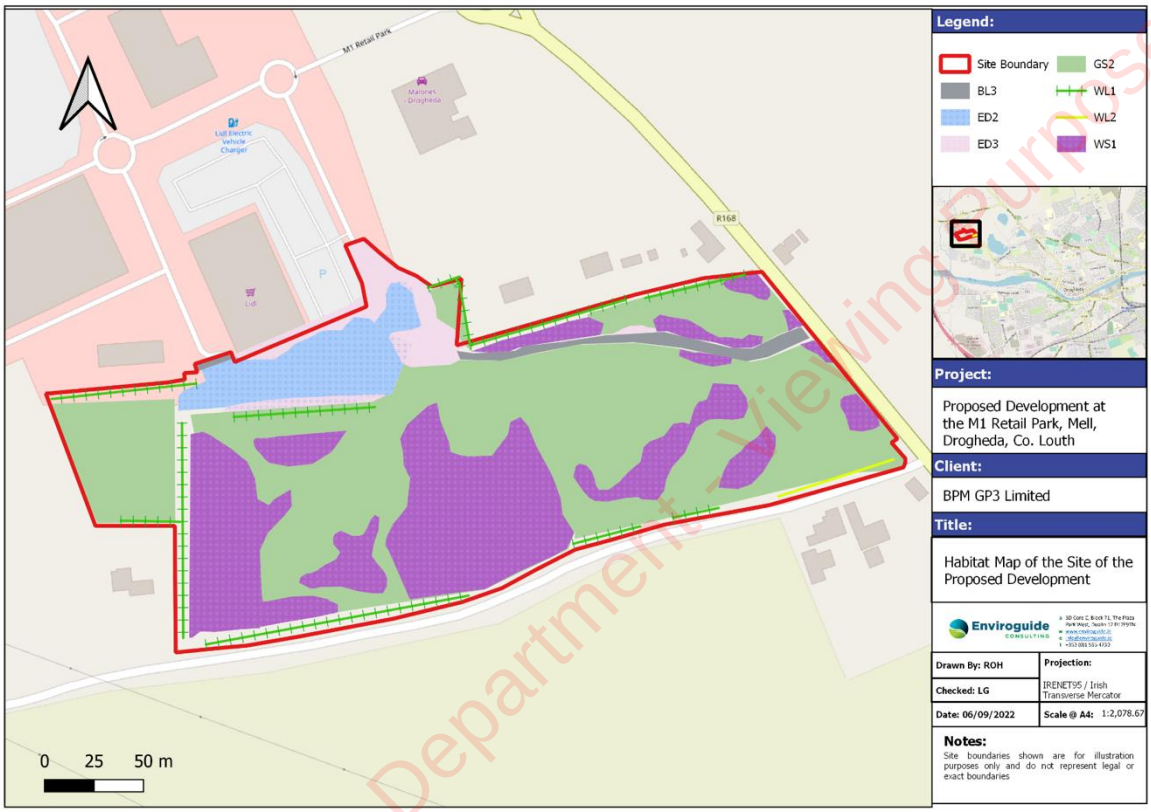

Figure 10-32: Habitat map of the Site of the Proposed Development

Concluding, most of the site of the Proposed Development is covered with *Scrub and Dry Meadows* and *Grassy Verges* and, in a minor percentage, *Spoil and Bare Ground*.

Considering this, and taking on account that the treelines, hedges, and the highest value trees are going to be maintained, within the Proposed Development site, it is considered that the Landscape Impacts of the Proposed Development are overall low.

10.5.1.1 Construction Phase

During the Construction Phase that is expected to last 24 months, the site landscape will undergo a change. Expected landscape impacts include:

- Numerous large, brightly coloured earth moving equipment, construction machinery, cranes operating on the site and construction site offices/facilities, security lighting and fencing etc;

- Change in colour and form of topography due to the excavation, removal and storage of soils;
- Removal of trees and shrubs and part of the West hedgerow;
- Creation of areas of hard surfaces (car parks, paths, roads);
- Construction of proposed new buildings;
- Planting of proposed green structure (trees, shrubs, herbaceous, lawns);

These landscape impacts will reduce rapidly with distance from the site boundaries, and intervening hedgerows, open park spaces, and existing buildings will further reduce the impacts to minor to negligible, negative and short term for the Construction Phase.

It is concluded that the Proposed Development will, therefore, have a minor, negative and short to medium-term impact on the landscape character of the site during the Construction Phase.

10.5.1.2 Operational Phase

It is not expected that the Operational phase of the Proposed Development will cause any negative impact.

It is considered, in the context of the Development Plan zoning, the Proposed Development is a continuation of existing trends in the local area.

The potential landscape impacts will be neutral and long-term as a result of the Proposed Development.

10.5.2 Visual Impacts

10.5.2.1 Visual Receptor Sensitivity

In terms of visual sensitivity, the receptors will be categorised as those being:

- Typically, non-designated viewpoints of modest visual amenity representing local residential receptors. These are deemed to be of Medium-low visual sensitivity.
- Typically, single designation viewpoints representing tourists / visitors or local residents involved in recreational or amenity based activity where an appreciation of the visual setting is integral to the experience and pleasant views are afforded. These are deemed to be of Medium visual sensitivity.
- Typically, an amenity and/or heritage feature viewpoint with aesthetic and/or extensive views, but without any scenic designation. This is deemed to be of Medium visual sensitivity.
- Typically, a scenic designation viewpoint, in combination with a separate heritage/amenity designation. These are deemed to be of High-Medium visual sensitivity.

10.5.2.2 Magnitude of Visual Impact

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing View
2. Montage View

The baseline photography was captured in June 2022 (Viewpoints A to L) and September 2022 (Viewpoints M and N) and thus, deciduous trees are with full leaf. In this instances seasonal factors are not considered to contribute to material differences in the visual impacts assessed below and any likely variations will be described.

10.5.2.3 Viewpoint Locations

A total of 14 viewpoint locations were selected for use in the photomontage assessment of visual effects. The choice of viewpoint locations is influenced by both the views available and the type of viewer. Choice of viewpoint locations aimed to incorporate prominent visual receptors where there is likely to be either a high residential receptors or regular motor traffic. The choice of viewpoint locations should cover locations where the Proposed Development will be completely visible as well as partially visible and the choice of viewpoint locations in this instance did so.

Figure 10-33: Proposed viewpoint's location

10.5.2.4 Viewpoint Assessment

All predicted visual effects of the viewpoints below are long term and direct effects.

The images that follow intend to represent, as accurately as possible, the physical and visual characteristics of the Proposed Development from a variety of distances and directions around the site. Priority was given to views from the public domain, such as main roads and to views from potentially sensitive locations such as residential areas. The location of all views is shown on figure 10-33. For each of the visuals, an existing and a proposed view is presented and where the Proposed Development is not visible in the view, the elements of the development will be shown as a red outline.

- ***Viewpoint A***

Figure 10-34: Viewpoint A, N51, Existing View

Figure 10-35: Viewpoint A, N51, Proposed View

Viewpoint A (Figures 10-34 and 10-35)	
Location	N51
Coordinates	Latitude & Longitude:53.434118, -6.232860
Viewing distance to site boundary	500m
Direction of View	Northeast
Existing View	View from the N51 to the Retail Park. The existing buildings that are visible from this view, mark the landscape, being partially blocked by mostly shrub-vegetation next to the road.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing buildings. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint B***

Figure 10-36: Viewpoint B, N51 (Waterunder roundabout), Existing View

Figure 10-37: Viewpoint B, N51 (Waterunder roundabout), Proposed View

Viewpoint B (Figures 10-36 and 10-37)	
Location	N51 (Waterunder roundabout)
Coordinates	Latitude & Longitude:53.434453, -6.231107
Viewing distance to site boundary	350m
Direction of View	North
Existing View	View from the N51, near the *Waterunder* roundabout, which takes up much of the visibility from this viewpoint. Some of the Retail Park buildings are visible behind the roundabout, but they are framed by large trees. On the left side of this point of view, a patch of vegetation, with great density, can be seen.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing buildings. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint C***

Figure 10-38: Viewpoint C, R168 (near Kiearns Motors), Existing View

Figure 10-39: Viewpoint C, R168 (near Kiearns Motors), Proposed View

Viewpoint C (Figures 10-38 and 10-39)	
Location	R168 (near Kiearns Motors)
Coordinates	Latitude & Longitude:53.433992, -6.23669
Viewing distance to site boundary	200m
Direction of View	North
Existing View	View from the R168, near *Kiearns Motors*, with *Maiones Toyota* and its car park being the most visible element. It's possible to see the dwellings that are to the north of the Proposed Development site and the tree-shrub hedge that is in front of them. The small tree in the center of the roundabout and the lamp posts along the road end up having great visual relevance from this point of view.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Low
Duration of Effects	Short-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development results in a minor visual impact since only part of its northeast front is visible, behind the dwellings. All the foreground elements that make up this point of view end up maintaining a visual predominance over the Proposed Development. With the growth of vegetation that exists in front of the dwellings, this impact will eventually become imperceptible.

- ***Viewpoint D***

Figure 10-40: Viewpoint D, R168, Existing View

Figure 10-41: Viewpoint D, R168, Proposed View

Viewpoint D (Figures 10-40 and 10-41)	
Location	R168
Coordinates	Latitude & Longitude:53.433625, -6.23176
Viewing distance to site boundary	100m
Direction of View	North
Existing View	View from the R168 to the west, with an empty lot dominating this point of view. Part of the dwellings located to the north of the Proposed Development site are visible, but almost completely hidden by the existing tree-shrub hedge. There is a metallic fence that exists between the road and the vacant terrain, that is included in the "*B3 - Retail Park*" according to the LCDP. Lighting posts and low voltage overhead cables end up having a negative visual relevance from this point of view.
Value of the View	Low
Visual Susceptibility	Medium to Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Negligible
Duration of Effects	Short-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up having a minimal visual expression, with only part of the building to the north being visible, behind the dwellings. The existing tree-shrub hedge will fully mitigate this visual impact in the short term.

- ***Viewpoint E***

Figure 10-42: Viewpoint E, Unnamed road (close to the LIDL parking lot), Existing View

Figure 10-43: Viewpoint E, Unnamed road (close to the LIDL parking lot), Proposed View

Viewpoint E (Figures 10-42 and 10-43)	
Location	Unnamed road (close to the LIDL parking lot)
Coordinates	Latitude & Longitude:53.433508, -6.231024
Viewing distance to site boundary	60m
Direction of View	North
Existing View	View from an unnamed road, inside the Retail Park, next to LIDL. The view is occupied almost entirely by the northern part of the Proposed Development site. A land with herbaceous cover and spontaneous and dispersed arboreal and shrub vegetation is visible. However, the elements that have a greater visual scope from this point of view turn out to be part of the LIDL, the publicity sign of this structure (which ends up having the most negative visual impact in relation to the other elements of the landscape) and the lighting-posts.
Value of the View	Low
Visual Susceptibility	Medium to Low
Visual Sensitivity	Medium
Magnitude of Visual Changes	Medium
Duration of Effects	Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Moderate
Conclusion or Visual Impact of Proposed Development	The Proposed Development turns out to have a moderate visual impact since it significantly alters the view from this point. However, considering that the site as a commercial/industrial context, it ends up blending into the landscape. The vegetation proposed on the foreground of the Proposed Development, combined with the retained existing vegetation, can significantly mitigate this visual impact and, in the medium term, with the growth of vegetation, it is expected that the visual impact will end up being minor.

- ***Viewpoint F***

Figure 10-44: Viewpoint F, Unnamed road, Existing View

Figure 10-45: Viewpoint F Unnamed road, Proposed View

Viewpoint F (Figures 10-44 and 10-45)	
Location	Unnamed road
Coordinates	Latitude & Longitude:53.433483, -6.231580
Viewing distance to site boundary	75m
Direction of View	North
Existing View	A viewpoint also within the Retail Park, like Point E, but overlooking a western part of the Proposed Development site. This view ends up being dominated by the presence of the green metallic fence that limits the property of the site, and by the visible part of the "Cristal Clean M1 Retail Park" (namely the air conditioning system) that negatively impacts this view. Behind the fence it is still possible to see some scattered medium-sized trees.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	High
Duration of Effects	Medium-term
Quality of Effects	Neutral to Beneficial
Significance of Landscape and Visual Effects	Moderate to Significant
Conclusion or Visual Impact of Proposed Development	With the introduction of the Proposed Development, the metal fence that conditioned the view to the south is removed, and the visual range will be wider. The impact of the Proposed Development turns out to be moderate to significant as it becomes the main object of this view. However, the visible part of the "*Crystal Clean M1 Retail Park*" continues to have the most negative visual impact. With the growth of the proposed arboreal vegetation the visual impact of the Proposed Development will be partially mitigated. If shrub *strata* is installed, the visual impact of the new parking lot will also be lower in the medium term.

- ***Viewpoint G***

Figure 10-46: Viewpoint G, R168 (Trinity St.), Existing View

Figure 10-47: Viewpoint G, R168 (Trinity St.), Proposed View

Viewpoint G (Figures 10-46 and 10-47)	
Location	R168 (Trinity St.)
Coordinates	Latitude & Longitude:53.433261, -6.225613
Viewing distance to site boundary	5m
Direction of View	East
Existing View	View from R168 (Trinity St.) west towards the Proposed Development site. The view is quite heterogeneous with many elements dissonant between them, being the one with the greatest visual impact (negative) the 3 posts and medium voltage overhead cables. The metallic fence and the electricity box also contribute to the lowest value of this view, with scattered vegetation, namely shrubs, still visible.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Medium
Duration of Effects	Medium-term
Quality of Effects	Neutral to Beneficial
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The visibility of the Proposed Development turns out to be minor, with only a small part of the new building (garden center) and part of the car park being visible. The Proposed Development impact turns out to be neutral and the visual impact will be almost mitigated with the growth of the proposed vegetation in the foreground, in the medium term. This impact can be considered beneficial as it screens the referred existing dissonant elements and gives a more homogeneous reading of this landscape.

- ***Viewpoint H***

Figure 10-48: Viewpoint H, R168 (Trinity St.), Existing View

Figure 10-49: Viewpoint H, R168 (Trinity St.), Proposed View

Viewpoint H (Figures 10-48 and 10-49)	
Location	R168 (Trinity St.)
Coordinates	Latitude & Longitude:53.432431, -6.224518
Viewing distance to site boundary	285m
Direction of View	Southeast
Existing View	View from the R168 (Trinity St.), but at a more south-east point from viewpoint G. The road ends up dominating the visibility of this point and also the hedge, mostly shrub-*strata*, next to the road that forms a visual barrier to the west. Part of some dwellings are still visible to the southeast of the Proposed Development site.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Low
Duration of Effects	Short-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up having a minor visual impact, since only the highest part of one of the proposed buildings is visible. This visual impact will be mitigated, in the short term, with the growth of the proposed arboreal vegetation.

- ***Viewpoint I***

Figure 10-50: Viewpoint I, R168 (Trinity St.), Existing View

Figure 10-51: Viewpoint I, R168 (Trinity St.), Proposed View

Viewpoint I (Figures 10-50 and 10-51)	
Location	R168 (Trinity St.)
Coordinates	Latitude & Longitude:53.431519, -6.223693
Viewing distance to site boundary	595m
Direction of View	Southeast
Existing View	View from the R168 to the west, at a point further south-east, and close to the junction with Cement Road and the ALDI. View marked by the horizon line of the road with a separation between the road and the terrain to the west made by a metal fence and an arboreal hedge, still in formation, but which prevents much of the visibility to the background. Presence of dissonant elements in the landscape such as light poles and medium voltage poles.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint J***

Figure 10-52: Viewpoint J, Slane Road, Existing View

Figure 10-53: Viewpoint J, Slane Road, Proposed View

Viewpoint J (Figures 10-52 and 10-53)	
Location	Slane Road
Coordinates	Latitude & Longitude:53.431830, -6.23341
Viewing distance to site boundary	340m
Direction of View	South
Existing View	View from Slane Road, adjacent *to Oliver Plunketts GAA Club Louth*, to the north. There is no visibility to the north due to the presence of a shrub hedge of about 2/3 meters high next to the road.
Value of the View	Medium
Visual Susceptibility	Medium to High
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint K***

Figure 10-54: Viewpoint K, Slane Road, Existing View

Figure 10-55: Viewpoint K, Slane Road, Proposed View

Viewpoint K (Figures 10-54 and 10-55)	
Location	Slane Road
Coordinates	Latitude & Longitude:53.432442, -6.232937
Viewing distance to site boundary	285m
Direction of View	Soutwest
Existing View	View from Slane Road, further west than Viewpoint J, at the intersection with Barrack Lane. The presence of a shrub-hedge, next to the road, prevents visibility to the East. The presence of a medium voltage pole, behind the mentioned hedge, turns out to be the most dissonant element of this view.
Value of the View	Medium
Visual Susceptibility	Medium to High
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint L***

Figure 10-56: Viewpoint L, Barrack Lane, Existing View

Figure 10-57: Viewpoint L, Barrack Lane, Proposed View

Viewpoint L (Figures 10-56 and 10-57)	
Location	Barrack Lane
Coordinates	Latitude & Longitude:53.432806, -6.231496
Viewing distance to site boundary	5m
Direction of View	Southwest
Existing View	View from Barrack Lane, at a point near the southwestern edge of the Proposed Development site, and next to the only existing dwelling at this point. The tree-shrub hedge that exists on both sides of the road prevents visibility from either north or south.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint M***

Figure 10-58: Viewpoint M, R168, Existing View

Figure 10-59: Viewpoint M, R168, Proposed View

Viewpoint M (Figures 10-58 and 10-59)	
Location	R168
Coordinates	Latitude & Longitude:53.433497, -6.225955
Viewing distance to site boundary	20m
Direction of View	Southwest
Existing View	View from R168, near a dwelling that is close to the northeast edge of the Proposed Development site. The building and garden of the property end up dominating this view. The hedgerow, that follows the road on the south side, greatly limits visibility to the background. However, there is still a section of the view, between the end of the house and the beginning of this hedge, that allows visibility to the Proposed Development site, namely the hedgerow at the northeast edge.
Value of the View	Medium to Low
Visual Susceptibility	High
Visual Sensitivity	High
Magnitude of Visual Changes	Medium
Duration of Effects	Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The house and garden remain the dominant elements of this view. The Proposed Development has a minor visual impact, as the proposed vegetation will mitigate the presence of the new buildings in the short-term. In the medium-term this vegetation will almost screen the visibility to the Proposed Development.

- ***Viewpoint N***

Figure 10-60: Viewpoint N, R168, Existing View

Figure 10-61: Viewpoint N, R168, Proposed View

Viewpoint N (Figures 10-60 and 10-61)	
Location	Barrack Lane
Coordinates	Latitude & Longitude:53.433065, -6.225786
Viewing distance to site boundary	5m
Direction of View	North
Existing View	View from a dwelling on the opposite side of Barrack Lane, on the southeast edge of the Proposed Development site. Although the stone wall, with a metal fence on top, is the dominant element in this view, there is still a considerable visual scope for the Proposed Development site. The tree-shrub hedge at the southern edge of the site has many breaks, this being a section of about 50 meters without vegetation.
Value of the View	Medium to Low
Visual Susceptibility	High
Visual Sensitivity	High
Magnitude of Visual Changes	High
Duration of Effects	Long-term
Quality of Effects	Beneficial
Significance of Landscape and Visual Effects	Moderate
Conclusion or Visual Impact of Proposed Development	The proposed green structure within the Proposed Development site ends up becoming the dominant visual element in this point of view. In the medium to long term this will mitigate the proposed buildings. The demolition of the stone wall at the edge of the site ends up increasing the visual range to the north but this visibility will become screened in the medium-term. In the medium-term the proposed buildings will also be screened. The proposed green structure will continue to dominate this point of view.

10.5.2.5 Visual Impacts Effects Conclusion

After evaluating the visual impact on these 14 points, the Table 10-14 below summarizes 3 of these criteria (Duration, Quality and Significance) of the 7 assessed in each image. These are the criteria that are considered more important to the final visual impact assessment.

Table 10-14 Visual Impact Assessment Results

Duration of the Effects	Viewpoints	Total	%
Permanent	_	0	0%
Long-term to Permanent	_	0	0%
Long-term	N	1	7%
Medium to Long-term	_	0	0%
Medium-term	E, F, G, M	4	29%
Short to Medium-term	_	0	0%
Short-term	C, D, H	3	21%
Temporary	A, B, I, J, K, L	6	43%
Quality of the Effects			
Beneficial	N	1	7%
Neutral to Beneficial	F, G	2	14%
Neutral	A, B, C, D, E, G, H, I, J, K, L, M	11	79%
Neutral to Negative	_	0	0%
Negative	_	0	0%
Significance of Landscape and Visual Effects			
Imperceptible	A, B, I, J, K, L	6	43%
Minor to Imperceptible	_	0	0%
Minor	C, D, G, H, M	5	36%
Minor to Moderate	_	0	0%
Moderate	E, N	2	14%
Moderate to Significant	F	1	7%
Significant	_	0	0%
Profound	_	0	0%

It is concluded that in 43% of these viewpoints the visual impacts from the Proposed Development will be temporary, 21% in the short-term and 36% will be above short-term.

With regard to quality, 79% of the viewpoints are considered neutral, with 21% of the viewpoints being neutral to beneficial of beneficial.

Finally, 43% of the viewpoints are considered to have an imperceptible impact and 36% minor impact. Only 14% are considered to have a moderate impact and 7% moderate to significant impact.

In the viewpoints considered as having a visual impact, it will be important to understand what mitigation measures could be adopted in addition to those already foreseen in the project. Many of these measures involve the implementation and development of the proposed vegetation, which is of particular importance when considering these viewpoints. Therefore, special attention should be given to the proposed vegetation, considering the measures for installing the vegetation and the possibility of using plants with a larger size, and with more volume, so the mitigating effect can be more efficient.

10.5.3 Daylight and Sunlight assessment

Lawler Sustainability carried out a detailed daylight and sunlight assessment for the Proposed Development. This report analysed the impact of the Proposed Development on the surrounding existing dwellings in terms of daylight and sunlight. It has been completed using the ModelIT, Radiance and Suncast applications within the IES Virtual Environment 2021 software.

Figure 10-62: Neighbouring Properties Assessed. Source: Lawler Sustainability

The results demonstrate that an excess of 50% of the existing neighbouring private garden areas will receive at least 2 hours of sunlight, when the Proposed Development is complete (Figure 10-63).

The results also show that as least 50% of the Proposed Development amenity space will achieve a minimum of 2 hours of direct sun light on the 21st of March (figures 10-64 to 10-65).

It is concluded that the Proposed Development has a negligible adverse impact on the surrounding properties.

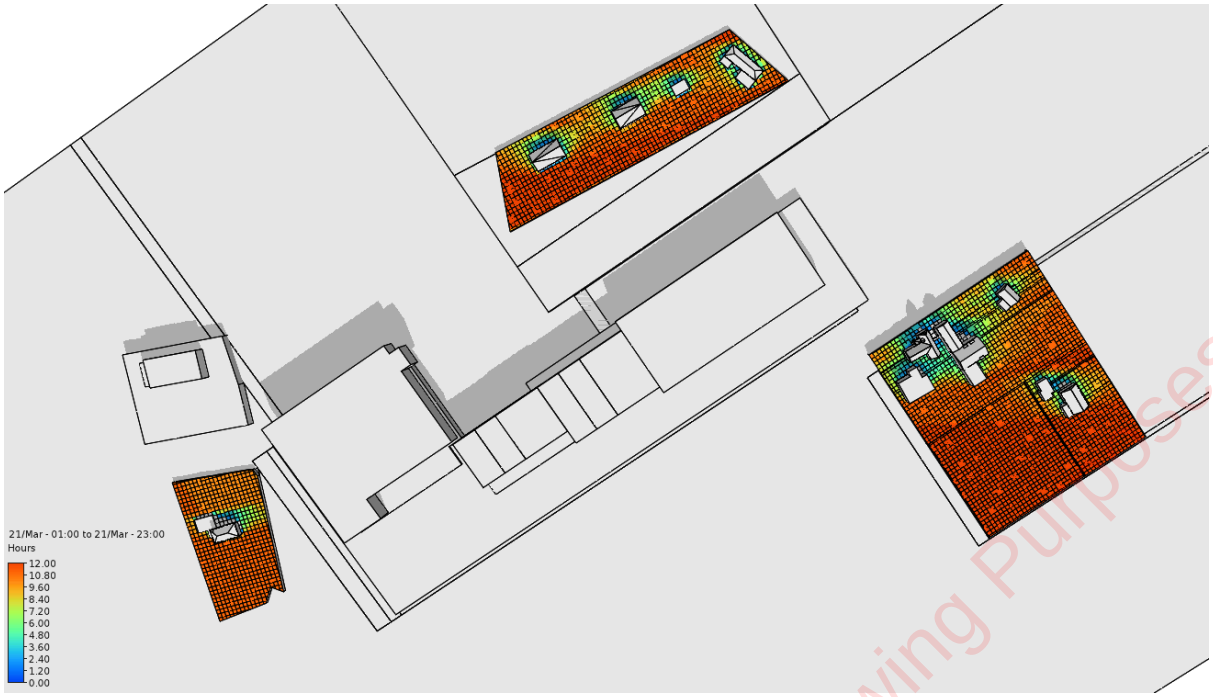

Figure 10-63: Annual Sunlight Probable Hours: Absolute Values on the 21st of March. Source: Lawler Sustainability

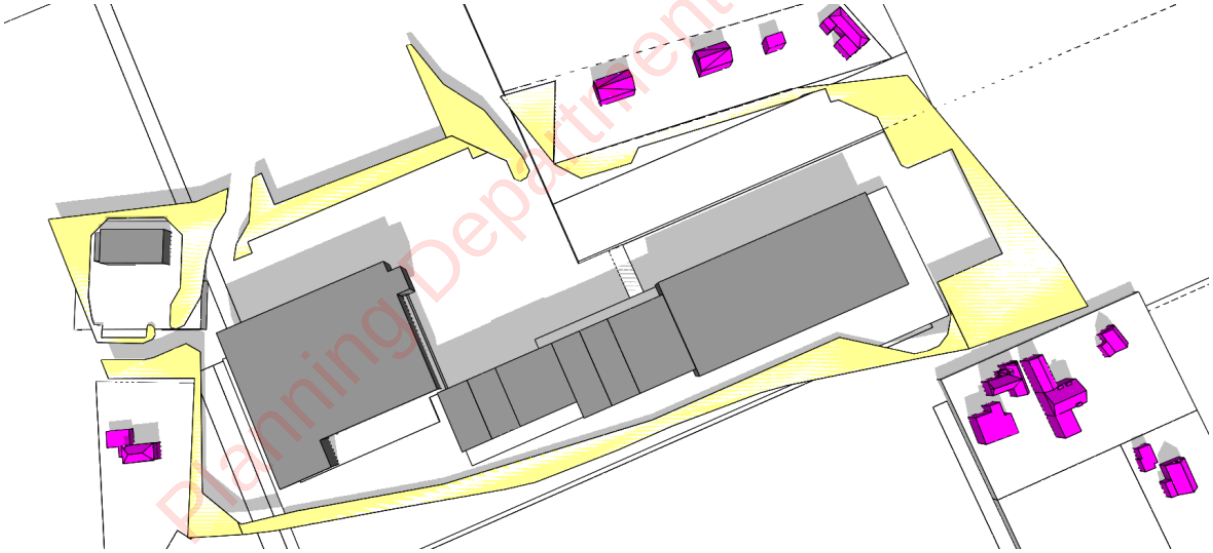

Figure 10-64: Public amenity spaces from the proposed retail unit. Existing residential buildings on magenta; proposed retail units on gray; public amenity spaces on yellow. Source: Lawler Sustainability

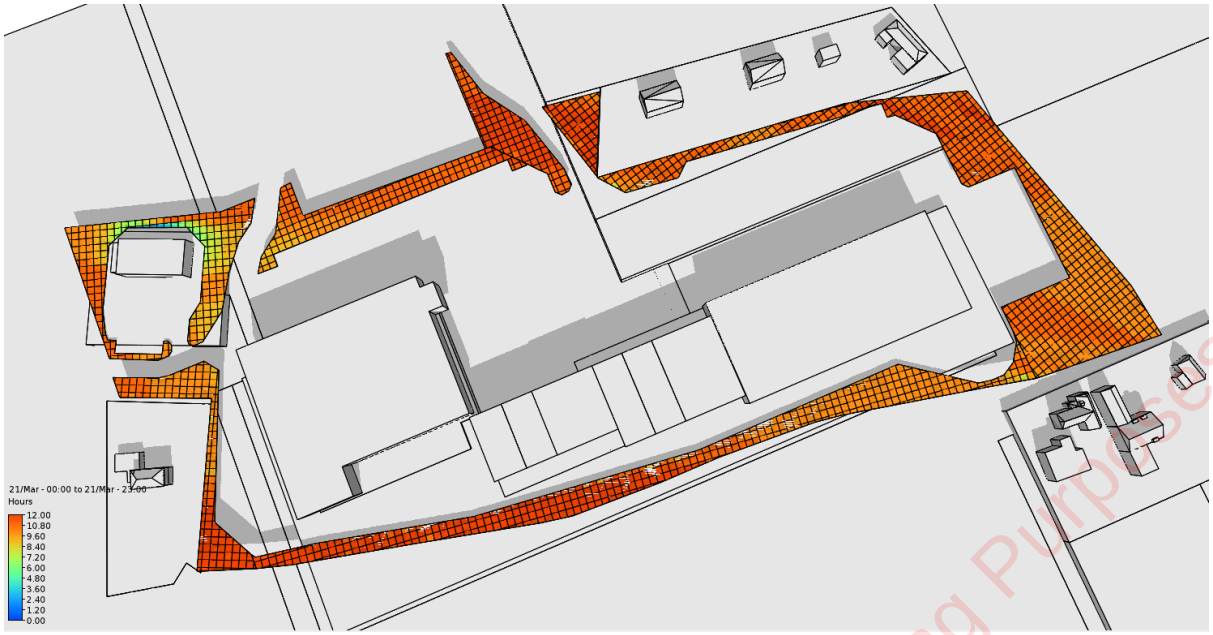

Figure 10-65: Annual Sunlight Probable Hours for Amenity Areas.

The coloured areas receive > 2 hours of sunlight on the 21st of March.

10.5.4 **Potential Cumulative Impacts**

Cumulative impacts can be described as impacts that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.

Given the zoning of the adjoining lands it is reasonable to expect additional development in close proximity, mainly at the West and North.

10.5.5 **"Do Nothing" Impact**

The do-nothing impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur. In the event that the development does not proceed it is very likely that the Proposed Development site would be developed in the future in line with its zoning. If the site is left in its current state, it will be likely continued to be maintained in its current manner and hence a neutral impact will persist on the existing landscape.

10.6 Avoidance, Remedial & Mitigation Measures

The key landscape and visual mitigation measures used during the Construction Phase have been incorporated into the layout of the site and design of the proposed buildings. The height of the buildings will be identical to those existing in the *Retail Park*, clad in a similar neutral colored material and will have a similar horizontal emphasis.

The 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 any locations close to 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(s) and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

For those trees proposed for retention, all necessary mitigation measures will be put in place in order to prevent or reduce impact to its very minimum. Mitigation measures used will need to include the erection of protective fencing at the very start of the works, ground protection installation within root zones where fencing cannot be erected to enclose the entire root zones, monitoring of the site works by the project Arboriculturist throughout the construction process and the use of tree friendly techniques and products for the construction process. This is specified in the Arboricultural report.

10.6.1 **"Worst Case" Scenario**

The worst-case effects arise when the mitigation measures as proposed substantially fail.

This would result in landscape and visual impacts lasting in the medium to long term as due to the location of the Proposed Development on valuable zone land it would be highly likely that it would be redeveloped in the near future.

It is predicted that the 'worst case' scenario of potential visual impact will occur during the winter months when the deciduous vegetation is in a state of dormancy. This will result in the reduced screening effect of deciduous vegetation and potentially increased views of the development. The accompanying photographic survey demonstrates such winter conditions. The potential visual impact will be reduced as the proposed mitigation planting establishes and grows. The Proposed Development is also likely to be most visible during clear weather conditions.

10.7 Residual Impacts

Residual Impacts are defined as '*effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining '*environmental costs'* of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. No negative residual impacts in the context of landscape and visual impact are anticipated regarding this Proposed Development.

10.7.1 Construction Phase

Notwithstanding the proposed ameliorative and mitigation measures proposed during the Construction Phase, it is considered that the initial development of the site, including removal of vegetation and general construction activity will result in overall residual effects that are

moderate, negative temporary impacts and ongoing residual effects that will be moderate, neutral short-term impacts by the closest receptors and reduce rapidly with distance to impacts which are minor/negligible, neutral short term impacts.

10.7.2 **Operational Phase**

On completion, the disturbance and change associated with the construction stage will be gradually altered by the influence that the new development establishes on the character and visual context of its environs. In this regard it is considered that the Proposed Development will have a residual minor local impact on the landscape character of its environs and reduce rapidly with distance to impacts which are negligible, neutral long-term impacts.

10.8 Monitoring

10.8.1 Construction Phase

Landscape tender drawings and specifications were produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

Any construction works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the construction works, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

10.8.2 Operational Phase

Monitoring of the mitigation measures will form part of the landscape management plan. Replacement trees, replacement planting and pruning measures will be captured in landscape maintenance plans and are intrinsically linked to the proposed mitigation measures. All landscape works will be in an establishment phase for the initial three years from planting. A landscape maintenance plan accompanies the planning application. Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

10.9 Interactions

Interactions between Landscape and Visual Impact and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

10.9.1 Population and Human Health

It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the nature of the surrounding landscape, will cause any issues for the residential local population.

10.9.2 Biodiversity

The proposed landscaping of the site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The landscaping proposals will entail losses and contributions in terms of vegetation at the site, which in turn will affect the ecology of the site. The site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.

It is noted that the Proposed Development further negates any habitat loss through the provision of a number of plantations included in the project design. As such, no significant cumulative habitat loss will occur involving the Proposed Development.

10.9.3 Archaeology and Cultural Heritage

As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

10.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

10.11 Conclusion

This Chapter has related the Landscape Impact Assessment (LIA) and the Visual Impact Assessment (VIA) in respect of a Proposed Retail/Commercial Development at lands adjoining the M1 Retail Park County Louth, including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre (Unit 10)(2,350sq.m gfa), 8 no. smaller re-tail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m).

The site of the Proposed Development is currently predominately greenfield with some dispersed trees and shrubs and is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The immediate surrounding landscape is urban/residential to the north, with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature.

In terms of the LIA some significant changes will occur on the landscape of the site, mainly with the removal of existing vegetation, earth movements and general construction activity to the implementation of the proposed buildings, but these changes will also be counterbalanced with the implementation of the new green structure and maintenance of some hedgerows (namely on the western limit and the existing sections on the southern limit).

In what refers to the VIA, 14 viewpoints were assessed, chosen by sensitivity of the views trough site visits and Viewshed's analysis. As it can be seen by the conclusion on the visual effects (Chapter 10.5.2.5) the visual impacts of the Proposed Development are limited to the viewpoints in closer areas of the site that do not have a natural or physical barrier in the existing situation – namely the north and east front. The typology of the proposed buildings adapts well to the existing commercial environment. The new plantings planned for the peripheral zones of the Proposed Development will manage to mitigate the minor visual impacts caused in the short to medium term.

10.12 References

- Louth County Development Plan 2021-2027
- The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013
- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Report (2022)
- Technical Information Note on Townscape Character Assessment, 2016, published by the Landscape Institute
- 'The Countryside Agency and Scottish Natural Heritage – Landscape Character Assessment Guidance for England and Scotland' 2002
- EPA Advice notes on current practice in the preparation of environment impact statements (2003)
- EPA - Environmental Management Guidelines - Environmental Management in the Extractive Industry
- Section 177F of the Planning and Development Act 2000 (as amended)
- A Handbook on Environmental Impact Assessment, Scottish Natural Heritage
- Journal of Environmental Psychology, Visual Thresholds for Detection, Recognition and Visual Impact in Landscape Settings (H. Shang and I.D. Bishop, 2000)
- Landscape design with plants, Brian Clouston
- Atlas of the Irish rural landscape, Aalen, Whelen, Stout

11 ARCHAEOLOGY AND CULTURAL HERITAGE

11.1 Introduction

This chapter of the EIAR describes and assesses the potential effects of the Proposed Development, located in Lands adjoining the M1 Retail Park in Louth on Archaeology, Cultural Heritage and Architectural Heritage. The applicant is seeking planning permission from Louth County Council for the construction of a retail development consisting of 10 no. retail units ranging in size from 300 sq.m to 3,450 sq.m, including 2 no. large anchor units (1 no. supermarket and 1 no. DIY/Home/Leisure with associated garden centre).

The aim of this chapter is to assess the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development, in order to determine any significant impacts that may arise as a result of the Proposed Development and highlight any potential effects this may have on these resources. In addition, mitigation measures are recommended, in accordance with the policies of Louth County Council, the Department of Arts, Heritage, Regional, Rural and Gaeltacht affairs, the National Monuments Acts 1930-2004 and best practice guidelines.

The assessment comprised a paper survey and cartographic research. The sources used were the Record of Monument and Places (RMP), Department of Culture, Heritage and the Gaeltacht (DoCHG), the National Museum of Ireland topographical files, the County Development plans and various literature resources.

The RMP is comprised of manuals listing all known archaeological sites and monuments in each County with accompanying maps locating these sites and additional information from archaeological excavations and assessment records in the intervening period. All sites included in the RMP are protected under the National Monuments Acts (1930-2004). The record is continually updated with information from the results of on-going research and excavation, as new sites are discovered. The types of Recorded National Monuments, both within the study area and in the immediate vicinity, have served to inform the author as to the potential sub-surface archaeology within the study area. This is augmented through the results of previous archaeological excavations and investigations both within and without the study area published in excavation summary reports for each year (www.excavations.ie).

The National Museum maintains a register of finds of archaeological objects from each townland in the twenty-six counties of the Republic of Ireland. Detailed records are held for each find, many of which are regarded as ‘stray finds’ having been recovered by farmers in the course of ploughing or other such activities and received to the museum in accordance with national monuments legislation. The records contain information such as type and location of find, correspondence between the museum and the finder, and, where applicable, results of excavations carried out by museum staff at the location of the finds.

The Louth County Development Plan (2021-2027) has a list of protected structures which has established the preservation of these structures including their settings. The Record of Protected Structures was established under the Local Government (Planning and

Development) Act 2000 and comprises a listing of structures of architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest, along with accompanying maps. It also safeguards the protected structures along with their curtilage against any development without the express permission of the Minister for the Department of Arts Heritage and the Gaeltacht.

A number of literary sources and Cartographic maps were also consulted. Literary sources are a valuable means of completing the written archaeological record of an area and gaining insight into the history of the environs of the proposed works. The principal sources consulted are listed in the bibliography at the end of this chapter. Cartographic maps consulted were the OS 6-inch first edition mapping (1837-1842), 25-inch mapping series (1889-1913) and third edition (1909) for Co. Louth.

11.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting and Ellen O'Carroll, Archaeological Consultant. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Archaeology Chapters and Archaeology & Cultural Heritage Chapters of EIARs.

Dr. Ellen O'Carroll has a Masters (Hons) in Archaeological Methods and Practices from University College Cork and a PhD from Trinity College Dublin in Environmental Archaeological sampling using botanical techniques. She also completed a Diploma in EIA management from UCD and has undertaken, managed and co-ordinated a variety of Archaeological and Architectural sections of EIA's and SEA's.

11.2 Study Methodology

11.2.1 Guidance and Legislation

The following legislation and guidance documents were consulted as part of this assessment. This legislation makes up the main legal mechanisms by which Archaeological, Architectural and Cultural Heritage resources are protected in Ireland.

- National Monuments Act, 1930-2014;
- Heritage Act, 1995;
- Architectural Heritage and Historic Properties Act, 1999;
- Local Government (Planning and Development) Act, 2000
- The Planning and Development (Strategic Infrastructure) Act, 2006;
- EPA 'Advice Notes for preparing Environmental Impact Statements' (Draft 2015);
- EPA 'Guidelines on the Information to be Contained in Environmental Impact Statements' (EPA, 2002);
- EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2022);
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage Protection: Guidelines for Planning Authorities, 2011, (formerly) Department of Arts, Heritage and the Gaeltacht.

The assessment contained in this chapter has involved a desktop study / paper survey which considered all available archaeological, architectural, historical and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features.

11.2.2 Desk Study

The following archaeological, historical and cartographic sources were examined as part of the paper study:

Records of Monuments and Places (RMP) is a list of monuments recorded under Section 12 (1) of the National Monuments (Amendment) Act 1994.

Sites and Monuments Record (SMR) is a national baseline database of known archaeological sites and monuments in Ireland.

Topographical Files of the National Museum of Ireland is an archive containing records of all finds logged by the National Museum.

Aerial Photographs provide an important archaeological resource in terms of detecting new sites and identifying the exact location and extent of known sites. These features can be identified through surface anomalies such as earthworks or distinct vegetation marks.

Excavations Bulletin is an annual publication, started in 1970, which summarises all archaeological excavations carried out in Ireland each year (www.excavations.ie).

The National Inventory of Architectural Heritage is a comprehensive database of structures relating to the architectural heritage of Ireland.

Louth County Development Plan contains a list of Architectural Conservation Areas and recorded Protected Structures for County Louth.

Cartographic Sources are important in providing topographical information on areas of archaeological potential as well as tracing land use development within the Proposed Development area.

11.3 The Existing and Receiving Environment (Baseline Situation)

The site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development. The immediate surrounding landscape is urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the site), with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the site, and Barrack Lane is adjacent to the south of the site.

Ringforts and enclosures are undoubtedly the most common field monuments within the Irish landscape and there are 2 no. ringforts and 3 no. enclosures located within a 1.5km radius of the Proposed Development. A ringfort is generally Early Medieval in date and is a space surrounded by an earthen bank formed by material thrown up from a fosse or ditch located immediately outside the earthen bank. Generally, ringforts vary in size from 25–50 metres in

diameter and are usually circular in plan but can also be oval or D-shaped (Stout, 1997). Other monuments in the surrounding landscape are prehistoric burial monuments such as barrows, ring ditches and cremations, prehistoric cooking places (*Fulachta fia*) and holy wells. Many of these were uncovered during the construction of the M1.

In Mell townland and located 200m to the southeast of the development lands are Patrick's Well (LH024-01001) and St Patrick's Stone (LH024-01002), a cup- marked boulder are by the side of the RI68 road. Also in Mell townland is a holy well, 'Toberboice' (which gives its name to the lane leading down to the river), and an enclosure with souterrains and a cemetery (LH024-012) discovered during pipe-laying in 1984. However, a number of other sites were uncovered close by during archaeological monitoring of topsoil stripping for the M1 motorway. Two adjoining prehistoric ring barrows and an Early Christian cemetery were excavated on higher ground above the glen, 250m to the west, at Mell 2 (00E0430). A ring barrow of Early Bronze Age date at Tullyallen 1 (00E0429), and a curvilinear ditch probably also of Bronze Age date, Tullyallen 3 (00E0947), were located 100-200m further west. On the same ridge as the aforementioned sites, but lying in a pasture field outside the road-take 150m west of the fulacht fiadh, a previously unrecorded site - a possible ring barrow or enclosure - appears as a cropmark on an aerial photograph, one of a series taken of the motorway route before construction (www.excavation.ie).

Figure 11-1 indicates the location of the Proposed Development in relation to archaeological monuments and architectural features.

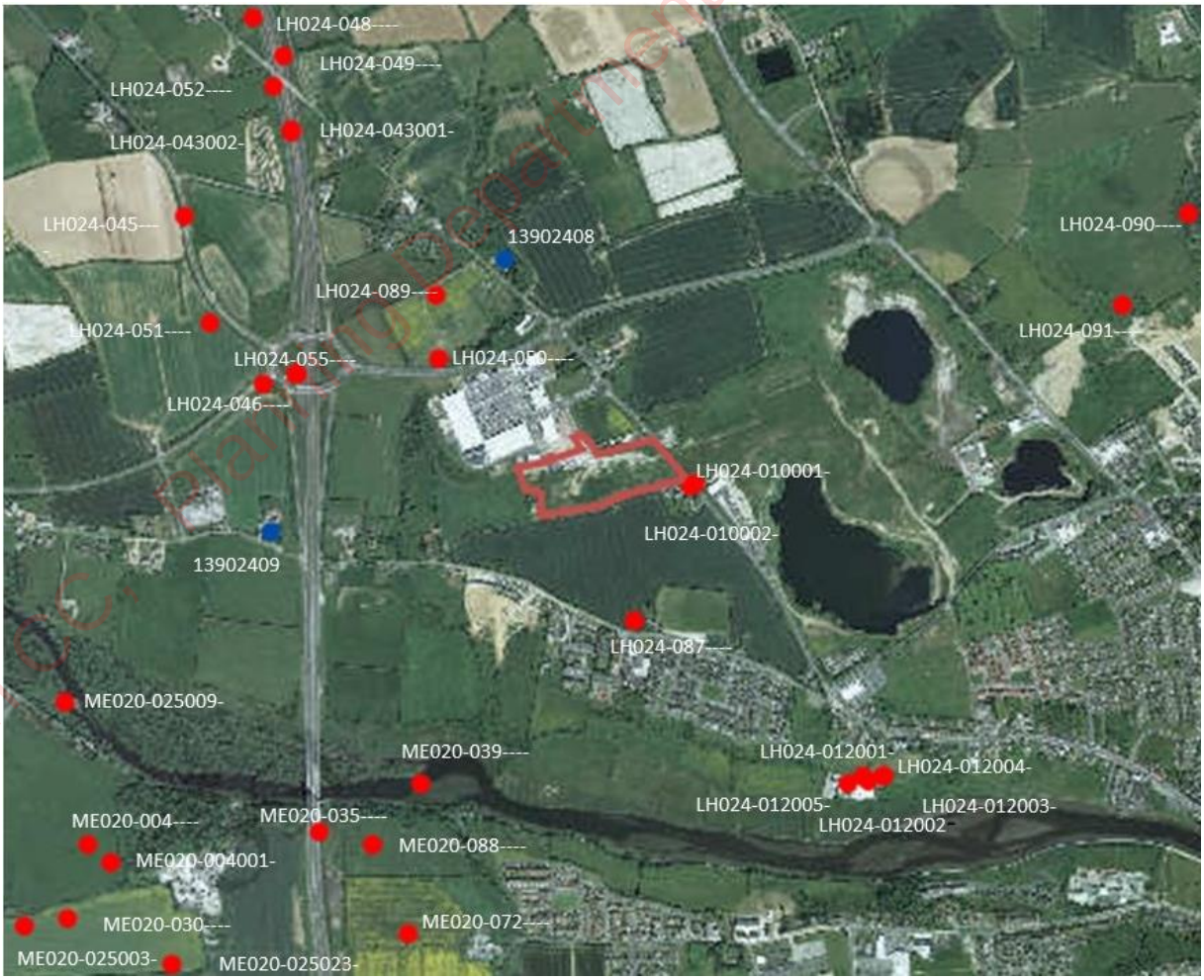

Figure 11-1: Location of Proposed Development (red line boundary) in relation to archaeological monuments and architectural features (red and blue dots)

11.4 Characteristics of the Proposed Development

BPM GP3 Limited intend to apply for Planning Permission for development on lands to the south of the existing M1 Retail Park, Mell, Drogheda, Co. Louth.

The development will consist of:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

11.4.1 RMP files (Record of Monuments and Places) close to the study area

Within a 1.5km radius of the Site there are 23 no. recorded archaeological monuments. The monuments are listed below, and identified by townland, RMP number, site type, site status and distance of the site for the Proposed Development. The RMP reference consists of a three-letter county code, the relevant number of the Ordnance Survey six-inch sheet on which the Site is located, and the number of the individual monument. This information is gathered from the online Historic Environment Viewer provided by the Department of Culture, Heritage, and the Gaeltacht. These monuments are discussed below within the context of the historical and archaeological background of the surrounding area. No Recorded Monuments will be affected by the development plans. No Recorded Monuments will be affected by the development plans.

RMP No. LH024-050----

Townland Mell

Site Type Fulacht fia

Description Discovered prior to road construction (Excavation Licence No. 00E0946). A small spread of burnt material (10.8m x 3.2m) was initially exposed (this was not the full extent of the spread but all that was exposed to facilitate the development). Removal of the spread uncovered three pits cut into the natural subsoil. One was sub-rectangular (1.5m x 1.2m; D 0.8m), the second was sub-circular (diam. 1.5m; D 0.41m) and the third was irregularly shaped and lined with charcoal, however its full extent was not established as it extended beyond the road take. (Campbell 2002, 235).

Distance This RMP site is located 0.5 km North-West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-089----

Townland Mell

Site Type Ringfort - rath

Description Located at the tip of a small, low W-E spur. It overlooks a curve to the E of a small N-S stream that is c. 170-200m distant. The cropmark of a circular enclosure (diam. c. 30m) defined by a single fosse is visible only on Google Earth (21/07/2021). This is within an outer oval enclosure (dims c. 60m NE-SW; c. 50m NW-SE) defined by single fosse, but the perimeters of both appear to coincide NW-N.

Distance This RMP site is located 0.6 km North West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-010002-

Townland Mell

Site Type Ritual site - holy/saint's stone

Description Marked 'St. Patrick's Stone' on the 1835 and 1938 'OS 6-inch' maps. A large natural boulder with three circular depressions, which, according to tradition are the prints of St. Patrick's knees and staff (Davies 1944, 296; IFC Schools' Mss 679, 181).

Distance This RMP site is located 0.2 km East of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-010001-

Townland Mell

Site Type Ritual site - holy well

Description Marked 'St. Patrick's Well' on the 1835 and the 1938 'OS 6-inch' maps. Covered over with a public pump when inspected by ASI in 1966.

Distance This RMP site is located 0.2 km East of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-087----

Townland Mell

Site Type Ringfort - rath

Description Located towards the top of a S-facing slope. An arc (int. diam. c. 20m E-W; ext. diam. c. 25m) of two fosses curving SW-N-ENE is visible only on Apple Maps, which utilises a survey conducted by Bluesky International during June 2018. It was first reported by Anthony Murphy.

Distance This RMP site is located 0.4 km South of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-055----

Townland Mell

Site Type Cremation pit

Description Discovered prior to construction of the M1 motorway in 2000 (Excavation Licence 00E0430). A triangular pit (1m x 0.75m) filled with ash, charcoal, burnt clay and fragments of cremated bone. Postholes found around this pit were filled with the same material as the main pit. Situated immediately to the E of cemetery (LH024-054----) and just S of a ring ditch (LH024-062----) and Bronze Age enclosure (LH024-063----) and possibly associated with the latter two. (Breen 2002, 235)

Distance This RMP site is located 0.8 km West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-046----

Townland Tullyallen

Site Type Barrow - ring-barrow

Description A multi-phase ring barrow (external diam. c. 13.2m), with a centrally placed cremation contained within a pottery vessel, was uncovered here in 2000 prior to construction of the M1 Motorway (Excavation Licence No. 00E0429). The ditch (max. D c. 1m; Wth 1.9m) displayed three distinct phases of activity and at least six token cremations were discovered in the SE quadrant of the final phase. (Chapple 2002, 242-3)

Distance This RMP site is located 0.9 km West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-051----

Townland Tullyallen

Site Type Excavation - miscellaneous

Description Discovered prior to road construction (Excavation Licence No. 00E0947). A curvilinear ditch (max. Wth at the top of excavated section 2.9m; max. D 1.68m) which contained a flint scraper, two waste flint flakes, an inscribed stone disc and a small quantity of burnt bone. A small linear trench (L 3.1m; Wth 0.16m; max. D 0.25m) was located 5m N of this ditch and contained six struck flint flakes. (Campbell, 2002)

Distance This RMP site is located 1.1 km West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-045----

Townland Tullyallen

Site Type Enclosure

Description A complex of ditches, pits and spreads were excavated here in 2000 prior to construction of the M1 Motorway (Excavation Licences No. 00E0282 and 00E0832). The exact function of these features is not certain. Flints, slag and burnt bone were recovered in association with the features. (Duffy 2002, 243)

Distance This RMP site is located 1.3 km North West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-043001-

Townland Mell

Site Type Souterrain

Description An L- shaped souterrain with a collapsed beehive chamber at one end was uncovered here in 2000 prior road construction of the M1 motorway (Excavation Licence 00E0631). The walls were of drystone construction. The total length of the souterrain was 36.88m and its roof (of lintels) was intact for almost one third of this. The average width of the passage was 0.72m and its height was 1.1m. At about mid-length there was a step c. 0.45m in height. A number of sherds of Carrowkeel ware pottery were recovered from the souterrain together with a bronze mount decorated with openwork interlace. Six sections of earthworks (LH024-043002-) were excavated in the vicinity. (Breen 2002, 235-6)

Distance This RMP site is located 1.2 km North West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-043002-

Townland Mell

Site Type Excavation - miscellaneous

Description Sections of six separate linear ditches were exposed and excavated here in 2000-1 prior road construction of the M1 motorway (Excavation Licence 00E0631). 'Ditch A' was located 27m SE of a souterrain (LH024-043001-), it was V- shaped (Wth 2-3.5m; D 1.56m) and a 24m length running in a E-W direction was excavated to facilitate the road development. The only find was a piece of iron slag. 'Ditch B' was located just over 40m S of 'Ditch A'. The excavated L was 29m (Wth 1.7-2.8m; D 1.18m). Finds recovered included animal bones, a lignite spindle whorl, part of a lignite bracelet and a blue glass bead. 'Ditch C' was V-shaped (max. Wth 1.6m; D 0.7- 2m) and appeared to be cut by the souterrain. A sherd of pottery and some possible cremated bone were recovered from the fill. 'Ditch D' was located 20m S of the souterrain, it was V-shaped (Wth c. 1.5m; D 0.6m) and its surviving L was 13.11m. A number of flint flakes and some possible sherds of Neolithic pottery were recovered from the area around this ditch. (Breen 2002, 236-7). 'Feature F' (Wth 2-3.5m) was located 27m SW of the souterrain and the only find from it was a piece of iron slag. 'Feature G' (Wth 1.7-2.8m; D 1.18m), was located 41m south of the souterrain and finds 'included a flint blade, cores and débitage, prehistoric pottery, a cylindrical wooden object, and two items of lignite or similar material: a spindle-whorl and a fragment of a bracelet'. (Breen 2003, 267)

Distance This RMP site is located 1.2 km North West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-052----

Townland Mell

Site Type Excavation - miscellaneous

Description A sub-circular pit (0.83m x 0.58m, D 0.14m) which contained sherds of coarse pottery, heat fractured stones and a possible granite maul was discovered prior to construction of the M1 motorway (Excavation Licence No. 00E0940). (Campbell 2002, 237).

Distance This RMP site is located 1.3 km Noth West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-049----

Townland Mell

Site Type Fulacht fia

Description Discovered prior to construction of the M1 motorway (Excavation Licence No. 01E0067). A spread of burnt material (10.5m x 8m) was initially exposed. Removal of this uncovered four pits cut into the natural subsoil. The widest and shallowest pit (3m x 1.6m; D 0.16m) contained a flint scraper and five waste flakes. (Campbell 2003, 268)

Distance This RMP site is located 1.3 km Noth West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-048----

Townland Mell

Site Type Fulacht fia

Description Discovered prior to construction of the M1 motorway (Excavation Licence No. 00E0945). A spread of burnt material (13m x 8.8m) was initially exposed. Removal of this uncovered four pits, the largest of which may have functioned as a trough (2.6m x 1.8m; D 0.6m). A large amount of flint was recovered from the site. (Campbell 2002, 237)

Distance This RMP site is located 1.5 km North of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. ME020-039----

Townland Oldbridge

Site Type Ford

Description N/A

Distance This RMP site is located 1.0 km South West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. ME020-088----

Townland Oldbridge

Site Type Enclosure

Description Located at the bottom of a N-facing slope down to a W-E section of the River Boyne, with the river c. 100m to the N, and just E of the M1 motorway. Archaeological testing (08E0506) identified a large enclosure (int. diam. c. 70m) defined by a ditch which produced a wealth of Middle Bronze Age pottery. (Ó Maoldúin 2011)

Distance This RMP site is located 1.1 km South West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. ME020-035----

Townland Oldbridge

Site Type Excavation - miscellaneous

Description N/A

Distance This RMP site is located 1.2 km South West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. ME020-072----

Townland Oldbridge

Site Type Enclosure

Description A possible enclosure was identified on Lidar imagery

Distance This RMP site is located 1.3 km South of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-012005-

Townland Mell

Site Type Ritual site - holy well

Description Marked on the 1835 'OS 6-inch' map as 'Toberboice Well'. There is a tradition that St. Boice drank from this spring before he was beheaded (IFC Schools' Mss 679, 179). It was covered in concrete when inspected by ASI in 1967.

Distance This RMP site is located 1.0 km South East of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-012001-

Townland Mell

Site Type Souterrain

Description The site consisted of two sections of souterrain and a cemetery site (LH024-012003-) within an enclosure (LH024-012004-) discovered during pipe-laying. The two sections of souterrain were situated 8-10m apart. The E section of the souterrain consisted of a drystone-built passage (L 2m). The W section consisted of part of a delintelled circular chamber.

Distance This RMP site is located 0.5 km South of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-012003-

Townland Mell

Site Type Burial ground

Description Associated with the remains of souterrain (s) (LH024-012001- and LH024-012002-), discovered in 1983 during the course of cutting a trench for sewerage. The site was recorded by Mr C. Manning (OPW) who supervised the digging of trial trenches in 1985 and discovered a small enclosure (LH024-012004-). It was c. 50m in diameter and was defined by

a ditch (Wth 2.5m, D 1.8m). The burials were very scattered but were seen to be orientated E-W and were not slab-lined. The souterrain and the burials were enclosed by the ditch.

Distance This RMP site is located 0.5 km South of the development Site.

Impact This site will not be affected by the Proposed Development plans.

RMP No. ME020-025009-

Townland Oldbridge

Site Type Ford

Description N/A

Distance This RMP site is located 1.5 km South West of the development Site

Impact This site will not be affected by the Proposed Development plans.

RMP No. LH024-091----

Townland Moneymore

Site Type Ring-ditch

Description Located at the bottom of a slight N-facing slope and at the S edge of a smal basin (diam. c. 300m N-S; c. 300m E-W). An oval enclosure (dims c. 20m E-W; c. 15m N-S) defined by a single fosse feature is recorded in a gradiometer survey (18R0118) of a development area. It has a wide entrance at E and it may have numerous pits in the interior. It is situated beneath a N-S access route that is depicted on the 1835 edition of the OS 6-inch map. (Murphy and Breen 2021, 9)

Distance This RMP site is located 1.4 km East of the development Site.

Impact This site will not be affected by the Proposed Development plans.

11.4.2 Topographical files, National Museum of Ireland (NMI)

There are no topographical files on the Site of the Proposed Development in the National Museum files. The closest recorded topographical file to the Proposed Development is the Hill of Rath (object type - Three Cordoned Urns; One Encrusted Urn; Bone Pin; Bronze Razor; Flint Flake; Polished Stone 'Whetstone'; etc.) located 1.4km from the Proposed Development.

11.4.3 Cartographic Analysis

The following historical maps were analysed as part of the paper study for this report.

11.4.3.1 Historic six-inch Ordinance Survey Map, 1837-1842

The first edition of the six-inch Ordnance Survey map was carried out from 1837-1842. This map shows the Proposed Development Site and surrounding areas as agricultural land. This similar layout is recorded in all mapping consulted.

See Figure 11-2 OS mapping historic 6'' First Edition Colour (GEOHIVE).

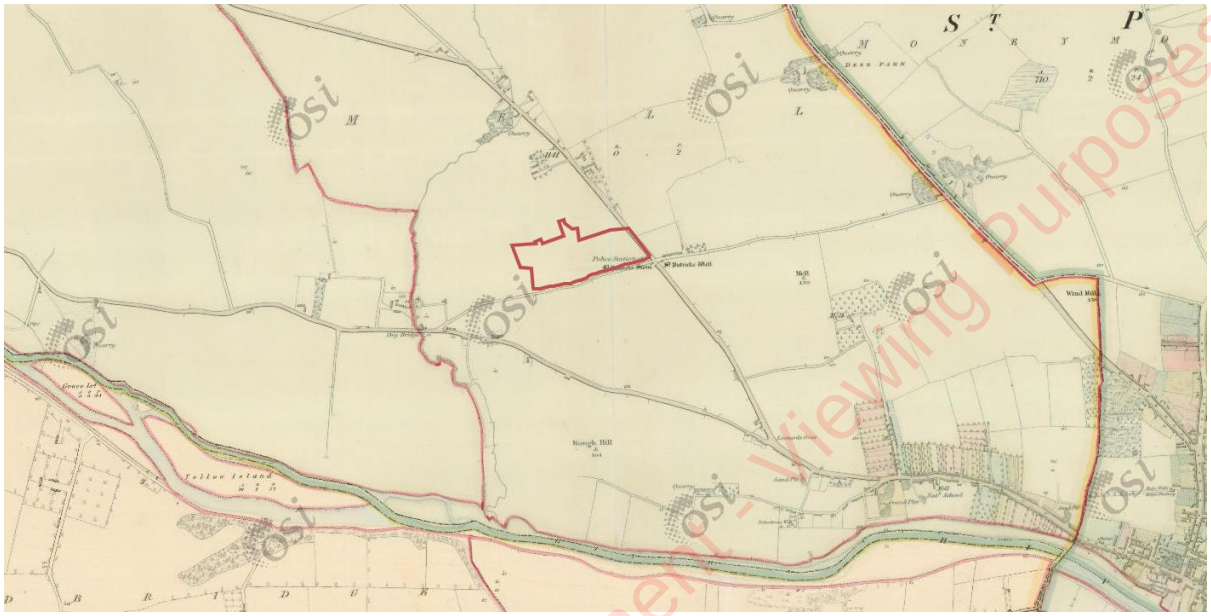

Figure 11-2: First Edition 6-inch Ordinance Survey Map, 1837-1842 with project site (Red outline)

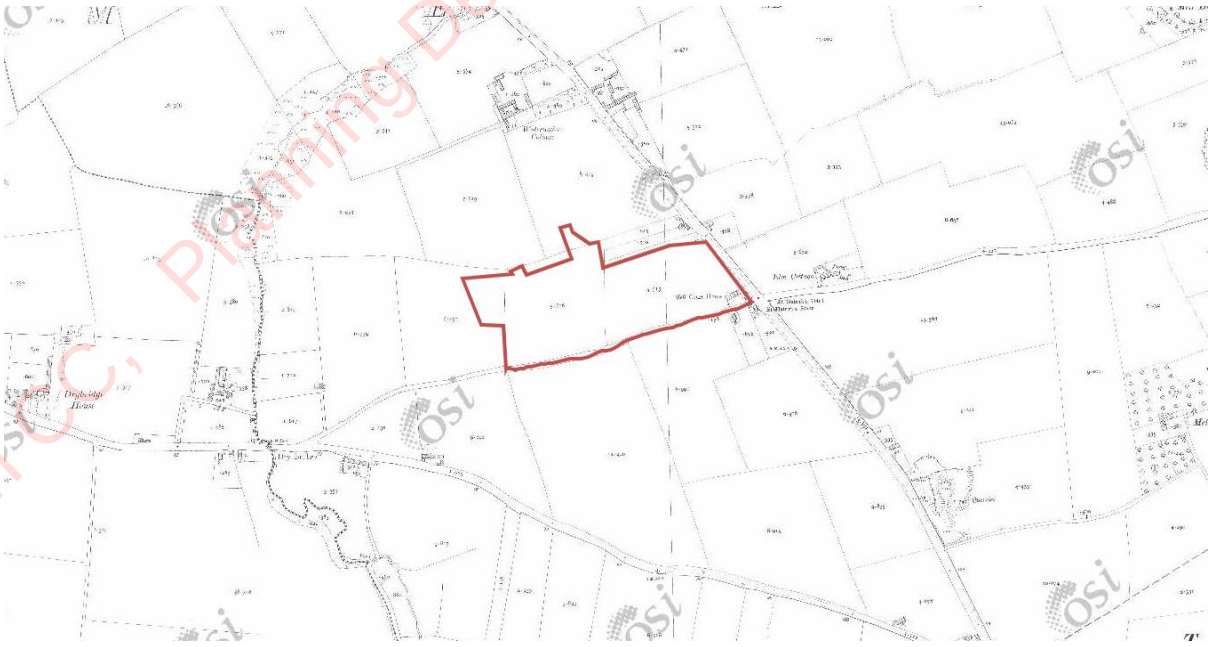

Figure 11-3: First Edition 25-inch Ordinance Survey Map, 1837-1842 with project site (Red outline)

11.4.3.2 Topographical Files

The topographical files of the National Museum of Ireland are a national archive of all known finds that have been recorded by the National Museum, donated in accordance with national monuments legislation. The information on artefact finds have been recorded by the National Museum of Ireland since the late 18th century, and the information obtained from this is important in helping to establish prehistoric and historic activity in the Proposed Development area. Artefacts are the primary files however it also includes references to monuments as well as previous excavations records. A search in the topographical files as well as the National Museum of Ireland finds database (2010) on the Heritage maps online facility produced 1 no. results for the development lands and surrounding areas within a 1.5 km radius.

The following finds relate to townlands in the general area and reflect prehistoric and early historic activity.

Name: Hill of Rath

Object Type: Three Cordoned Urns; One Encrusted Urn; Bone Pin; Bronze Razor; Flint Flake; Polished Stone 'Whetstone'; etc.

Distance: 1.3 km East of Proposed Development.

11.4.3.3 Excavations Database and Previous Work Carried Out in the Surrounding Area

Excavations.ie contains summary accounts of all the excavations carried out in Ireland – North and South – from 1970 to 2018. This dataset is compiled in order to provide summary accounts of all excavations carried out on the island of Ireland.

Within a 1.5km radius of the Site there are 19 no. recorded excavations. The excavations are listed below, and identified by license number, site name, site type, and distance of the site for the Proposed Development. This included 6 no. of prehistoric sites and 3 no. site of “No archaeological significance”.

License No.: 05E0072

Site Name: WATERUNDER, MELL

Site Type: Prehistoric settlement and Iron Age industry

Distance: This excavation site is located 0.3 km North-West of the development Site.

License No.: 00E0738

Site Name: SLANE ROAD, DROGHEDA

Site Type: No archaeological significance

Distance: This excavation site is located 0.4 km South of the development Site.

License No.: 00E0738 ext.

Site Name: SLANE ROAD, DROGHEDA

Site Type: No archaeological significance

Distance: This excavation site is located 0.4 km South of the development Site.

License No.: 04E1687

Site Name: WATERUNDER, MELL

Site Type: Monitoring

Distance: This excavation site is located 0.5 km North-West of the development Site.

License No.: 00E0860

Site Name: Oldbridge

Site Type: Battlefield

Distance: This excavation site is located 0.6 km South of the development Site.

License No.: 00E0430

Site Name: MELL 2

Site Type: Early medieval cemetery and prehistoric cremation pit

Distance: This excavation site is located 0.75 km North-West of the development Site.

License No.: 00E0430 ext.

Site Name: MELL 2

Site Type: Ring-ditch and ditched enclosure

Distance: This excavation site is located 0.75 km North-West of the development Site.

License No.: 13E0400

Site Name: Oldbridge

Site Type: No archaeology found

Distance: This excavation site is located 0.9 km South of the development Site.

License No.: N/A

Site Name: TULLYALLEN 2

Site Type: No archaeological significance

Distance: This excavation site is located 0.95 km West of the development Site.

License No.: 00E0947

Site Name: TULLYALLEN 3

Site Type: Prehistoric ditch

Distance: This excavation site is located 1 km North-West of the development Site.

License No.: 98E0285

Site Name: OUGHBOY, DROGHEDA

Site Type: Medieval monastic

Distance: This excavation site is located 1 km South-East of the development Site.

License No.: 00E0832

Site Name: TULLYALLEN 4

Site Type: Prehistoric

Distance: This excavation site is located 1.2 km North-West of the development Site.

License No.: 00E0631

Site Name: MELL 3

Site Type: Souterrain and earlier features

Distance: This excavation site is located 1.2 km North-West of the development Site.

License No.: 00E0938

Site Name: OLDBRIDGE 2

Site Type: Prehistoric pit

Distance: This excavation site is located 1.2 km South-West of the development Site.

License No.: 00E0939

Site Name: OLDBRIDGE 3

Site Type: Undated deposits

Distance: This excavation site is located 1.2 km South-West of the development Site.

License No.: 00E0940

Site Name: MELL 6

Site Type: Prehistoric pit

Distance: This excavation site is located 1.3 km North-West of the development Site.

License No.: 01E0067

Site Name: Mell 4

Site Type: Fulacht fiadh

Distance: This excavation site is located 1.3 km North-West of the development Site.

License No.: 04E0507 and ext.

Site Name: Rathmullan Road, Drogheda

Site Type: Enclosure

Distance: This excavation site is located 1.3 km South of the development Site.

License No.: 08E0506

Site Name: Oldbridge

Site Type: Testing

Distance: This excavation site is located 1.3 km South of the development Site.

11.4.4 Louth County Development Plan 2021-2027

The Louth County Development Plan 2021-2027 addresses Architectural Conservation Areas, historic areas and Protected Structures, and recognises the statutory protection afforded to all Records of Monuments and Places (RMP) and all archaeological heritage sites under the National Monuments Legislation (1930-2004), and the development plan lists a number of aims and objectives in relation to archaeological and architectural heritage.

- BHC 1: To protect and enhance archaeological sites and monuments, underwater archaeology, and archaeological objects listed in the Record of Monuments and Places (RMP), and/or the Register of Historic Monuments and seek their preservation (i.e. presumption in favour of preservation in situ or in exceptional cases, at a minimum, preservation by record) through the planning process and having regard to the advice

and recommendations of the National Monuments Service of the Department of Housing, Local Government and Heritage and the principles as set out in the 'Framework and Principles for the Protection of the Archaeological Heritage' (Department of Arts, Heritage, Gaeltacht and the Islands 1999).

- BHC 33: To ensure any new service infrastructure (installed by the Local Authority or Public/Private Sector Utility Companies) shall not be located where it will be detrimental to the character of the Architectural Conservation Area.

Each of these objectives has been considered and the Proposed Development has been designed in such a way as to fulfil the objectives.

Ardee, Carlingford, Drogheda and Dundalk are all former walled towns in County Louth, which were founded between the twelfth and thirteenth centuries. Each of these walled towns is regarded as a single recorded monument and all are Zones of Archaeological Potential. Town walls and other defences are categorised as National Monuments under the National Walled Towns Policy 2008. The Site is located approximately 1.14 km from Drogheda town centre. The upstanding remains of the walled towns in Drogheda are identified as Protected Structures however based on the HeritageMaps.ie, the Site in does not lie in the vicinity of any protected structures.

11.4.4.1 Architecture

Protection is also recognised to areas of cohesive architectural value and these areas can be classified as Architectural Conservation Areas (ACA), and any works that may have a material effect on the special character of an ACA needs planning permission. An area can be designated an ACA often because it contains a group of historic buildings or has a distinctive street size/plot size that contributes to the distinct character of a town or village.

In the Drogheda area, there are 18 no. Architectural Conservation Areas, as follows:

- Bolton Square/Green Lanes
- Clintons Lane
- The Dale
- Fair Street
- Laurence's Street
- Legavoureen Park
- Magdalene Street (North)
- St. Mary's Cottages
- Millmount
- North Quays / Back Lanes
- St. Peters Church
- Railway Terrace
- Windmill Road
- West Street
- Leyland Place
- Ship Street
- Old Abbey Lane
- Merchant's Quay

Figure 11-4: Proximity of Site to ACA's

The Proposed Development does not lie within any of the above designated areas. The nearest ACA to the Site is Windmill Road which is located 1.9km East.

11.4.4.2 Protected Structures

A protected structure is a structure or part of a structure that a planning authority considers to be a special interest from an "*architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest*".

In certain circumstances, some archaeological structures may also be considered as architectural heritage, meaning they may therefore appear on both the Record of Monuments and Places (RMP) and the Record of Protected Structures (RPS). These structures are protected by both the National Monuments Acts and the Planning and Development Acts 2000 (as amended).

According to the Louth County Development Plan Map 24, there are no protected structures within the Site boundary. The nearest protected structure is a "*detached five-bay two-storey house, built c. 1820. Porch to south, attached outbuilding to west*" (008) located 0.8km east of the Site. Drybridge Cottage (DB-292) is also located approximately 450m from the site and is described as a *"Four-bay single-storey thatched cottage with thatched gabled porch and triangular thatched dormer window, replacement windows, and new half door"* (Figure 11-5).

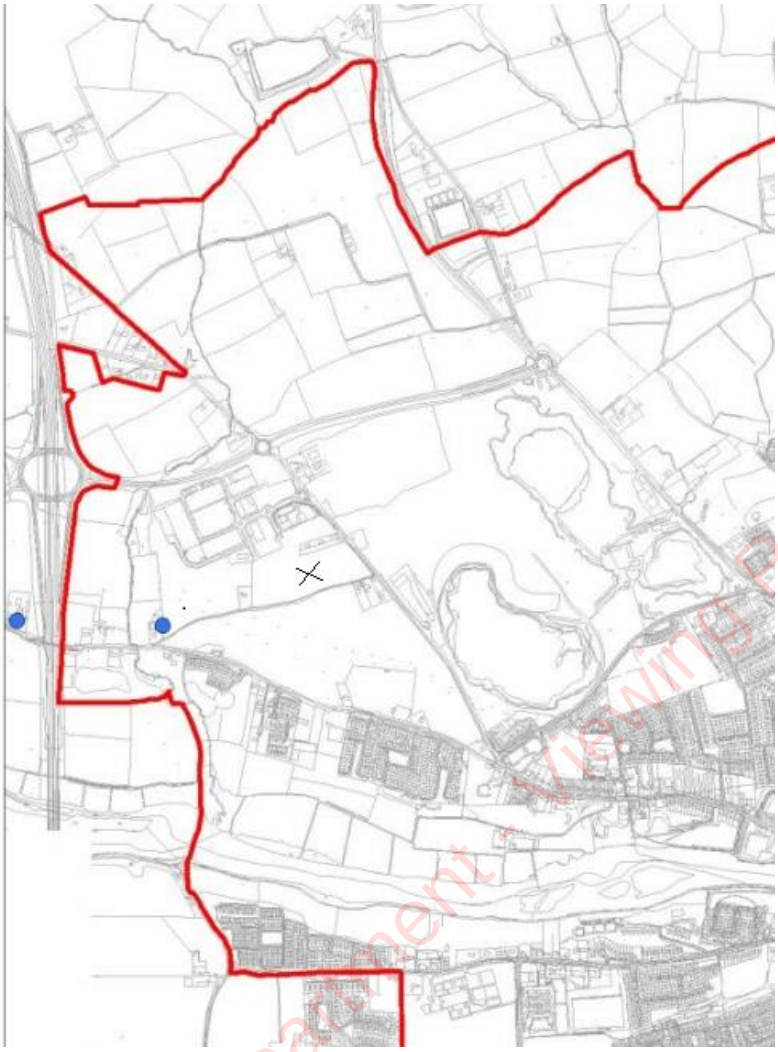

Figure 11-5: Built Heritage Drogheda (Extracted from Louth CDP, Appendix 8, Map 13). (Protected Structures detailed in blue. Site location detailed with black X)

11.4.4.3 Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) was reviewed in order to identify any buildings/features of architectural significance within 2km of the Proposed Development Site. The NIAH Registration Number refers to the registration number on the National Inventory of Architectural Heritage building survey of County Louth. The NIAH is a section within the Department of the Arts Heritage and the Gaeltacht, and the work involves identifying and recording the architectural heritage of Ireland from 1700 to present day Ireland. It is important to note that there may be structures in the NIAH survey that are also included in the RPS, however not all of them are. 2 no. buildings/features of architectural significance are located with 1.5km of the Proposed Development Site. Information from the National Inventory of Architectural Heritage on these buildings and their features are given below.

Reg. No. 13902409 (Drybridge House)

Date 1800 - 1840

Original Use House

Categories of Special Interest Architectural

Description Detached five-bay two-storey house, built c. 1820. Attached to two-storey range of farm buildings to west and farmyard complex to west.

Distance This is located 0.9 km West of the development Site

Impact This site will not be affected by the Proposed Development plans

Reg. No. 13902408

Date 1850 - 1890

Original Use Farmhouse

Categories of Special Interest Architectural

Description Detached five-bay two-storey farmhouse, built c. 1870, now disused

Distance This is located 0.9 km West of the development Site

Impact This site will not be affected by the Proposed Development plans

11.5 Potential Impact of the Proposed Development

11.5.1 Construction Phase

The Site has been previously developed and as such there has been significant ground disturbance within its boundary. There is a low potential for the discovery of archaeological remains. Although no recorded archaeological sites occur within the development boundary and no features of possible archaeological interest were identified on the field surfaces, the potential for sub-surface archaeological remains being discovered during earthmoving and topsoil stripping must be considered.

11.5.2 Operational Phase

The Operational Phase of the Proposed Development will not result in any impact on the Archaeology and Cultural Heritage of the area.

Once appropriate mitigation measures such as pre-development archaeological testing and resolution of any uncovered remains are implemented there will be no archaeological impacts during the construction phase.

11.5.3 Potential Cumulative Impacts

In the context of archaeology and cultural heritage impact, no cumulative effects are anticipated from the Proposed Development.

11.5.4 “Do Nothing” Impact

A do-nothing scenario would result in the Site remaining as a greenfield site. If the Proposed Development were not to proceed, the existing Site would continue to be present.

The land of the current Site is currently an operational retail park, a 'Do-Nothing' scenario would result in under-utilisation of the landscape in terms of improving the Proposed Development for retail purposes and would be limited in the range of amenity and use.

11.6 Avoidance, Remedial & Mitigation Measures

11.6.1 Construction Phase

It is recommended that a programme of invasive linear test trenching be carried out by a licensed archaeologist in the areas of sub-surface works including re-routing of services, additional drainage, slip roads, and other facilitation works associated with the proposed development site. The purpose of testing is to identify sub surface archaeological remains within the development site and to determine the impact of the proposed development on such remains if they occur. Should archaeological features and or deposits be revealed then any further work would be subject to further licensing with approval from the Department of Arts, Heritage and the Gaeltacht who may recommend preservation *in situ* or preservation by record. The testing should be completed as far in advance of other scheduled site works as possible.

The presence or otherwise of archaeological soils or deposits could also be determined by examining the reports on any engineering bore-holes and test-pits that may be carried out in advance of construction in the waterlogged area.

All recommendations in this report are subject to discussion with and approval from the Department of Arts, Heritage and the Gaeltacht.

11.6.2 Operational Phase

Once appropriate mitigation measures such as pre-development archaeological testing and resolution of any uncovered remains are implemented there will be no archaeological impacts during the construction phase.

11.6.3 "Worst Case" Scenario

If the Proposed Development were to proceed without the implementation of the archaeological mitigation measures outlined in Section 11.6 then construction works could result in permanent, direct, significant, negative impacts on any unrecorded, sub-surface archaeological features that exist within the site.

11.7 Residual Impacts

Following the successful implementation of the mitigation measures outlined in Section 11.6.1, no residual impacts on the cultural heritage resource are predicted to arise as a result of the Proposed Development.

11.8 Monitoring

11.8.1 Construction Phase

No specific monitoring measures are required in relation to archaeology and cultural heritage for the Proposed Development (see Section 11.6).

11.8.2 Operational Phase

Following the successful implementation of the mitigation and monitoring measures outlined above no further monitoring measures will be required during the operational phase.

11.9 Interactions

Interactions between Archaeology and Cultural Heritage and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

11.9.1 Land, Soil and Geology

The Construction Phase of the Proposed Development will require:

- Excavation of subsoil and bedrock to reduce levels to construct the foundations and for the surface water drainage including an attenuation tank to a maximum depth of 3.3mbGL.
- Piling for the construction of foundations (to be confirmed at detailed design phase).
- Excavated material that cannot be reused on-site will be temporarily stockpiled at the Site and then be removed by the licenced waste carriers and sent for reuse at other local development sites or recovery with disposal considered as a final option only.
- The Proposed Development will include the importation of aggregates for the construction of roads and other infrastructure.

There will be no excavation of soil or bedrock or infilling of waste during the Operational Phase of the Proposed Development. There will be discharges to ground via the SuDs during the Operational Phase of the Proposed Development. Approximately 66% of the Proposed Development Site area will be hard covered with buildings and impermeable pavement on completion of the Proposed Development.

11.9.2 Landscape and Visual

As there are no known archaeological or architectural remains found during the desk top survey, is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

11.10 Difficulties Encountered When Compiling

There were no difficulties in compiling the specified information with regard to archaeological, architectural and cultural heritage.

11.11 References

Archaeological Survey Database, available at: http://webgis.archaeology.ie/historicenvironment/

Department of Arts, Heritage, Gaeltacht and the Islands (1999b). Policy and Guidelines on Archaeological Excavation. Dublin. Government Publications Office.

Heritage Maps available at: https://heritagemaps.ie/

National Monuments of Ireland database available at: http://webgis.archaeology.ie/historicenvironment/

National Inventory of Archaeological Heritage, available at: http://www.buildingsofireland.ie/Surveys/Buildings/

OSI mapping (www.osi.ie)

https://heritagemaps.ie/WebApps/HeritageMaps/index.html

Louth County Development Plan 2021-2027

www.excavations.ie

12 MATERIAL ASSETS: WASTE, UTILITIES AND TRAFFIC

12.1 Traffic

12.1.1 Introduction

This section assesses the traffic and transport impacts of a proposed retail at the M1 Retail Park, Drogheda, Co. Louth (the Proposed Development) on the local road network, as well as identifying proposed mitigation measures to minimise any impacts.

The development comprises 8,926 m^2 GFA of retail / shopping space, of which 4,100 m^2 will be a major supermarket outlet.

This document should be read in conjunction with the following 2 No. documents:

- Traffic Assessment for proposed retail development, M1 Retail Park, Drogheda, County Louth
- Mobility Management Plan for proposed retail development, M1 Retail Park, Drogheda, County Louth

12.1.1.1 Quality Assurance and Competence

This Chapter was written by Dr Martin Rogers, Transport Planning Professional, Chartered Civil Engineer and Chartered Town Planner. Dr Rogers has been a practicing transport planner for the past 20 years, authoring both traffic and transport assessments and Mobility Management Plans for major development projects in Ireland during this period. He is currently a Senior Lecturer in Civil Engineering at TU Dublin.

12.1.2 Study Methodology

The assessment of the potential impact of the Proposed Development on the material assets in the area was carried out according to the methodology specified by the EPA and the specific criteria set out in the Guidelines on Information to be contained in an Environmental Impact Assessment Report 2017 (Draft).

An annual growth rate of 1.6% has been assumed for the period late-2016 to 2030, decreasing to 0.7% for 2031 to 2040, based on the central / medium growth estimate for Louth, published by TII in 2019 (PE-PAG-02017-2).

The methodology included a number of key inter related stages;

- Background Review: This background review is broken down as follows:
  (i) An examination of the local regulatory and development management documentation.
  (ii) An analysis of previous ‘transport’ related, strategic and site-specific studies of development and transport infrastructure proposals across the M1 Retail Park area.

- Traffic Counts: Classified junction automatic traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the Proposed Development.
- Trip Generation: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the Proposed Development.
- Trip Distribution: Based upon both the existing and future (for the adopted assessment horizon years) network characteristics, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network using the following software:
    - TRL ARCADY Junction 10 software – Roundabout Junction
- Assessment of Impacts.

In line with the EPA Draft Guidelines (EPA, 2017), seven generalised degrees of impact significance are used to describe impacts: imperceptible, not significant, slight moderate, significant, very significant or profound.

Please refer to the Table 3.3 of the draft EPA EIAR Guidelines.

12.1.3 The Existing and Receiving Environment (Baseline Situation)

12.1.3.1 Road Network

The site is located within the M1 Retail Park, approximately 2.5 km north-west of Drogheda.

Access from the site to the local road network is via an internal roundabout to the R168 link which runs northwards towards the N51 and southwards towards Drogheda.

From the R168 junction with the N51, access to the M1 is 500 metres to the west. To the east, the N51 intersects with the R132, 900 metres from its junction with the R168.

The four critical junctions are thus as follows:

- Junction No. 1 – R168 / Retail Park Access Road roundabout junction
- Junction No. 2 – N51 / R168 / L6322 roundabout junction
- Junction No. 3 – N51 / R132 roundabout junction
- Junction No. 4 – M1 / N51 Interchange

A site location plan is provided within Figure 12.1, and the location of the site relative to these 4 No. critical junctions is detailed within Figure 12.2.

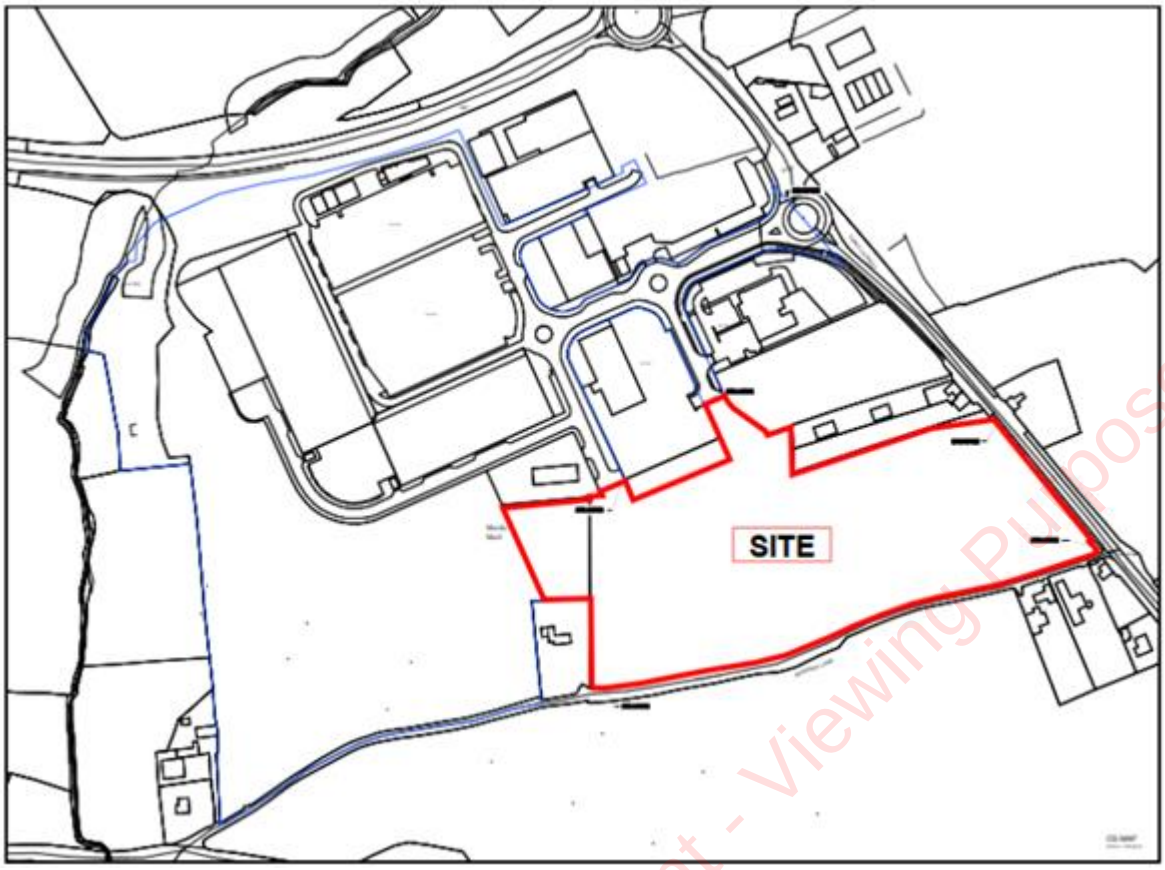

Figure 12-1: Site layout

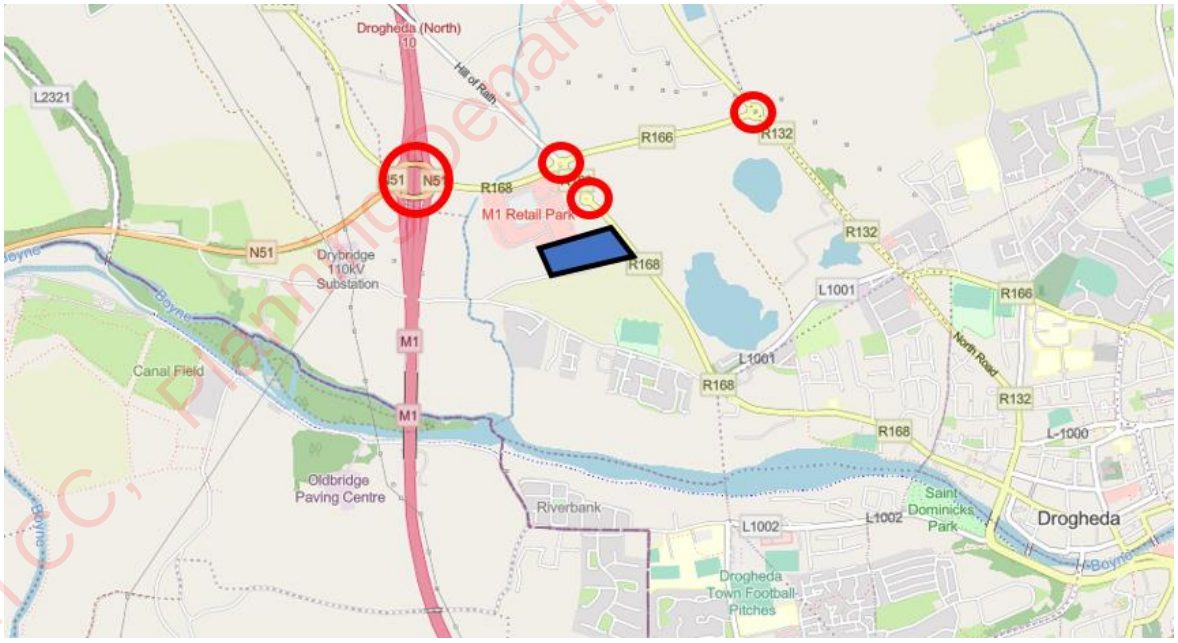

Figure 12-2: Location of site relative to 4 No. critical junctions

On the network, peak flows typically occur on weekdays, with peak hourly flows typically occurring between 7am and 9am in the morning and between 4pm and 6pm in the evening.

A retail development will generate peak flows during the evening peak, typically between 5pm and 6pm, and on midday Saturday typically between 12 noon and 1pm.

However, as demonstrated by the M1 traffic counts on the TII website, the daily flows at the weekend are significantly below weekday volumes.

Take Tuesday 5th April, the date of the traffic survey at the 3 No. roundabout junctions under analysis, the daily flow at the traffic counter at Monasterboice County Louth between Junction 10 and Junction 11 registered a daily flow of 37513 vehicles. If one takes Saturday 9th April, the daily flow recorded was 30,317 vehicles, 24% less.

If one takes comparative volumes for a 3450 m^2 GFA food superstore on a weekday versus the weekend, as detailed within Appendix 1 of the Traffic Assessment Report, the difference is approximately 7.5% in favour of weekend flows.

The weekday analysis thus provides the most robust and onerous evaluation.

Accordingly, information from a traffic surveys traffic survey was analysed, dated Tuesday 5th April 2022 for the 3 No. roundabout junctions close to the Proposed Development.

The survey was carried out over a 12-hour period between 0700 and 1900 in order to ascertain the peak hour flows for all traffic movements at the roundabout junction.

The surveys indicated that the weekday morning peak occurred between 0800 and 0900 with the evening peak occurring between 1700 and 1800 - these were observed to be the timeframes during which the junctions were most heavily loaded. The following analysis is based on these peak periods.

It is assumed that the Proposed Development will open in 2024.

An annual growth rate of 1.6% has been assumed for the period late-2016 to 2030, decreasing to 0.7% for 2031 to 2040, based on the central / medium growth estimate for Louth, published by TII in 2019 (PE-PAG-02017-2).

The computed 2022 flows at the 3 No. critical junctions in the vicinity of the Proposed Development are as follows:

Morning peak

- Junction No. 1 – R168 / Retail Park roundabout junction: 989 passenger car units (PCU)
- Junction No. 2 – N51 / R168 / L6322 roundabout junction: 1797 passenger car units (PCU)
- Junction No. 3 – N51 / R132 roundabout junction: 1642 passenger car units (PCU)

Evening peak

- Junction No. 1 – R168 / Retail Park roundabout junction: 1523 passenger car units (PCU)

- Junction No. 2 – N51 / R168 / L6322 roundabout junction: 2076 passenger car units (PCU)
- Junction No. 3 – N51 / R132 roundabout junction: 1610 passenger car units (PCU)

ALL-DAY

- Junction No. 1 – R168 / Retail Park roundabout junction: 14239 passenger car units (PCU)
- Junction No. 2 – N51 / R168 / L6322 roundabout junction: 19139 passenger car units (PCU)
- Junction No. 3 – N51 / R132 roundabout junction: 16648 passenger car units (PCU)

One can see that both ALL 3 No. roundabout junctions are heavily loaded during both peaks.

The observed morning peak hour, evening peak hour and all-day flows for April 2022 for the 3 No. critical junctions are detailed in Diagrams 1, 2 and 3 of Appendix 3 within the Traffic Assessment Report for the Proposed Development.

Tables 3-1, 3-2 and 3-3 within the Traffic Assessment for the Proposed Development details the ratios of flow to capacity, queue lengths and delays at the three critical junctions for the 2022 morning and evening peaks respectively.

The analysis within the Traffic Analysis indicates that the R168 / Retail Park Roundabout Intersection at present operates below capacity on all approaches during both peak hours, with a maximum degree of saturation of 52%.

The analysis within the Traffic Analysis indicates that the N51 / R168 / L6322 Roundabout Intersection is a busy junction, at present operating within capacity on all approaches during both peak hours, with a maximum degree of saturation of 77%.

The analysis within the Traffic Analysis indicates that the R132 / N51 Roundabout Intersection at present operates below capacity on all approaches during both peak hours, with a maximum degree of saturation of 59%.

12.1.3.2 Public Transport and Cycling Network

12.1.3.2.1 Bus Services

Figure 12-3 contains a map detailing the existing bus services within Drogheda:

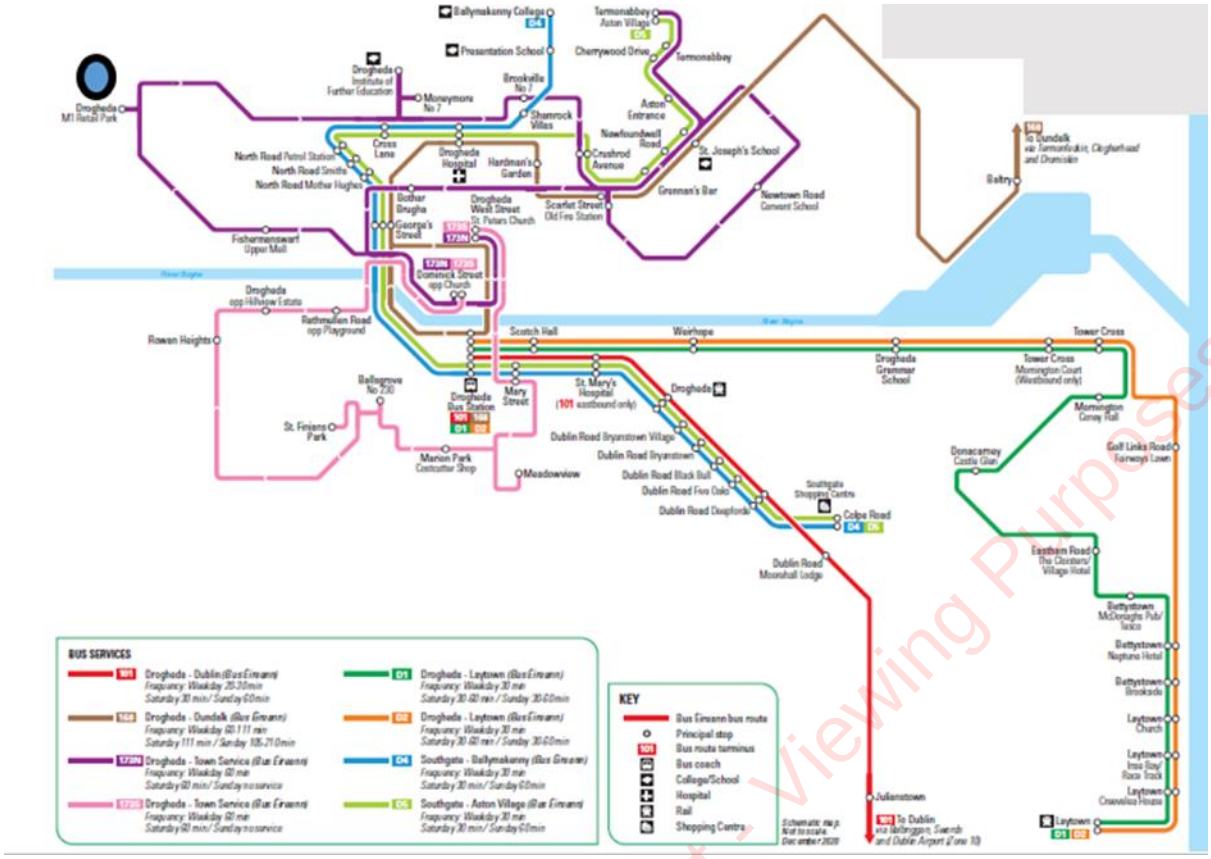

Figure 12-3: Existing Bus Services within Drogheda town

One can see that the 173N connects the north town centre to the M1 Retail Park, running every 60 minutes Monday through to Saturday.

This service connects into the south town area via the 173S service which runs from the town centre to the south area.

In addition, the Bus Eireann D1/D2 routes link the town centre to nearby Laytown / Bettystown, running every 30-60 minutes Monday through to Sunday, and the Bus Eireann D4/D5 routes link the northern townlands of Ballymakenny / Aston Village to the south townland of Southgate, running every 30-60 minutes Monday through to Saturday and every 60 minutes on Sunday. All routes run via the town centre.

Table 5-1 within the Mobility Management Plan details the main routes linking Drogheda to other urban centres.

Figure 12-4 provides details of these routes.

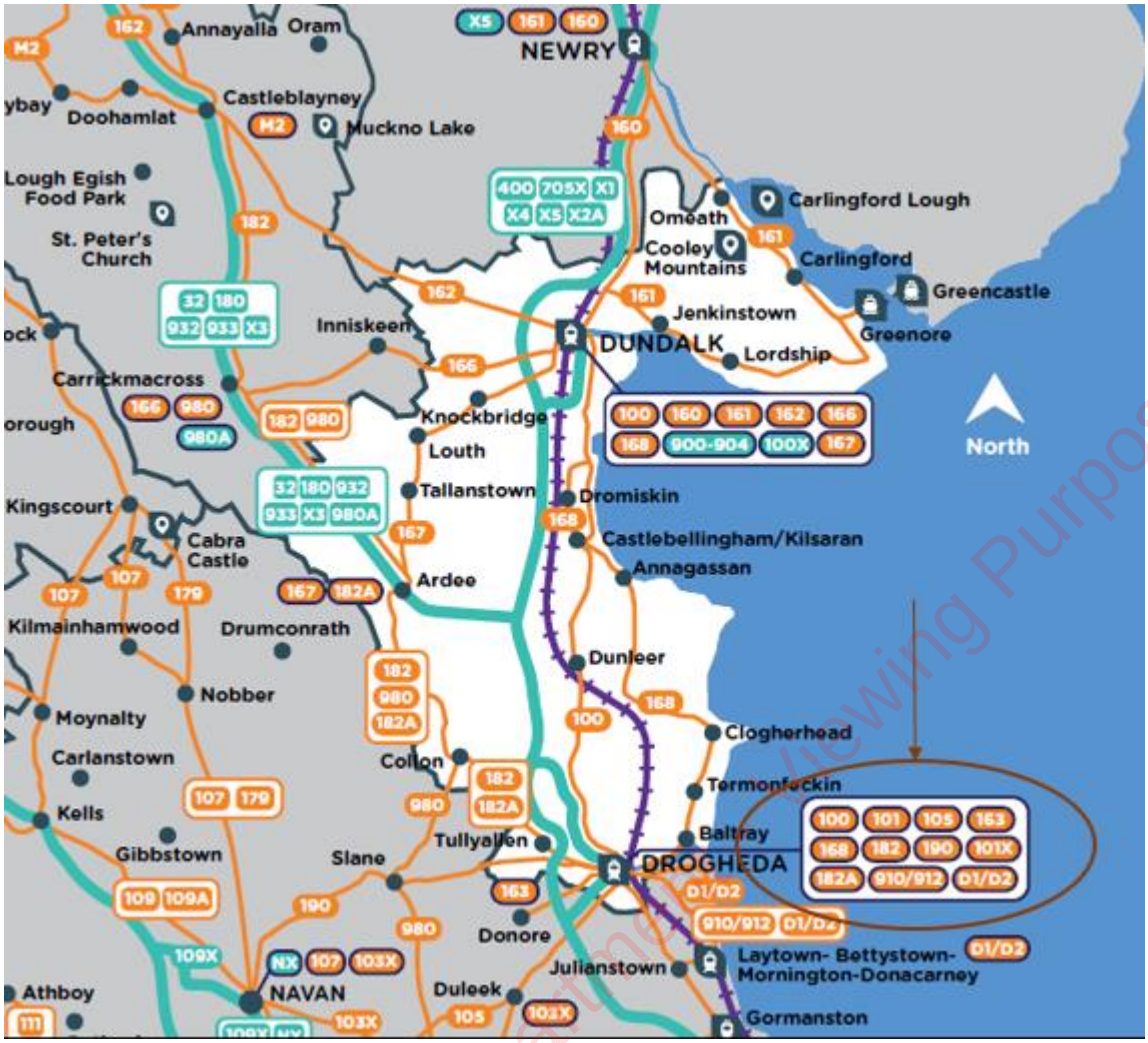

Figure 12-4: Existing routes connecting Drogheda to other urban centres

Thus, bus services provide significant linkages to other urban centres and, within Drogheda itself, provides a direct link to the M1 Retail Park.

12.1.3.2.2 Cycle Facilities

At present there are no existing dedicated cycle facilities close to the Proposed Development.

12.1.3.3 Existing Modal Splits

Table 3-2 within the mobility management plan for the proposal details the derived modal splits from the 2016 Census Data for the journey to work.

For the existing inhabitants in 4 No. Electoral Districts closest to the Proposed Development site, excluding those not stating a mode preference for the journey to work, 65% commute by private car as detailed within the 2016 Census, with 9% commuting by bus or train and 19% cycling or walking.

12.1.4 Characteristics of the Proposed Development

BPM GP3 Limited intend to apply for Planning Permission for development on lands to the south of the existing M1 Retail Park, Mell, Drogheda, Co. Louth.

The development will consist of:

A retail development comprising:

A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

The development comprises 10,69- m^2 GFA of retail / shopping space, of which 4,085 m^2 GFA will be a major supermarket outlet.

Thus, for the purposes of computing the trip generation volumes associated with the development, the following quantum is assumed:

- 4,085 m^2 GFA food superstore
- 6,605 (including drive0-thru unit) m^2 GFA retail outlets within shopping centre

The site is located within the M1 Retail Park, approximately 1km northwest of Drogheda.

Access from the site to the local road network is via an internal roundabout to the R168 link which runs northwards towards the N51 and southwards towards Drogheda.

From the R168 junction with the N51, access to the M1 is 500 metres to the west. To the east, the N51 intersects with the R132, 900 metres from its junction with the R168.

Its proposed year of opening is 2024.

Also, for the purposes of this analysis, the trip generation volumes associated with the proposed drive through restaurant at the M1 Retail Park development, located within the north-eastern portion of the main car park serving the existing retail park, will also be considered. This development will be 375 m^2 GFA in size.

The very robust and conservative assumption is that all development will also be fully in place and operational by 2024.

12.1.5 Potential Impact of the Proposed Development

12.1.5.1 Construction Phase

12.1.5.1.1 Direct / Indirect Impact

The total construction period is estimated at 24 months, this is to be broken down as follows;

Enabling Works - Cut & Fill- 2 months

Construction - 22 months

This is an indicative figure and subject to planning and compliance approvals.

The following estimates for weekday traffic have been made with respect to a proposed construction programme and activities on site:

- No of private vehicles per day from staff and site visitors – 35
- No. of light good vehicles per day from subcontract staff - 25
- No. of heavy goods vehicles per day during enabling work process - 80
- No heavy goods vehicles per day outside of the enabling works periods – 20

The above results in an estimate of 160 vehicles accessing the site daily during the enabling works phase and will reduce to 80 vehicles outside of the excavation period.

Over a 10-hour working day, this equates to 1 vehicle entering and leaving the site on average every 3.75 minutes during enabling works phase and 7.5 minutes entering and leaving the site all times outside the enabling works period.

The 80 number of enabling works vehicles is based on a predicted maximum 10 vehicles per hour based on a realistic availability and assignment of resources. This equates to an average of 1 No. HGV vehicle movement every 6 minutes during enabling works.

Traffic surveys carried out as part of the traffic Impact Assessment for this project defined the peak traffic hours as 08:00 - 09:00 and 17:00 – 18:00.

Construction operation time is predicted to be between 8:00 and 18:00. Given that the site workforce will be arriving at site before 8AM and leaving after 6PM, the traffic movements generated by the site workers will take place outside the peak times for network flows. Site workers will also be encouraged to use public transport.

During the construction phase, HGV's entering the site will be guided by signs to a waiting area before being directed to their location and on departure enter a cleaning area prior to leaving site.

Therefore, the impact of the development during the construction phase will have a slight impact on the road network with short term temporary slight effects.

The site is currently permeable to pedestrians. Appropriate hoarding will be erected around the site perimeter in order to protect the works and members of the public. The boundary to the site will be maintained and site security will be provided throughout the construction period.

12.1.5.2 Operational Phase

12.1.5.2.1 Road Network

12.1.5.2.1.1 Introduction

The traffic impact of the Proposed Development is derived by assessing the trips generated by the proposal, taking the existing, day of opening and design year flows on the network, gauging the extent to which the superimposed flows from the proposed and adjacent committed developments will affect the efficiency of future network flows.

12.1.5.2.1.2 Direct / Indirect Impact

The analysis of traffic growth volumes on the traffic network plus traffic generated by proposed and adjacent development constitutes a robust assessment of the likely direct impacts of the Proposed Development.

There are no likely indirect impacts arising as there are no substantial adjacent planned developments close to the Proposed Development site.

The impact of the Proposed Development on the following 4 No. junctions is assessed:

- Junction No. 1 – R168 / Retail Park Access Road roundabout junction
- Junction No. 2 – N51 / R168 / L6322 roundabout junction
- Junction No. 3 – N51 / R132 roundabout junction
- Junction No. 4 – M1 / N51 Interchange

12.1.5.2.1.3 Flows Generated by Proposed Development

Tables 2-2, 2-4 and 2-6 within the Traffic Assessment for the Proposed Development details the predicted flows generated by the food superstore, retail and fast-food drive-through components respectively within the Proposed Development, with Table 2-8 within the Traffic Assessment for the Proposed Development detailing the predicted flows generated by the planned adjacent drive-through restaurant.

Table 2-9 within the Traffic Assessment for the Proposed Development details the combined uncorrected flows generated by the total development (proposed plus adjacent planned) a within the M1 Retail Park for the morning peak, evening peak and all-day.

Based on research by the TRICS Consortium in the UK, this report will assume that 35% of the trips detailed within Table 2-5 are already present on the network (pass-by / diverted trips) and thus not new, additional trips (TRICS Report 14/1, JMP Consultants). This report states that, ideally, the pass-by / diverted trips percentage should be measured locally, but figures within the report detail figures significantly in excess of this figure of 35%.

This report assumes that the 35% reduction assumed covers both the proportion of trips already on the network and those trips that are multi-purpose with more than one unit visited.

Table 12-1 provides the corrected overall generated flows which will be utilised within this report and distributed onto the local road network:

Table 12-1: Corrected Generated flows for proposed plus adjacent planned development

	Weekday AM		Weekday PM		ALL-DAY	
	IN	OUT	IN	OUT	IN	OUT
TOTAL	212	180	308	323	4154	4154
	392 two-way		631 two-way		8308 two-way	

12.1.5.2.1.4 Distribution Of Flows Generated by Proposed Development

All generated flows are distributed onto the local road network using the patterns of flow demonstrated in Diagrams 1, 2 and 3 within Appendix 4 of the Traffic Assessment for the Proposed Development for the morning peak hour, evening peak hour and all-day respectively.

Diagram 1 within Appendix 4 of the Traffic Assessment for the Proposed Development contains a diagram of incident development flows on the 3 No. nearby junctions during the morning peak hour.

Diagram 2 within Appendix 4 of the Traffic Assessment for the Proposed Development contains a diagram of incident development flows on the 3 No. nearby junctions during the evening peak hour.

Diagram 3 within Appendix 4 of the Traffic Assessment for the Proposed Development contains a diagram of incident development flows on the 3 No. nearby junctions for the all-day (7am to 7pm) scenario.

12.1.5.2.1.5 Assumptions Regarding Traffic Growth Within Local Road Network

The 2014 Traffic and Transport Assessment Guidelines published by the NRA requires that the relevant junctions be analysed for the existing situation (2022), and for the year of opening (2024), the design year 1 (year of opening plus 5) and design year 2 (year of opening plus 15) with and without the Proposed Development in place.

An annual growth rate of 1.6% has been assumed for the period 2022 to 2030, decreasing to 0.7% for 2031 to 2039, based on the central growth estimate for Louth published by TII in 2019 (PE-PAG-02017-2).

The 2024 Do-Nothing ('without development') scenario is derived by factoring the survey results in Diagrams 1 and 2 within Appendix 3 of the Traffic Assessment for the Proposed Development up by 3.2% ($(1.016)^2$ - 1 = 0.032). The 2024 Do-Something ('with development') scenario is derived by adding the development flows detailed in Diagrams 1 and 2 within Appendix 4 of the Traffic Assessment for the Proposed Development to these factored network flows.

The 2029 Do-Nothing ('without development') scenario is derived by factoring the survey results in Diagrams 1 and 2 within Appendix 3 of the Traffic Assessment for the Proposed Development up by 11.75% ($(1.016)^7$ - 1 = 0.1175). The 2029 Do-Something scenario is derived by adding the development flows detailed in Diagrams 1 and 2 within Appendix 4 of the Traffic Assessment for the Proposed Development to these factored network flows.

The 2039 Do-Nothing ('without development') scenario is derived by factoring the survey results in Diagrams 1 and 2 within Appendix 3 of the Traffic Assessment for the Proposed Development up by 20.9% ($(1.016^8 \times (1.007)^9) - 1 = 0.209$). The 2039 Do-Something scenario is derived by adding the development flows detailed in Diagrams 1 and 2 within Appendix 4 of the Traffic Assessment for the Proposed Development to these factored network flows.

Table 12-2 details the network and development flows incident on the 3 No. critical intersections on the projected day of opening in 2024, within 2029, 5 years after opening and within 2039, 15 years after opening with the proposal in place:

Table 12-2 Network and development flows at 3 No. junctions on day of opening (2024), Design Year 1 (2029) and Design Year 2 (2039)

R168 / Retail Park roundabout junction	Network Flows		Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2024)	1021	1572	392	631	1413	2203	27.7	28.6
Design Year 1 (2029)	1106	1702	392	631	1498	2333	26.2	27.0
Design Year 2 (2039)	1196	1841	392	631	1588	2472	24.7	25.5
N51 / R168 / L6322 roundabout junction	Network Flows		Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2024)	1887	2179	256	409	2143	2588	11.9	15.8
Design Year 1 (2029)	2040	2356	256	409	2296	2765	11.1	14.8
Design Year 2 (2039)	2204	2546	256	409	2460	2955	10.4	13.8
N51 / R132 roundabout junction	Network Flows		Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2024)	1696	1662	64	103	1760	1765	3.6	5.8
Design Year 1 (2029)	1835	1800	64	103	1899	1903	3.4	5.4
Design Year 2 (2039)	1985	1947	64	103	2049	2050	3.1	5.0

The 2014 Traffic and Transport Assessment Guidelines requires the impact of the additional traffic volumes on the critical nearby junctions to be assessed in detail if:

- Development flows exceed 10% of existing turning movements at the two relevant junctions;
- Development flows exceed 5% of turning movements if the location has the potential to become congested.

It is noted that the 5% threshold is just exceeded at the N51 / R132 junction during the evening peak hour. The other two junctions are above the 10% threshold.

In the interests of robustness, all three junctions will be analysed in detail.

In traffic impact terms, therefore, the impact of the Proposed Development will be low at all locations except the Kilbride Road / site access priority junction.

Table 12-3 details the existing flows along the M1 in the vicinity of the Interchange, as measured on Tuesday 5th April (37513 vehicles) factored up by 1.032, 1.119 and 1.209 to reflect 2024, 2029 and 2039 network flows respectively. The incident flows from the Proposed Development are as per Diagram 1 in Appendix 3 which details the 2-way flows to and from the interchange along the N51:

Table 12-3: Network and development flows at M1 Interchange on day of opening (2024), Design Year 1 (2029) and Design Year 2 (2039)

M1 Interchange	Network Flows	Development flows	Total flows	Development flows as % of total flows
	ALL-DAY	ALL-DAY	ALL-DAY	ALL-DAY
Day of opening (2024)	38725	3615	42340	8.5
Design Year 1 (2029)	41925	3615	45540	7.9
Design Year 2 (2039)	45375	3615	48990	7.4

It can be seen that the incident flows are significantly below the 10% threshold, therefore no further traffic analysis at this location is deemed necessary.

12.1.5.2.1.6 Impact of Adjacent permitted development

In terms of significant permitted development in the vicinity, the proposed Strategic Housing Development accessed off Slane Road to the south of the proposed retail development (ABP-311678-21), involves the development of 237 No. dwellings at the site.

The development was granted permission on 9th February 2022.

The traffic assessment for the proposed residential development indicates 75 No. departures and 17 No. arrivals during the morning peak, with 28 No. departures and 75 No. arrivals during the evening peak, equivalent to a maximum directional flow of 1.25 vehicles per minute.

The assumed distributions within the traffic assessment indicate traffic predominantly exiting to / arriving from the west via Slane Road and exiting to / arriving from the east via the Cement Road direction.

The distributions indicate approximately 25% of entering / exiting traffic doing so via the R168 / Retail Park and N51 / R168 roundabout junctions.

The traffic assessment indicates that the Proposed Development will increase flows at the R168 / Retail Park roundabout junction by a maximum of 1% during the morning peak and 2% during the evening peak and will increase flows at the N51 / R168 roundabout junction by a maximum of 1% during the morning peak and 1% during the evening peak.

The predicted impact on the M1 Interchange is 0% during both peaks.

(Table 6-1, Atkins TTA, August 2021)

It can thus be concluded that the impact of the permitted development on the junctions of relevance to this development is at extremely low levels and does not warrant detailed analysis.

12.1.5.2.2 Public Transport and Cycling Network

Given that the mobility management plan for the proposal predicts only 2% of workers / customers travelling to the Proposed Development by bicycle, with only 9% travelling by public transport, the impact on these modes of transport are predicted to be low.

12.1.5.3 Potential Cumulative Impacts

The cumulative impact of the Proposed Development is evaluated by assessing the impact on the local road network of the combined flows from both proposed and adjacent planned developments.

The traffic analysis detailed the performance of the Proposed Development on the 3 No. critical junctions for the following 6 No. scenarios:

- 2024 flows without Proposed Development in place (AM and PM peak) - 2024 WOD
- 2024 flows with Proposed Development in place (AM and PM peak) - 2024 WDEV
- 2029 flows without Proposed Development in place (AM and PM peak) - 2029 WOD
- 2029 flows with Proposed Development in place (AM and PM peak) - 2029 WDEV
- 2039 flows without Proposed Development in place (AM and PM peak) - 2039 WOD
- 2039 flows with Proposed Development in place (AM and PM peak) - 2039 WDEV

The ARCADY programme from the TRL Junction 10 suite of programmes was used to analyse all scenarios.

12.1.5.4 "Do Nothing" Impact

Analysis of AM and PM peak hour flows for 3 No. 'without-development' scenarios

Tables 3-1, 3-2 and 3-3 within the Traffic Assessment for the Proposed Development details the ratios of flow to capacity, queue lengths and delays at the three critical junctions for the 2024, 2029 and 2039 morning and evening peaks respectively.

For the R168 / Retail Park Roundabout Intersection, in 2024, with network flow increases only allowed for and no development in place, the intersection will operate with a slight increase in maximum degree of saturation over the existing situation to 54%. By 2029, the intersection will operate with a minor increase in maximum degree of saturation from 54% to 58%. By 2039, the intersection will operate with an increase in maximum degree of saturation to 63%.

For the N51 / R168 / L6322 Roundabout Intersection, in 2024 with network flow increases only allowed for and no development in place, the intersection will operate with an increase in maximum degree of saturation over the existing situation to 82%. By 2029, the intersection will operate with a minor increase in maximum degree of saturation from 82% to 89%.By 2039, the intersection will operate with an increase in maximum degree of saturation to 96%.

For the R132 / N51 Roundabout Intersection, in 2024, with network flow increases only allowed for and no development in place, the intersection will operate with a slight increase in maximum degree of saturation over the existing situation to 61%. By 2029, the intersection will operate with a minor increase in maximum degree of saturation from 61% to 66%.By 2039, the intersection will operate with an increase in maximum degree of saturation to 72%.

12.1.6 Avoidance, Remedial & Mitigation Measures

This section details the measures which will mitigate the traffic impacts detailed within this section of the EIAR.

In this regard we will detail mitigation measures which will offset any traffic impacts predicted for both the construction and operational phases of the Proposed Development.

Mitigation measures describe any corrective measures that are either practicable or reasonable, having regard to the potential impacts discussed above.

12.1.6.1 Construction Phase

The following measures to mitigate the impact of the construction phase on the existing environment are proposed with reference to the road network.

12.1.6.1.1 Road Network Construction Stage Measures to be implemented:

To ensure the road network will have a slight impact with short term temporary slight effects, the following migration will be incorporated.

- To reduce the potential impact with morning traffic particularly between the hours of 8am and 9am, no HGV's will be allowed to leave site during this period. However, vehicles coming to site will be against morning traffic and will therefore have minimal impact on the local road network. These vehicles will be able to enter site and wait in the waiting area, if necessary, be loaded and ready to leave site after 9am.
- Informing workers and expected visitors regarding access arrangements and parking provision to ensure an appropriate mode of travel is chosen; By enforcing this the potential impacts of road delays will be slight and have short term neutral effect.
- Clear and appropriate signage within the site to advise of permitted routes, speed limits, safety requirements.

- Any recommendations with regard to construction traffic management made by the Local authority will be adhered to.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- Provision of sufficient on-site parking and compounding to ensure no overflow of construction generated traffic onto the local network.
- A dedicated 'construction site' access / egress system will be implemented during the construction phases.
- Site offices and compound will be located within the site boundary. The site will accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas. This will prevent visitors or employees parking on the surrounding roads
- A series of 'way-finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- Truck wheel washes will be installed at construction entrances necessary to ensure the surrounding Road is kept clean.

12.1.6.1.2 Pedestrian Construction Stage Measures to be implemented:

To ensure the potential impact of the Proposed Development on the pedestrian routes will be slight with short term temporary neutral effect the following mitigation measures have been incorporated.

- Promote usage of public transport by site staff by clearly displaying local bus, services with a map and timetable indicating routes and travel times.
- Only Safe-Pass accredited personnel will be permitted on site and daily in-out attendance records will be maintained.
- Hoarding to be set up around the perimeter to prevent pedestrian access.
- Signage to be implemented to clearly indicate navigation routes around the site.
- Provide bike parking locations on site to promote the usage of cycling by site staff.

12.1.6.2 Operational Phase

The following mitigation measures are proposed for the operational phase of the Proposed Development with reference to the road network:

The Proposed Development will have a moderate to significant impact with a moderately negative long-term effect on the 3 No. critical junctions, the following mitigation measures have been incorporated into the design to limit the effect.

The traffic assessment for the Proposed Development details that two of the three critical junctions are at present busy and congested during the morning and evening peak hours of travel, and will continue to experience increased congestion going into the future if the required conservative growth estimates are applied to existing surveyed network flow, with estimated total generated traffic from both proposed and planned adjacent development adding between 3.1% and 15.8% to future predicted congestion levels at both heavily loaded junctions within this comprehensive traffic analysis.

Given that the critical junctions under analysis are congested, it is appropriate that there is mitigation to minimise car usage by residents and visitors to the Proposed Development. This comprises the limited on-site car parking spaces.

The traffic growth estimates utilised within the traffic analysis for the Proposed Development, while in line with TII guidelines, are significantly higher than car-use targets currently in place for the Greater Dublin Area, where significant decreases in the use of car-based travel for the journey to work are at the centre of core strategies going forward. This decrease in car usage will have a direct knock-on effect on the volume of car trips using retail outlets during weekday peak hour periods.

The mobility management plan for the Proposed Development envisages that 35% (just over one-third) of trips to and from the Proposed Development will be undertaken by public transport / cycling / walking.

Further mitigation will be provided through enhanced public transport and cycling infrastructure planned for the vicinity which will help move the mode of travel away from car based trips.

12.1.6.2.1 Proposed Bus Infrastructure

The National Transport Authority (NTA) published the 'Connecting Ireland – Rural Mobility Plan' in November 2021. The aim of this initiative is to with the aim of increasing connectivity, particularly for people living outside our major cities and towns.

Their document on the Louth Public Transport Network detailed the following public transport improvements for Drogheda:

Proposed Route 29 – connecting Drogheda to Athlone, also serving Mullingar, Navan and Slane. This is a new corridor. The NTA propose a minimum service frequency of 60 minutes.

Proposed Route 39 – connecting Dublin to Belfast, also serving Drogheda. The NTA propose to better integrate this existing route along the corridor indicated.

Proposed Route 163 – connecting Drogheda to Athboy. This is a new corridor. The NTA propose a new route from Athboy to Drogheda via Navan and Duleek. Minimum service frequency of 3 return trips a day

Improvements to Existing Route 168 – connecting Drogheda to Newry. The NTA propose to integrate routes 168 and 161 to create a new coastal route between Drogheda, Dundalk and Newry. Minimum service frequency of 9 return trips Monday to Saturday, with 4 return trips on Sunday.

Figure 5-3 within the mobility management plan for the Proposed Development provides details of these new / enhanced routes.

12.1.6.2.2 Proposed Rail Infrastructure

Project Ireland 2040 plans to extend the DART as far as Drogheda by 2027. This programme will result in the DART bring extended to locations along the east coast of Ireland such as

Donabate, Rush and Lusk, Skerries, Balbriggan and on to Drogheda (see Figure 5-4 within the mobility management plan for the Proposed Development).

12.1.6.2.3 Proposed Cycling Infrastructure

As part of the Drogheda Cycle Scheme proposed by Louth County Council, in the area aligning the Collon Road, Hill of Rath Roundabout, onto which the Proposed Development directly accesses via the R168, and Rosehall Roundabout directly east of the Hill of Rath Roundabout, 2.25km of footpaths and cycle lanes will be constructed. This will provide access to the M1 Retail Park.

Furthermore, a cycle lane and footpath will be installed on the North Road from Rosehall roundabout to Patrick Street. This will serve commercial, retail and residential developments in the vicinity.

Figure 5-5 within the mobility management plan for the Proposed Development provides details of the proposed cycle just east of the Hill of Rath roundabout.

12.1.6.3 "Worst Case" Scenario

The 'worst-case' scenario comprises analysis of the impact of the total proposed plus adjacent planned development on the critical junctions within the local road network in 2024, 2029 and 2039.

Tables 3-1, 3-2 and 3-3 within the Traffic Assessment for the Proposed Development details the ratios of flow to capacity, queue lengths and delays at the three critical junctions for the 2024, 2029 and 2039 morning and evening peaks respectively.

For the R168 / Retail Park Roundabout Intersection, in 2024, with network flow increases and the proposed plus planned adjacent developments in place, the maximum degree of saturation increases to 68%. By 2029, the maximum degree of saturation increases to 72%. By 2039. By 2039, the maximum degree of saturation increases to 78%.

For the N51 / R168 / L6322 Roundabout Intersection, in 2024 with network flow increases and the proposed plus planned adjacent developments in place, the maximum degree of saturation increases to 94%. By 2029, the maximum degree of saturation increases to 100%.By 2039, the maximum degree of saturation increases to 109%.

For the R132 / N51 Roundabout Intersection, in 2024, with network flow increases and the proposed plus planned adjacent developments in place, the maximum degree of saturation increases to 64%. By 2029, the maximum degree of saturation increases to 70%. By 2039, the maximum degree of saturation increases to 75%.

It must be emphasised that all junctions are within capacity by 2029.While 1 No. junction will be over capacity by 2039, this prediction I based on significant network growth rates of 21%.

12.1.7 Residual Impacts

12.1.7.1 Road Network

Provided that the proposed mitigation measures are implemented, the impact of the Proposed Development during the construction stage will be an imperceptible impact of neutral and temporary effect during the construction phase.

There is an increase of road usage by private vehicles in the operational phase, however future sustainable transport provisions will result in a consequent model shift and will result in the mitigation effect traffic flow on the network set out in the above section on traffic impacts.

It can be assumed that the predicted increase in use of public transport and soft modes by residents at the Proposed Development will result in a moderate impact with negative and long-term effects on both critical junctions.

12.1.7.2 Pedestrians/Cyclists

Provided that the proposed mitigation measures are implemented, the impact of the Proposed Development during the construction stage will be of a temporary nature and will be imperceptible. There will be an increase in pedestrians and cyclists in the surrounding area in the operational stage. This will have a marginally effect on the existing public transport, pedestrian and cycle networks. Therefore, the impacts of the development will be neutral, imperceptible and long term.

12.1.7.3 Public Transport

Provided that the proposed mitigation measures are implemented, the impact of the Proposed Development during the construction stage will be of a temporary nature and will be imperceptible. There will be an increase in public transport usage by both site staff and customers.

12.1.8 Monitoring

12.1.8.1 Construction Phase

Construction traffic will be monitored to ensure that the construction vehicles are travelling to and from the Proposed Development at the agreed times with the Local Authority.

12.1.8.2 Operational Phase

It will be management's intention that a Mobility Management Strategy Co-ordinator be appointed to administer, implement, monitor and review mobility management issues for the Proposed Development. The co-ordinator will also liaise with the local authority, public transport companies and facility managers on issues relevant to the maximisation by staff and customers of non-car based journeys to the facility.

The co-ordinator will have a vital role in encouraging and enabling organisations on the Proposed Development site to adopt measures which will achieve the objectives listed above within section 7. The duties of the co-ordinator are as follows:

- Promoting the environmental and health benefits of their travel choices
- Promoting bike use for travel to the facility
- Promoting walking to the facility
- Promoting sustainable work practices
- Promoting rail and bus based travel to the facility
- Monitoring the modal splits for staff and customers

More detail of this monitoring activity vital to the promotion of using sustainable modes to travel to and from the Proposed Development is provided within the mobility management plan for the Proposed Development.

12.1.9 Interactions

12.1.9.1 Construction Phase

Increased traffic flows during construction, notwithstanding the mitigation measures outlined, do have temporary impact in respect of air, noise, biodiversity and human health and these impacts are dealt with in the appropriate chapters of this EIAR. Chapter 4- Population and Human Health & Chapter 5 – Biodiversity.

12.1.9.2 Operational Phase

Increased traffic flows resulting from the development, notwithstanding the mitigation measures outlined, do have an impact in respect of air, noise, biodiversity and human health and these impacts are dealt with in the appropriate chapters of this EIAR.

12.1.10 Difficulties Encountered When Compiling

No difficulties were encountered when preparing this chapter.

12.1.11 References

The following sources of information were used in the completion of this EIAR Chapter:

- ‘Traffic and Transport Assessment Guidelines’ (May 2014) National Road Authority;
- ‘Traffic Management Guidelines’ Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- ‘Guidelines for Traffic Impact Assessments’ The Institution of Highways and Transportation; and
- Louth Development Plan 2021-2027.
- Standard Assessment Methodology (SAM) - TRICS Good Practice Guide, 2016

- Travel Plans for New Residential Developments: Insights from Theory and Practice (De Gruyter, 2015)
- 'Traffic and Transport Assessment Guidelines' (May 2014) National Road Authority;
- 'Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003); and
- 'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation (1994).

12.2 Waste and Utilities

12.2.1 Introduction

Material assets have been defined as 'Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons' (EPA 2002).

This definition was further expanded by the EPA in 2022 in *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* which states:

'The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.'

The scope and definition of Material Assets within the context of the EIA process has been defined by the EIA Directive as including Architectural and Archaeological Heritage or Cultural Heritage. These elements are assessed separately in Chapter 11 under Archaeology & Cultural Heritage.

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply,
- Gas Supply,
- Information and Communications Technology,
- Surface Water Drainage,
- Water Supply and Demand,
- Wastewater Management, and
- Waste Management

Natural resources (water, land, biodiversity, air etc) are addressed in their respective chapters.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

12.2.2 Study Methodology

The methodology adopted for the assessment takes cognisance of the relevant guidelines as follows:

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)

- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets, namely built services, utilities and infrastructure associated with the existing Site and the Proposed Development. All phases of the Proposed Development were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the Site of the Proposed Development was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps, Civil Infrastructure Report and Planning Part L & NZEB Compliance Report.

Assessment of the likely impact of features of the Proposed Development, including surface water runoff, foul water discharge and water usage was carried out in accordance with the following guidelines:

- IS EN752, “Drain and Sewer Systems Outside Buildings”

12.2.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assessed based on EPA Guidance (2022). The terminology and methodology used for assessing the impact significance and corresponding effects throughout this chapter are described using the definitions detailed in Tables 12-4 to 12-8. Impact will vary from negative to neutral or positive, and also will vary in significance on the receiving environment.

Table 12-4: Terminology used to assess the quality potential impacts & effects (EPA, 2022)

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Table 12-5: Terminology used to assess the significance of potential impacts & effects (EPA, 2022)

Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Table 12-6: Terminology used to assess the duration of potential impacts/effects (EPA, 2022)

Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Table 12-7: Definition of the Extent and Context of Effects (EPA, 2022)

Quality	Definition
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Table 12-8: Definition of the Probability of Effects (EPA, 2022)

Quality	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Figure 12-5 (extracted from the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022) shows how the character of the predicted impact in relation to the sensitivity of the receiving environment can determine the significance of the impact.

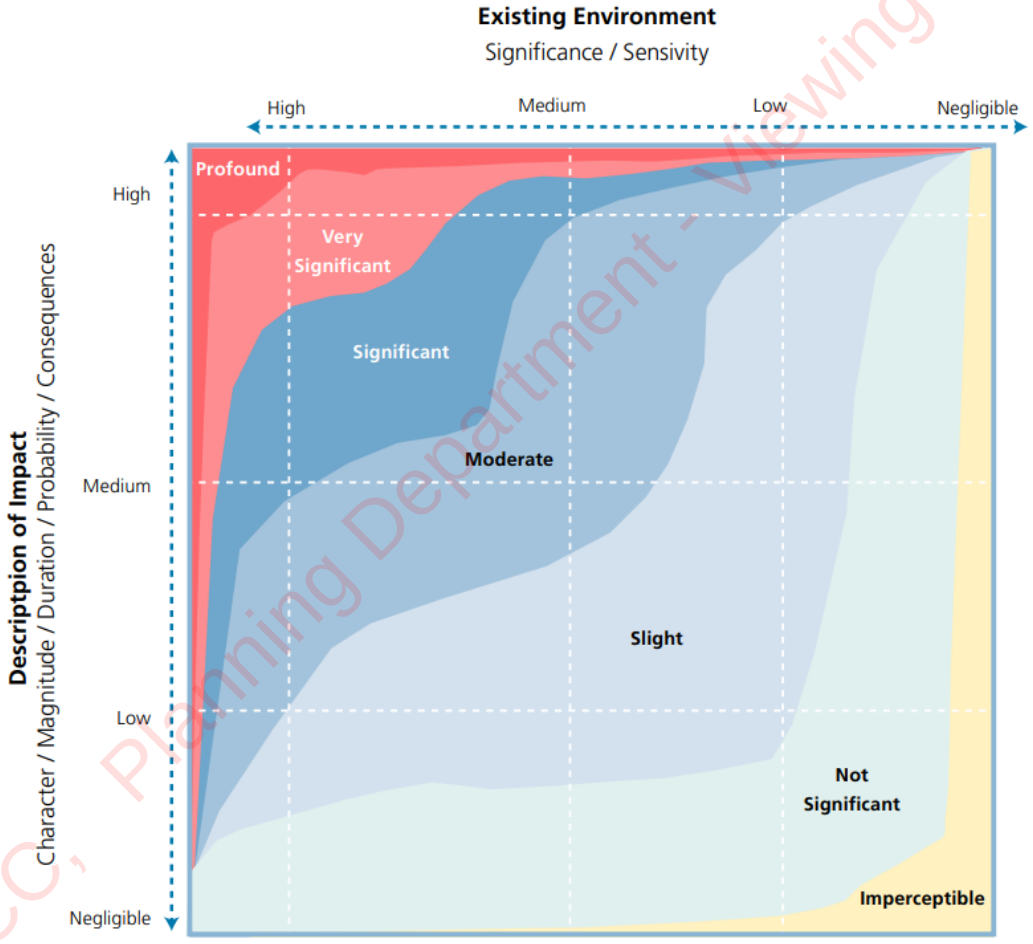

Figure 12-5 Chart showing typical classifications of the significance of impacts (EPA 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports)

12.2.3 The Existing and Receiving Environment (Baseline Situation)

12.2.3.1 Site Location

The site of the Proposed Development is located on lands adjoining the existing M1 Retail Park in the townland of Mell, in the Civil Parish of Tullyallen, Co. Louth. The M1 is located approximately 0.55km west of the Site and Drogheda Town Centre lies approximately 2.5km southeast of the Proposed Development.

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2021) were reviewed and key observations on-site and off-site are summarised in Table 12-9.

Table 12-9: Historical Land Use

Date	Information Source	Site Description
1837-1842	**OSI map 6inch**	**On-site:** Agricultural fields and a police station in the southeast corner **Off-site:** St.Patrick's Stone and St. Patrick Well to the south east, agricultural fields and individual dwellings.
1888-1913	**OSI map 25inch**	**On-site:** Police station is now named "Mell Court House" **Off-site:** Two dwelling have been built along the northern site boundary.
1830-1930	**OSI Cassini map 6inch**	**On-site:** Mell Court house is now named Presbytery **Off-site:** No significant changes
1995	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** A dwelling has been constructed along the western boundary of the site. A very large quarry has been dug on the opposite side of Trinity Street.
2000	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** A residential estate named "Oldbridge Estate" has been constructed approx. 420m south of the site ofhte Proposed Development. The M1 motorway is under construction.
2005	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** The M1 motorway is complete
2005-2013	**OSI Aerial Photography**	**On-site:** Part of the site of the Proposed Development has been used as a construction compound for the M1 Retail Park and a construction access road has been opened through the northern portion of the site from Trinity Street. V&W Recycling Centre has been constructed on the opposite side of Trinity Street, beside the disused quarry. **Off-site:** The M1 Retail Park has been constructed and is open for business.
2021	**Google Maps Photography**	**On-site:** The M1 Retail Park construction compound has been removed but the construction access road is still visible. **Off-site:** Malones Toyota Garage has been added to the M1 Retail Park.

12.2.3.2 Immediate Surroundings

The site of the Proposed Development comprises an agricultural field within the administrative jurisdiction of Louth County Council. The immediate surrounding landscape is

urban/residential to the north (the existing M1 Retail Park and a dwelling and its garden lie adjacent to the northern boundary of the site), with the remaining surrounding landscape to the east, south and west, predominantly agricultural in nature. The R168 (Trinity St) road is adjacent to the east of the site, and Barrack Lane is adjacent to the south of the site.

12.2.3.3 Local Settlement and Land Use

The Proposed Development Site is well located, served by public transport and is within a short distance of key residential locations such as Tullyallen Village and Drogheda Town, with links to the M1. Access to the M1 Drogheda (Exit 10) is located approximately 550m from the site. Bus route No. 173N serves the M1 Retail Park area with direct links to Drogheda Town Centre.

12.2.3.4 Power Supply

12.2.3.4.1 Electricity Supply & Grid Connection

The site is well located with regards to electrical supply infrastructure. There is both high voltage transmission lines and local distribution infrastructure in the area with a mix of overhead and underground cables. The Site is currently greenfield. There is currently no onsite consumption of electricity.

12.2.3.4.2 Gas supply

Gas Networks Ireland builds, develops and operates Ireland's gas infrastructure, maintaining over 14,521 km of gas pipelines and two sub-sea interconnectors. Gas Networks Ireland is responsible for connecting all new gas customers to the network, and for work on service pipes and meters at customers' premises, on behalf of all gas suppliers in Ireland. The Site is currently greenfield. There is currently no onsite consumption of natural gas.

12.2.3.5 Information and Communications Technology (ICT)

National Broadband Ireland was set up by the Irish Government to facilitate the roll out of fibre broadband across the Country. The Department of the Environment, Climate and Communications have developed an interactive map which details the progress of the rollout of the National Broadband Plan. The High-Speed Broadband map[22] identifies locations and premises as amber or blue and the map is updated on a quarterly basis. Amber areas depict target areas for the State intervention of the National Broadband Plan. Blue areas indicated that commercial operators have instated or are in the process of delivering high speed broadband services. The site of the Proposed Development is located within a Blue area and High speed broadband is available.

In terms of mobile telecommunication for transmission and reception, the closest mobile communications masts hosting Vodafone and Eir antenna are located approximately 850m West site of the Proposed Development at the Drybridge 110kV Substation.

The Site is currently greenfield, hence ICT infrastructure is not established or in place.

[22] https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map

12.2.3.6 Local Hydrology and Hydrogeology

The Proposed Development is located withing the Boyne catchment (ID 07) and the Boyne_SC-130 sub catchment (ID 07) (EPA 2022). The closest surface water feature is named locally and recorded on the EPA database (EPA, 2022) as the Mell River and this lies 0.3km west. Its flows in a southerly direction before joining the Boyne River 0.8km south of the Site. The Boyne River flows eastwards, discharging into the Irish Sea, approximately 9 km east of the Proposed Development site.

The Site is situated on the Drogheda groundwater body, with an overall Good Groundwater body status (EPA 2022). The main aquifer type within the Site boundary is *Regionally Important Aquifer - Karstified (diffuse). Sandstone and shale till (Lower Paleozoic) with matrix of Irish Sea Basin origin.* The level of vulnerability of the Site to groundwater contamination via human activities ranges from *Low* to *High*.

The soils and geology encountered during the desk study and from site investigations in the vicinity of the site are assessed in Chapter 6 of the EIAR. The soil and geology at the Site are mapped as "'*Irish Sea till*'" overlying "*Irish Sea Till derived from Lower Palaeozoic sandstones and shales*" (IrSTLPSsS) subsoils. The bedrock beneath the Site is mapped as Limestone and Carboniferous shale of the Tullyallen Formation (GSI, 2022).

12.2.3.7 On-site Surface Water Drainage

The Site of the Proposed Development is a previously undeveloped, greenfield site. As such, surface water currently infiltrates to ground and run-off discharges to the surrounding watercourses in line with the existing topography of the Site at greenfield rates.

12.2.3.8 Water Supply and Demand

The Site of the Proposed Development is greenfield and there is no water supply or demand at present. The Site is currently not connected to a municipal water supply, but it is located in a well-serviced area. There are a number of Irish Water watermains in the vicinity of the Proposed Development.

12.2.3.9 Wastewater management

The Site is greenfield and as such there are no wastewater management requirements at present, however, the foul drainage system installed as part of the original M1 Retail Park development outfalls to an existing pumping station constructed at the southwest corner of the site. A 225mm diameter gravity sewer collects the foul effluent from the existing M1 Retail Park and runs south towards Barrack Lane where it connects to another 225mm diameter gravity sewer that falls westwards along Barrack Lane (inside the site boundary) from its junction with the Collon Road to the pumping station at the southwestern corner of the site. From there the effluent is pumped back up through a 100mm diameter rising main that runs eastwards along Barrack Lane (inside the site boundary) to a 225mm diameter sewer in the Collon Road. The Collon Road sewer runs southwards where it connects into the town's main sewerage network. Part of the original brief was to future proof, where cost effective, the foul water network and an additional 300mm rising main was laid parallel with the live 100mm main so that in the future, if the pumping station was upgraded for a bigger population, the larger rising main is already in place (Civil Infrastructure Report, Barrett Mahony, 2022).

12.2.3.10 Waste Management

Louth County Council (LCC) is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. LCC's waste management activities are governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021. The Proposed Development site is currently a greenfield site and therefore has no waste management requirements.

12.2.4 Characteristics of the Proposed Development

The Proposed Development will consist of the construction of a retail development comprising:

> *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.*

12.2.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the Material Assets of the area.

12.2.5.1 Power Supply

For new buildings other than dwellings, compliance with Part L1 of the Second Schedule to the Building Regulations requires that "*A building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of Carbon Dioxide (CO2) emissions associated with this energy use insofar as is reasonably practicable*."

A Planning Part L & NZEB Compliance Report has been prepared for the Operational Phase of the Proposed Development by Lawler Sustainability (2022), which provides details on how the buildings comply with the regulations, and the mechanical and electrical services that will be installed at the Proposed Development.

12.2.5.1.1 Construction Phase

Construction related activities will require temporary connection to the local electrical supply network. The Main Contractor will apply for a power supply from ESB Networks to power both the construction compound and the construction site. The size of supply will be calculated to ensure it is sufficient to power both the site compounds and construction site activities. Mobile diesel-powered generators may also be used during the Construction Phase.

Connecting a new development to the electricity distribution system must be carried out in accordance with ESB Networks' specifications, and in particular with the guidance provided in the documents ESB Networks National Code of Practice for the Customer Interface Version 5 (2021) and ESB Networks Construction Standards for MV Substation Buildings (2019). The developer must undertake the preparatory work such as installation of ducting and provision of substation plinth or building. Once the preparation work has been completed to a satisfactory standard, ESB Networks will commence installation of the electricity cabling/lines and any other necessary equipment. A temporary suspension of the network locally to facilitate the connection works may be required during the Construction Phase, and an additional temporary suspension will also occur when power is provided to the Site of the Proposed Development. These temporary suspensions will be controlled by ESB Networks as the statutory undertaker and in accordance with standard protocols.

The potential impact from the Construction Phase of the Proposed Development on the local electrical supply network is likely to be negative, slight, and short-term.

12.2.5.1.2 Operational Phase

Electricity will be required to provide public lighting, domestic lighting, power supply and heating for each individual unit for the Proposed Development. Electric car charging facilities will be provided in the car park in line with Government policy. The ESB Substation, Transformer Room and LV Metering Switchroom will be housed along the western boundary of the site. All public and amenity lighting will use low energy LED light fittings and be installed in line with LCC specifications. LED light fittings with presence-detection will also be used throughout circulation areas and will be locally controlled.

The impact of the Operational Phase of the Proposed Development on the electricity supply network is likely to be to increase demand to the existing supply. The potential impact from the Operational Phase on the electricity supply network is likely to be neutral and not significant in the long term.

12.2.5.2 Information and Communications Technology (ICT)

12.2.5.2.1 Construction Phase

Connections will be required to the existing ICT network during the Construction Phase of the Proposed Development which, if not conducted in accordance with best practice, has the potential to impact on local telecoms & ICT connectivity. However, due to the *temporary* and

phased nature of the Construction Phase the potential impact of the Construction Phase on the local telecoms network is considered negative and not-significant.

12.2.5.2.2 Operational Phase

The impact of the Operational Phase of the Proposed Development on the telecoms network is likely to be a marginal increase in demand. The Site of the Proposed Development is located within an area where high speed broadband is available, and as such, the impact from the Operational Phase on the telecoms network is likely to be neutral and not-significant in the long term.

12.2.5.3 Local Hydrology and Hydrogeology

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR. There will be no abstraction required from surface water bodies or groundwater aquifers at the Site of the Proposed Development during the Construction or Operational Phase, and there will be no direct discharges of untreated water to surface water or groundwater during the Construction or Operational Phase.

12.2.5.3.1 Construction Phase

The bedrock aquifer of the Tullyallen Formation beneath the Proposed Development Site is within the Drogheda Groundwater Body. During the Construction Phase, soil and subsoil will be excavated, which will temporarily increase the potential of infiltration rainfall to the underlying aquifer. During the Construction Phase of the Proposed Development there will be an overall increase in impermeable areas (to approximately 66% of the total site area) which will reduce the infiltration potential from surface water. Overall, as described in Chapter 7, it is considered that any impact on the hydrogeological regime within the aquifer during the Construction Phase is unavoidable, and will be negative and imperceptible in the short-term, however, the effects will only occur within a very localised zone of the aquifer and there will be no impact on the hydrogeological regime of the receiving groundwater body and associated downgradient receptors.

12.2.5.3.2 Operational Phase

During the Operational Phase of the Proposed Development there is limited to zero potential for any adverse impact on the receiving water (hydrological and hydrogeological) environment at the Site of the Proposed Development. As the current greenfield lands will be replaced by hardstanding areas in the Proposed Development, the permeability of the surface cover at the Site will be modified, however, discharge to ground from the on-site attenuation features will increase recharge from the Site. Rainfall will enter the ground from slow infiltration from the permeable paving and through permeable geotextile material from the bio-retention/tree pits. While there may be local variations in the mechanism for groundwater recharge, the overall regional groundwater flow regime will not be altered. The impact of the Site Development on the recharge regime will be neutral and imperceptible in the long term.

12.2.5.4 Surface Water Drainage

12.2.5.4.1 Construction Phase

There will be no direct discharges to groundwater or surface water during the Construction Phase. Temporary diversions of surface water courses are not required for the Construction

Phase, however there may be a requirement for management of surface water (rainwater) during groundworks. In the absence of mitigation, there is a potential for the release of suspended solids or contaminants into the Mell Stream and downstream waterbodies including the Boyne Estuary transitional waterbody and Boyne Estuary Plume Zone. Potential discharges via surface water runoff could result in a negative, moderate and short term impact on the water quality of the Mell Stream on account of dilution within the drainage network and Mell Stream. The impact on water quality in downstream waterbodies and watercourse elsewhere within the catchment could be negative, not significant and short term, in the absence of mitigation. Surface water runoff from the Proposed Development Site will be discharged to the existing surface water drainage sewer on Barrack Lane south of the site. The surface water discharge consists of a 225mm uPVC sewer, the drainage outfalls to a tributary stream (Mell Stream, noted on Drawing MRE-BMD-00-00-DR-C-1001 as Kenny Stream (local name)), which ultimately discharges to the Boyne River.

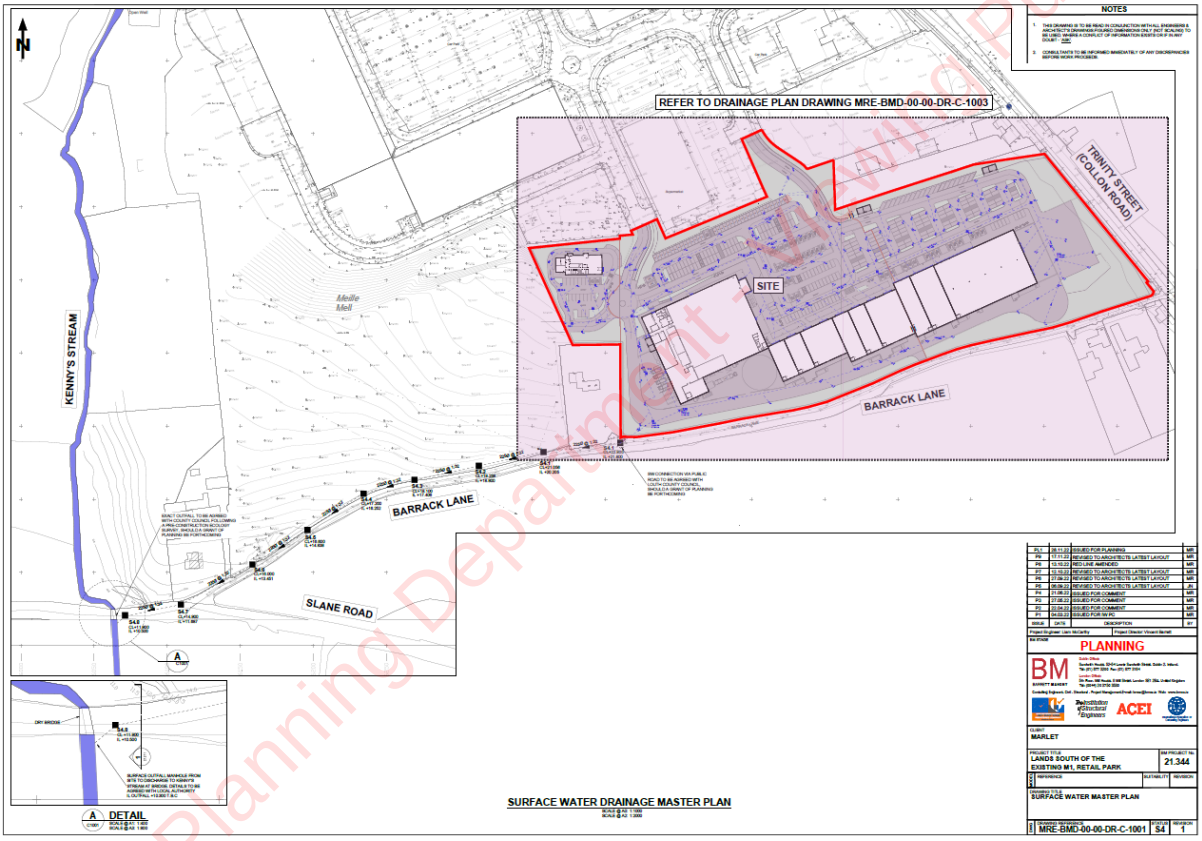

Figure 12-6 Surface Water Master Drainage Plan (Drawing Ref. MRE-BMD-00-00-DR-C-1001; Barrett Mahoney, 2022)

Construction Phase activities at the Proposed Development site that could potentially impact on water quality are detailed in the Hydrology Chapter of this EIAR and control measures for potential emissions to surface water, groundwater and soil are detailed in the Construction Environmental Management Plan (CEMP) (Enviroguide Consulting, 2022) and will be implemented by the appropriate contractor as required.

12.2.5.4.2 Operational Phase

The surface water drainage system for the Proposed Development has been designed in accordance with the principles of Sustainable Drainage Systems (SuDS), as embodied in the

recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). A two-stage treatment is proposed for the site. Interception and attenuation storage, and 20% climate change has been applied to the design calculations in accordance with GDSDS guidelines. The overall impermeable area of the site 3.165ha and providing the target of 10mm interception storage (in accordance with the requirements of the GDSDS) equates to a required volume of 316.5m^3. The SuDS measures chosen for the Proposed Development are detailed in Table 12-10 along with the storage capacity for each measure.

Table 12-10 Interception Calculations (Source: Civil Infrastructure Report, Barrett Mahony, 2022)

Interception Provided	Area (m^2)	Storage l/m^2	Capacity m^3
Filter Trench	1138	75	85.35
Tree Pit	1713	75	128.48
Permeable paving	3539	30	106.17
TOTAL			**320**

As can be seen from Table 12-10, the total interception storage provided (320m^3) is greater than the required storage volume (316.5m^3) (Civil Infrastructure Report, Barrett Mahony, 2022). An attenuation tank will be located under the ground level, beside the basement. Since the building footprint covers the site area surface water runoff from the roof will drain to this tank via rainwater downpipes. The rate of discharge from the attenuation tank will be controlled by a hydrobrake set at 24.1l/sec, located in a manhole adjacent to the attenuation tank, from which the outfall is pumped to a ground level manhole. The water will fall by gravity from here to the public surface water manhole.

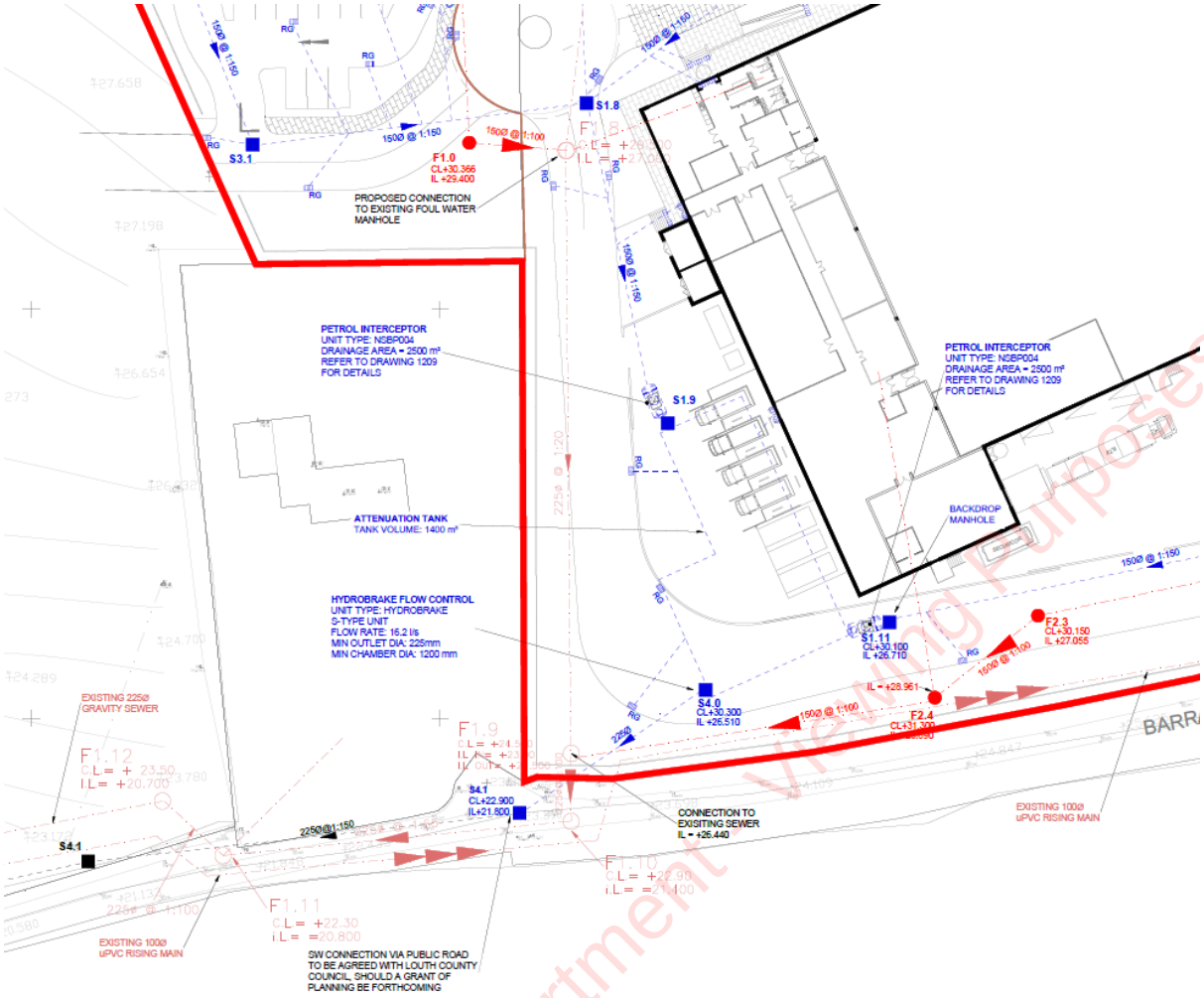

Figure 12-7 Attenuation Tank, Petrol Interceptor and Hydrobrake – extracted from Drawing MRE-BMD-00-00-DR-C-1003 – Proposed Drainage Layout (Barrett Mahony, 2022)

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from roads and the impermeable areas. Given the design of the surface water management strategy for the Proposed Development and the implementation of SuDS features, it is considered that there will be an overall neutral, imperceptible, long-term impact on the receiving surface water quality of the Mell Stream and the Boyne River.

12.2.5.5 Water Supply and Demand

12.2.5.5.1 Construction Phase

Site offices and construction activities will create a demand for water supply to the site. A temporary connection is required to facilitate on-site works for all developments. Commencement of construction will therefore result in a net increase in the water demand for the site of the Proposed Development. Water supply to the Proposed Development will be provided by the existing Irish Water (IW) infrastructure by adding a new connection to the existing 450mm diameter watermain along Collon Road. Confirmation of Feasibility (Ref. CDS22001877) was received from IW on the 29th of April 2022 and can be found in Appendix 4 of the Civil Infrastructural Report (Barrett Mahony, 2022). IW stated that the proposed

connection to the IW public supply network is feasible at this moment in time, subject to upgrades. In order to accommodate the proposed connection to the IW public supply network, upgrade works are required to extend the length of the network by approximately 240m of new 100mm diameter main to be laid to link up connection main and existing 150mm uPVC main, refer to the red dashed line in Figure 12-8.

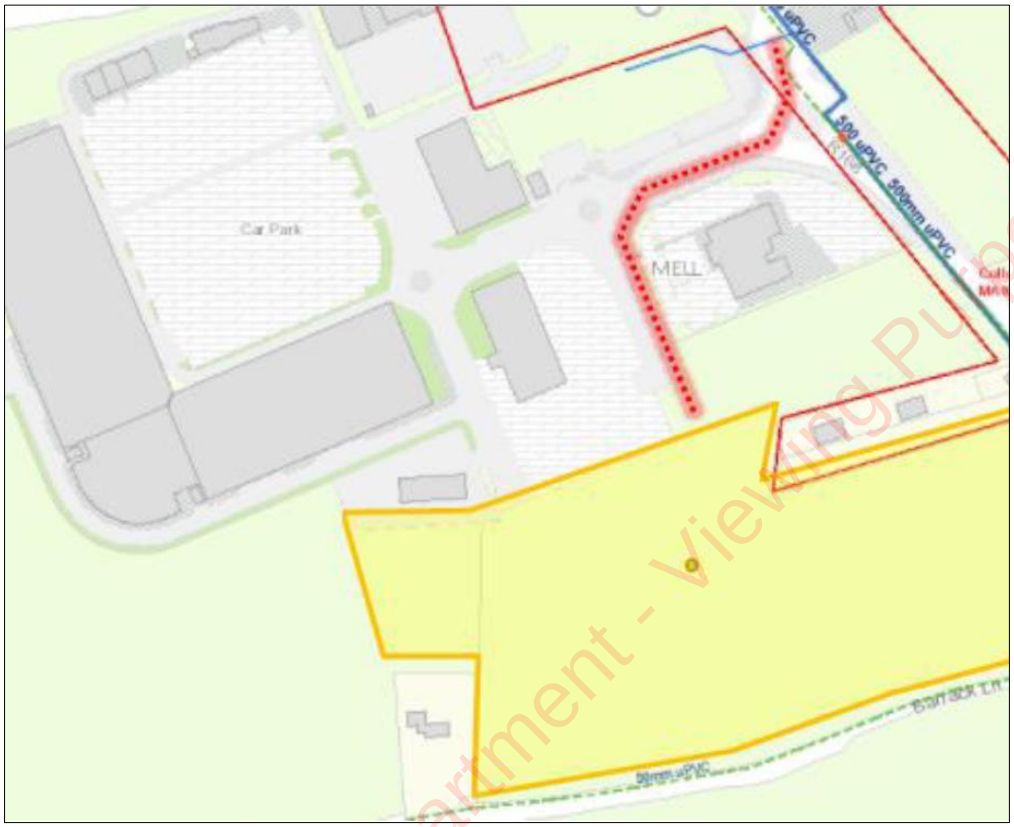

Figure 12-8 Required public water supply upgrade works are indicated by the red dashed line (Source: IW Confirmation of Feasiblity, Appendix 4, Civil Infrastructural Report, Barrett Mahony, 2022)

IW also stated that the water connection cannot take place until the trunk main upgrade works are complete (Phase 1; 450mm dia. x 850m). The expected completion date for the upgrade works is Q4 2022 (Ref. SNDP Drogheda Project 2021). Some local diversions may be required to water supplies to accommodate the construction works which may require temporary outages. Additionally, new connection works may cause water supply disruptions during the Construction Phase. These disruptions will be controlled by Irish Water and LCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, not significant and temporary.

12.2.5.5.2 Operational Phase

During the Operational Phase of the Proposed Development there will be a demand for water from the public water supply. The mains water supply is operated in accordance with relevant existing statutory consents. The full calculations for the water demand for the Proposed Development are calculated as per Section 3.7.2 of the Irish Water Code of Practice for Water Infrastructure and are included in the Civil Infrastructural Report prepared by Barrett Mahony (2022). Commercial daily water usage demand has been calculated using the area of the commercial units, estimating 1 person per 18m^2 in the retail units, with a per capita

consumption rate of 30 litres per head per day averages at approximately 17,842 l/day, with an average demand of 0.258 l/sec and a peak demand of 1.291 l/sec (Barrett Mahony, 2022). Irish Water have confirmed that, based on a desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, the proposed demand can be facilitated (IW Confirmation of Feasiblity, Ref. CDS22001877; Appendix 4, Civil Infrastructural Report, Barrett Mahony, 2022).

In accordance with best practice, water conservation appliances are to be incorporated as part of the Proposed Development to reduce the water demand, including water saving tap valves, eco-flush toilet system and water saving appliances. The likely effect of the increase in mains water demand will be neutral, not significant, and long-term on mains water supply.

12.2.5.6 Wastewater management

12.2.5.6.1 Construction Phase

A temporary connection is required to facilitate on-site works for all developments. Commencement of construction will therefore result in a net increase in the wastewater produced at the site of the Proposed Development. It will be the Main Contractor's responsibility to apply to Irish Water for connections to the foul water drains to service the site toilets and canteen facilities during the Construction Phase.

The proposed foul drainage system can connect to the existing 225mm sewer pipe laid parallel to Barrack Lane that outfalls to the pumping station. The pumping station will need to be upgraded to accommodate the increase in population, but the rising main infrastructure is already in place as described. The proposed pipe network has been designed in accordance with the relevant requirements of the Irish Water Code of Practice for Wastewater Infrastructure (Civil Infrastructure Report, Barrett Mahony, 2022). Confirmation of Feasibility (Ref. CDS22001877) was received from IW on the 29th of April 2022 and can be found in Appendix 4 of the Civil Infrastructural Report (Barrett Mahony, 2022). IW stated that the proposed connection to the IW public supply network is feasible at this moment in time without infrastructure upgrades by IW. Foul water sewer connections will be constructed strictly in accordance with Irish Water requirements and drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H. The new connection works may cause disruptions to the foul water network during the Construction Phase. These disruptions will be controlled by Irish Water and LCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, non-significant and temporary.

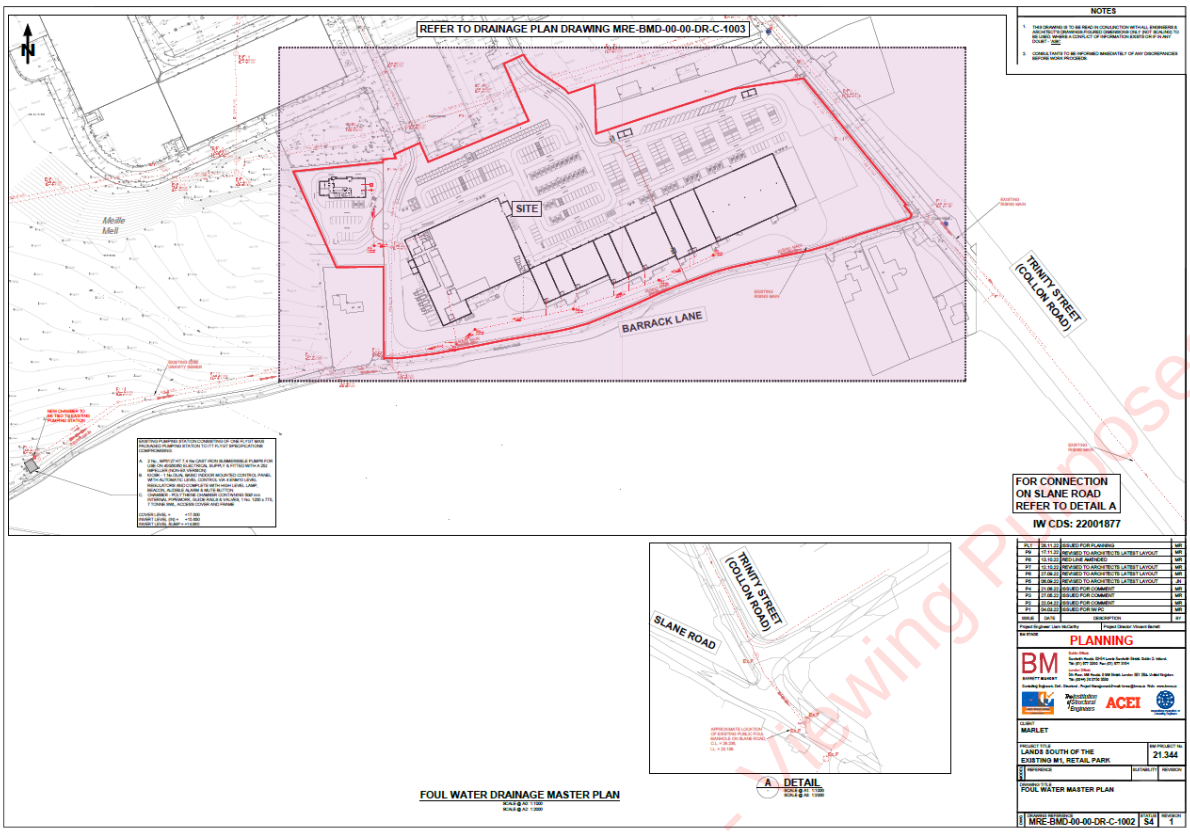

Figure 12-9 Foul Water Master Drainage Plan (Drawing Ref. MRE-BMD-00-00-DR-C-1002; Barrett Mahoney, 2022)

12.2.5.6.2 Operational Phase

The full calculations for foul water flows from the Proposed Development have been performed in line with the Irish Water Code of Practice for Wastewater Infrastructure (2020). Commercial wastewater loads have been calculated using the area of the commercial units, 10,705m^2, estimating 1 person per 18m^2 in the retail units, with a per capita wastewater dry weather flow of 30 litres per person per day. The resulting total dry weather foul water flow from the commercial units of the Proposed Development is 17,842 l/day, with an average flow of 0.23 l/sec and a peak flow of 1.39 l/sec. The proposed foul outfall pipe, 225mm diameter at a gradient of 1:150 has a capacity of 30.6 l/s which is sufficient for all foul pipework within the site (Civil Infrastructure Report, Barrett Mahony, 2022).

Capacity within the existing foul sewer network has been confirmed by Irish Water. The foul water from the Proposed Development will be discharged from the Site will be to mains sewer and discharge to be treated at Drogheda Waste Water Treatment Plant (WWTP).

The increase in wastewater being discharged to the public sewer will have a negative but non-significant impact on the capacity of the sewer in the long term.

12.2.5.7 Waste Management

12.2.5.7.1 Construction Phase

The majority of waste arising during the Construction Phase will comprise soil and stone materials associated with the excavation works required for foundations and connections to

utilities and services. A member of the construction team will be appointed as the Waste Officer to ensure commitment, operational efficiency and accountability during the Construction Phase of the Proposed Development.

The waste streams that will be generated by Construction and Demolition (C&D) activities are as follows:

- Topsoil and subsoil
- Packaging and general waste from construction activities
- General site clearance waste including tree stumps
- Municipal waste generated by workers

All waste generated during the Construction Phase will be segregated onsite to enable ease in re-use and recycling, wherever appropriate. Material will be segregated on-site for the appropriate waste stream and disposal destination. The Waste Officer or appointed delegate will ensure waste streams are adequately identified. The segregation and management of waste storage and stockpiling will be routinely inspected and audited by the Waste Officer. In general, the priority in relation to waste management on site shall be to promote recycling, reuse and recovery of waste and diversion from landfill wherever possible. This will be also managed in accordance with the principles set out in the CEMP (Enviroguide, 2022). After in-situ reuse and recycling options have been fully considered, all residual waste streams will be collected by appropriately authorised waste collection contractors and will be managed using suitably permitted/licensed waste disposal or materials recovery facilities.

Land regrading to required levels will take place during the Construction Phase. Prior to excavation, a cut and fill model will be developed to confirm cut and fill volumes. Detailed quantities of material to be excavated will be verified through accurate survey techniques by the groundwork's contractor at the Construction Phase. As much as possible, excavated topsoil, subsoil and stone will be retained on site and will be reused as fill material and for landscaping. If excess clean soil and stone is generated, this will be exported off-site for reuse under Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27). Under Article 27, uncontaminated soil and stone free from anthropogenic contamination, which is excavated during the Construction Phase of a development can be considered a by-product and not a waste, if (a) further beneficial use of the material is certain, (b) it can be used directly without any further processing, (c) it is produced as an integral part of the development works and (d) the use is lawful and will not have any adverse environmental or human health impacts (EPA, 2019). For Article 27 to apply, the beneficial use mentioned in point (a) above must be identified for the entirety of the excavated soil from the Proposed Development prior to its production, with that use taking place within a definite timeframe, for it to be regarded as certain. Offsite removal of soils will be undertaken in accordance with the CEMP and relevant waste management legislation.

Any surplus soil not suitable for re-use as a by-product under Artcile 27 and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. The disposal of such material will occur on a phased basis thereby reducing any potential effects on the surrounding road network.

Due to the use of permitted/licensed waste collection/waste management facilities, it is not predicted that the production of waste will cause any likely significant effects on the environment. It is the responsibility of the Main Contractor to ensure that waste collection contractors are legally permitted to carry the waste, and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005.

12.2.5.7.2 Operational Phase

The commercial/retail units will generate similar waste types to domestic waste types:

- Dry mixed recyclables
- Mixed Municipal (non-recyclable)
- Organic (food) waste, and
- Glass

with some additional commercial “office” type wastes such as paper and printer ink, batteries, and waste electrical and electronic equipment (WEEE).

The List of Waste (LoW) code (previously referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the Proposed Development are provided in Table 12-11.

Table 12-11 Expected Waste Types and List of Waste Codes

Waste Description	List of Waste Code
Mixed Municipal Waste	20 03 01
Mixed Dry Recyclables	20 03 01
Biodegradable Kitchen Waste	20 01 08
Glass	20 01 02
Bulky wastes	20 03 07
Waste electrical and electronic equipment*	20 01 35* 21 01 36
Batteries and accumulators*	20 01 33* 20 01 34
Textiles	20 01 11
Fluorescent tubes and other mercury containing waste*	20 01 21
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.)*	20 01 13/19/27-28/29-30
Plastic	20 01 39
Metals	20 01 40
Paper and Cardboard	20 01 01

**Individual waste type may contain hazardous materials*

With proper management, a high level of recycling, reuse and recovery will be achieved at the development in line with European and national waste targets, as set out in the Eastern-Midlands Region Waste Management Plan 2015-2021.

In the absence of mitigation, the potential impact from the Operational Phase on municipal waste disposal is likely to be long term, negative and moderate.

12.2.5.8 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and proposed developments was completed as part of this assessment. There are several existing, proposed and granted planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. Table 12-12 details the existing, proposed and granted planning permissions on record in the area:

Table 12-12 Summary of Potential Cumulative Impacts with additional Planning Applications in the Area

Planning Ref No.	Applicant Name	Summary of Development
211283 09/02/2022	Loughdale Properties Limited	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works on the Slane Road, Drogheda. ABP-311678-21
211046 14/12/2021	Louth County Council	Part 8 application for permission to carry out the development of 20 No. residential units and all associated/ancillary works on lands off Trinity Street/Mell at Boice Court Phase 2, Drogheda Co Louth the development will comprise of the following: Site 'A' (0.16ha) 3 no. 3-bed, 2-stroey dwellings 1no. 3-bed single-storey dwelling new pedestrian/cycle path linking Phase 1 and Phase 2 of Boice Court All associated Landscaping and ancillary/site development works. Site 'B' (0.24ha) 3no. 3 storey blocks comprising of a total of 16 no. duplex/apartment units, i.e., 2 no. blocks each with 2no. 1-bed apartment and 2 no. 3-bed duplexes and 1 no. block with 4no. 1-bed apartments and 4 no. 3-bed duplexes Associated bin/bicycle stores new pedestrian route from Boice Court Phase 2 to Cement Road All associated landscaping and ancillary/site development works.
LB191735 (Meath County Council) 21/02/2020	CAP Developments LLC	Alterations to existing road infrastructure within the site and clearance of the site (including removal of existing internal roadways and removal / diversion of services) to make way for the proposed development; Construction of a two storey (with mezzanine levels at both storeys) data storage facility building with a maximum overall height of c. 25 metres, containing data halls, associated electrical and AHU Plant Rooms, a loading bay, maintenance and storage space, office administration areas,

		screened plant and solar panels at roof level, all within a building with a total gross floor area (GFA) of c. 28,573 sq.m; Emergency generators (26 no.), emission stacks and associated plant are provided in a fenced compound adjacent to the data storage facility, along with a single emergency house supply generator; A 6 MVA substation and associated 6MVA electricity connection; A water sprinkler pump room, MV Building, unit substation, water storage tanks, humidifier tanks and diesel tanks and filling area; Modification of the existing entrance to the subject site (from the estate road to the east), which will function as a secondary entrance providing for emergency and construction access. A new main entrance and access control point to the lands is proposed (also from the estate road to the east) and a single-storey gate house/ security building at this entrance with a GFA of c. 29.5 sq.m.; Construction of internal road network and circulation areas, footpaths, provision of 50 no. car parking spaces and 26 no. cycle parking spaces within a bicycle shelter; Landscaping and planting (including provision of an additional planted berm to the northern boundary, and alterations to existing landscaping adjacent to the entrance to the Business and Technology Park), boundary treatments, lighting, security fencing, bollards and camera poles, bin store, and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring 19.46 hectares. An EIAR has been submitted with this application.
19880 18/12/2019	Wogans Build Centre	Permission for a new 7-bay warehouse extension attached to the side of the existing warehouse with ancillary first floor offices, associated parking, building signage, boundary treatments and all associated site development works.
18667 11/10/2018	Moffett Investment Holdings ULC	Extension of Duration Parent Ref: (08/101) 10-year permission - for a mixed-use development comprising a total of 527 no. dwellings (terraces, semi-detached, duplex and apartments and a civic/commercial neighbourhood centre of c 5,823sqm
1858 21/03/2018	Simon Paler Elmsont Limited	FURTHER EXTENSION OF DURATION REF: 12510022 which consists of Permission for Residential development of 190 units & a 430 sq.m. creche which, shall comprise of 3-bed apartments, 2-bed apartments, 4-bed houses, 3-bed houses, 2-bed dwellings, 3-bed duplex units, connection to public services & all associate works. PARENT PERMISSION REF: 06510077
17310 17/01/2018	North Drogheda Development Partnership	Permission for development to consist of amendments to a permitted residential development (Ref. 071507) to alter dwelling unit types, and to amend conditions 6(ii) and 51 (i)(a). The total permitted number of units of 1056 no. will remain unchanged

The Proposed Development will increase the impact on the existing Material Assets. Having regard to other permitted developments in the area, which are either under construction or where construction has not yet commenced, there is potential for greater impact arising from the demand of additional population living in the area.

12.2.5.8.1 Power Supply

There is a possibility that the Proposed Development, in combination with the adjacent permitted developments, as well as other nearby development sites, could impact the availability of electricity supply. Following a grant of planning permission, the ESB review the electrical demand requirements for all proposed developments and confirm if the public network has capacity to cater for same, with or without network upgrades, prior to connection to the public network. If network upgrades are required these would benefit the local community as a whole, as it would modernise the network in this area. Therefore, it is considered that the likely effect of the cumulative impact of the Proposed Development with existing and the adjacent permitted developments on electricity supply infrastructure will be neutral to positive and not significant in the long-term.

12.2.5.8.2 Information and Communications Technology (ICT)

Communications masts hosting Vodafone and Eir antenna are located in close proximity to the Proposed Development, and the site is located in a Blue area, where highspeed broadband is available, hence there is adequate telecoms provision in the area of the Proposed Development. Therefore, it is considered that the likely effect of the cumulative impact of the Proposed Development with existing and the adjacent permitted developments on the surrounding telecom's infrastructure will be neutral and not significant in the long-term.

12.2.5.8.3 Water Supply

IW have provided Confirmation of Feasibility (CoF) (Ref. CDS22001877) through the Pre-Connection Enquiry process, that the Proposed Development can be facilitated at this moment, subject to upgrades. IW have noted in the CoF that the trunk main upgrade works must be completed prior to the connection of the Proposed Development. Hence, IW have reviewed the effect on the existing water supply network from both existing and the adjacent permitted developments, and as such it is considered that the cumulative effects are likely to be neutral and not significant in the long term.

12.2.5.8.3.1 Surface water drainage

The requirement to provide SuDS systems to treat and attenuate SW discharge in new developments, and the provision of separate foul and surface water drainage systems, will ensure that the likely effect of the cumulative impact of the Proposed Development with existing and the adjacent permitted developments on the local surface water infrastructure is neutral to positive and imperceptible in the long-term.

12.2.5.8.3.2 Wastewater Management

IW have also provided CoF (Ref. CDS22001877) through the Pre-Connection Enquiry process, that the Proposed Development can be connected to the wastewater network at this moment without infrastructure upgrade by Irish Water. Hence, as IW have reviewed the effect on the existing wastewater network from both existing and the adjacent permitted developments, it is considered that the cumulative effects are likely to be neutral and not significant in the long term.

12.2.5.8.3.3 Waste Management

The high number of waste contractors and waste treatment facilities operating in the Eastern-Midlands Waste Region, along with the requirement for all existing, proposed and permitted developments in the area to manage waste in compliance with national and local legislation,

policies and plans, will ensure that the likely effect of the cumulative impact of the Proposed Development with existing and the adjacent permitted developments on waste generation and waste management during both the Construction an Operational Phases will not be significant in the long term.

Accordingly, surrounding permitted development, when considered cumulatively with the Proposed Development, will result in a permanent impact on the receiving networks and services, however, the impact is not considered to be significant having regard to the capacity of services.

12.2.5.9 "Do Nothing" Impact

If the Proposed Residential Development is not advanced, the site will remain as a greenfield area.

12.2.6 Avoidance, Remedial & Mitigation Measures

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. The measures that will be taken to ensure that there will be no significant impact on the surrounding Material Assets during the Construction Phase include:

Waste will be stored onsite in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify LCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s).

Additionally, a Construction Environmental Management Plan will be in effect for the full duration of works. The Health and Safety Authority's "Code of Practice for Avoiding Danger from Underground Services" will be followed during construction and excavation activities and all underground and overhead utilities and public services will be identified and protected during the Construction Phase. All temporary suspensions to public services will be controlled by the relevant statutory undertaker, in accordance with standard protocols and all services will be reinstated as soon as possible post connection. Potable water networks and foul water sewers will be properly tested prior to connection.

12.2.6.1 "Worst Case" Scenario

In the event that the Proposed Development was to proceed, a worst-case scenario in relation to built services & infrastructure (electricity, telecommunications, gas, water supply infrastructure, and sewerage), would be where the works involved during construction resulted in an extended power or telecommunications outage, or disruption to water supply or sewerage systems for existing properties in the area due to unforeseen delays on site.

A worst-case scenario in relation to waste would be where a previously unclassified hazardous waste stream arose on the site during excavations, which was not identified and segregated

appropriately and resulted in the contamination of a non-hazardous waste stream, such as soil and stones, resulting in a large volume of hazardous waste that would require specialist removal and treatment. Additionally, the contaminated soil and stones would no longer be fit for use for fill and landscaping and would need to be replaced with imported materials.

However, taking account of the avoidance and mitigation measures, the worst-case scenarios are deemed to be an unlikely scenario.

12.2.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other chapters of the EIAR, no significant residual impacts are anticipated on the surrounding Material Assets.

12.2.8 Monitoring

12.2.8.1 Construction Phase

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the facility and that these records will be maintained on site.

12.2.8.2 Operational Phase

The building management company and retail unit operators will be required to maintain the bins and storage areas in good condition as required by the LCC Waste Bye-Laws. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

12.2.9 Interactions

The Proposed Residential Development will provide additional housing in a densely populated urban area. Material assets, utilities and waste interact with other environmental receptors as follows:

- Population and Human Health: The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4.
- Biodiversity: The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.
- Land, Soil and Geology: Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated

from the site. Potential impacts on land, soils and geology are addressed in Chapter 6.

- Water (Hydrology & Hydrogeology): Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7.
- Traffic: Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Drogheda area. Potential impacts on traffic are addressed in Chapter 12.1.

12.2.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

12.2.11 References

Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021

Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

ESB Networks (2021) National Code of Practice for the Customer Interface Version 5

ESB Networks (2019) Construction Standards for MV Substation Buildings

European Union (Waste Directive) Regulations 2020, S.I. No. 323 of 2020

Greater Dublin Strategic Drainage Study (2005) Regional Drainage Policies Technical Document – Volume 2, New Developments

Health and Safety Authority (2010) Code of Practice for Avoiding Danger from Underground Services

https://myplan.ie/national-planning-application-map-viewer/ (viewed online 08.09.2022)

https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map (viewed online 08.09.2022)

https://webapps.geohive.ie/mapviewer/index.html (viewed online 08.09.2022)

Irish Water Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2)

Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851.

Waste Management Acts 1996 (as amended)

13 RISK MANAGEMENT

13.1 Study Methodology

13.1.1 Scope and Context

The relevant legislation that applies to this Chapter is the Planning and Development Regulations 2001 – 2021, as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the proposed development resulting from … the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events*."

Additionally, the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), which implement the Seveso III Directive (2012/18/EU), and which revoked the 2006 Major Accident Regulations also applies to this Chapter.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

13.1.2 Guidelines and Reference Material

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines (2022) state that the EIAR must take account of "*the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)… The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g., the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk*

Assessment may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents."

Reference has also been made to the Department of the Environment, Heritage & Local Government (DoEHLG) Publication 'Guide to Risk Assessment in Major Emergency Management 2010' and the Office of Emergency Planning, Department of Defence (DOD) Publication 'A National Risk Assessment for Ireland 2020'. A consolidated list of national hazards for Ireland identified in the DOD document are identified in Table 13-1.

Table 13-1 Consolidated List of National Hazards (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

Hazard: Civil	**Hazard: Natural**
• Large Crowd Event • Pandemic • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident	• Storm • Snow and Ice (Including prolonged low temperature) • Flooding (Including pluvial, fluvial and coastal)
Hazard: Transportation	**Hazard: Technological**
• Maritime Incident • Air Incident • Transport Hub (Includes Airports, Ports and Rail Stations)	• Structural Collapse (Including Dam, Tunnel, Bridge and Building) • Nuclear Incident (Abroad) • Cyber Incident • Disruption of Energy Supply (Including oil, gas, electricity and communications)

13.1.3 Risk Assessment Methodology

The risk assessment methodology has been supported by general risk assessment methods. Hazard analysis and risk assessment are accepted internationally as essential steps in the process of identifying the challenges that may have to be addressed by society, particularly in the context of emergency management. Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard.

Table 13-2 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	**Classification**	**Average Recurrence Interval**
1	Extremely Unlikely	100 or more years between occurrences
2	Very Unlikely	51-100 year between occurrences
3	Unlikely	11-50 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Ongoing/Less than 1 year between occurrences

13.2 Predicted Impacts

The EIAR chapters within this report identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the Proposed Development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1 Assessment:

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment e.g., construction workers.

Phase 2 Screening:

The list was screened and major events such as volcanoes were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g., risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant chapter. Table 13-3 lists the major accidents and/or disasters reviewed.

Table 13-3: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development? (Y/N)	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., predominantly commercial development.	N/A	N/A
Pandemic	Y	COVID-19 is an illness that can affect your lungs and airways. It is caused by a virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is spread in sneeze or cough droplets. The Proposed Development poses no additional COVID-19 risk. It is anticipated that there will be approximately 150 workers directly employed during the peak of the Construction Phase of the project. During the Construction Phase of this Proposed Development HSE guidelines will be adhered to as relevant. All workers directly and indirectly employed during the Operational Phase of the Proposed Development will comply with the relevant Government protocols that will be in place at that point in time in relation to COVID-19.	Local businesses, construction workers	Chapter 4 (Population and Human Health) of this report addresses COVID-19.

Water Supply Distribution and Contamination	N	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers associated with the dewatering works. The existing water supply for the Proposed Development will be via connection to the public supply.	Local water users	Chapter 7 (Water (Hydrology and Hydrogeology)) of this report identifies the control measure required to avoid contamination of water supplies during construction works.
Food Chain Contamination	N	Relevant to the Proposed Development in the Operational Phase. Any food retail units will be required to register with the HSE and would need to adhere to food safety legislation and traceability requirements.	N/A	N/A
Animal Disease	N	Not relevant to the Proposed Development	N/A	N/A
Terrorist Incident	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., commercial development.	N/A	N/A
Transportation				
Maritime Incident	N	Not considered vulnerable. The Site of the Proposed Development is approximately 9km from the coast.	N/A	N/A
Air Incident	N	Not considered vulnerable. The closest commercial airport is Dublin Airport, which is approximately 33km north of the Site of the Proposed Development. The closest domestic airport is Ballyboughal Airfield, which is located approximately 26.5km northwest of the Site of the Proposed Development.	N/A	N/A
Transport Hub (Includes Airports, Ports and Rail Stations)	N	Not considered vulnerable. The closest rail station is McBride Train Station, Drogheda, which is approximately 3.5km east of the Site of the Proposed Development. The closest maritime port is Drogheda Port, which is approximately 3.2km east of the Site of the Proposed Development. *For airports see above*.	N/A	N/A

Natural				
Cultural, Archaeological and Architectural Heritage	N	Not considered vulnerable as no known archaeological, architectural or cultural heritage remains were found during the desk top survey.		Chapter 11 (Archaeology and Cultural Heritage) of this EIAR assessed the impact of the Proposed Development on the Archaeological and Cultural Heritage.
Landslides / Sinkholes / Earthquakes	Y	Earthquakes are not likely to occur in the vicinity of the Proposed Development at a sufficient intensity to pose a risk for the Proposed Development. The GSI database indicates that the Proposed Development is located within an area of low susceptibility to landslides. There are several karst features recorded within a 2km radius of the Proposed Development within the Tullyallen Formation as recorded in Section 6.3.11. There are both recharge (swallow holes) and discharge (springs) features identified. Geohazards risks such as subsidence and sinkholes are present within karst areas.	N/A	Chapter 6 (Land, Soil and Geology) of this EIAR assessed the vulnerability of the Proposed Development to ground movements.
Floods/Storm surge/Tidal flooding	N	Not considered vulnerable. The Site-Specific Flood Risk Assessment (Barrett Mahony, 2022) concludes that there is no potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding at the site of the Proposed Development.	N/A	Chapter 7 (Hydrology) of this EIAR assesses the vulnerability of the project to flooding.
Severe weather such as Tornados, Heatwaves, Blizzards and Droughts	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A
Air Quality events	N	Vehicular emissions Dust emissions	Residents/ workers	Chapter 8 (Air Quality) of this EIAR identifies the impact of the construction and operation of the development on

				ambient air quality.
Wildfires	N	Not considered vulnerable due to the location of the site of the Proposed Development.	N/A	N/A
Fire	Y	There is a risk of fire which might lead to loss of life and environmental pollution.	Residents / Employees / Members of the Public	Section 13.3 of this Chapter deals with Fire Safety and Emergency Response.
Invasive species	Y	Sycamore (*Acer pseudoplatanus*) and Butterfly-bush (*Buddleja davidii*), should be controlled/removed as per the appropriate best-practice guidelines and under the supervision of an appropriate qualified invasive species professional. There is a risk of introducing invasive species to the Proposed Development. Any material required on the Site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present. All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.	Native species / local biodiversity	Chapter 5 (Biodiversity) of this EIAR identifies the vulnerability of the project to invasive species.
Technological				
Structural Collapse (Building)	N	This has been taken into consideration in the building design. All buildings have been designed to modern standards. No further assessment is required.	N/A	N/A
Structural Collapse (Dam, Bridge, Tunnel failure)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A
Flood defence failure	N	Not considered vulnerable No flood defence systems are included as part of the Proposed Development due to the low flood risk.	N/A	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Nuclear incident	N	Not considered vulnerable. There are no nuclear power stations close to the Proposed Development.	N/A	N/A
Cyber incident	N	Not considered vulnerable The retail/commercial units may opt to have cyber protection in place when operational. This will be at the discretion of the unit operators.	N/A	N/A

Disruption to energy supply (oil, gas, electricity)	N	Not considered vulnerable. ESB Networks maintain the electricity network in Ireland. Gas Networks Ireland maintain the natural gas network in Ireland.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on energy systems.
Utilities failure (communications)	N	Not considered vulnerable. In Ireland, the fixed-line communications market is dominated by Eir; while Eir, Three, and Vodafone own Ireland's mobile telecommunications infrastructure.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on communications systems.
Utilities failure (water supply)	N	Not considered vulnerable. A pre-connection enquiry was submitted to Irish Water in relation to a Water & Wastewater connection for the Proposed development and Irish Water have advised the proposed connection to the Irish Water networks can be facilitated at this moment in time.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable. A pre-connection enquiry was submitted to Irish Water in relation to a Water & Wastewater connection for the Proposed development and Irish Water have advised the proposed connection to the Irish Water networks can be facilitated at this moment in time.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on wastewater and sewage removal and treatment
Utilities failure (solid waste)	N	Not considered vulnerable. The implementation of the CEMP during the Construction Phase and waste management plans during the Operational Phase will mitigate risks from solid waste.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on solid waste removal and treatment
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	Not considered vulnerable. There are no Upper Tier Seveso sites adjacent to the Site of the Proposed Development. The nearest Upper Tier Seveso Site is Flogas Terminal located approximately 3km East of the Proposed Development.	N/A	N/A

13.3 Fire Safety and Emergency Response Plan

13.3.1 Construction Phase:

The site will be managed in accordance with the Construction Environmental Management Plan which will ensure that all hazardous and flammable substances on site will be segregated and stored appropriately. There will be no smoking allowed on site and all hot works will be subject to a work permit system.

13.3.2 Operational Phase:

The design criteria of the buildings are in accordance with all relevant building and fire safety standards and the units will have protective services and evacuation strategies in place prior to occupancy. Access routes serving the Proposed Development have been designed to provide adequate space for the Fire Brigade.

13.4 Geohazards

Chapter 6 (Land, Soil and Geology) of this EIAR has assessed the potential impact of the Proposed Development on sinkholes and ground stability at the Site. There are no karst features recorded within the site boundary, however, there are several karst features recorded within a 2km radius of the Proposed Development within the Tullyallen Formation as detailed in Chapter 6. Bulk excavations and other groundworks including engineered infill of ground to achieve Site levels could result in the stability issues during construction. Detailed design will be specified by an appropriately qualified geotechnical Engineer for the construction of foundations at the Site to ensure that ground conditions are engineered and controlled appropriately. Any potential issues will be considered as part of the detailed design stage and will incorporate appropriate mitigation measures. Refer to Chapter 6 for detailed information.

13.5 Cumulative Impacts

The cumulative effects of Proposed Development on Major Accidents and Disasters have been assessed taking other planned, existing and permitted developments in the surrounding area into account. All planning permission applications that have been granted and developed have been incorporated into the baseline assessment of this application.

As noted in Table 13-3, the Site of the Proposed Development is not an industrial site, and is not regulated, connected to or close to any site regulated under the COMAH Regulations. Additionally, there are no developments under construction or proposed in the in the vicinity of the Site of the Proposed Development which will be regulated under the COMAH Regulations, and so there is no potential for cumulative impacts relating to major accidents involving dangerous substances.

All cumulative impacts have been detailed in the relevant technical chapters and are summarised in Chapter 15.

13.6 Residual Impacts

Through the implementation of mitigation measures detailed in the relevant technical chapters of this EIAR, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects as a result of the Proposed Development, alone or in combination with other projects.

The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented.

13.7 Monitoring

All monitoring proposals for the risks identified in Table 13-3 have been detailed in the relevant technical chapters as listed in Table 13-3 and are included in Chapter 15 Mitigation Measures and Monitoring.

13.8 Difficulties Encountered When Compiling

No difficulties were encountered in completing this Risk Chapter.

13.9 References

- Chapter 4-12 of Volume 2 of this EIAR
- Environmental Resources Management Ireland Ltd (2005) Public Safety Zones Report
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Garda Mapping Section – Seveso Sites Ireland WebMap [Viewed Online 07.09.2022] https://www.arcgis.com/home/item.html?id=a01b5a0a6ff24f10adff30beaa3b6fd0
- Office of Emergency Planning (2020) 'A National Risk Assessment for Ireland 2020' Department of Defence Publication
- Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018

14 INTERACTIONS

14.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's '*Guidelines on information to be contained in Environmental Impact Assessment Reports'* (2017), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft, 2017) and Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) were also considered.

Article 3 of the Directive states:

1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
    a) population and human health;
    b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
    c) land, soil, water, air and climate;
    d) material assets, cultural heritage and the landscape;
    e) the interaction between the factors referred to in points (a) to (d)

14.1.1 Quality Assurance and Competence

This Chapter was prepared by Arthur Greene, Graduate Environmental Consultant, Enviroguide Consulting. Arthur has a Master of Science (Hons) in Ecosystem Science and Policy from University College Dublin and Justus Liebig University and a Bachelor of Arts (Hons) in Geography from Trinity College Dublin. Arthur has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Archaeology Chapters and Archaeology & Cultural Heritage Chapters of EIARs.

14.1.2 Description of the Proposed Development

The Proposed Development (as detailed in Chapter 2) comprises of: *A retail/commercial development comprising: (i) provision of 10 no. retail units including a part-licenced anchor retail supermarket store (Unit 1)(4,085sq.m gfa), a DIY/Home store, including a garden centre(Unit 10)(2,350sq.m gfa), 8 no. smaller retail/commercial units, including a café and pharmacy (Units 2-8) (ranging in size from 300sq.m – 760sq.m gfa) and 1 no. single storey Drive-Thru Restaurant/Café unit (375sq.m). A deliveries area, service yard and ground mounted plan units will be provided to the side (south) and rear (west) of Retail Unit 1, a*

dedicated set down point is also proposed adjacent to the front entrance to Retail Unit 1. Deliveries will also be accommodated to the rear (south) of the proposed retail units (Units 2-10) with a truck turning area provided to the rear (south) of unit 10. Dock levellers will also be provided to the rear of units 2-10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the proposed development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus/coach parking area comprising 4 no. bus/coach parking spaces is also provided within the eastern portion of the site, adjacent to the Trinity Street Frontage. 104 no. bicycle parking spaces are proposed at surface level to serve the proposed retail units. A partially covered pedestrian circulation space will be provided to the front of each of the proposed retail units. The development also includes: (ii) provision of 2 no. vehicular and pedestrian connection points to the existing M1 Retail Park to the north which will provide access to the proposed retail development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, landscaping, boundary treatments, and lighting; (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage, plant areas; 3 no. ESB substations; and (vi) all associated site development works necessary to facilitate the proposed development.

Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR, and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

14.2 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 14-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised below in Table 14-2 to Table 14-10.

Table 14-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land, Soil and Geology	7. Hydrology	8. Air Quality & Climate	9. Noise & Vibration	10. Landscape & Visual Amenity	11. Archaeology, Architecture & Cultural Heritage	12. Material Assets – Waste & Utilities	12. Material Assets - Traffic
Population and Human Health										
Biodiversity										
Land, Soil and Geology										
Hydrology										
Air Quality and Climate										
Noise & Vibration										
Landscape & Visual Amenity										
Archaeology, Architectural and Cultural Heritage										
Material Assets – Waste & Utilities										
Material Assets - Traffic										

	No Interaction
	Interaction
	N/A

Table 14-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, *Population and Human Health,* details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate. Construction Phase: • There is potential for dust nuisances and traffic related emissions as well as noise and vibration impacting on human health however, appropriate mitigation measures will be implemented. • A risk is posed to public health in the event that waterbodies are polluted however, appropriate mitigation measures are discussed in the CEMP. • Increased traffic as well as visual impacts from the construction site will have a short-term impact on Population and Human Health. Operational Phase: • There will be moderate to significant, long term negative impact on human health as a result of increased traffic in the locality.	
Interactions	
Air Quality	Interactions with air quality during the construction and operational phase has the potential to cause dust nuisances and traffic related emissions impacting on human health. However, Chapter 8 has concluded that there will be no significant air quality impacts. All ambient air quality legislative limits will be complied with and therefore the predicted impact is not significant with a neutral effect on human health. Air quality is discussed further in Chapter 8 of this EIAR.
Hydrology	Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Mitigation measures have been proposed in Chapter 7 of this EIAR and following their implementation there are no likely significant adverse impacts as a result of Hydrology and as such there will be no significant impacts on population and human health. Hydrology has been fully assessed in Chapter 7 of this EIAR.
Noise and Vibration	Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to

	interact with the surrounding population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction and operational phase will not cause a significant impact. The operation of external M&E plant, delivery noise, and retail related traffic noise have also been assessed and based on the implementation of the proposed mitigation measures no significant impacts will be experienced.
Landscape and Visual	The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the urban nature of the surrounding landscape, will not cause any significant impacts and as such there will be no significant impact on population and human health.
Material Assets: Waste and Utilities	The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Construction and Demolition Waste Management Plan (CDWMP) (AECOM, August 2022) and CEMP (Enviroguide, August 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Chapter 12.2 of this EIAR has concluded there will be no significant impacts on the Material Assets (Waste and Utilities) as a result of the Proposed Development and subsequently there will be no significant impact on population and human health.
Material Assets: Traffic	Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the number of people utilising the road network to visit the retail park and subsequently an increase in the number of vehicles. The site is also permeable to pedestrians posing a potential human safety impact with construction vehicles. The Construction Phase will have a slight, short term, negative impact on human health and the Operational Phase will have a moderate to significant, long term negative impact on human health. Mitigation measures have been proposed in Chapter 12.1 of this EIAR to ensure pedestrian safety during the construction phase and the limit the effects of the Proposed Development on the road network and subsequently the human health of those utilising it.
Conclusions	
No significant adverse effects on Air Quality, Hydrology or Waste & Utilities is expected to occur as a result of the Proposed Development. Increased Traffic and Noise Pollution is expected during the Construction Phase of the Proposed Development. The Landscape and Visual assessment deemed	

that there will be no significant impact as a result of the Proposed Development. There will be moderate to significant, long term negative impact on human health as a result of increased traffic in the locality.

Table 14-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, *Biodiversity,* details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate. Construction Phase: • The bulk removal of soils at the Site can have implications for biodiversity. • Interactions between hydrology and biodiversity can occur through impacts to water quality. Monitoring and Mitigation measures are established in Chapter 7 to prevent a negative interaction between Hydrology and Biodiversity. • Dust mitigation measures have been established in Chapter 8 to prevent a negative interaction between air quality and biodiversity. • Noise monitoring will take place throughout the Construction Phase to ensure noise and vibration does not exceed the limits established in the CEMP and interact with biodiversity. Operational Phase: • The operation of the facility will not involve any new point water source discharges and there will be no other material releases that would cause adverse impacts on surface waters. Hence, no impacts are expected.	
Interactions	
Land, Soil and Geology	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the impact of the Proposed Development on the receiving soils underlying the Site during the Operational Phases of the Proposed Development, is described in Chapter 6 - 'Land, Soil and Geology' of this EIAR. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 6. The bulk removal of soils at the Site can have implications for biodiversity. Natural regeneration of native and local seeds is the preferred option for re-vegetating areas to be retained for biodiversity.
Hydrology	The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7 - 'Hydrology' of this report as well as in his Chapter, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an

	accidental pollution event during the construction and operational phase. This interaction has the potential to result in impacts on habitats and fauna that are hydrologically linked to the Site.
Air Quality and Climate	An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR. Dust emissions arising from the Construction Phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.
Noise and Vibrations	An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9- 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9. There is potential for interactions between noise and sensitive fauna, e.g., birds, that occur in adjacent habitats from increased noise levels during the Construction Phase. However, as described, noise related impacts are not deemed to be significant.
Landscape and Visual	An assessment of the potential impacts of the Proposed Development on the surrounding landscape character is outlined in Chapter 10 – Landscape and Visual. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 10. Landscaping at a development site can have significant implications for biodiversity. The landscape plan for the Proposed Development includes an area to be retained for biodiversity. The lighting plan for the Site has also been sensitively designed to protect bats from light pollution. Significant negative effects are not predicted.
Material Assets: Traffic	Construction waste arising from Site operations could negatively affect local fauna through entrapment, for example. However, appropriate waste management practices on Site will ensure no significant effects occur on local biodiversity.
Conclusions	
Appropriate Mitigation and Monitoring methods have been established to mitigate risk of impacts to Biodiversity and the surrounding environment during both the Construction and Operational Phases of the Proposed Development.	

Table 14-4: Land, Soil and Geology

Land, Soil and Geology	
Summary	
Chapter 6 of this EIAR, *Land, Soil and Geology*, details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate. Construction Phase: • Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase of the Proposed Development. The receiving hydrological environment and biodiversity as well as Human Health will be protected through the required procedures. Operational Phase: • Design measures taken during the Construction Phase will limit any potential for any direct adverse impact on the receiving land, soil, geological environment during the operational phase of the Proposed Development.	
Interactions	
Material Assets: Traffic	Soil excavated during construction works for the Proposed Development will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan. Specific issues relating to Traffic associated with the Proposed Development are outlined in the Traffic Assessment (Barrett Mahony, 2022).
Population and Human Health	No public health issues associated with the land, soil, geology conditions at the Proposed Development have been identified for the Construction or Operational Phase. The Proposed Development is not considered to be within a High Radon Area and where required radon barriers will be installed in accordance with current building regulations. Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers. The necessary measures will also be implemented to address any nuisance issues associated with dust dispersion during construction works including

	the offsite removal of surplus soil. The potential impacts associated with airborne dust is addressed in Chapter 8 (Air Quality) and Chapter 4 (Population& Human Health) of this EIAR. Specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Hydrology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.
Material Assets: Waste and Utilities	An assessment of the potential impact of the Proposed Development on the material assets including built services, infrastructure, traffic, and waste management is included in Chapter 12 of this EIAR.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Landscape and Visual	During the construction phase the Site landscape will undergo a change from agricultural land to a retail part with landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 10 of this EIAR.
Air Quality and Climate	The excavation of soils across the Proposed Development Site and the temporary stockpiling of soils pending reuse or removal off-site has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate are included in Chapter 8 of this EIAR.
Conclusions	
The Construction Phase of the Proposed Development on Land and Soil has the potential to have adverse impacts on Air Quality, Biodiversity, Hydrology and Population and Human Health through dust and air pollution. However, appropriate Mitigation and Monitoring methods have been established in the respective Chapters.	

Table 14-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, *Hydrology and Hydrogeology*, provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate. Construction Phase: • Effective Mitigation and Monitoring measures have been established to ensure protection of Hydrology and Hydrogeology during the Construction Phase of the Proposed Development. These measures aim to mitigate pollution risks to Biodiversity, Water and Land, Soil, Geology and Hydrogeology. • No public health concerns have been identified during the Construction Phase of the Proposed Development. • Any discharges to the public foul sewer and abstractions from water supply from the Proposed Development will be under consent from Irish Water. Operational Phase: • There are no adverse effects predicted during the Operational Phase of the Proposed Development.	
Interactions	
Population and Human Health	It is noted the inner source protection zone of the Drybridge water supply is delineated within the Site boundary (within the SI/L). There is potential for contamination during construction due to use of release of cementitious material or earthworks reaching groundwater causing contamination at the source The risk is the worst-case scenario given the low permeability sub-soils on Sites. All works will be carried out in accordance with industry standards. With the mitigation measures set out in Section 7.6, the risk is considered to be “unlikely”. No other public health issues associated with the water (hydrology and hydrogeology) conditions at the Proposed Development Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.

	It is noted that specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Land, Soil, Geology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology.
Material Assets: Water	Any discharges to the public foul sewer and abstractions from water supply from the Proposed Development will be under consent from Irish Water. An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR.

Conclusions

Mitigation and Monitoring measures have been established for the protection of Water and Biodiversity in both the Construction and Operational Phases of the Proposed Development.

Population and Human Health is protected by the appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.

There are no adverse effects expected for Land, Soil, Geology and Hydrogeology as a result of the Proposed Development.

Table 14-6: Air Quality and Climate

Air Quality and Climate	
Summary	
Chapter 8 of this EIAR, *Air Quality and Climate*, provides an assessment of the potential impacts of the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary. Construction Phase: • Dust deposition and air pollution as a result of the Construction Phase have the potential to interact with Biodiversity and Human Health however, appropriate mitigation measures have been established in the CEMP and Chapter 8 of this EIAR. Operational Phase: • The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions.	
Interactions	
Population and Human Health	Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.
Biodiversity	Interactions between Air Quality and Biodiversity have been considered as the Construction Phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.
Material Assets: Traffic	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current

	assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.
Conclusions	
Appropriate mitigation measures have been recommended and will be implemented at the Site to minimise the risk of dust emissions arising during the Construction Phase and provided such measures are adhered to, it is not considered that significant air quality impacts will occur. Traffic-related pollutants that may arise during the Operational Phase of the Proposed Development however, the impacts of this is considered insignificant.	

Table 14-7: Noise and Vibration

Noise and Vibration	
Summary	
Chapter 9 of this EIAR, *Noise and Vibration*, provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary. Construction Phase: • There is a potential risk of temporary to short term noise and vibration impact and effects through the use of heavy machinery and equipment. These impacts are expected to be slight or moderate. Operational Phase: • Traffic-related noise and vibration that may continue during the Operational Phase of the Proposed Development however, the impacts of this is considered insignificant.	
Interactions	
Population and Human Health	Potential interactions include increased footfall to the existing M1 Retail Park and increased development in the surrounding area in response to the increase in local amenities. Expected impacts would be slight or moderate since changes to the ambient noise environment would be small in magnitude and would not be expected to be involve changes in character.
Conclusions	
The operation of on-site machinery will be intermittent and last only for the duration of the Construction Phase. Operational Phase noise and vibration impacts have also been assessed in relation to traffic and plant equipment and no significant impacts will be experienced.	

Table 14-8: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 10 of the EIAR, *Landscape and Visual Assessment*, provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area. The Proposed Development does not have any negative interactions with Population and Human Health or Archaeology and Cultural Heritage. Although, some vegetation will be removed from the Site. The site in its current condition is not of high ecological value, and landscaping proposals will result in no significant cumulative habitat loss at the Proposed Development.	
Interactions	
Population and Human Health	It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the nature of the surrounding landscape, will cause any issues for the residential local population.
Biodiversity	The proposed landscaping of the site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The landscaping proposals will entail losses and contributions in terms of vegetation at the site, which in turn will affect the ecology of the site. The site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard. It is noted that the Proposed Development further negates any habitat loss through the provision of a number of plantations included in the project design. As such, no significant cumulative habitat loss will occur involving the Proposed Development.
Archaeology and Cultural Heritage	As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.
Conclusions	
The Proposed Development does not have any negative interactions with Population and Human Health, Archaeology and Cultural Heritage or Biodiversity.	

Table 14-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 11 of the EIAR, *Archaeology and Cultural Heritage,* provides information on the known architectural, archaeological, and cultural heritage sites in the study area. Construction Phase: • Earthworks during the Construction Phase will potentially cause adverse effects on the Landscape and Visual characteristics of the site and may cause increased Noise and Vibration which must be monitored to avoid/mitigate potential damage to Archaeological Sites. Operational Phase: • It is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.	
Interactions	
Land, Soil and Geology	The Construction Phase of the Proposed Development will require: • Excavation of subsoil and bedrock to reduce levels to construct the foundations and for the surface water drainage including an attenuation tank to a maximum depth of 3.3mbGL. • Piling for the construction of foundations (to be confirmed at detailed design phase). • Excavated material that cannot be reused on-site will be temporarily stockpiled at the Site and then be removed by the licenced waste carriers and sent for reuse at other local development sites or recovery with disposal considered as a final option only. • The Proposed Development will include the importation of aggregates for the construction of roads and other infrastructure. There will be no excavation of soil or bedrock or infilling of waste during the Operational Phase of the Proposed Development. There will be discharges to ground via the SuDs during the Operational Phase of the Proposed Development. Approximately 66% of the Proposed Development Site area will be hard covered with buildings and impermeable pavement on completion of the Proposed Development.

Landscape and Visual	As there are no known archaeological or architectural remains found during the desk top survey, is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

Conclusions

The Earthworks that will occur during the Construction Phase of the Proposed Development are the primary risk to Archaeology and Cultural Heritage. However, mitigation measures are discussed in the CEMP and no there are no known archaeological or architectural remains found during the desk top survey.

Table 14-10: Material Assets - Traffic, Waste and Utilities

Material Assets - Waste and Utilities	
Summary	
Chapter 12 of the EIAR, *Material Assets*, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure. Construction Phase: • Pollution of soil and/or hydrology/waterways has the potential for negative interactions between Biodiversity, Land, Soil and Geology and Hydrology. The necessary monitoring and mitigation measures for these are discussed in the CEMP as well as the respective Chapters of this EIAR. Operational Phase: • Waste collection activities at the Proposed Development have the potential to increase traffic flow in the transport infrastructure surrounding the Proposed Development.	
Interactions	
Population and Human Health	The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4.
Biodiversity	The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.
Land, Soil and Geology	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land, soils and geology are addressed in Chapter 6.
Hydrology	Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7.
Material Assets: Traffic	Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Drogheda area. Potential impacts on traffic are addressed in Chapter 12.1.
Conclusions	

The Construction Phase of the Proposed Development has the potential to cause adverse effects to Biodiversity, Land, Soil and Geology and Hydrology.

The Operational Phase of the Proposed Development has the potential to cause adverse effects to Traffic through increased traffic activity.

Table 14-11: Material Assets - Traffic

Material Assets - Traffic	
Summary	
Chapter 12 of the EIAR, *Material Assets*, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure. Main interactions include: • Increased traffic flow • Increased noise pollution • Road closures	
Interactions	
Construction Phase	Increased traffic flows during construction, notwithstanding the mitigation measures outlined, do have temporary impact in respect of air, noise, biodiversity and human health and these impacts are dealt with in the appropriate chapters of this EIAR. Chapter 4- Population and Human Health & Chapter 5 – Biodiversity.
Operational Phase	Increased traffic flows resulting from the development, notwithstanding the mitigation measures outlined, do have an impact in respect of air, noise, biodiversity and human health and these impacts are dealt with in the appropriate chapters of this EIAR.
Conclusions	
Increased traffic flows during the Construction and Operational Phases have impacts in respect of air, noise, biodiversity and human health.	

14.3 References

EIAR Chapters 4 to 12 inclusive.

15 Mitigation and Monitoring Measures

15.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

15.2 Summary of Mitigation Measures

15.2.1 Population and Human Health

15.2.1.1 Construction Phase

15.2.1.1.1 Mitigation

During the Construction Phase of the Proposed Development, it is expected that HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility. Frequently touched objects and surfaces such as door handles, machine steering wheels and gear levers will be cleaned and disinfected frequently.

No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air quality, noise, traffic, waste etc. are identified in their respective chapters in this EIAR.

15.2.1.1.2 Monitoring

No specific monitoring measures are proposed or required in relation to Population and Human Health for the Construction Phase of the Proposed Development.

Monitoring activities will be implemented for the for the Construction Phase in accordance with the CEMP submitted as part of this planning application.

15.2.1.2 Operational Phase

15.2.1.2.1 Mitigation

All workers employed during the Operational Phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to Covid-19.

No specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions, noise, traffic etc. are identified in their respective chapters in this EIA Report.

15.2.1.2.2 Monitoring

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, water, noise and traffic are identified in their respective Chapters in this EIAR.

15.2.2 Biodiversity

15.2.2.1 Construction Phase

15.2.2.1.1 Mitigation

15.2.2.1.1.1 Mitigation 1: Construction Phase Surface Water Management

Although there are no waterbodies immediately adjacent to the Proposed Development, the following best practise measures will be put in place to ensure the minimisation of potential impacts to waterbodies as a result of the Proposed Development.

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environmental Section of Louth County Council.

Personnel working on Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international practice including but not limited to:

- CIRIA (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- BPGCS005, Oil Storage Guidelines.
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004; Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006).
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

The following standard measures will protect surface waters during the Construction Phase of the Proposed Development:

- There will be no discharges to groundwater or surface water during the Construction Phase of the Proposed Development.
- The contractor will ensure that no contaminated water / liquids leave the Proposed Development Site (as surface water run-off or otherwise) and enters the existing drainage at the Site or local drainage gullies on the adjoining roads.
- There may be a requirement for localised dewatering or sump pumping on a temporary basis during excavation works and management of water from these excavations will include control of surface water runoff and pumping of water from excavations.
- Silt fencing will be installed and maintained as a protective measure during the Construction Phase. The silt fencing will act as a temporary sediment control device to protect the public surface water network adjacent to the Site. Silt fencing will be installed along the Site boundaries where there may be a risk of runoff.

- This fencing will be monitored to ensure they remain functional throughout the construction of the Proposed Development. Where necessary, maintenance will be carried out to on the fences to ensure they continue to be effective. This will be particularly important after heavy rainfall events. The frequency of the monitoring will depend on the stage of works, and the local environmental conditions. Daily checks may be appropriate during the initial Site clearance and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.
- It will be ensured that all protection measures will be maintained in good and effective condition for the duration of the proposed works and checked regularly to ensure that they are operating effectively.
- To prevent elevated levels of erosion and sedimentation at the Site during the Construction Phase, surface water at the Site will be managed and controlled for the duration of the construction works, until the permanent surface water drainage system for the Proposed Development is complete.
- There will be no cement washout on Site except for washout of chutes, the washings of which will be collected into an appropriate container for compliant off-Site management.
- Run-off from the working Site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with overflows directed to land rather than a watercourse.
- Silty water generated on Site will be treated using settlement ponds and temporary interceptors and traps will be installed until such time as permanent facilities are constructed. Where settlement ponds are not practical due to location constraints, filtration bags or silt buster systems will be utilised
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.
- Any imported materials will, as much as possible be placed on Site in their proposed location and double handling will be avoided. Where this is not possible, designated temporary material storage areas will be used.
- Where cast-in-place concrete is required, all work will be carried out in the dry and effectively isolated from any drainage ditch or surface water sewer.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling stations located on Site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site.
- Only emergency breakdown maintenance will be carried out on Site. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed off Site.
- All personnel working on Site will be trained in pollution incident control response.

- Any other diesel, fuel or hydraulic oils stored on Site will be stored in bunded storage tanks. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCD005).
- All associated waste from portaloos and/or containerised toilets and welfare units will be removed from Site by a licenced waste disposal contractor.

Headwall and Surface Water Sewer Construction

It is proposed to discharge surface water from the Site of the Proposed Development to the Mell Stream, the exact location of the proposed headwall will be agreed with the County Council following grant of planning and a pre-construction ecological survey of the area of works.

The Headwall and base will be construction via *in situ* concrete. If required, sandbags will be placed at the outfall during the Construction Phase.

All near stream works will be carried out in accordance with an approved method statement and under the direction of Inland Fisheries Ireland personnel. Once the schedule of near stream works has been drawn up the developer will consult with Inland Fisheries Ireland (IFI) before commencing works. All works will be completed in agreement with IFI.

Any works near the Mell Stream will be carried out in accordance with IFI (2016) *Guidelines on the Protection of fisheries during construction works in and adjacent to water*. Works associated with the headwall construction will be supervised by an appropriately qualified Ecological Clerk of Works (EcOW) engaged by the appointed contractor.

Field parameters (pH, temperature and conductivity) are required to be collected directly downstream of the works, prior to commencement of works for the construction of the headwall. This will confirm the baseline conditions, field parameters will also be collected at regular intervals during the construction works to ensure there is no potential risk to water quality in the Mell Stream or downstream associated waterbodies during the near stream works. The EcOW will visually inspect the water quality during the works, observe for the release of suspended sediment or contaminants to the stream and ensure silt fencing and other protection measures are installed and remain effective for the duration of the works near the Mell Stream. Works for the headwall and surface water sewer will not occur during periods of high rainfall.

15.2.2.1.1.2 Mitigation 2: Protection of Habitats

Trees that are proposed to be retained will be protected by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on Site and prior to any development or soil stripping taking place. Areas that are designated for new plantings will similarly be protected. Barriers will be fit for the purpose of excluding construction activity. In most cases barriers will consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage will be affixed to the barrier in an unrestricted easily viewed location. The protective barriers will remain in an undisturbed condition and only removed on completion of all construction activity finished grading and sodding. Any breach of the protective fence will be reported to the consulting arborist.

During the course of the Construction Phase the integrity of the protective fencing must be respected and remain in place at all times. No building materials or soil heaps will be stored within this area. Should essential works need to take place within the root protection area, the

project arborist must be informed in advance and any necessary mitigation measures will be put in place. The protective fencing will remain in situ for the duration of the project and will only be removed upon completion of all works. Construction will only commence once the protective barriers and/or ground protection have been erected.

Further information on Tree Protection measures can be found in the Arboricultural Impact Assessment accompanying this application.

15.2.2.1.1.2.1 Invasive Species

No high impact or legally controlled invasive plant species were identified on or adjacent to the Site of the Proposed Development during field surveys by Enviroguide Consulting.

The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development.

For the Construction Phase, the contractor will prepare a project specific Invasive Alien Plant Species (IAPS) standard operating procedure document, in advance of work commencement. The document will cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS onsite, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite. These measures to include:

- Validation that all machinery/vehicles are free of IAPS, prior to their first introduction to Site.
- Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS.
- A regular schedule of Site inspections across the SIAPS growing season, for the duration of the Construction Phase.
- Validation that all machinery/vehicles are free of IAPS, prior to leaving the Site.
- Appropriate and effective Site biosecurity hygiene to ensure that no IAPS are transmitted offsite for the duration of the Proposed Development.

Although not considered to be 'high impact' invasive species or listed under regulation S.I. 477, the non-native species recorded at the Site, Sycamore *Acer pseudoplatanus* and Butterfly-bush *Buddleja davidii*, should be controlled/removed as per the appropriate best-practice guidelines and under the supervision of an appropriate qualified invasive species professional. Removal and disposal will be carried out in accordance with appropriate guidelines such as TII (formerly NRA) Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010), with consideration given to the prevention of spread of these plants. Removal and management options for the invasive species found on Site, namely Sycamore and Butterfly Bush are provided below:

15.2.2.1.1.2.2 Sycamore

There are no specific eradication methods available for Sycamore, the following guideline for removal and management of this species is amended from the guidelines for Cherry Laurel:

- Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth.

- Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth.
- Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a machine. To avoid regrowth, stumps will be turned upside down and soil will be brushed off the roots.
- Stump regrowth and seedlings can be effectively killed by spraying regrowth with a suitable herbicide. Best practice spraying protocols should be carefully followed. General broadcast spraying is not as effective as stump spot treatment and has the potential to impact on surrounding non-target species. For herbicide treatment to be effective each individual leaf needs be thoroughly wetted with herbicide to kill the plant.
- Disposal of material will be undertaken with due caution to prevent accidental spread of the plant.

15.2.2.1.1.2.3 Butterfly Bush

Buddleia (also known as the butterfly bush) is a member of the *Buddlejaceae* family. It is very fast growing and can reach 2m in its first year, producing flowers and setting seed. It colonises bare ground very rapidly and can quickly form mono-typic stands. As buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care will be taken to ensure material is disposed of in a manner to avoid this risk.

After uprooting, it is essential to plant the ground (e.g., with native flower and shrub species) in order to prevent a flush of new seedling growth.

15.2.2.1.1.3 Mitigation 3: Protection of Terrestrial Fauna

15.2.2.1.1.3.1 Small mammals

As best-practice, all construction related waste on Site e.g., plastic sheeting, netting etc. will be kept in designated areas on Site and kept off ground level to protect Hedgehogs from entrapment and death. These measures will also act to mitigate potential negative impacts on any other small mammal species potentially utilising the Site.

15.2.2.1.1.3.2 Vegetation Clearance

Any clearance of vegetation will be carried out outside the main bird breeding season, i.e., outside the period of 1st March to 31st August, in compliance with the Wildlife Act 1976 (as amended). Should any vegetation removal be required during this period, this vegetation will be checked for bird or nests by a qualified Ecologist. If encountered, the precise location within the hedgerow/trees and the species of bird present will be recorded. The area will be protected and the NPWS will be consulted prior to any works commencing in this area. The Site manager will be informed of the presence of nesting birds and advised that no works can commence in this area until further notice. Appropriate protection measures will be implemented in consultation with the project ecologist.

Table 15-1 provides guidance for when vegetation clearance is permissible. Information sources include the Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act*, 2000.

The preferred period for vegetation clearance is within the months of **September and October**. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., Hedgehog, Pygmy Shrew). Where this seasonal restriction cannot be observed, a check for active roosts and nests will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist/ ornithologist and repeated as required to ensure compliance with legislative requirements.

Table 15-1. Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/works are not permissible.

<table>
<tr><th>Ecological Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Breeding Birds</td><td colspan="2">Vegetation clearance permissible</td><td colspan="6">Nesting bird season. No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist.</td><td colspan="4">Vegetation clearance permissible.</td></tr>
<tr><td>Bats</td><td colspan="8">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist.</td><td colspan="2">Preferred period for tree-felling</td><td>Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist</td></tr>
<tr><td>Hibernating mammals (e.g., Hedgehog, Pygmy Shrew)</td><td colspan="3">Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.</td><td colspan="7">Vegetation clearance permissible</td><td>Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.</td></tr>
</table>

15.2.2.1.1.3.3 Bats and Tree Felling

The over-mature Ash tree identified for removing was identified as holding low bat roost potential. As a precautionary measure, this tree will be subject to a pre-felling survey by a qualified bat ecologist, the evening/ dawn before felling; to confirm the presence or absence of bats.

Should bats be found, felling will be postponed until a derogation licence is obtained by the bat ecologist from the NPWS. This will avoid any harm to bats and the committing of an offence

under the The Wildlife Act 1976 as amended. Should the trees be found to be free of bats by the bat ecologist then felling can proceed within 24hrs of the survey, any longer than this and a second survey will be required to ensure bats are not present. Felling of Moderate roost potential trees will be by 'soft-felling', where the tree in question is section felled by a tree surgeon under the supervision of the bat ecologist if the bat ecologist recommends it.

If the bat specialist is content that section felling is not required, then trees will be felled as follows (as per NRA (Now TII) Guidelines):

- Tree-felling will be undertaken in the period September to late October. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Tree-felling will be undertaken using heavy plant and chainsaw. Prior to felling the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active.
- The tree should then be pushed to the ground slowly and should remain in place for a period of 48 hours to allow bats/other wildlife to escape. Trees will then be inspected by a bat specialist.
- Trees will not be sawn up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, will elapse prior to such operations to allow bats to escape.
- Trees for future landscaping will comprise of semi-mature native Irish species where possible.
- When felling trees with a chainsaw, it is important to ensure that the rate of fall is not accelerated by the use of a chain and vehicle (e.g., tractor). It is unlikely that a bat would survive such a heavy impact.

15.2.2.1.1.3.4 Bat Box installation

To offset the loss of hedgerows on Site, a series of 10 bat boxes will be erected on suitably large trees along the boundaries of the Site to provide future roosting opportunities. The guidance of a suitably qualified Bat ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes should be placed over 4m high (if possible), the trees in which they are placed should not be illuminated.

15.2.2.1.1.3.5 Reduction of noise related impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. The following best practise measures will be put in place to ensure the minimisation of potential impacts on fauna as a result of the Proposed Development. Limiting the hours during which Site activities likely to create high levels of noise are permitted.

- Establishing channels of communication between the contractor/developer, local authority and residents.
- Appointing a Site representative responsible for matters relating to noise.
- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

15.2.2.1.1.3.6 Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development, and will ensure no significant dust related impacts occur on nearby sensitive receptors including local faunal species:

- Haulage vehicles transporting gravel and other similar materials to Site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the construction period.
- 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 thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the Site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel will be used at Site exit points to remove caked-on dirt from tyre tracks.
- Equipment will be washed at the end of each workday.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If practical, wheel-washing facilities will be located at all exits from the Construction Site.

- Dust production as a result of Site activity will be minimised by regular cleaning of the Site access roads using vacuum road sweepers and washers. Access roads will be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the Site agent and is weather and activity dependent.
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind
    - Stockpiles
    - Areas where there will be loading and unloading of dust-generating materials.
- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

15.2.2.1.1.4 Mitigation 4: Protection of Semiaquatic and Aquatic Fauna

The surface water and groundwater mitigation and management measures detailed in 15.2.2.1.1.1 will serve to protect the water quality of the Mell Stream and River Boyne, which in turn will eliminate any potential negative impacts on aquatic species that are sensitive to water quality changes.

To ensure there is no potential harm/disturbance to Otter utilising the Mell Stream during the proposed installation of the surface water headwall, preconstruction ecological surveys for Otter along the area of works will be undertaken. This will ensure there has been no new holts established in close proximity of the proposed outfall location and ensure compliance with the legal protection afforded to otters. The following measures are proposed:

- Upon grant of planning and prior to construction works commencing, the appointed contractor will engage the services of a suitably qualified ecologist to conduct a preconstruction Otter survey of the Mell stream. This survey will be undertaken in accordance with the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006).
- If an active Otter holt is confirmed within 150 meters of the proposed works, a local NPWS conservation ranger will be contacted. This may require an application for a derogation licence from the NPWS to exclude the Otter holt. If required, any further mitigation measures required will follow those outlined in the *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (NRA, 2006) and will be agreed with the NPWS at the time of licence application.

15.2.2.1.2 Monitoring

As a precautionary measures, it is recommended that the relevant potential bat roost tree, located within the south-eastern boundary of the Site is surveyed for bats the night/morning before felling by a suitably qualified bat ecologist and, if required by the Bat ecologist, is section-felled under their supervision. If bats are present, all work must cease, and NPWS contact in order to obtain a derogation licence.

Should any vegetation removal be required during the period of March 1st to September 1st, this vegetation will be checked for birds by a suitably qualified ecologist, and if any are noted during this evaluation prior to removal, the recommendations of the ecologist will be followed in terms of protecting the nest/eggs onsite.

Prior to construction works commencing for the surface water outfall to the Mell Stream, the appointed contractor will engage the services of a suitably qualified ecologist to conduct a preconstruction Otter survey of the area of works. This survey will be undertaken in accordance with the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006).

15.2.2.2 Operational Phase

15.2.2.2.1 Mitigation

15.2.2.2.1.1 Mitigation 5: Protection of Habitats and Flora

The landscaped sections of the Proposed Development will be managed in a way so as to mitigate the loss of the existing hedgerows as much as is possible. In this way new hedgerows, treelines and areas of scrub will be maximised in the ecological value they provide at the Site, with habitat connectivity ensured along the margins of the Proposed Development; connecting it in with the wider field boundary network in the area. This connectivity is vital for wildlife such as birds, bats, mammals and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows, treelines and scrub in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increase provision of food resources and higher quality shelter to wildlife inhabiting and commuting through the area.

The above low intervention approach may not be suitable for the more landscaped areas of the Site, which may need to be maintained to a higher degree for health and safety or aesthetic reasons. However, native species will be used wherever possible in these locations to maximise the biodiversity value of these internal landscaped parts of the Site.

For the hedgerows and scrub running along the outer margins of the Site, the following management approach is proposed to maximise their biodiversity value and offset the loss of existing hedgerows at the Site:

- Hedgerows will be maintained with a natural meadow strip of 1-2m at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A two-cut management approach is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip once during February and March (this is before

most verge plants flower and it will not disturb ground-nesting birds). Cut the verge once again during September and October (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).

N.B. Raising the cutter bar on the back cut will lower the risk to amphibians, reptiles and small mammals.

- Hedgerows, where possible, should be allowed to reach at least 2.5m in height, and should be trimmed in an A-shape; maintaining a wider base to compliment the natural meadow strip at their base.
- Where hedgerow trimming needs to occur delay trimming as late as possible – until January and February as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow cutting should be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) needs to be taken.
- Where possible, cut these outer boundary hedgerows on a minimum 3-year cycle (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (Blackthorn in March, Hawthorn in May).
- Where they occur naturally, Bramble and Ivy should be allowed grow in hedgerows, as they provide key nectar and pollen sources in summer and autumn.

Methods to Avoid

Hedgerows will not be over-managed. Tightly cut hedges mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.

Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.

DO NOT use pesticide/ herbicide sprays or fertilisers near hedgerows, scrub or areas of wildflower meadows as they can have an extremely negative effect on the variety of plants and animals that live there.

15.2.2.2.1.2 Mitigation 6: Protection of Fauna

15.2.2.2.1.2.1 Bat friendly lighting measures

To minimise disturbance to bats in the immediate vicinity of the Site, the lighting and layout of the Proposed Development has been designed to minimise light spill. This will be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust ‘Artificial Lighting and Wildlife Interim Guidance’ and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'.

It is recommended that bat-friendly lighting measures are incorporated into the project design and associated lighting plan. Dark buffer zones can be effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of features do not exceed certain

defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature. Examples of this application can be seen in Figure 15-1.

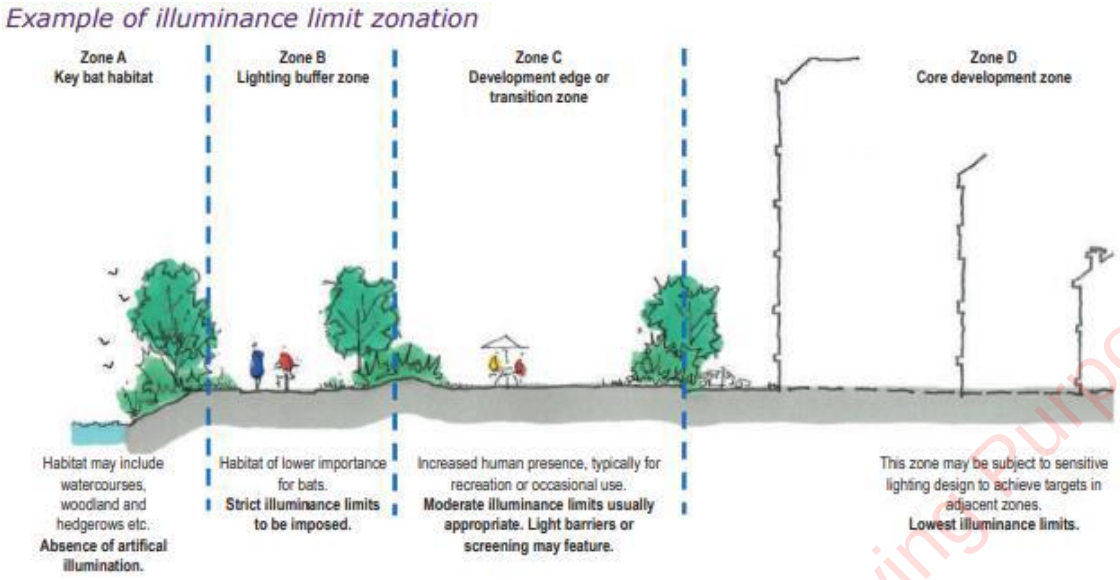

Figure 15-1 External lighting zonation diagram adapted from ILP (2018).

Night-time lighting across the Site will be kept to a minimum (once satisfying health and safety requirements), through the reduction of light spill from the buildings via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and through the Proposed Development grounds. For safety reasons, lighting will be required to illuminate the car park on Site however several factors have been included in the lighting design to mitigate the disruption to bats in the vicinity of the Proposed Development.

Incorporation of appropriate luminaire specifications will have a considerable input in mitigating the potential impact of night-time lighting on local bats. Based on the above guidance documents, the lighting scheme for the Proposed Development, as confirmed by Lawler Consulting, has incorporated the following measures:

- The lighting installation has been designed to only illuminate the new car parking area. The proposed luminaires minimise light spill to any other area forming part of the bats commute (boundary features). The luminaries included in the project design provide no up light and have narrow downward beams of light, and optics which prevent back spill.
- Lighting design software will be utilised to predict where light spill will occur.
- Lighting cowls/shields will be installed on luminaries where there may be the potential for any light spill onto the perimeter of the Site.
- The light output from dusk to dawn will be restricted using LED controls to dim the luminaires located across the carpark and along the boundaries of the Site. This will benefit commuting and foraging bats as the dimmer can be set to suitable times throughout the year.
- LED luminaries will be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

- Narrow spectrum bulbs will be used to lower the range of species affected by lighting. Light sources that emit minimal ultra-violet light and avoid the white and blue wave-lengths of the light spectrum will be utilised to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats may utilise for foraging.
- Maintain dark zones for foraging bats in areas where lighting is not necessary e.g., along the vegetated boundaries of the Site and southern woodland area. However, where lighting is required, this lighting will be placed at a minimum height using the lowest lux value permitted for public health and safety.
- 'Warm white' (more yellow/orange colour) at 2700ºK will be used, warmer colour temperatures with peak wavelengths greater than 550nm (~2700ºK) cause less impacts on bats.
- Retained treelines will not incur an increase in current lux levels due to the Proposed Development.
- Planting will provide areas of darkness suitable for bats to feed and commute.
- Reflective surfaces will not be placed under lights.

15.2.2.2.2 Monitoring

Monitoring is not considered to be necessary during the Operational Phase.

15.2.3 Land and Soils

15.2.3.1 Construction Phase

15.2.3.1.1 Mitigation

The Construction Environmental Management Plan (CEMP) will be prepared (Enviroguide, 2022) to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground having regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA - C532', CIRIA, 2001).

The CEMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

15.2.3.2 Export of Soil and Stone Material

The removal offsite of surplus soil and stone from the Proposed Development will be reused as a by-product under Article 27 by-product notification or sent for recovery at a suitable authorised facility. It will be the contractor's responsibility to engage a specialist waste service contractor (s) who will possess the requisite authorisations, for the collection and movement of by-product / waste materials offsite. Material will be brought to an authorised facility which currently holds an appropriate waste facility permit or licence for the specified waste types. Waste Permitting, Licences & Documentation under the Waste Management (Collection Permit) Regulations 2007, as amended, a collection permit to transport waste, which is issued by the National Waste Collection Permit Office (NWCPO), must be held by each waste collection contractor.

The reuse of excavated soil and stone for the Proposed Development (i.e., topsoil for landscaping) will be subject to assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.

The approximate cut and fill volumes for the Proposed Development are:

- Cut: 51,405m^3.
- Fill: 16,720m^3.

Detailed quantities of material to be excavated will be verified through accurate survey techniques and detailed in the CDWMP (Enviroguide, 2022) which will be further developed by the appointed Contractor in advance of works commencing.

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWMP (Enviroguide, 2022) and will be managed in accordance with all legal obligations.

15.2.3.3 Import of Aggregates

Contract and procurement procedures will ensure that all imported aggregates required for the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates shall be subject to management and control

procedures which shall include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

15.2.3.4 Management of Stockpiles (soil and other materials/ waste)

For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area shall be identified and designated.
- All stockpiles shall be assigned a stockpile number.
- Material identified for reuse on site, off site and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawings.
- Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust.
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the Site.
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will not be located near Site boundaries or sensitive receptors and a set-back of 10m will be maintained from any boundary with offsite receptors.

When a stockpile has been sampled for classification purposes, it shall be considered to be complete, and no more soil shall be added to that stockpile prior to removal off Site. An excavation/stockpile register shall be maintained on-site

Any waste generated from construction activities, including concrete, asphalt and soil stockpiles, will be stored on-site in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required).
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

15.2.3.5 Concrete Works

Where possible precast concrete will be used where required during construction. However, where cast-in-place concrete is required (i.e., foundations, footpaths), all work will be carried out to avoid any contamination of the receiving soil and geological environment through the

use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

15.2.3.6 Handling of Chemicals and Fuels

- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station to be determined by the contractor. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works onsite.
- Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed offsite.
- Any diesel, fuel or hydraulic oils stored on Site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005) and Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004); and
- Emergency procedures will be developed by the appointed contractor, and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements. In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to soils and geology associated with the Construction Phase of the Proposed Development.

15.2.3.6.1 Monitoring

There are no monitoring requirements specifically in relation to land, soil and geology.

15.2.3.7 Operational Phase

15.2.3.7.1 Mitigation

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.

The Proposed Development Site is within a Moderate Radon Area. The EPA required radon barriers will be installed in accordance with current building regulations in High Radon Areas only.

15.2.3.7.2 Monitoring

There are no monitoring requirements specifically in relation to land, soil and geology.

15.2.4 Hydrology

15.2.4.1 Construction Phase

15.2.4.1.1 Mitigation

The Construction Environmental Management Plan (CEMP) (Enviroguide,2022) and a Construction and Demolition Waste Management Plan (CDWMP) (currently being prepared by Enviroguide) will be implemented by the appropriate contractor to ensure, site-specific procedures and mitigation measures to monitor and control environmental impacts throughout the Construction Phase of the project and ensure the construction activities do not adversely impact the environment. The CEMP will be submitted with the planning application for the Proposed Development.

Mitigation measures will be adopted as part of the construction works on the Proposed Development Site. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff.
- Control of Management of works nears water courses.
- Management and control of materials from off-site sources.
- Appropriate piling material (water-based, biodegradable non-hazardous substances) and best practice methodology to prevent creating vertical migration pathways.
- Appropriate fuel and Chemical handling, transport and storage; and
- Management of accidental release of contaminants at the Site.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice; good construction management practices will minimise the risk of pollution from construction activities at the Site including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- BPGCS005, Oil Storage Guidelines.
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA 697, The SuDS Manual, 2007.
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004; and
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006).

15.2.4.1.1.1 Control and Management of Works Near Water Courses

All necessary works carried out adjacent to the Mell Stream for the construction of the new headwall (*Exact outfall to be agreed with County Council following a pre-construction ecology survey*) will follow the guidelines published by Inland Fisheries Ireland (IFI) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters* (2016) and The National Roads Authority (now Transport Infrastructure Ireland) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. All works will be carried out in accordance with an approved method statement prepared by an appropriately qualified Environmental /Ecological Clerk of Works employed by the Contractor.

A watching brief by an Environmental /Ecological Clerk of Works will be required during critical stages in particular near stream works for the headwall and outfall at the Mell Stream. An NIS has been prepared for the Site.

Field parameters (pH, temperature, and conductivity) are required to be collected directly downstream of the works prior to commencing works to confirm baseline and then at regular intervals during the works. The Environmental Clerk of works will visually inspect the water quality during the works, observant for release of suspended sediment or contaminations to the stream. Silt fences are required to be installed for the duration of works. Works for the headwall and surface water sewer will not occur during periods of high rainfall.

15.2.4.1.1.2 Control and Management of Water

There will be no discharges to groundwater or surface water during the Construction Phase. The Contractor is to ensure that no contaminated water/ liquids leave the Proposed Development Site (as surface water and run-off or otherwise) and enter the existing drainage at the Site or local drainage gullies on the adjoining roads including Barrack Lane.

There may be a requirement for localised dewatering or sump pumping on a temporary basis during excavation and management of water from these excavations will include control of surface water runoff and pumping of water from excavations.

15.2.4.1.1.3 Control and Management of Soil

As outlined in Section 12.2.4.8 of the Chapter 12 – Material Assets: Waste and Utilities. The Proposed Development Site is currently a greenfield Site and therefore has no waste management requirements.

15.2.4.1.1.4 Importation of Soil and Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with a By-Product Notification under Article 27 of the European Communities (Waste Directive) Regulations 2011. Therefore, any unsuitable material will be identified, avoided, and not imported to the Site.

15.2.4.1.1.5 Concrete Works

The use of cementitious grout used during the construction of foundations and piles will be required and any potential impact to water quality will be avoided through the use of appropriate design and methods that will be implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

The piling methodology (specified at detailed design stage) where required, will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions.

15.2.4.1.1.6 Foundations and Piling

The design for foundations will include strip, pad or piled foundation solutions. Where piled foundations are required, the proposed piling methodology will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater, if encountered. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions.

15.2.4.1.1.7 Handling of Fuels and Hazardous Materials:

Fuel, oils and chemicals used during construction are classified as hazardous. Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station to be determined by the contractor by mobile road tanker brought to the Site as required. Each station will be fully contained equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works onsite.

There will be appropriate storage areas for any fuel, oils and chemicals. Storage will be within a clearly marked bund on an impervious base remote from any surface water features such as oil. Temporary oil interceptors will be installed for period of the construction phase. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

There will be no bulk storage of fuels, oils or other chemicals. Any required quality of these materials will be stored in bunded storage tanks. Bunds will have regard to Environmental

Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004 as amended) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Only emergency maintenance will be carried out on Site.

Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.

Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.

In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with current industry best practice procedures and EPA guidelines.

Site staff will be familiar with emergency procedures in the event of accidental fuel spillages and all staff on-site will be fully trained on the use of equipment to be used on-site.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite and will be from a road tanker brought to Site as required. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the contractor before the commencement of works onsite.

15.2.4.1.1.8 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from Irish Water) which will be constructed in accordance with Irish Water guidelines or by tankering of waste offsite by an appropriately authorised contractor in compliance with all legislative requirements.

15.2.4.1.1.9 Wheel-Wash and Water Treatment Facilities

The use of wheel-wash and water treatment facilities and water treatment facilities will be used as required on Site. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm or impact to the receiving water environment.

To prevent tracking of dust and debris on haul routes offsite the following will be undertaken:

- Implement a wheel washing system where required.
- Use of dedicated internal haul routes and set down areas that will be covered with hardcore or similar; and

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.

To prevent fugitive runoff from the Site the following will be implemented:

- Silt traps, silt fences will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage.
- Where localised shallow water is encountered in excavations during the construction phase, surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network.
- Onsite water treatment system will be used if required to remove suspended solids and hydrocarbons; and
- All sludges and other waste from wheel-wash and water treatment infrastructure will be removed from the Site by the approved contractor in accordance with all legislative requirements.

15.2.4.1.2 Monitoring

During the construction phase the following monitoring measures will be considered:

- The Contractor will carry out inspections and monitoring during excavations, piling and other groundworks to ensure that measures protective of water quality outlined in this EIAR, CEMP (Enviroguide, 2022) and CDWMP (currently being prepared) are fully implemented and effective.
- Groundwater monitoring will be undertaken by a competent hydrogeologist appointed by the Contractor prior to construction commencing and for the duration of the Construction Phase to verify that there is no impact on the groundwater beneath the Site and no unacceptable risk to downgradient receptors including the identified Drybridge Water Supply Scheme, Groundwater monitoring from the Drybridge Water Supply Scheme should be included to verify, if any impact to groundwater onsite is potentially migrating offsite and impacting the Drybridge Water Supply.
- Routine monitoring and inspections during refuelling and concrete works to ensure no impacts and compliance with ameliorative, remedial, and reductive measures.
- Materials management and waste audits will be carried out at regular intervals by the appointed contractor.
- The near stream works will be overseen by an appropriately qualified Environmental/ Ecological Clerk of Works (ECOW) engaged by the appointed contractor. Water quality monitoring of up and downstream locations is also recommended to determine whether any potential risk to water quality in the Mell Stream and downstream associated water bodies during the near stream works.

There are no other specific monitoring or sampling requirements in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

15.2.4.2 Operational Phase

15.2.4.2.1 Mitigation

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development.

With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Mell Stream, the potential for surface water generated at the Site of the Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SuDS measures and interceptor incorporated in the Project Design. Project specific SuDS measures are described in Section 7.4.2.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

15.2.4.2.2 Monitoring

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

15.2.5 Air Quality and Climate

15.2.5.1 Construction Phase

15.2.5.1.1 Mitigation

15.2.5.1.1.1 Air Quality

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures will be employed as necessary to further prevent such impacts occurring:

- Vehicle and wheel washing facilities will be provided at site exit where practicable. If necessary, vehicles are to be washed down before exiting the site.
- Netting is to be provided to enclose scaffolding to mitigate escape of air borne dust from the existing buildings.
- Shroud piling machinery as shown below when operating near to boundaries.
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Dust emission over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
- No burning of materials to be permitted on site.
- Water sprays for dust suppression should be affixed to mechanical excavators/munchers involved in demolition works.
- Water sprays and cannons should be used where possible during cutting, with protective measures applied to retained finishes local to the cutting.
- Prior to commencement, the Main Contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions.
- In areas of poor natural ventilation, dust capture/extraction methods should be employed by the Main Contractor.

- The Main Contractor should allocate suitably qualified and experienced personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

- The Main Contractor will be required to appoint a senior member of its site management team to act as the liaison with third parties in respect of complaints regarding dust and or site activities.

- Monitoring of dust deposition should be undertaken at nominated boundary locations to ensure that dust levels comply with the TA Lift limit value of 350mg/(m²/day) based on a 30-day average using Bergerhoff gauges (Limits to be agreed with local authority).

15.2.5.1.1.2 Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

15.2.5.1.2 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at a strategic locations along the site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard.

15.2.5.2 Operational Phase

15.2.5.2.1 Mitigation

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for

development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

15.2.5.2.2 Monitoring

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

15.2.6 Noise and Vibrations

15.2.6.1 Construction Phase

15.2.6.1.1 Mitigation

Various mitigation strategies may be employed to reduce construction noise, including the following:

- Limiting operation of noisiest activities to exclude periods identified as important to residential amenity.
- Selection of items of plant with lower noise levels.
- Engagement and dialogue between construction contractor and local community.
- Monitoring of site noise levels to ensure compliance with limits.
- Assign responsibility for issues relating to noise to a competent member of site staff.
- If necessary, install local noise barriers with absorptive linings near to specific sources, during construction works.
- Provide enclosures around generators.
- Switch off engines and equipment when not required.
- Warning reversing alarms should give adequate warning but have minimum impact on people outside site.
- Plant and activities should be reviewed so they are the quietest available (and therefore demonstrate use of best practicable means).

A key for minimising impact on neighbours is development of good community relations with local residents. It is good practice to:

- advise residents when works are due to start.
- provide site contact details if neighbours want to complain about the noise.
- establish a site point of contact for dealing with noise complaints.
- have an established procedure for dealing with complaints, recording time/details and responding within a certain time period.

Further guidance on construction noise reduction is available in BS5228. The guidance of BS5228 will be implemented as necessary for control of decommissioning noise from the Proposed Development.

15.2.6.1.2 Monitoring

15.2.6.1.2.1 Construction Phase Noise Monitoring

It is recommended that noise monitoring of works is conducted when each stage of the construction commences. Noise can be measured for individual items of plant, in addition to measurements at the nearest noise sensitive locations to confirm if site limits are met and recommend improvements to the noise mitigation scheme. Alternatively, wireless access noise monitors may be installed at boundary locations close to the NSLs. One noise monitor at each NSL boundary (for a total of three monitors) would be sufficient and access to data provided via online portal.

Construction noise by its nature is irregular and variable in nature. The BS5228 noise prediction methodology tends to over predict the noise and is based on generic data for the

type of plant used. By monitoring noise during the start of the main stages of work more appropriate noise control methods will be advised.

15.2.6.1.2.2 Construction Phase Vibration Monitoring

It is not anticipated that vibration monitoring would be required provided that adequate setback distances of vibration inducing equipment from sensitive locations are observed.

15.2.6.2 Operational Phase

15.2.6.2.1 Mitigation

15.2.6.2.1.1 External M&E Plant Noise

Noise from external M&E plant has been assessed to have slight impacts upon nearby NSLs. In the unlikely event of a significant adverse effect being identified, various mitigation strategies may be employed. These include:

- Partial enclosure of plant with noise barriers,
- Acoustic attenuators on fans, outlets and ventilation louvres,
- Replacement with lower noise output models, and
- Removal of items of plant to alternative locations.

15.2.6.2.1.2 Deliveries Noise

Deliveries to loading bays at the rear of the Proposed Development are predicted to have significant adverse noise impacts due to proximity of the loading bays to NSL2. Avoidance and mitigation strategies include:

- Replacement of tonal reversing alarms with white noise alarms which have the added benefit of improved directional localisation by human listeners.
- Setting tonal reversing alarms to their lowest practicable level within safe limits.
- Avoidance of sprung hinge type loading bridges (edge-of-dock levellers) which produce impulsive impact noise when traversed.
- Avoidance of metal cages by using plastic cages which produce low noise levels when rolled.
- Exclusive use of “silent” pallet trucks which are designed to produce low noise levels for situations where noise sensitive locations are nearby.
- Instructing drivers to switch off engines when vehicles are stationary.
- Careful design and construction of loading bays, ramps and thresholds to avoid sharp transitions which could bump loads, thereby producing impulsive noise.
- Manoeuvring HGVs at idling revs during early morning deliveries.
- Avoidance of parking refrigerated vehicles close to NSLs.
- Noise barriers of sufficient height to block line of sight to sensitive receivers.
- Acoustic absorption on vertical surfaces close to noise generating activities.

Figure 15-2 shows predicted noise levels for a 1-hour period in which all delivery bays are in operation and noise barriers protecting NSL1 and NSL2 with heights and extents as indicated.

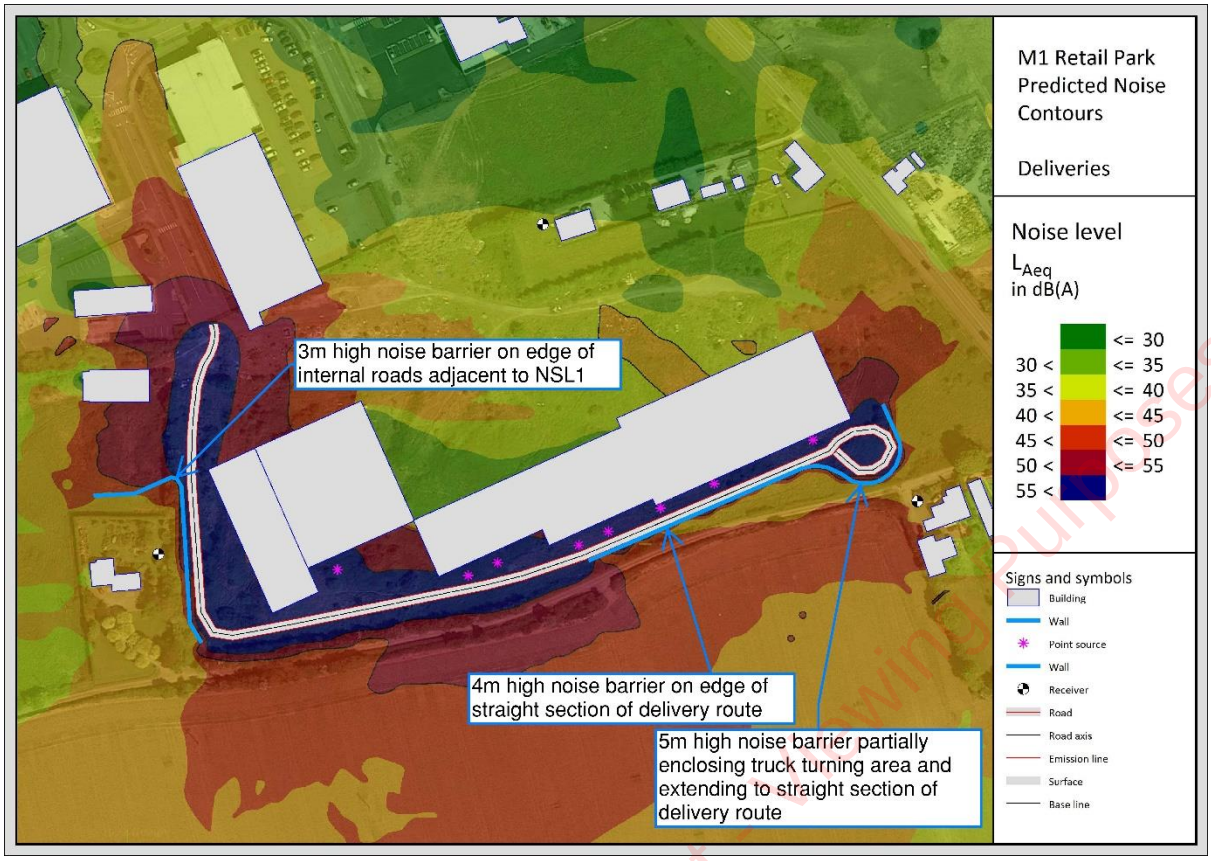

Figure 15-2: Predicted deliveries noise contours with all delivery bays in operation and noise barriers with heights and extents as shown.

All of the above measures are recommended to reduce deliveries noise at NSL1 and NSL2, and, if fully implemented, should be sufficient to avoid significant adverse noise impacts from deliveries. Should the above measures prove insufficient, the following operational control measure, following appropriate acoustic assessment, may be employed:

- Avoidance of goods deliveries before 7am.

15.2.6.2.1.3 Retail Road Network Traffic Noise

Noise from retail road network traffic has been assessed to have imperceptible impacts. In the unlikely event that adverse effects are identified, measures such as encouragement of alternative transport modes may be employed.

15.2.6.2.1.4 Retail Site Internal Road Traffic Noise

The significance of internal road traffic noise effects have been assessed to be slight. In the unlikely event that a significant adverse effect is identified, local noise barriers may be employed to reduce vehicle noise impacts on affected receptors.

15.2.6.2.2 Monitoring

It is not expected that operational noise and vibration monitoring would be required for the Proposed Development. If, however, adverse noise impacts were to be identified at one of the noise sensitive locations, a boundary noise monitor may be installed to monitor noise and inform avoidance/mitigation efforts.

15.2.7 Landscape and Visual

15.2.7.1 Construction Phase

15.2.7.1.1 Mitigation

The key landscape and visual mitigation measures used during the Construction Phase have been incorporated into the layout of the site and design of the proposed buildings. The height of the buildings will be identical to those existing in the *Retail Park*, clad in a similar neutral colored material and will have a similar horizontal emphasis.

The 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 any locations close to 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(s) and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

For those trees proposed for retention, all necessary mitigation measures will be put in place in order to prevent or reduce impact to its very minimum. Mitigation measures used will need to include the erection of protective fencing at the very start of the works, ground protection installation within root zones where fencing cannot be erected to enclose the entire root zones, monitoring of the site works by the project Arboriculturist throughout the construction process and the use of tree friendly techniques and products for the construction process. This is specified in the Arboricultural report.

15.2.7.1.2 Monitoring

Landscape tender drawings and specifications were produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

Any construction works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the construction works, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

15.2.7.2 Operational Phase

15.2.7.2.1 Mitigation

15.2.7.2.2 Monitoring

Monitoring of the mitigation measures will form part of the landscape management plan. Replacement trees, replacement planting and pruning measures will be captured in landscape maintenance plans, and are intrinsically linked to the proposed mitigation measures. All landscape works will be in an establishment phase for the initial three years from planting. A landscape maintenance plan accompanies the planning application. Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

15.2.8 Archaeology and Cultural Heritage

15.2.8.1 Construction Phase

15.2.8.1.1 Mitigation

It is recommended that a programme of invasive linear test trenching be carried out by a licensed archaeologist in the areas of sub-surface works including re-routing of services, additional drainage, slip roads, and other facilitation works associated with the proposed development site. The purpose of testing is to identify sub surface archaeological remains within the development site and to determine the impact of the proposed development on such remains if they occur. Should archaeological features and or deposits be revealed then any further work would be subject to further licensing with approval from the Department of Arts, Heritage and the Gaeltacht who may recommend preservation *in situ* or preservation by record. The testing should be completed as far in advance of other scheduled site works as possible.

The presence or otherwise of archaeological soils or deposits could also be determined by examining the reports on any engineering bore-holes and test-pits that may be carried out in advance of construction in the waterlogged area.

All recommendations in this report are subject to discussion with and approval from the Department of Arts, Heritage and the Gaeltacht.

15.2.8.1.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage for the Proposed Development (see Section 11.6).

15.2.8.2 Operational Phase

15.2.8.2.1 Mitigation

Once appropriate mitigation measures such as pre-development archaeological testing and resolution of any uncovered remains are implemented there will be no archaeological impacts during the construction phase.

15.2.8.2.2 Monitoring

Following the successful implementation of the mitigation and monitoring measures outlined above no further monitoring measures will be required during the operational phase.

15.2.9 Materials Assets – Waste and Utilities

15.2.9.1 Construction Phase

15.2.9.1.1 Mitigation

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. The measures that will be taken to ensure that there will be no significant impact on the surrounding Material Assets during the Construction Phase include:

Waste will be stored onsite in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify LCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s).

Additionally, a Construction Environmental Management Plan will be in effect for the full duration of works. The Health and Safety Authority's "Code of Practice for Avoiding Danger from Underground Services" will be followed during construction and excavation activities and all underground and overhead utilities and public services will be identified and protected during the Construction Phase. All temporary suspensions to public services will be controlled by the relevant statutory undertaker, in accordance with standard protocols and all services will be reinstated as soon as possible post connection. Potable water networks and foul water sewers will be properly tested prior to connection.

15.2.9.1.2 Monitoring

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the facility and that these records will be maintained on site.

15.2.9.2 Operational Phase

15.2.9.2.1 Mitigation

15.2.9.2.2 Monitoring

The building management company and retail unit operators will be required to maintain the bins and storage areas in good condition as required by the LCC Waste Bye-Laws. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

15.2.10 Materials Assets – Traffic

15.2.10.1 Construction Phase

15.2.10.1.1 Mitigation

15.2.10.1.2 Road Network Construction Stage Measures to be implemented:

To ensure the road network will have a slight impact with short term temporary slight effects, the following migration will be incorporated.

- To reduce the potential impact with morning traffic particularly between the hours of 8am and 9am, no HGV's will be allowed to leave site during this period. However, vehicles coming to site will be against morning traffic and will therefore have minimal impact on the local road network. These vehicles will be able to enter site and wait in the waiting area, if necessary, be loaded and ready to leave site after 9am.
- Informing workers and expected visitors regarding access arrangements and parking provision to ensure an appropriate mode of travel is chosen; By enforcing this the potential impacts of road delays will be slight and have short term neutral effect.
- Clear and appropriate signage within the site to advise of permitted routes, speed limits, safety requirements.
- Any recommendations with regard to construction traffic management made by the Local authority will be adhered to.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- Provision of sufficient on-site parking and compounding to ensure no overflow of construction generated traffic onto the local network.
- A dedicated 'construction site' access / egress system will be implemented during the construction phases.
- Site offices and compound will be located within the site boundary. The site will accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas. This will prevent visitors or employees parking on the surrounding roads
- A series of 'way-finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- Truck wheel washes will be installed at construction entrances necessary to ensure the surrounding Road is kept clean.

15.2.10.1.3 Pedestrian Construction Stage Measures to be implemented:

To ensure the potential impact of the Proposed Development on the pedestrian routes will be slight with short term temporary neutral effect the following mitigation measures have been incorporated.

- Promote usage of public transport by site staff by clearly displaying local bus, services with a map and timetable indicating routes and travel times.
- Only Safe-Pass accredited personnel will be permitted on site and daily in-out attendance records will be maintained.
- Hoarding to be set up around the perimeter to prevent pedestrian access.

- Signage to be implemented to clearly indicate navigation routes around the site.
- Provide bike parking locations on site to promote the usage of cycling by site staff.

15.2.10.1.4 Monitoring

Construction traffic will be monitored to ensure that the construction vehicles are travelling to and from the Proposed Development at the agreed times with the Local Authority.

15.2.10.2 Operational Phase

15.2.10.2.1 Mitigation

The following mitigation measures are proposed for the operational phase of the Proposed Development with reference to the road network:

The Proposed Development will have a moderate to significant impact with a moderately negative long-term effect on the 3 No. critical junctions, the following mitigation measures have been incorporated into the design to limit the effect.

The traffic assessment for the Proposed Development details that two of the three critical junctions are at present busy and congested during the morning and evening peak hours of travel, and will continue to experience increased congestion going into the future if the required conservative growth estimates are applied to existing surveyed network flow, with estimated total generated traffic from both proposed and planned adjacent development adding between 3.1% and 15.8% to future predicted congestion levels at both heavily loaded junctions within this comprehensive traffic analysis.

Given that the critical junctions under analysis are congested, it is appropriate that there is mitigation to minimise car usage by residents and visitors to the Proposed Development. This comprises the limited on-site car parking spaces.

The traffic growth estimates utilised within the traffic analysis for the Proposed Development, while in line with TII guidelines, are significantly higher than car-use targets currently in place for the Greater Dublin Area, where significant decreases in the use of car-based travel for the journey to work are at the centre of core strategies going forward. This decrease in car usage will have a direct knock-on effect on the volume of car trips using retail outlets during weekday peak hour periods.

The mobility management plan for the Proposed Development envisages that 35% (just over one-third) of trips to and from the Proposed Development will be undertaken by public transport / cycling / walking.

Further mitigation will be provided through enhanced public transport and cycling infrastructure planned for the vicinity which will help move the mode of travel away from car based trips.

15.2.10.2.2 Proposed Bus Infrastructure

The National Transport Authority (NTA) published the 'Connecting Ireland – Rural Mobility Plan' in November 2021. The aim of this initiative is to with the aim of increasing connectivity, particularly for people living outside our major cities and towns.

Their document on the Louth Public Transport Network detailed the following public transport improvements for Drogheda:

Proposed Route 29 – connecting Drogheda to Athlone, also serving Mullingar, Navan and Slane. This is a new corridor. The NTA propose a minimum service frequency of 60 minutes.

Proposed Route 39 – connecting Dublin to Belfast, also serving Drogheda. The NTA propose to better integrate this existing route along the corridor indicated.

Proposed Route 163 – connecting Drogheda to Athboy. This is a new corridor. The NTA propose a new route from Athboy to Drogheda via Navan and Duleek. Minimum service frequency of 3 return trips a day

Improvements to Existing Route 168 – connecting Drogheda to Newry. The NTA propose to integrate routes 168 and 161 to create a new coastal route between Drogheda, Dundalk and Newry. Minimum service frequency of 9 return trips Monday to Saturday, with 4 return trips on Sunday.

Figure 5-3 within the mobility management plan for the Proposed Development provides details of these new / enhanced routes.

15.2.10.2.3 Proposed Rail Infrastructure

Project Ireland 2040 plans to extend the DART as far as Drogheda by 2027. This programme will result in the DART bring extended to locations along the east coast of Ireland such as Donabate, Rush and Lusk, Skerries, Balbriggan and on to Drogheda (see Figure 5-4 within the mobility management plan for the Proposed Development).

15.2.10.2.4 Proposed Cycling Infrastructure

As part of the Drogheda Cycle Scheme proposed by Louth County Council, in the area aligning the Collon Road, Hill of Rath Roundabout, onto which the Proposed Development directly accesses via the R168, and Rosehall Roundabout directly east of the Hill of Rath Roundabout, 2.25km of footpaths and cycle lanes will be constructed. This will provide access to the M1 Retail Park.

Furthermore, a cycle lane and footpath will be installed on the North Road from Rosehall roundabout to Patrick Street. This will serve commercial, retail and residential developments in the vicinity.

Figure 5-5 within the mobility management plan for the Proposed Development provides details of the proposed cycle just east of the Hill of Rath roundabout.

15.2.10.2.5 Monitoring

As part of the mobility management plan process, the mobility management plan coordinator

It will be management's intention that a Mobility Management Strategy Co-ordinator be appointed to administer, implement, monitor and review mobility management issues for the Proposed Development. The co-ordinator will also liaise with the local authority, public transport companies and facility managers on issues relevant to the maximisation by staff and customers of non-car based journeys to the facility.

The co-ordinator will have a vital role in encouraging and enabling organisations on the Proposed Development site to adopt measures which will achieve the objectives listed above within section 7. The duties of the co-ordinator are as follows:

- Promoting the environmental and health benefits of their travel choices
- Promoting bike use for travel to the facility
- Promoting walking to the facility
- Promoting sustainable work practices
- Promoting rail and bus based travel to the facility
- Monitoring the modal splits for staff and customers

More detail of this monitoring activity vital to the promotion of using sustainable modes to travel to and from the Proposed Development is provided within the mobility management plan for the Proposed Development.