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ENNIS LRD

VOLUME II
Main Statement



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VOLUME II | Contents

CHAPTER 1 | Introduction

1.1 Introduction.....1-1

1.2 Author Information and Competency.....1-1

1.3 Proposed Development Site and Study Area 1-1

1.4 Requirement for EIAR 1-2

1.5 Purpose of Environmental Impact Assessment 1-2

1.6 Methodology 1-3

1.7 Competency.....1-3

1.8 Format and Structure of the EIAR.....1-3

1.9 Cumulative Effects 1-4

1.10 Impact Assessment Methodology 1-5

1.11 Scoping and Public Consultation 1-6

1.12 References and Sources 1-6

CHAPTER TWO | Project Description

2.1 Introduction.....2-1

2.2 Expertise and Qualifications 2-1

2.3 Description of Existing Environment 2-1

2.4 Description of Proposed Development.....2-2

2.5 Description of Construction Phase 2-7

2.6 Commissioning.....2-9

2.7 Decommissioning.....2-9

2.8 Conclusion 2-9

CHAPTER THREE | Alternatives Considered

3.1 Introduction 3-1

3.2 Do-Nothing Scenario.....3-1

3.3 Alternative Locations 3-2

3.4 Alternative Layouts 3-2

3.5 Alternative Design.....3-7

3.6 Alternative Processes.....3-7

3.7 Description of Secondary and Off-Site Developments.....3-7

3.8 Cumulative Impact.....3-7

3.9 Mitigation Measures.....3-8

CHAPTER FOUR | Population and Human Health

4.1 Introduction 4-1

4.2 Expertise and Qualifications 4-1

4.3 Methodology 4-1

4.4 Baseline Environment 4-2

4.5 Impact Assessment 4-10

4.6 Mitigation Measures.....4-12

4.7 Monitoring.....4-13

4.8 Residual Impact Assessment.....4-13

4.9 Risk of Major Accidents or Disasters.....4-13

4.10 The ‘Do Nothing’ Scenario 4-13

4.11 Worst Case Scenario 4-13

4.12 Interactions.....4-13

4.13 References and Sources 4-14

CHAPTER FIVE | Landscape and Visual

5.1 Introduction 5-1

5.2 Research Methodology.....5-1

5.3 Receiving Landscape Environment 5-2

5.4 Characteristics of the Proposed Development 5-8

5.5 Potential Impacts of the Proposed Development.....5-9

5.6 Mitigation Measures.....5-9

5.7 Predicted Impacts of the Proposed Development.....5-10

5.8 Residual Impacts.....5-13

5.9 Interactions.....5-13

5.10 References.....5-13

RECEIVED: 30/06/2025

RECEIVED: 30/06/2024

CHAPTER SIX | Material Assets: Traffic and Transport

6.1 Introduction 6-1

6.2 Expertise and Qualifications 6-1

6.3 Proposed Development 6-1

6.4 Methodology 6-2

6.5 Difficulties Encountered.....6-4

6.6 Existing Receiving Environment.....6-4

6.7 Potential Impact of the Proposed Development 6-5

6.8 Mitigation Measures.....6-9

6.9 Residual Impact 6-9

6.10 Summary.....6-10

6.11 Conclusion 6-10

CHAPTER SEVEN | Material Assets: Built Services

7.1 Introduction 7-1

7.2 Author Information & Competency 7-1

7.3 Reference to Guidelines Relevant to Discipline 7-1

7.4 Methodology 7-1

7.5 Description of Existing Environment.....7-2

7.6 Characteristics of Proposed Development 7-3

7.7 Predicted Impacts 7-4

7.8 Mitigation and Monitoring Measures.....7-6

7.9 Residual Impacts.....7-7

CHAPTER EIGHT | Material Assets: Waste

8.1 Introduction 8-1

8.2 Expertise & Qualifications 8-1

8.3 Proposed Development 8-1

8.4 Methodology 8-1

8.5 Difficulties Encountered.....8-3

8.6 Baseline Environment 8-3

8.7 The ‘Do nothing’ Scenario.....8-5

8.8 Potential Significant Effects 8-5

8.9 Mitigation Measures.....8-6

8.10 Residual Impact Assessment 8-7

8.11 Reinstatement 8-8

8.12 Risk of Major Accidents or Disasters 8-8

8.13 Significant Interactions 8-8

8.14 Monitoring 8-9

8.15 Summary of Mitigation and Monitoring 8-9

8.16 Conclusion 8-10

8.17 References & Sources 8-10

CHAPTER NINE | Land & Soils

9.1 Introduction 9-1

9.2 Author Information & Competency 9-1

9.3 Reference to Guidelines Relevant to Discipline 9-1

9.4 Methodology 9-1

9.5 Description of Existing Environment.....9-2

9.6 Predicted Impacts 9-4

9.7 Mitigation and Monitoring Measures.....9-7

9.8 Residual Impacts 9-8

9.9 Monitoring.....9-8

9.10 Potential Cumulative Impacts 9-8

9.11 Reinstatement 9-8

9.12 Interactions 9-8

9.13 References 9-8

CHAPTER TEN | Water and Hydrology

10.1 Introduction.....10-1

10.2 Methodology 10-1

10.3 Description of existing Environment 10-3

10.4 Predicted Impact of the Project.....10-7

10.5 Mitigation and Monitoring 10-8

10.6 Residual Impacts.....10-9

10.7 Monitoring.....10-10

10.8 Interactions.....10-10

10.9 References.....10-10

CHAPTER ELEVEN | Biodiversity

11.1 Introduction.....11-1

11.2 Expertise & Qualifications 11-1

11.3 Proposed Development.....11-1

11.4 Methodology 11-1

11.5 Difficulties Encountered 11-2

11.6 Baseline Environment.....11-2

11.7 Habitats and Species 11-9

11.8 The ‘Do Nothing’ Scenario 11-17

11.9 Potential Significant Effects 11-17

11.10 Mitigation Measures 11-22

11.11 Residual Impact Assessment 11-24

11.12 Risk of Major Accidents or Disasters 11-25

11.13 Worst Case Scenario.....11-25

11.14 Interactions 11-25

11.15 Monitoring 11-26

11.16 Summary of Mitigation and Monitoring 11-26

11.17 Conclusion 11-27

11.18 References and Sources 11-27

RECEIVED: 30/06/2025

RECEIVED: 30/06/2025

CHAPTER TWELVE | Noise and Vibration

12.1 Introduction.....12-1

12.2 Expertise & Qualifications 12-1

12.3 Proposed Development.....12-1

12.4 Methodology 12-1

12.5 Difficulties Encountered 12-5

12.6 Baseline Environment.....12-5

12.7 The ‘Do Nothing’ Scenario 12-7

12.8 Potential Significant Effects 12-7

12.9 Mitigation Measures 12-12

12.10 Residual Impact Assessment 12-14

12.11 Risk of Major Accidents or Disasters 12-15

12.12 Worst Case Scenario.....12-15

12.13 Significant Interactions.....12-15

12.14 Monitoring 12-15

12.15 Summary of Mitigation and Monitoring 12-16

12.16 Conclusion 12-16

12.17 References and Sources 12-17

CHAPTER THIRTEEN | Air Quality

13.1 Introduction.....13-1

13.2 Expertise & Qualifications 13-1

13.3 Proposed Development 13-1

13.4 Methodology 13-1

13.5 Difficulties Encountered 13-4

13.6 Baseline Environment.....13-4

13.7 The ‘Do Nothing’ Scenario 13-7

13.8 Potential Significant Effects 13-7

13.9 Mitigation Measures 13-9

13.10 Residual Impact Assessment 13-10

13.11 Risk of Major Accidents or Disasters 13-11

13.12 Worst Case Scenario.....13-11

13.13 Interactions 13-11

13.14 Monitoring 13-11

13.15 Summary of Mitigation and Monitoring 13-12

13.16 Conclusion 13-12

13.17 References and Sources 13-12

CHAPTER FOURTEEN | Climate

14.1 Introduction.....14-1

14.2 Expertise & Qualifications 14-1

14.3 Proposed Development 14-1

14.4 Methodology 14-1

14.5 Difficulties Encountered 14-7

14.6 Baseline Environment.....14-7

14.7 The ‘Do Nothing’ Scenario 14-10

14.8 Potential Significant Effects 14-10

14.9 Mitigation Measures 14-14

14.10 Residual Impact Assessment 14-15

14.11 Risk of Major Accidents or Disasters 14-15

14.12 Worst Case Scenario.....14-15

14.13 Interactions 14-15

14.14 Monitoring 14-16

14.15 Summary of Mitigation and Monitoring 14-16

14.16 Conclusion 14-16

14.17 References and Sources 14-16

CHAPTER FIFTEEN | Cultural Heritage

15.1 Introduction.....15-1

15.2 Expertise & Qualifications 15-1

15.3 Proposed Development.....15-1

15.4 Methodology 15-1

15.5 Baseline Environment.....15-7

15.6 Potential Significant Effects 15-13

15.7 Mitigation Measures 15-14

15.8 Residual Impact Assessment 15-15

15.9 Risk of Major Accidents or Disasters 15-15

15.10 Worst Case Scenario.....15-15

15.11 Interactions 15-15

15.12 Monitoring 15-15

15.13 Conclusion 15-15

15.14 References and Sources 15-15

CHAPTER SIXTEEN | Risk of Major Accidents and Disasters

16.1 Introduction.....16-1

16.2 Expertise & Qualifications 16-1

16.3 Methodology 16-1

16.4 Difficulties Encountered 16-3

16.5 Baseline Environment.....16-3

16.6 Characteristics of the Proposed Development.....16-5

16.7 Environmental Receptors 16-5

16.8 Predicted Impacts 16-6

16.9 Mitigation Measures 16-9

16.10 References.....16-9

CHAPTER SEVENTEEN | Interactions

17.1 Introduction.....17-1

17.2 Population and Human Health 17-1

17.3 Landscape and Visual 17-1

17.4 Material Assets: Traffic and Transport 17-1

17.5 Material Assets: Built Services.....17-1

17.6 Material Assets: Waste 17-2

17.7 Land and Soils 17-2

RECEIVED: 30/06/2025

RECEIVED: 30/06/2025

17.8 Water & Hydrology.....17-2

17.9 Biodiversity.....17-2

17.10 Noise and Vibration.....17-2

17.11 Air Quality 17-3

17.12 Climate 17-3

17.13 Cultural Heritage 17-3

17.14 Major Accidents and Disasters 17-3

17.15 Conclusion 17-3

CHAPTER EIGHTEEN | Summary of Mitigation Measures

18.1 Introduction.....18-1

RECEIVED 30/06/2025

CHAPTER ONE

INTRODUCTION



RECEIVED: 30/06/2025

CHAPTER ONE

Table of Contents

Introduction

1.1 Introduction 1-1

1.2 Author Information and Competency..... 1-1

1.3 Proposed Development Site and Study Area 1-1

1.4 Requirement for EIAR 1-2

1.5 Purpose of Environmental Impact Assessment 1-2

1.6 Methodology 1-3

1.7 Competency..... 1-3

1.8 Format and Structure of the EIAR..... 1-3

1.9 Cumulative Effects 1-4

1.10 Impact Assessment Methodology 1-5

1.11 Scoping and Public Consultation 1-6

1.12 References and Sources 1-6

Table of Tables

Table 1.1 EIAR Team Consultancy Details Consultancy..... 1-3

Table 1.2 EIAR Chapters and Contributors 1-4

Table 1.3 Applications considered for cumulative impacts..... 1-4

Table 1.4 Impact Rating Terminology..... 1-5

Table of Figures

Figure 1.1 Site Location 1-1

Figure 1.3 Land Use Zoning Objective 1-2

RECEIVED: 30/06/2025

CHAPTER 1 | Introduction

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) sets out the results of the environmental assessments which have been completed for the proposed development to inform the planning consent process.

The assessment has been completed as a statutory environment assessment. The environmental impact assessment process has been completed in line with Directive 2014/52/EU, based on the guidance presented in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

The EIAR is a presentation of the potential environmental impacts of the proposed development with a focus on significant impacts.

Chapter 1 introduces the project and described the scope and methodology of the EIA process. The consultation process which was undertaken is outlined and the competencies of the environmental assessment team are provided.

1.2 Author Information and Competency

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a Bachelor’s degree in Arts (International), majoring in Geography, and a Master’s in Planning and Sustainable Development. She has over 5 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following four Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Dunboyne Phases 1 and 2 Large Scale Residential Development, Dunboyne, Co. Meath
- Rathgowan Large Scale Residential Development, Mullingar, Co. Westmeath
- Castlelands Large Scale Residential Development, Mallow, Co. Cork.

1.2.1 The Applicant

Glenveagh are a leading Irish home builder founded in 2017, whose vision is to build homes and create sustainable communities through exemplary design. Their focus on people, homes, and communities has created successful developments nationally by understanding that well planned, well designed, and well-built homes is the essence of thriving communities.

1.2.2 Brief Project Description

A detailed description of the project is provided in Chapter 2. To summarise, the applicant seeks permission for the development comprising a total of 300 no. residential units, a creche, and all associated site development works.

The overarching vision for this scheme is the establishment of a new residential neighbourhood to the south of Ennis town centre.

1.3 Proposed Development Site and Study Area

The subject site is located in Ennis, to the west of the Ennis Golf Club and to the east of the N85. An existing housing development, Ballymacaula View, is located to the south of the site, and 6 no. existing detached houses are located along the eastern boundary. The Beechpark Roundabout is located to the south of the site.

The site currently consists of agricultural fields and field boundaries. The existing access to the site is from the R474 road to the south.



Figure 1.1 Site Location

The site is located in the Cahircalla More Neighbourhood, as identified in the Clare County Development Plan 2023-2029, and is zoned for low density residential development which is described as follows:

‘The underlying priority shall be to ensure that the character of the settlement/area is maintained and further reinforced by a high standard of design. Proposed developments must also be appropriate in scale and nature to the areas in which they are located.’

The Ennis Golf Club lands to the east are zoned ‘recreation’. The lands to the south are zoned ‘existing residential’ and ‘strategic residential reserve’.

The lands to the west of the N85 are zoned ‘agriculture’, ‘enterprise’, and ‘tourism’.

The Ennis & Environs map included in Volume 3a of the Development Plan identifies the site as LDR7, as shown in the extract below. Section 2.5.2 of Volume 3a states the following in relation to LDR7:

This site has the benefit of planning permission. Should future applications be made residential development on this site will be required to incorporate a buffer of sufficient width between the proposed development and the N85 to protect residential amenity.

Appendix 1 of Volume 3a includes a Serviced Land Assessment which identifies the subject site as meeting requirements for compact growth, public transport, roads, footpaths, water supply and waste water.

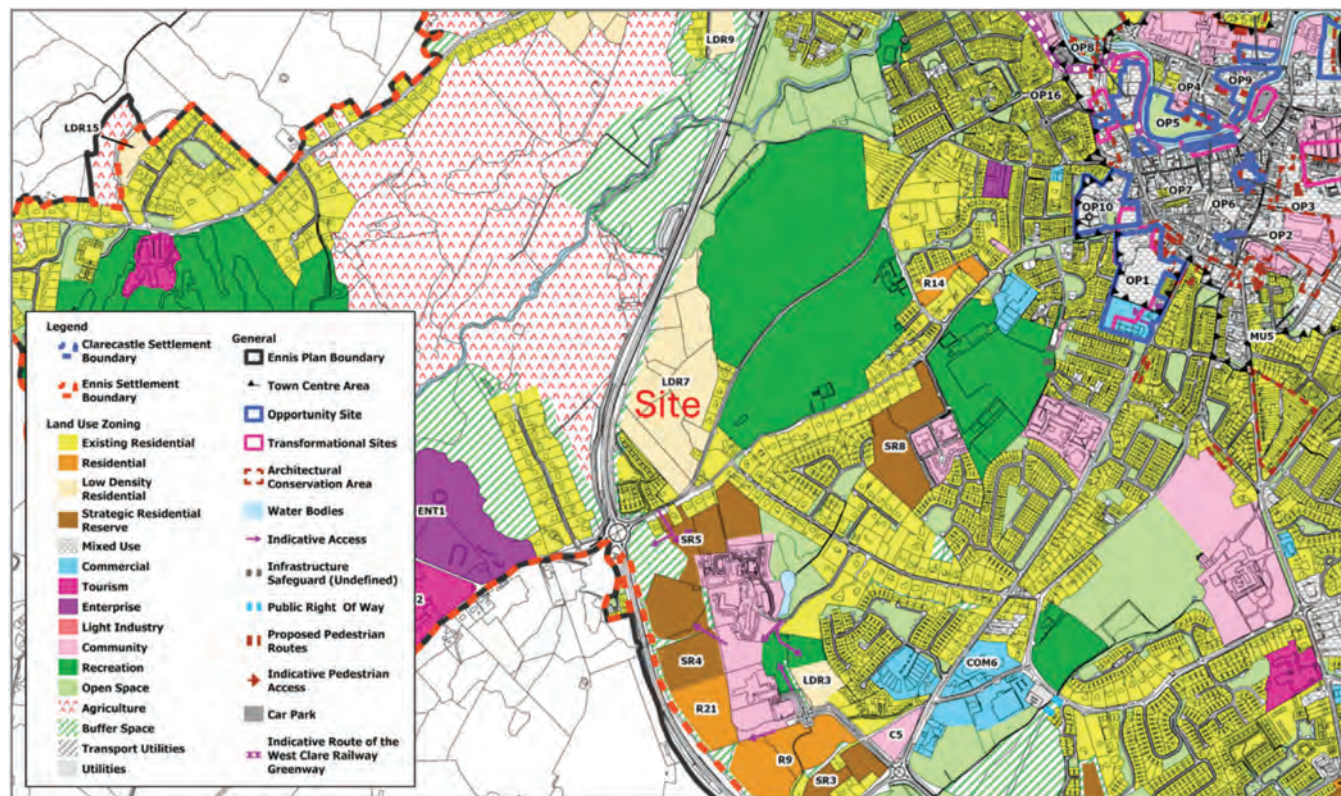


Figure 1.3 Land Use Zoning Objective

In general, the study areas are defined individually for each environmental topic, according to guidance and the geographic scope of the potential impacts or of the information required to assess those impacts. Details are provided by each discipline as part of the description of baseline conditions of the site.

1.4 Requirement for EIAR

Environmental Impact Assessment (EIA) requirements derive from EU Directives. Council Directive 2014/52/EU amended Directive 2011/92/EU and is transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Proposed development which falls within one of the categories of development specified in Schedule 5 of the Planning and Development Regulations 2001, as amended, which equals or exceeds, a limit, quantity, or threshold prescribed for that class of development must be accompanied by an EIAR.

Section 10 of Part 2 of Schedule 5 includes 'Infrastructure Projects' and provides the following thresholds for requiring an EIA:

10. Infrastructure projects

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

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

(In this paragraph, 'business district' means a district within a copy or town in which the predominant land use is retail or commercial use)

The proposed Large Scale Residential Development (LRD) is for 300 no. residential units on a site area of c. 11.3 hectares. While this does not exceed the threshold of 500 units set out in 10(b)(i), a mandatory EIA is required under the provisions of Part 2, 10(b)(iv) as the proposed development site exceeds the threshold of 10ha within the built-up area of Ennis, Co. Clare.

1.5 Purpose of Environmental Impact Assessment

The objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), before development consent being given, of public and private developments that are likely to have significant effects on the environment.

The 2014 Directive provides a definition of EIA and this is now defined by section 171A of the Planning and Development Act, 2000 (as inserted by Regulation 16 of the 2018 Regulations).

It is defined as a process consisting of:

- the preparation of an EIAR by the developer;
- the carrying out of consultations with the public, prescribed bodies (and, where relevant, any affected Member States);
- the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through the consultation process;
- the reasoned conclusion of the competent authority on the significant effects of the project on the environment; and
- the integration of the competent authority's reasoned conclusion into any development consent decision.

The definition of EIA thus provides for a clear distinction between the process of environmental impact assessment to be carried out by the competent authority and the preparation by the developer of an EIAR.

Section 2 of the 2000 Act has been amended to define an EIAR as 'a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.

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As defined in the Environmental Protection Agency - Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, an Environmental Impact Assessment (EIA) is the:

“process of examining the anticipated environmental effects of a proposed project – from consideration of environmental aspects at design stage, through consultation and preparation of an Environmental Impact Assessment Report (EIAR), evaluation of the EIAR by a competent authority, the subsequent decision as to whether the project should be permitted to proceed, encompassing public response to that decision”

1.6 Methodology

The EIAR entails a systematic analysis and assessment of the potential environmental effects of a proposed development on its receiving environment. Article 3(1) of the amended Directive prescribes a range of environmental topics that must be addressed in the EIAR, as follows:

“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) A description of the likely significant effects of the project on the environment;
- b) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
- c) A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics and an indication of the main reasons for the options chosen, considering the effects of the project on the environment ; and
- d) A non-technical summary; and,
- e) Any additional information specified in Annex IV of the Directive/Schedule 6 to the 2001 Regulations, as amended, relevant to the specific characteristics of the project and to the environmental features likely to be affected.

As is required by Annex IV of the 2014 Directive, this EIAR addresses matters including proposed demolition works, risks to human health, major accidents/disasters, biodiversity, climate change and cumulative effects with other existing and/or approved projects.

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

- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.
- Department of Housing, Planning and Local Government (DHPLG) (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- EU (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.
- EU (2017) EU Environmental Impact Assessment of Projects: Guidance on Scoping.
- DHPLG (2017). Circular letter PL 1/2017 – Advice on Administrative Provisions in Advance of Transposition.
- European Commission (EC) (2017). Environmental Impact Assessment of Projects. Guidance on the preparation of Environmental Impact Assessment Report.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on Scoping.

- EC (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- EC (EC) (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

1.7 Competency

Various environmental specialists were commissioned to complete the specialist chapters of the EIAR, as required by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment. It is a requirement that the EIAR must be prepared by competent experts:

“Experts involved in the preparation of [EIARs] should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality”.

For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants (MH Planning) to direct and coordinate the preparation of the EIAR. A team of qualified specialists were engaged to prepare individual chapters.

The details of each consultancy within the EIAR team are provided in the table below. The qualifications of consultants responsible for each discipline is provided in the introduction to each chapter.

Table 1.1 EIAR Team Consultancy Details Consultancy

	Address	Phone	Email
MH Planning	6 Joyce Square, Barrack House, Ballincollig, Cork.	021 4208710	info@mhplanning.ie
Deady Gahan Architects	Eastgate Village Retail Park Little Island, Cork	021 435 5016	info@dgarchitects.ie
TOBIN	Fairgreen House, Fairgreen Road, Co. Galway	091 565211	info@tobin.ie
AWN Consulting	The Tecpro Building, Clonshaugh Business and Technology Park, Dublin 17	01 8474220	Ciara.nolan@awnconsulting.ie
John Cronin & Associates	3a, West Point Trade Centre, Ballincollig, Cork.	021 4810311	info@johncronin.ie
Jane McCorkell Design		087 6839520	info@janemccorkell.com
Altemar Ltd Marine and Environmental Consultants	Greystones, Co. Wicklow	01 2010713	info@altemar.ie

1.8 Format and Structure of the EIAR

This EIAR is prepared according to the ‘Grouped Format Structure’ as described in the Guidelines on information to be contained in Environmental Impact Statements (EPA, 2022). This means that each topic is considered as a separate section. The advantages of using this format are that it is easy to investigate a single topic and it facilitates easy cross-reference to specialist studies.

The EIAR is sub divided into 3 no. volumes as follows:

- **Volume I** Non-Technical Summary;
- **Volume II** Environmental Impact Assessment Report; and
- **Volume III** Appendices to Environmental Impact Assessment Report.
- **Volume II** is presented as 18 chapters as outlined in Table 1-2.

Table 1.2 EIAR Chapters and Contributors

Chapter	Chapter Title	Consultancy	Lead Consultant
1	Introduction	McCutcheon Halley	Saoirse Kavanagh
2	Project Description	McCutcheon Halley	Saoirse Kavanagh
3	Alternatives	McCutcheon Halley	Saoirse Kavanagh
4	Population & Human Health	McCutcheon Halley	Saoirse Kavanagh
5	Landscape & Visual	Jane McCorkell Design	Jane McCorkell
6	Material Assets: Traffic & Transport	TOBIN	Micheál Geraghty
7	Material Assets: Built Services	TOBIN	Michael Naughton
8	Material Assets: Waste	AWN Consulting	Chonail Bradley and Laura Berry
9	Land & Soils	TOBIN	John Dillon
10	Water & Hydrology	TOBIN	John Dillon and Dr. Aristotelis Tegos
11	Biodiversity	Altamar	Bryan Deegan
12	Noise & Vibration	AWN Consulting	Aoife Kelly and Robert Holohan
13	Air Quality	AWN Consulting	Tanmay Gojamgunde and Ciara Nolan
14	Climate	AWN Consulting	Ciara Nolan
15	Cultural Heritage	John Cronin and Associates	John Cronin, Tony Cummins and Peter Looney
16	Risk of Major Accidents and Disasters	AWN Consulting	Matthew Michie
17	Interactions	McCutcheon Halley	Saoirse Kavanagh
18	Summary of Mitigation Measures	McCutcheon Halley	Saoirse Kavanagh

In addition, contributors have had regard to other relevant discipline-specific guidelines, these are noted in individual chapters of the EIAR.

1.9 Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into Directive 2011/92/EU. Annex IV of the EIA Directive is to be read in conjunction with article 5(1) and sets out the information to be included in an EIAR. Annex IV was transposed into national law

via article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the “2018 Regulations”) which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended.

The Directive requires that the EIAR describes the cumulation of effects with other existing and/or approved projects.

Cumulative effects may arise from:

“- The interaction between the various impacts within a single project;

- The interaction between all the differing existing and / or approved projects in the same areas as the proposed project.”¹

In August 2018, the Department of Housing, Planning and Local Government issued Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. The Guidelines summarise “cumulative effects” in the following way at page 40;

“Effects are not to be considered in isolation but cumulatively i.e., when they are added to other effects. A single effect on its own may not be significant in terms of impact on the environment but, when considered together with other effects, may have a significant impact on the environment. Also, a single effect which may, on its own, have a significant effect, may have a reduced and insignificant impact when combined with other effects.

Paragraph 2(e)(i)(V) of Schedule 6 (paragraph 5(e) of Annex IV) provides as follows;

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

Accordingly, each chapter of this EIAR assesses the cumulative effect of the following permitted development in combination with the proposed development.

Table 1.3 Applications considered for cumulative impacts

Reference	Development	Decision	Distance to Site
24/60086	48 no. residential units	Granted 25 th September 2024	3.7km
24/122 extension of duration to 17/977	51 no. residential units	Granted 10 th June 2024	1.5km
24/60652	74 no. residential units	Lodged 19 th December 2024 FI requested 21 st Feb 2025	2.1km
25/60265	54 no. residential units	Lodged 14 th May 2025 Decision due 8 th July 2025	3.3km

¹ Department of Housing, Planning and Local Government, “Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment” (August 2018), page 40.

Individually, each specialist consultant has reviewed under construction, permitted, and or under consideration development in the local area, and using their expertise they have identified projects relevant to their discipline that may interact to produce a cumulative effect. The detail of the identified projects and plans is set out within each specialist chapter of this EIAR.

Cumulative effects are not limited to projects, and it is necessary to also consider relevant Plans. According to the Environment Protection Agency (2020), in Ireland, key cumulative effects – where environmental receptors are at, or near, their thresholds or their capacity to assimilate more change – include climate change; water quality, flood risk, air quality, biodiversity and landscape. For the purpose of this EIAR, the following have been considered in relation to culminative impacts:

- **Clare Council Development Plan 2022-2029** - gives spatial expression to the county’s economic, social, housing, and cultural development. The Plan has a key role in protecting the environment, heritage, and amenities of the city and in mitigating against the impacts of climate change. It includes policies and objectives for all of the aspects included in this EIAR.
- **The Climate Action Plan, 2025** - climate change is the ultimate cumulative effect, nationally and internationally.
- **National Biodiversity Plan** - The Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland’s ‘Vision for Biodiversity. It has been developed in line with the EU and International Biodiversity strategies and policies.
- **Standards in the EU Air Quality Directive and ‘daughter’ directives** - establish the levels of air pollutants that have no significant impacts on human health or the environment.

Each of the chapters considers the above plans as relevant to each chapter. In addition, each of the specialist chapters (4 - 15) considers the cumulative effects of projects and plans relevant to the zone of influence and discipline specific factors.

1.10 Impact Assessment Methodology

Each chapter of this EIAR assesses the direct, indirect, cumulative, and residual impact of the proposed development for both the construction and operational stage of the proposed development.

The impact assessment methodology is detailed in the respect of the various environmental topics in the respective chapters herein. The assessment of impacts is based on the source-pathway-receptor model, which dictates that, for an environmental impact to occur, there must be a source, a receptor which is sensitive to the effect in question, and a pathway by which the effect can reach the receptor. Unless otherwise stated, the criteria for effect / impact characterisation are as per the EPA guidelines (as set out in Table 1.2). The significance of an impact is determined through comparison of the character of the predicted effect to the sensitivity of the environment / receptor in question.

Table 1.4 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or the improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	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).

Significance of Effect	
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 Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effect	An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.
Duration of Effects	
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
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
Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Probability of Effects	
Likely	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.

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Type of Effects	
Indirect (Secondary or Off-site)	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	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
Do-Nothing	The environment as it would be in the future should the subject project not be carried out.
Worst-Case	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

1.11 Scoping and Public Consultation

The EIAR was scoped following an appraisal of the 2022 EPA Guidelines on Information to be contained within the EIAR, through design team meetings with the specialist consultants, through the pre-planning meetings held with Clare County Council, and decisions issued on previous applications on the subject site.

The scope of individual assessments is informed by discipline specific guidelines and, where this is the case, they are referenced in each chapter.

Additionally, prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government’s EIA Portal. The purpose of this tool is to inform the public, in a timely manner, of applications that are accompanied by an EIAR.

A dedicated website for this proposed development is established and the EIAR is available at <https://ennislrd.ie/>

The following prescribed bodies have been consulted in relation to the general scope of the EIAR.

- Department of Housing, Local Government, and Heritage
- Department of Tourism, Culture, Arts, Gaeltacht, Sport & Media
- Department of Education
- Geological Survey Ireland (Department of the Environment, Climate and Communications)
- The Heritage Council
- Office of Public Works (OPW)
- Transport Infrastructure Ireland (TII)
- The National Transport Authority (NTA)

- The Health and Safety Authority (HSA)
- The Health Service Executive (HSE)
- Inland Fisheries Ireland
- Bat Conservation Ireland
- Uisce Éireann
- An Taisce
- Bord Gais
- ESB
- Environmental Protection Agency
- Fáilte Ireland

Responses received are presented in Appendix 1.1

1.12 References and Sources

Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022); https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003). <https://www.epa.ie/publications/monitoring--assessment/assessment/advice-notes-on-current-practice-in-the-preparation-of-environmental-impact-stat.php>

EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

EU Environmental Impact Assessment of Projects: guidance on Scoping (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Scoping_final.pdf

Guidelines for Planning Authorities and An Bord Pleanála on carrying our Environmental Impact Assessment (OPR, 2018). <https://www.opr.ie/wp-content/uploads/2019/08/2018-Environmental-Impact-Assessment-1.pdf>

CHAPTER TWO

PROJECT DESCRIPTION

RECEIVED: 30/06/2025



RECEIVED: 30/06/2025

CHAPTER TWO

Table of Contents

Project Description

2.1 Introduction 2-1

2.2 Expertise and Qualifications 2-1

2.3 Description of Existing Environment 2-1

2.4 Description of Proposed Development..... 2-2

2.5 Description of Construction Phase 2-7

2.6 Commissioning..... 2-9

2.7 Decommissioning..... 2-9

2.8 Conclusion 2-9

Table of Tables

Table 2.1 Development Overview 2-2

Table of Figures

Figure 2.1 Site Location 2-1

Figure 2.2 Proposed Site Layout..... 2-2

Figure 2.3 Character Areas 2-3

Figure 2.4 3D Render of Creche from Site Entrance..... 2-4

Figure 2.5 Access and Connections 2-5

RECEIVED: 30/06/2025

CHAPTER 2 | Project Description

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the proposed development and provides details in relation to the construction and operational phases of the scheme. The chapter was prepared in conjunction with the relevant member of the Design Team, and it should be read in conjunction with the submitted drawings together with supporting reports.

The EIA Directive requires that an EIAR includes a description of the project comprising information on the site, design, size and other relevant features of the project. Recital 22 of the 2014 Directive requires that

“In order to ensure a high level of protection of the environment and human health, screening procedures and environmental impact assessments should take account of the impact of the whole project in question, including, where relevant, its subsurface and underground, during the construction, operational and, where relevant, demolition phases”.

This chapter satisfies the requirements of the EIA Directive, providing detail on the location, size and characteristics of the proposed project.

2.2 Expertise and Qualifications

This chapter of the EIAR has been prepared by Majella O’Callaghan and Saoirse Kavanagh of McCutcheon Halley Planning Consultancy with input from Eamonn Gahan of Deady Gahan Architects.

Majella O’Callaghan BA (Hons) Geography and Economics, MSc Urban and Regional Planning and Diploma of Project Management is a Senior Planner at McCutcheon Halley Planning Consultancy. Majella holds qualifications in Planning and Project Management and is a corporate Member of the Irish Planning Institution. She has worked with multi-disciplinary teams on a number of projects and has over 10 years planning experience and has provided input to a variety of development projects that require environmental and planning assessment of potential impacts.

Saoirse Kavanagh is an Executive Planning Consultant at McCutcheon Halley Planning Consultancy and holds a Bachelor’s degree in Arts (International), majoring in Geography, and a Master’s in Planning and Sustainable Development. She has over 5 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the ten Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

Eamonn Gahan, director of Deady Gahan Architects, BA (Hons) Architecture, Post Graduate Diploma in Architecture, MRIAI, studied architecture in the United Kingdom and worked for a number of years in London before returning to Ireland. He has over 20 years professional experience in designing residential, healthcare and commercial projects. Eamonn is a registered RIAI Architect, is an RIAI Grade 3 Conservation Architect and a qualified Passive House Designer (Architects Registration No. 04148).

2.3 Description of Existing Environment

The subject site of c. 11.3ha is located west of Ennis town centre and occupies a green field site beside the N85 National Road. In the immediate context of the site is Ennis Golf Club to the east and a recently completed development to the southwest of the subject site. The site is located near a variety of facilities in Ennis town within a 20-minute walking distance.

The site is bounded on the western side by the N85 national road, and a series of bungalows are situated to the east, with the land to the north designated as zoned open space.

The site is within easy walking distance of several commercial, recreational and community facilities including local shops, churches and schools. Access to the site is via Circular Road which runs along the east of the site.



Figure 2.1 Site Location

The proposed development is located in the townlands of Ballymacaula and Drumbiggle within the town of Ennis. The subject site is situated to the west of Ennis town centre and approximately 25 kilometres north of Shannon Airport. The site lies within close proximity to several important routes including the N85 Ennis ring road, the M18 Limerick-Galway route and the R474 Ennis to Miltown Malbay route. The total site area comprises 11.32 hectares and slopes downwards in a northerly direction. There is a net developable area of 8.9 hectares. The Claureen River is located to the north which flows adjacent to the north boundary of the site.

The site itself is made up of a group of greenfields subdivided by a variety of hedgerows. These native hedgerows define the existing field boundaries and are part of the local green infrastructure network. There are several mature tree species contained within the hedgerows with prominent high value trees retained within the open spaces. These are dealt with further in the Landscape and Visual Impact Chapter (Chapter 5) and the Biodiversity Chapter (Chapter 11).

2.4 Description of Proposed Development

The proposed Large Scale Residential Development comprises the construction of 300 no. residential units (14 no. 1 beds, 91 no. 2 beds, 164 no. 3 beds, 31 no. 4 beds), a creche, and all associated site development including drainage, landscaping, amenity spaces, car and bike parking, a pumping station, and upgrades to Drumbiggle Road.

An overview of the key development statistics is set out in the following table:

Table 2.1 Development Overview

Development Statistics	
Gross Site Area	11.3ha
Net Site Area	8.57ha
No. Residential Units	300 no. residential units
Creche	400.7sqm, 80 no. childcare spaces
Density	35uph
Building Height	1 to 3 storeys
Unit Mix Summary	14 no. 1 beds (4.7%), 91 no. 2 beds (30.3%), 164 no. 3 beds (54.7%), 31 no. 4 beds (10.3%)
Car Parking	536 no. car parking spaces
Bicycle Parking	202 no. cycle parking spaces
Public Open Space	15%
Plot Ratio	0.361 (net site area)
Site Coverage	22.2% (net site area)

2.4.1 Layout

The proposed layout has been informed by pre-planning discussions with Clare County Council, ecological surveys results, the previously permitted Strategic Housing Development, recent decisions by An Bord Pleanála, the surrounding context including the N85 to the west, the Golf Course and detached houses to the east, and the recently constructed housing development to the south.

In addition, the proposed layout has been designed in accordance with the following policy documents:

- National Planning Framework
- Regional Spatial & Economic Strategy for the Southern Region
- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (2024)
- Clare County Development Plan 2023-2029

An overview of the site layout is shown in figure 2.2.



Figure 2.2 Proposed Site Layout

The ecological surveys found two badger setts along the eastern boundary of the site. The proposed layout has been designed to provide the appropriate 30m buffer around both of these setts.

The Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities encourages increased densities and provides a standard of 16m separation distance between houses. The site layout has been designed in line with these guidelines.

The Clare County Development Plan has zoned the site as ‘low density residential’, ‘open space’, and ‘buffer space’. The proposed layout has been designed in accordance with these zonings while also taking into account national guidelines for increased densities.

A portion of land along the eastern boundary of the site, within Glenveagh’s ownership, is being left undeveloped to provide an appropriate buffer to the golf club. This overlaps with the buffer required for the badger setts discovered along the eastern boundary.

2.4.2 Residential

The proposed layout provides a total of 300 no. residential units comprising 9 no. detached houses (3%), 112 no. semi-detached houses (37.3%), 159 no. townhouses (53%), and 20 no. accessible bungalows (6.7%).

The 9 no. detached houses, and 20 no. bungalows have been included following feedback form Clare County Council to cater for an increased variety of households.

The 20 no. bungalows are designed as accessible, step-down units, around a central communal courtyard area.

These houses are organised into 3 no. character areas to provide three distinct areas within the scheme. Each area is distinguished by the design and materials used in the proposed houses.



Typical Character Area 1 Contiguous Elevations



Typical Character Area 2 Contiguous Elevations



Typical Character Area 3 Contiguous Elevations

Figure 2.3 Character Areas

2.4.3 Childcare Facility

The proposed development includes a 400.7sqm creche which will provide 80 no. childcare spaces. This facility is located at the entrance of the site, adjacent the site entrance which will allow for convenient accessibility. The proposal includes 11 no. car parking spaces for both staff and visitors (including 1 no. accessible space and 2 no. EV spaces), 2 no. motorbike spaces, and 2 no. drop-off car parking spaces.



Figure 2.4 3D Render of Creche from Site Entrance

2.4.4 Access & Connections

Connectivity is one of the central design principles of the proposed scheme. The current layout is therefore crossed by several connections and links which connect to the adjacent areas. Logical movement routes through the new hierarchy of streets and paths assists vital future connections and the integration of the scheme into its context. The positive impact of the improved connectivity provides local residents with new links to take advantage of an existing transport infrastructure.

The proposed development will benefit from an entrance street (Primary Local Street) providing vehicular south-north access into the development. A prominent main gateway for vehicles, bicycles and pedestrians is formed at this entrance. The development will also be well connected to the recently constructed scheme to the south through 2 no. pedestrian access points. The development proposes to introduce a hierarchy of internal streets with the primary local streets creating loop systems around the site in the north and south, from which more modest streets branch off into a network of secondary local streets and shared surfaces. The design considered the Design Manual for Urban Roads and Streets (DMURS) as an important guide to create interesting diversified streets with a more intimate character, with the addition of shared surfaces which make them safer and more valuable civic spaces usable for communal activities.

The buffer zone required to mitigate noise from the N85 formed guidance to the layout along the western boundary. This led to the provision of a shared pedestrian and cycle amenity path within this section of the site along the western boundary which serves as a primary shared pedestrian and cycle route through the scheme. This shared primary route follows the Primary Local Street from the entrance through the site and runs along the central open space joining the amenity path on the western boundary. From here, this path connects to a series of pedestrian paths throughout the site.

This shared path, along with a generous planted buffer strip acts as a noise buffer between the proposed development and the N85 located to the west. This, along with the orientation of the west facing dwellings, will create a physical barrier that will partially mitigate the noise generated by the N85, ensuring that the proposed development is protected and there are no negative effects. This is further considered in Chapter 10 – Noise and Vibration of the EIAR.

In the local context, the provision for connections from the proposed development to the N85, the southern development and existing amenities within the locality will foster a sense of identity and community for the area.

The proposed development places an emphasis on walking and cycling as a more appropriate mode of transport. Where appropriate, shared pathways have been introduced to ensure that every area of the development is accessible on bike. The proposed pedestrian/cycle paths connecting the Site entrance to the N85 will ensure safe access for pedestrian/cyclists onto the wider public road network. The proposed development also includes various pedestrian connection points to areas surrounding the scheme to ensure a well-connected network, providing access to the wider area.



Figure 2.5 Access and Connections

2.4.5 Parking

2.4.5.1 Car Parking

A total of 536 no. car parking spaces are provided within the scheme.

1 no. car parking space is provided for the 1 bed and 2 bed houses and 2 no. car parking spaces are provided for the 3 bed and 4 bed houses. This equates to a total of 495 no. car parking spaces allocated to the residential units.

In addition, there are 11 no. car parking spaces provided for the creche (including 1 no. accessible and 2 no. electric vehicle) and 2 no. drop-off spaces. There are also 30 no. visitor car parking spaces provided.

The majority of the residential car parking is provided as in-curtilage parking where residents will be able to add electric vehicle charging points as required.

In order to cater for the EV charging needs of residents without in-curtilage parking, and for visitors, 10 no. EV spaces are provided in two EV charging hubs. This will allow the easy maintenance of the chargers and the provision of additional chargers into the future.

2.4.5.2 Cycle Parking

A total of 202 no. bike parking spaces are provided throughout the scheme.

The majority of the residential units have direct access to their rear gardens where bikes can be stored. For the 85 no. units without direct rear garden access, bike stores have been provided with 2 no. spaces in each. This provides a total of 170 no. secure bike spaces in the bike stores.

12 no. secure bike spaces are provided for the creche and a total of 20 no. visitor spaces are provided throughout the scheme.

2.4.6 Landscape

2.4.6.1 Public Open Space

The proposed layout includes 15% of the net site area as public open space in three large public open spaces and several smaller pocket parks. These public open spaces include a mix of kickabout spaces, playgrounds, seating, and native planting to serve both the future residents and the wider biodiversity of the area.

The land zoned public open space to the north of the site will provide additional public open space which is not included within the 15% for the purposes of the planning application. In addition, the badger buffer area is not included within the open space calculations.

The shared pedestrian and cycle path along the western boundary provides a high-quality amenity for the future residents of the area.

2.4.6.2 Private Amenity Space

Each of the proposed residential units is provided with a private amenity space, in line with the relevant standards and guidelines.

2.4.6.3 Boundaries

The proposal includes a range of boundary treatments to provide an appropriate response to the adjacent sites and developments.

A native hedgerow will be planted along the 30m buffer around the badger setts to protect the badgers and to improve the biodiversity of the area. Any planting proposed in this buffer area will be completed by hand to minimise any potential disturbance to the badger setts.

2.4.7 Site Services

Due to the nature of the site, a greenfield site, there are no existing surface water, waste water, storm water or watermain utilities on the site. There is an existing watermain located on the western boundary of the N85 and there is an existing foul sewer on the Cahercalla Road to the southeast of the site. Most of the utilities adjacent to the site are understood to serve other properties in the surrounding areas. The existing and proposed site services are described in detail in Chapter 7 Material Assets: Built Services. The following provides a summary of the existing and proposed site services.

2.4.7.1 Wastewater

It is proposed that the wastewater will flow through the gravity foul sewer network within the development to a pumping station located at the lowest point of the developable area in the northern section of the site. From here it will be pumped via a 110mm diameter Rising Main to an existing 225mm diameter foul sewer which runs in a south easterly direction on Cahercalla Rd, east of the site entrance.

A new 150 mm wastewater sewer will also be laid on the R474 circular road, connecting to the proposed wastewater sewer network within the development. This is to enable seven existing dwellings connect to the sewer mains should they require to in the future.

2.4.7.2 Surface Water

There is no existing surface water drainage network within the existing site. It is evident that existing rainwater drainage from the site is by means of direct infiltration and percolation into the existing agricultural ground. The local groundwater flow direction is likely to mirror the site topography and catchment drainage. The greenfield run off from the site, due to the existing topography, travels in a north and northwest direction towards the Claureen River.

It is proposed to use a Sustainable Urban Drainage Systems, (SuDS) approach to storm water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of urban storm water runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed SuDS features in the development are Tree Pits, Rain Gardens, Filter Strips/ Infiltration Trenches, and open swale, an infiltration basin, permeable paving on driveways, cellular underground soakaways, petrol interceptors, a hydro-brake flow control, and drainage kerbs.

The proposed surface water drainage network has been designed into seven catchment areas for the development. The surface water will flow to soakaways for 6 of the catchment areas and to an infiltration basin for the northernmost catchment area. The soakaways and the infiltration basin have been designed to cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc.

Surface water from the infiltration basin shall discharge into the Claureen River via a hydro brake manhole. The hydro brake will discharge surface water at an allowable controlled greenfield runoff rate to the Claureen River, located North of the site.

2.4.7.3 Water Supply

There is an existing 600mm diameter ductile iron watermain located on the western boundary of the N85. This is on the opposite side of the National Road to the site. There is also a 350mm diameter Asbestos watermain on the R474 circular Road on the eastern boundary of the site. Both watermains are owned and controlled by Uisce Éireann.

It is proposed to connect a 150mm diameter watermain to the existing 350mm asbestos watermain at the site entrance on the R474 Circular Road. All watermain designs will be fully vetted by Uisce Éireann prior to receiving an offer to connect. The 150mm diameter watermain will be constructed and connected in accordance with Uisce Éireann requirements.

The water supply required for the proposed development shall be via a 150mm diameter watermain along the main spine road of the development. A 100mm diameter PE watermain will breach off this spine main to service the clusters of houses/ Cul-de-sacs.

2.4.7.4 Flood Risk

A Flood Risk Assessment has been prepared and submitted as part of the LRD Application.

The subject site is located approximately 2km southwest of the Ennis town centre, alongside Ennis Golf Club and the N85, adjacent to the River Claureen. The developable area and open attenuation pond are located outside the predicted flood extents of the Claureen River. All works within the floodplain are drainage associated, and will not impact existing ground levels, fluvial flow routes or floodplain storage. Therefore, it is estimated that risk of fluvial flooding associated with the proposed development is minimal.

Based on the indicative pluvial flood mapping presented in the Office of Public Works (OPW) Preliminary Flood Risk Assessment (PFRA), it is estimated that an area along the eastern site boundary may be liable to pluvial flooding during an extreme 0.1% Annual Exceedance Probability (AEP) pluvial flood event.

Surface water arising at the site will be managed by a dedicated stormwater drainage system and on-site attenuation in accordance with Sustainable Drainage Systems (SuDS) principles. Thus, it is predicted that the proposed development will not contribute to flood risk elsewhere in the area and will mitigate pluvial flooding within the proposed development.

Based on a review of Geological Survey Ireland (GSI) subsurface mapping of karst features, historic and predicted groundwater flooding in the area, and the PFRA study, there is no evidence to suggest liability to groundwater flooding at the proposed development site.

Based on previous flood studies for the area completed by the OPW, the proposed development site is not at risk of tidal flooding during a 0.1% Annual Exceedance Probability (AEP) Mid-Range Future Scenario (MRFS) tidal flood event, where coastal waters do not extend upstream to the vicinity of the subject site.

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With reference to the PSFRM Guidelines, residential developments are classed as “highly vulnerable”, in terms of sensitivity to flooding. Such developments are considered appropriate in Flood Zone C—where there is less than a 0.1% AEP of flooding.

Based on the findings of this Flood Risk Assessment, it is estimated that all proposed residential dwellings and access roads are appropriately located within Flood Zone C. The sequential approach, as outlined in the PSFRM guidelines, has been appropriately adopted, locating the developable area outside the area of predicted flood risk.

2.4.7.5 Electrical Supply

There are existing power lines running along the eastern boundary of the site, this development proposes to underground the power line. There is a 10kV line running from south to north through the site that will also need to be undergrounded.

There will be 3 no. new substations constructed: One in the northeast, adjacent to the proposed pump station, the second located centrally along the eastern boundary of the development, and the third located in the shared surface area in the southeast corner of the site.

The proposed substations will provide power to several mini pillars which will provide power to the residential dwellings.

2.4.7.6 Gas Supply

There is no existing gas infrastructure near the proposed development.

All of the proposed residential units and the creche will be served by electric air-to-water heat pumps due to the requirement to meet Part L of the Building Regulations, of which L1 states 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”. Heat pumps run at an energy efficiency of approximately four times greater than gas and are a renewable form of energy which is a requirement of the building regulations.

No connections to the natural gas network will be required.

2.4.7.7 Telecommunications

Virgin and eircom networks are installed along the central local road and the design of the network has allowed for a connection to the proposed residential development.

2.4.8 Traffic

The volume of traffic expected to be generated from the proposed development, and the impact that this may have on roads and junctions is assessed in the traffic and transport assessment report submitted as part of this application. The results indicate that there will not be a significant impact on traffic on the surrounding road network and that all junctions in the surrounding area will operate well within capacity as a result of the development.

2.5 Description of Construction Phase

This application is accompanied by a **Construction Environmental Management Plan** (CEMP) and a **Construction and Demolition Waste Management Plan**. Both reports should be read in conjunction with this chapter for a comprehensive description of the construction phase.

2.5.1 Programme

Construction of the residential development will take place over 3 phases and it is estimated to take 36 months to complete.

Phase 1 of construction will take place in the southernmost and the northernmost areas of the site and will consist of the construction of 107 no. residential units, the creche, and the roads, pumping station, watermain and drainage facilities associated with these areas.

Phase 2 of construction will take place in the central area of the site and will consist of the construction of 128 residential units, and the roads, watermain and drainage facilities associated with these areas.

Phase 3 of construction will take place in the northern area of the site and will consist of the construction of 65 residential units, and the roads, watermain and drainage facilities associated with these areas.

The construction of social and community uses, public open space and private open space will be staggered throughout each phase.

Each Construction Phase will contain the following sub-phases:

- Phase A: Earthworks, Foundation and Podium Structure Works
- Phase B: Superstructure Works
- Phase C: Façade & Fit-Out Works
- Phase D: Landscaping Works

2.5.2 Site Establishment and Site Compound

The site establishment works will be carried out by the appointed Contractor, will include erecting perimeter hoardings around the site, construction of the site compound and storage areas, forming site access and egress points, enacting the traffic management plan, and providing site security.

The extent of compound and storage space required by the Main Contractor will vary for the duration of the works.

For the enabling works and earthworks phases, the Main Contractor will likely require a large-scale compound for storage and segregation of hazardous and non-hazardous excavated material. For the main construction works, the Main Contractor will again require a large compound and material storage area.

Given the size and open nature of the site, it is envisaged that there is adequate space on the site for the site compound, and adequate space to store such materials on a temporary basis, with no provisions for off-site storage proposed currently.

The Main Contractor will be responsible for the security of the site for the duration of the works. All reasonable precautions will be taken to prevent unauthorised access to the site, the works and adjoining properties. Adequate safeguards will be put in place to protect the site, the works, products /materials, plant and any existing buildings affected by the construction works from damage, theft and trespass.

2.5.3 Construction Hours

It is proposed that construction works will be carried out between the hours of 07:00 and 19:00 from Monday to Friday and 08:00 and 14:00 on Saturdays. No construction works will be carried out on Sundays or Bank Holidays, without the specific agreement of Clare County Council and workings hours will be confirmed by Clare County Council.

The construction shift times will ensure construction traffic will have limited impact on the peak periods of 07:00-08:00 in the morning and 17:00-18:00 in the evening as it is envisaged most construction staff will arrive to work before 08:00 in the morning and leave after 18:00 in the evening.

2.5.4 Construction Traffic

The impact of the construction generated traffic on the local road network during the construction of the proposed development is assessed in Chapter 6 Material Assets: Traffic and Transportation, and mitigation measures are proposed where necessary.

A Preliminary Construction Traffic Management Plan (CTMP) has been prepared by TOBIN Consulting Engineers and submitted with this application. A final CTMP will be developed by the Contractor and presented to Clare County Council for approval prior to commencement of the construction works. The CTMP will contain detailed temporary traffic management drawings for each construction stage and will include the mitigation measures described in this section.

Construction traffic travelling to the proposed development site will use the N85 Road and R474 Circular Road. The increase in traffic volumes as a result of construction vehicles visiting the site is not considered to be excessive and will be spread out over the duration of the construction of the development which will be developed in 3 phases. The designated access point is off the R474, which will allow delivery vehicles to pull off the road and into the site, thus, disruption will be extremely limited.

It is estimated that there will be up to 60-70 workers active on site at the peak of construction works. Assuming that these workers travel to site individually by private car, it is estimated that they will collectively generate 120 vehicle movements per day. There is estimated to be a maximum of 12 no. HGV vehicle movements per day which will be transporting construction materials and cut and fill material to and from the site.

Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development. Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads.

The contractor will be required to promote travel by sustainable modes of transport and to introduce a mobility management plan for its workforce to encourage access to the site by means other than by private car. The Mobility Management Plan will form part of the Construction Traffic Management Plan and will be agreed with CCC prior to works beginning on site, and will include promotion of the following measures as;

- Walking: The pedestrian environment surrounding the site is considered to be good with footpaths provided along all roads.
- Cycling: Cycle parking spaces and associated showers and lockers will be provided on the site for construction staff.

- Car Sharing: Car sharing among construction staff should be encouraged, especially from areas where construction staff may be clustered. The Contractor will aim to organise shifts in accordance with staff origins, hence enabling higher levels of car sharing. Such a measure offers a significant opportunity to reduce the proportion of construction staff driving to the site car parking facility and will minimize the potential traffic impact on the surrounding road network.
- Public Transport: The Contractor will issue an information leaflet to all staff as part of their induction on site highlighting the location of the various public transport services in the vicinity of the construction site, including bus routes that operate in the vicinity of the site.

2.5.5 Earthworks

A site investigation (SI) determined that the site stratigraphy was consistent throughout the site and generally comprised of; topsoil to a depth of 0.3m below ground level (bgl), cohesive deposits to a depth of 3m bgl and 8.8m bgl, weathered bedrock, and bedrock to a depth of 1.06m-2.6m bgl.

Based on the SI (which forms part of Appendix 7.1 of this EIAR), it is advised that excavation of cohesive deposits will only remain stable for a limited time and will need to be battered if excavation is below 1.25m bgl. Any excavations in soft cohesive deposits and granular deposits will need to be battered or the sides supported at all times.

The development has been designed to minimize and maintain a balance of cut and fill throughout the site, in keeping the proposed finish floor levels of the units and the proposed road levels as close to the existing ground levels as possible, thus, reducing the need to import or export bulk filling during the construction stage.

Uncontaminated excavated soil/subsoil will be used on site for fill requirements, to reduce waste volumes. If there is any excess uncontaminated excavated soil remaining, following the completion of fill, this soil will be taken off site for reuse at another location. The contractor shall ensure the haulage contractor and the receiving site has the necessary Waste Collection Permit from the local authority.

If the soil to be excavated contains contaminants it may still have suitable engineering properties that could make it useful as a fill material. A detailed analysis shall be undertaken to consider the potential options for reuse of the soil. Should this highlight potential options and subject to any legal requirements such as environmental licensing, the contaminated soil will be treated and retained on site for re-use where possible.

Refer to the Construction Environmental Management Plan (CEMP) and the Construction Waste Management Plan (CWMP) for further details on earthworks and details of the management of exported soils from site which have been submitted as part of this application.

2.5.6 Construction Management Plan

A Construction and Environmental Management Plan (CEMP) has been prepared and submitted as part of the Planning Application. This document presents information on construction logistics, health and safety, construction traffic management, environmental objectives and targets, environmental management, and waste management.

The plan details the requirements and logistics for work involved in the project and seeks to demonstrate how such works can be delivered in a logical, sensible and safe sequence, with the incorporation of specific measures to mitigate the potential impact on people, property and the environment. The CEMP should be viewed as an outline plan with the Construction Management Plan to be developed by the Main Contractor in consultation with Statutory Undertakers / Authorities and affected Stakeholders prior to works commencing on site.

2.5.7 Construction Health and Safety

The main contractor is required to provide a best practice working environment for all employees involved in the construction of the proposed development. This includes a responsibility to take into account all relevant statutory laws and guidelines.

All construction activity will be carried out in accordance with the requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013. The main contractor will be required to prepare a Construction Health & Safety Plan prior to commencement of construction activities.

The primary aim of planning for safety on this site is ensuring the safety of people involved in and affected by the development. This includes pedestrians, road users, neighbours, site staff and visitors to site. Some of the site-specific issues that will have to be addressed during the construction of the proposed development include:

- Managing demolition works and disposal of demolished materials.
- Identifying, storing and handling of hazardous and contaminated materials.
- Protecting existing roadways against damage, in particular in areas where excavations and retaining structures are proposed adjacent to roadways.
- Identifying, diverting, maintaining and connecting to existing live services.
- Managing vehicular and pedestrian traffic on the surrounding roadways for the duration of the construction works.
- Managing crane movements to limit lifting over live buildings and roadways.

All Contractors must progress their works with reasonable skill, care and diligence and, at all times, proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, pedestrians, road users and other interacting stakeholders.

Contractors are further required to ensure that, as a minimum, all aspects of their works and project facilities comply with legislation, good industry practice and all necessary consents.

Health and Safety requirements will be further expanded and developed within the Main Contractor's Construction Management Plan and Construction Stage Health and Safety Plan required to be prepared by the Project Supervisor at Construction Stage, prior to the commencement of works on site.

2.5.8 Construction Waste Management Plan

A Construction Waste Management Plan (CWMP) has been prepared as part of the Planning Application. The document has been prepared in accordance with the Environmental Protection Agency's Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for construction and demolition projects.

The proposed development will give rise to a variety of waste streams. Given the scale of the development and the volumes of waste that will be generated during construction, it is imperative to ensure that waste management at the site is tightly controlled and has the least possible impact on the surrounding environment.

The purpose of the Construction Waste Management Plan (CWMP) is to ensure that waste storage and movement within the development takes place in a manner which complies with relevant legislation and has a minimal impact on the nearby existing commercial and residential areas and ensures, where prevention is not possible, that maximum reuse, recycling and recovery of waste with diversion from landfill, wherever possible.

As a primary measure, waste generation will be avoided, where possible, by ensuring that an excess supply of building materials is not delivered to the site and that only the minimum materials required to meet the construction schedule are available on-site. Clean excavated materials will be reused on-site for backfill and landscaping.

Waste from demolition and construction will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996, as amended.

2.6 Commissioning

The testing and commissioning of services (drainage, watermain, gas, electricity) will be completed in accordance with relevant codes of practice.

2.7 Decommissioning

The design life of the scheme is greater than 60 years. Thus, for the EIA process, the development is considered permanent, and a decommissioning phase is not considered in this report.

2.8 Conclusion

This chapter sets out the development parameters for the proposed development including an overview of the Architectural, Landscape and Engineering strategy. An overview of the phasing for construction has also been provided, and further information can be found in the **Construction and Environmental Management Plan** prepared by TOBIN Consulting Engineers.

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CHAPTER THREE

ALTERNATIVES CONSIDERED



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CHAPTER THREE

Table of Contents

Alternatives Considered

3.1 Introduction 3-1

3.2 Do-Nothing Scenario 3-1

3.3 Alternative Locations 3-2

3.4 Alternative Layouts 3-2

3.5 Alternative Design..... 3-7

3.6 Alternative Processes..... 3-7

3.7 Description of Secondary and Off-Site Developments..... 3-7

3.8 Cumulative Impact 3-7

3.9 Mitigation Measures..... 3-8

Table of Figures

Figure 3.1 Alternative Layout A..... 3-2

Figure 3.2 Alternative Layout B..... 3-3

Figure 3.3 Alternative Layout C..... 3-4

Figure 3.4 Alternative Layout D – Submitted SHD Layout 3-5

Figure 3.5 Alternative Layout E – Final Submitted LRD Layout 3-7

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CHAPTER 3 | Alternatives Considered

3.1 Introduction

This chapter of the EIAR provides details on the evolution of the scheme design through the reasonable alternatives examined and provides an outline of the main alternatives considered and justification for the final proposed development.

3.1.1 Author Information and Competency

This chapter of the EIAR has been prepared by Majella O’Callaghan and Saoirse Kavanagh of McCutcheon Halley Planning Consultancy with input from Eamonn Gahan of Deady Gahan Architects.

Majella O’Callaghan BA (Hons) Geography and Economics, MSc Urban and Regional Planning and Diploma of Project Management is a Senior Planner at McCutcheon Halley Planning Consultancy. Majella holds qualifications in Planning and Project Management and is a corporate Member of the Irish Planning Institution. She has worked with multi-disciplinary teams on a number of projects and has over 10 years planning experience and has provided input to a variety of development projects that require environmental and planning assessment of potential impacts.

Saoirse Kavanagh is an Executive Planning Consultant at McCutcheon Halley Planning Consultancy and holds a Bachelor’s degree in Arts (International), majoring in Geography, and a Master’s in Planning and Sustainable Development. She has over 5 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the ten Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

Eamonn Gahan, director of Deady Gahan Architects, BA (Hons) Architecture, Post Graduate Diploma in Architecture, MRAI, studied architecture in the United Kingdom and worked for a number of years in London before returning to Ireland. He has over 20 years professional experience in designing residential, healthcare and commercial projects. Eamonn is a registered RIAI Architect, is an RIAI Grade 3 Conservation Architect and a qualified Passive House Designer (Architects Registration No. 04148).

3.1.2 Reference to Guidelines Relevant to Discipline

This chapter will set out why the final layout was selected and provides details of alternative layouts considered throughout the design and consultation process. This serves to indicate the main reasons for choosing the layout as proposed.

The Annex IV(2) of the amended Directive 2014/52/EU, notes that the following is required in relation to the consideration of alternatives in the preparation of the EIAR:

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

Alternatives may be described at six levels: do-nothing alternative, alternative locations, alternative layouts, alternative design, alternative processes and alternative mitigation measures. Nevertheless, Section 3.4.1. of the 2022 EPA Guidelines

stated that “in some instances some of the alternatives described below will not be applicable”. The consideration of the main alternatives in respect of the development of the subject land was undertaken by the Design Team and the main alternatives considered are identified below.

3.1.3 Difficulties Encountered in Compiling Information

Several different scenarios and layouts were taken under consideration before arriving at the final layout which has been described in Chapter 2, Project Description. All these scenarios and layouts were developed in consultation with the Design Team. As it has been described in Chapter 2, Project Description, the site has presented several challenges and issues to be resolved along the design process.

3.2 Do-Nothing Scenario

The ‘Do-nothing’ alternative is a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed.

The site comprises of a number of agricultural fields subdivided by a variety of hedgerows, with an undulating topography. The existing land-uses in the vicinity of the subject site comprise primarily residential, with a number of local services including a convenience supermarket, pharmacy, school, golf course, recreational uses, showgrounds, crèche and nursing home, all located within approximately 1 kilometre of the site entrance.

The site is located within the settlement boundary of Ennis and is subject to land use policies and objectives of Clare County Development Plan 2023-2029.

There have been two recent planning applications granted on the subject site, however, neither can be constructed. An application for 98 no. houses was permitted by An Bord Pleanála in December 2020, however, this permission is due to expire before it can be constructed (ref 18/811; ABP306088). A Strategic Housing Development for 289 no. residential units was permitted by An Bord Pleanála in April 2023, however, this decision is currently subject to a judicial review and cannot be constructed (ABP 314448).

Under a ‘do-nothing’ scenario, the proposed development site would remain in its current condition as a greenfield site and it would not fulfil its residential zoning objective. Accordingly, there would be a negative/adverse effect on population, as this approach would fail to address the shortage of houses in Ennis. This development maximised the efficiency of zoned land and is therefore of critical importance.

There would be no increase in traffic under the ‘do nothing’ scenario, however, the site would fail to achieve the National Planning Framework, National Strategic Outcomes for compact growth and sustainable mobility, both of which have a positive climate and human health benefits.

A ‘do-nothing’ scenario is an inappropriate and unsustainable approach that would result in the inefficient use of a strategically located and easily serviced area of zoned residential lands. A ‘do nothing’ approach is likely to result in a neutral impact on the environment in relation to material assets, water, land, air, climate, cultural heritage, biodiversity and landscape.

3.3 Alternative Locations

The leading vision of the Applicant and the Design Team since the inception of the project has been to develop a high-quality residential scheme on zoned land. The site is located beside the N85 national road to its west, with pedestrian and vehicular connections to Ennis town centre to the east. There are a variety of connections to nearby towns and Shannon airport. Within the context of the site, a range of amenities are located within walking distance including various schools, recreational uses and shops.

The proposed site is currently zoned as low density residential. The Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities, issued by the Department of Housing, Local Government and Heritage (DHLGH) in 2024, encourages increased densities in towns to achieve the national objectives of compact growth and to ensure a sustainable pattern of development.

Ennis is identified as a Key Town and the Compact Settlement Guidelines note that densities of between 30uph to 100uph are suitable in Key Towns. This density range is divided into 30uph to 50uph for suburban/urban extensions and 40uph to 100uph for centres and urban neighbourhoods.

The site offered significant opportunity to deliver a large residential development on underutilised greenfield site in close proximity to existing services and in close proximity to Ennis town centre and the site has capacity to absorb development without significantly effecting the existing landscape and visual characteristics of the surrounding area. In terms of alternative locations therefore, the location of the proposed within the development boundary of Ennis is entirely appropriate for residential development and the site is capable of delivering housing as a scale which is supported at a national level. Overall, this location would result in an increased number of new homes being delivered on the proposed development site with a positive effect for population.

Accordingly, having regard to the significant positive benefit that could be achieved and the fact that the amenities of existing dwelling surrounding the site will be safeguarded, this location was deemed appropriate.

3.4 Alternative Layouts

The design of the scheme has been an iterative process, led by Eamonn Gahan (director of Deady Gahan Architects) in conjunction with the Design Team and is presented in the Architectural Drawings and the Planning and Design Statement, which should be read in conjunction with this chapter of the EIAR.

The final layout, presented in the Architectural Drawings and the Design Statement which should be read in conjunction with this chapter of the EIAR, has evolved since the initial design stage subsequent to a number of design team meetings and in response to pre-planning meetings with Clare County Council. The scheme has undergone a rigorous appraisal, which has led to a final layout that responds appropriately to the site characteristics, opportunities and constraints.

Section 3.5.1 sets out the intermediate design progressions of the scheme and includes figures showing the proposed layout at each stage.

3.4.1 Alternative Layout A

This layout was designed by architects working with the sites previous developer and was granted by An Bord Pleanála in December 2020 (ABP Ref: 306088-19), comprising of 98 units and a net density of 30.4 units per hectare.



Figure 3.1 Alternative Layout A

Positive characteristics:

- The layout provides a high density for the area while incorporating a broad mix of unit types for the development.

Negative characteristics of the development:

- Limited hedgerows have been retained.
- Poor design concept which fails to provide a range of high quality usable open spaces and to establish a sense of place.
- The layout proposes one moderately sized open space in the center of the site.
- The layout is dominated by streets and car parking surface: the layout proposed standard parking arrangements everywhere with little variation in street width.
- The layout doesn't correctly respond to the noise buffer to the west of the site. By facing rear gardens onto this, the private amenity space could be disturbed by the noise of the N85 road.
- The layout lacks meaningful pedestrian and cycle facilities: there is a segregated cycle path that ends abruptly on a street and starts again after forcing cyclists to use the internal street network.
- The design of the layout, a large portion of the buildings within the proposal are high density units which don't reflect the requirements of the area.
- The location of the crèche in the centre of the development with the play area exposed on 3 sides to the public realm.

3.4.2 Alternative Layout B

Following the previous design permitted on site, it was decided at an early stage after taking on the project that the entire site should be considered rather than a small portion as per the previous grant of planning. This layout sought to incorporate a larger quantity of housing arranged around a looping street network to avoid the need for cul-de-sacs and allow for easy access through the development. A range of open spaces were also developed around the site, surrounded by houses and this scheme is illustrated in the figure below.



Figure 3.2 Alternative Layout B

This layout proposed the following Positive Characteristics:

- A series of open spaces were located centrally in the site and surrounded by houses.
- The scheme provided a definition of a hierarchy of streets and introduction of some shared surfaces.
- Houses were faced westwards to correctly address the noise buffer from the N85.

This layout proposed the following Negative Characteristics:

- The layout of the development was very linear and didn't reflect the topography of the site. The uninterrupted length of the streets wouldn't comply with DMURS standards.
- Various open spaces were located around the site but were very limited in size and usability.
- Pedestrian and cycle connection through the site needed further consideration as it required many street crossings.
- Lack of connections out of the site other than possible connections to the south of the site.
- Existing trees on site were not taken into consideration other than the existing hedgerow in the center of the site.
- The location of the Crèche parking at the site entrance wouldn't address the road frontage correctly and could cause traffic issues at the vehicular access route to the site.

3.4.3 Alternative Layout C – SHD S247 Layout



Figure 3.3 Alternative Layout C

A Section 247 meeting with Clare County Council was held on the 15th October 2021 in relation to the previous SHD application. Following this meeting, key items were discussed, and the feedback provided was incorporated into the layout. The scheme evolved from the initial conceptual design following the Section 247 meeting with Clare County Council.

Following further discussions and consultation with the applicant and the design team, it was decided that the layout of the scheme should better reflect the topography of the site and greater consideration for the retention of existing trees/hedgerows was needed. The proximity to the Golf Course to the east and the quality of the open spaces were also key items that were addressed. The housing mix was also increased to cater for a wider range of end user in the Ennis area.

Alternative C proposed the following positive characteristics:

- This layout proposed several more generous open spaces located around the site which were surrounded by a range of residential units.
- The layout provided green areas and parks which were crossed by pedestrian and cycle paths that connect throughout the site: this provided a north-south and east-west pedestrian connection.
- Definition of a hierarchy of streets and introduction of several shared surfaces.
- The location of the crèche was moved to address the public road to the east in order to interact with the wider community.
- A series of feature corner units were developed to properly address open spaces and important junctions to aid in place-making.
- A greater emphasis on the retention of existing landscape features.
- The site has been split into 3 no. character areas to enhance the quality and distinctiveness of the scheme.

Alternative C proposed the following negative characteristics:

- The shared surface and open spaces areas and plazas need a better definition and provide more details.
- Possible additional connection points to the surrounding areas should be reviewed.
- No provision for larger 4 bed units on site.
- Limited connection to surrounding facilities to the south of the site.
- Lack of generous open space elements in the north of the site.

3.4.4 Alternative Layout D – Submitted SHD Layout



Figure 3.4 Alternative Layout D – Submitted SHD Layout

Alternative D was informed by the examinations of the various alternatives (outlined previously) and has evolved since the initial design stage through several redesigns. It has been developed through various iterations and implementing changes during the Pre-Application process through comments received from Clare County Council and An Bord Pleanála.

The positive characteristics of the previous layouts are maintained but some amendments were made to improve the scheme and led to a new high quality residential development that responds appropriately to the site characteristics, opportunities and constraints. The permeability of the site was enhanced by additional pedestrian connections to the west of the site along the N85. A wider mix of units were incorporated into the site to provide for a wider range of end users. The number of units also increased to 289 units with the addition of these new unit typologies.

The submitted SHD layout provides the following positive characteristics:

- Several open spaces and plazas, in various scale, shape and materials, located around the site and surrounded by buildings.
- Definition of a hierarchy of roads and introduction of several shared surfaces which have been well defined and studied in all their aspects.
- A central plaza with planted elements has been designed near the entrance of the site surrounded by larger scale buildings to better define the area.
- A greater unit mix has been established with the introduction of possible 4 bed units located in various sections of the site.
- The landscape strategy provided a better focus on connectivity and permeability through the site and wider area which consisted of the provision of 2 no. proposed pedestrian connections to the N85 to the west of the site have been incorporated into the site layout to allow for additional access points and walking / cycle routes and Provision of 2 no. pedestrian connections to the south have been incorporated in the scheme with additional footpaths connecting the site to Circular Road.
- The layout to the north of the site has been redesigned in order to better address the zoned open space to the north and to provide passive surveillance for pedestrians and future occupiers of the development.
- 3 storey unit types have been developed to address the entrance plaza area and create a sense of scale upon entering the site.
- A large portion of existing trees and hedgerows have been retained throughout the Site.
- The open space has been reconsidered and designed to incorporate play elements and existing vegetation.
- The crèche has been redesigned in order to better address the entrance onto Circular Road and the entrance to the Site, while also respecting the adjacent existing houses.
- Use of several traffic calming measures.

Clare County Council noted the following negative characteristics of the submitted SHD layout:

- The density was considered too high for the location.
- The mix of house types was considered limited with no detached houses provided.
- Apartments would not considered suitable for the location.
- The house types proposed would not cater for families or elderly people.
- Potential for traffic conflicts by access to creche for drop-offs.

3.4.5 Alternative Layout E – Final Submitted LRD Layout

Following the submission of the previous SHD application on site, the Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities have been published which encourage increased densities and provide new density ranges for different settlements. In addition, further ecological surveys completed identified two badger setts to the east of the site.

The final layout maintains the positive elements of the previously submitted SHD layout but has been further refined to take the new guidelines into account, to address the council's comments on the previous iterations of the layout, and to provide appropriate buffers to the badger setts identified.

The separation distances between houses have been reduced where possible in line with the new guidelines and the net site area has been calculated in line with the new guidelines, providing a density of 35uph. This provides an appropriate density in line with the national guidelines.

In addition, the layout has been amended to exclude apartments and to provide 20 no. accessible bungalows and 9 no. detached houses. This housing mix will cater for an increased variety of households, including families and the elderly, and addresses the council's comments on the previous SHD layout.

The creche access has also been amended to provide a one-way system to reduce potential traffic conflicts raised by the council.

The layout along the eastern boundary has been amended to provide a 30m buffer around the two badger setts identified. This required a minor reconfiguration of the layout to accommodate the buffer space while also ensuring each house has appropriate access.

Throughout the design evolution of the subject site, the disadvantages of each early and alternative option were examined, with solutions considered in detail and the promising elements threaded through to the final and preferred strategy. As a result, it is our opinion that the proposed final strategy is the most appropriate scheme with the least environmental effects.

The multidisciplinary design and EIAR team placed respecting the existing environment and achieving environmental enhancements at the centre of the design development process. The final scheme is consistent with both local and national planning policy, and will create a new community with a strong identity, within a built-up urban environment. This chapter demonstrates that the proposed preferred alternative performs better than other alternatives considered during the design process.



Figure 3.5 Alternative Layout E – Final Submitted LRD Layout

3.5 Alternative Design

The proposed residential development has been prepared in accordance with the requirements of the “Clare County Development Plan 2023-2029”, the “Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (2024)” and the “Design Manual for Urban Roads and Streets”.

The design has therefore been informed by the need to achieve an appropriate density in the context of the “Sustainable Residential Development and Compact Settlement Guidelines for Planning Authorities”, by the need to provide a good mix of housing typologies which meet current market demand and by the need to deliver a good quality residential development within the existing urban environment. It is also considered that the proposed development will have a positive impact on human health due to the quality open spaces and sustainable modes of transport available to future residents.

The design of the layout has also been informed by the characteristics and the constraints of the site that consists of a sloping topography with some native hedgerows that subdivide the greenfields. The project is focused in following and working with the contours and in retaining the native trees and hedgerows where possible that give a distinctive character to the development.

Permeability is also very important and is achieved by providing connections between the proposed development, the N85, and the recently constructed development to the south with pedestrian connections to these locations included as part of this proposed development.

The overall development provides a mix of style, size and type of housing, arranged to provide a selection of units in varying configurations. The various housing types add to the choice available in the area ensuring the provision of homes that will meet the needs of the future residents of Ennis. For all these reasons the Design Team consider that the proposed design and layout is the optimal scheme for the subject site.

3.6 Alternative Processes

This is not considered relevant to the EIAR having regard to the nature of the proposed residential development. The proposed construction work comprises relatively of standard building construction processes, as such there are no specific alternative construction processes identified in this EIAR. It is also considered there is no new or technical challenging operational techniques required and no alternative operational process have been considered as part of this development.

3.7 Description of Secondary and Off-Site Developments

No significant secondary enabling development is necessary to facilitate the proposed residential development. It is considered that the planning application includes details of the necessary infrastructure works, which are required to facilities this development. These works are assessed within this EIAR.

3.8 Cumulative Impact

Each design iteration considered any potential impacts on neighbouring developments (existing, under construction and future), transforming the edges of the scheme to provide an appropriate transition to its direct context and reducing the potential of cumulative impacts.

The noise buffer consisting of existing hedgerows with supplemented planting protects the scheme from the N85 to the west, with existing hedgerows creating boundaries to the south, east and north of the site.

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3.9 Mitigation Measures

The mitigation measures outlined throughout the various EIAR chapters are considered appropriate for the proposed development therefore no alternative mitigation measures were considered in the preparation of this chapter.

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CHAPTER FOUR

POPULATION AND HUMAN HEALTH



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CHAPTER FOUR

Table of Contents

Population and Human Health

4.1 Introduction 4-1

4.2 Expertise and Qualifications 4-1

4.3 Methodology 4-1

4.4 Baseline Environment 4-2

4.5 Impact Assessment 4-10

4.6 Mitigation Measures 4-12

4.7 Monitoring 4-13

4.8 Residual Impact Assessment 4-13

4.9 Risk of Major Accidents or Disasters 4-13

4.10 The ‘Do Nothing’ Scenario 4-13

4.11 Worst Case Scenario 4-13

4.12 Interactions 4-13

4.13 References and Sources 4-14

Table of Tables

Table 4.1 Private Households By Size – CSO 2022	4-4
Table 4.2 Permanent Private Households by Number of Bedrooms – CSO 2022	4-4
Table 4.3 Permanent Private Households by Type of Occupancy	4-5
Table 4.4 Occupancy Status of Permanent Dwellings on Census Night.....	4-5
Table 4.5 Population Aged 15 years and over by principal economic status and sex	4-5
Table 4.6 Population aged 15 years and over by working from home	4-5
Table 4.7 Schools within Ennis	4-7
Table 4.8 List of Further Education in Ennis	4-7
Table 4.9 Medical Facilities in Study Area	4-8
Table 4.10 Sports and Recreational Facilities in Study Area.....	4-10

Table of Figures

Figure 4.1 Electoral Divisions in Study Area	4-2
Figure 4.2 Study Area 2022 Population Pyramid.....	4-3
Figure 4.3 Study Area Population Change 2016 to 2022.....	4-3
Figure 4.4 Private Households by % Number of Persons	4-4
Figure 4.5 Private Households by Number of Bedrooms (%)	4-4
Figure 4.6 Population aged 5 years and over by journey time to work, school or college	4-6
Figure 4.7 Location of Schools in relation to subject site	4-6
Figure 4.8 Location of Further Education in relation to subject site	4-7
Figure 4.9 Location of Childcare Facilities in relation to site (red star)	4-8
Figure 4.10 School Enrolment in Ennis – Actual and Projected	4-12

CHAPTER 4 | Population and Human Health

4.1 Introduction

This chapter of the EIAR assesses the potential impact of the proposed development on population and human health. Proposed mitigation measures are outlined where considered necessary. It is noted that other chapters of the EIAR also deal with likely significant environmental effects on population and human health arising from traffic and transportation, air quality and climate, noise and vibration, landscape and visual, material assets: utilities and the risk of major accidents and/or disasters and those chapters should be referenced in conjunction with this chapter of the EIAR.

4.2 Expertise and Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a Bachelor’s degree in Arts (International), majoring in Geography, and a Master’s in Planning and Sustainable Development. She has over 5 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following four Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Dunboyne Phases 1 and 2 Large Scale Residential Development, Dunboyne, Co. Meath
- Rathgowan Large Scale Residential Development, Mullingar, Co. Westmeath
- Castlelands Large Scale Residential Development, Mallow, Co. Cork.

4.3 Methodology

4.3.1 Relevant Legislation & Guidance

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

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2002)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Advise Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003)
- Planning and Development Regulations 2001 (as amended)
- Planning and Development Act 2000 (as amended)

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

4.3.2 Defining Population and Human Health

This chapter has been prepared pursuant to Schedule 6 of the Planning and Development Regulations 2001 (as amended). Section 2 of Schedule 6 sets out the additional information relevant to the specific characteristics of the project required, which includes a description of the likely significant effects on the environment of the proposed development resulting from, among other things:

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

Recital 22 to the EIA Directive provides that:

“in order to ensure a high level of protection of the environment and human health, screening procedures and environmental impact assessments should take account of the impact of the whole project in question, including, where relevant, its subsurface and underground, during the construction, operational and, where relevant, demolition phases.”

According to the European Commission’s Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017), human health is

“a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.”

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) advise that

“in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc.”

The EPA Advice Notes (EPA 2003) recommend considering the following issues when assessing the potential impacts and effects of a proposed development on Population and Human Health:

- Economic Activity Likely to Lead to Projects – will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?
- Social Consideration – will the development change the intensity of patterns and types of activities and land use?
- Land Use – will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?
- Tourism – will the development affect the tourism profile of the area?
- Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments.

For the purposes of this assessment impacts on tourism have been scoped out, as the proposed project comprises a residential development in a built-up area, and the site does not have any intrinsic tourism value and is not in proximity to any important tourism or amenity resources.

4.3.3 Site Surveys/Investigation

The appraisal of the likely significant effects of the proposed development on population and human health was conducted by reviewing the current socio-economic environment in the EIAR study area. This comprised visual assessments of the proposed site and the surrounding area, as well as an analysis of aerial photography and Ordnance Survey (OS) mapping. Information was gathered with respect to the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from the 2016 and 2022 Census date.

The data included information on population, age profile, household size, number of persons at work, and the unemployment profile. A desktop study of the following documents and websites was also undertaken:

- Clare County Council Development Plan 2023 – 2029
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education and Sciences (DES) website www.education.ie

4.3.4 Consultation

Consultations with both the local authority and statutory bodies were also used to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the proposed development were addressed. Further information on the consultation process and responses received is provided in Appendix 1.1

4.3.5 Difficulties Encountered in Compiling Information

No significant difficulties were encountered in accessing information during the preparation of this chapter.

4.3.6 Study Area

The study area for the demographic assessment includes 5 Electoral Divisions (EDs). The subject site is located within the Ennis Rural Electoral Division (ED) which comprises the land surrounding Ennis Town Centre. Ennis Town Centre itself is divided into 4 EDs – Ennis Urban 1, Ennis Urban 2, Ennis Urban 3, and Ennis Urban 4. The location of the site in relation to these 5 EDs is shown in Figure 2 below.

The 2022 and 2016 Census data for these 5 EDs, which comprise the study area, is assessed to provide an overview of the local demographics.

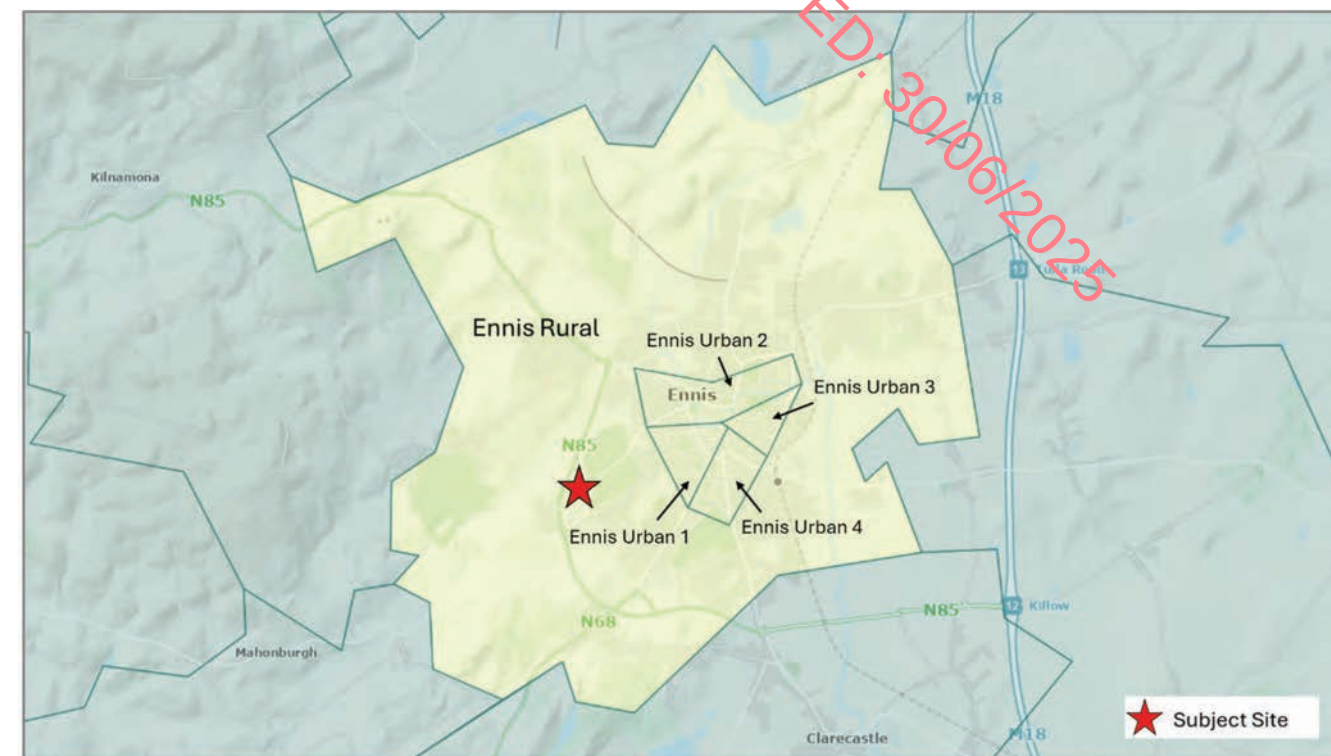


Figure 4.1 Electoral Divisions in Study Area

4.4 Baseline Environment

4.4.1 Demographic Profile of Local Population

The identified study area had a population of 24,714 no. persons in the 2022 census. This represented an increase of 2,043 no. persons, or 9%, on the 2016 census population of 22,671 no. persons.

The population pyramid in Figure 4.2 demonstrates that the proportion of the population within each age group, divided by male and female.

The primary school aged population (aged 5-12) represented 10.8% of the 2022 population, which is a slight decrease from the 11.5% in the 2016 census. The post primary school aged population (aged 13-18) represented 8.1% of the 2022 population, which is a slight increase from the 7.7% aged 13-18 in the 2016 census. Similar to the primary school level, those aged 0-4 decreased from 7.6% in the 2016 census to 6.2% in the 2022 census.

The following figure presents a comparison of the 2022 census with the 2016 census for the study area. It demonstrates a significant decline in the 25 to 35 age group and the 0-4 age group. This contrasts with a significant increase in those aged 10 to 24 and those aged 40+.

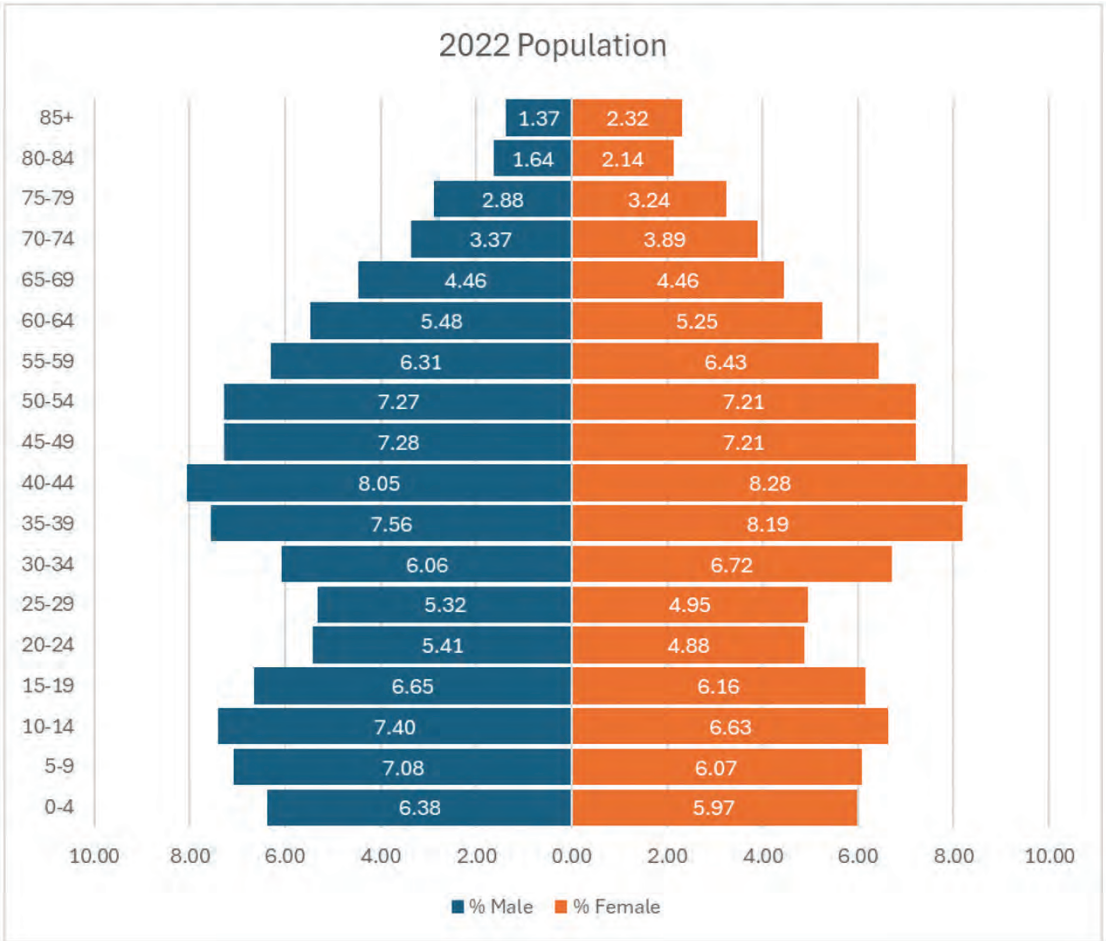


Figure 4.2 Study Area 2022 Population Pyramid



Figure 4.3 Study Area Population Change 2016 to 2022

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4.4.2 Household Size

The study area had a total of 23,920 no. persons living in 9,394 no. households, providing an average household size of 2.5 no. persons. Despite the increase in population, there is slight decrease in the overall household size compared to the 2016 household size of 2.7 no. persons. Over 57% of the households in the area are just one or two person households. Just over 10% of households includes 5 or more people.

Table 4.1 Private Households By Size – CSO 2022

	Households		Persons	
	Number	%	Number	%
1 person households	2,689	28.6%	2,689	11.2%
2 person households	2,753	29.3%	5,506	23.0%
3 person households	1,583	16.9%	4,749	19.9%
4 person households	1,374	14.6%	5,496	23.0%
5 person households	665	7.1%	3,325	13.9%
6 person households	224	2.4%	1,344	5.6%
7 person households	63	0.7%	441	1.8%
8 or more persons households	43	0.5%	370	1.5%
Total households	9,394	100.0%	23,920	100.0%

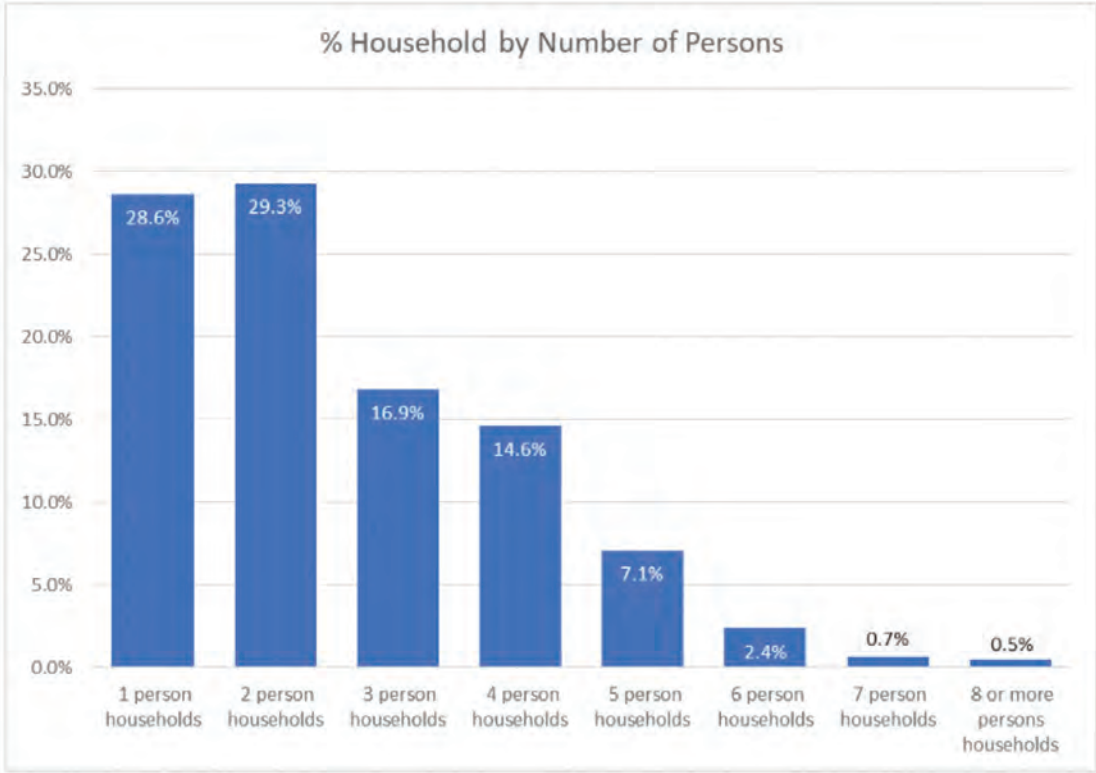


Figure 4.4 Private Households by % Number of Persons

Table 4.2 Permanent Private Households by Number of Bedrooms – CSC 2022

	Households		Persons	
	Number	%	Number	%
No bedrooms	0	0.0%	0	0.0%
1 bedroom	366	3.9%	571	2.4%
2 bedrooms	1,336	14.2%	2,394	10.0%
3 bedrooms	3,479	37.1%	8,647	36.2%
4 bedrooms	2,552	27.2%	7,617	31.9%
5 or more bedrooms	654	7.0%	2,163	9.0%
No. of bedrooms not stated	1,002	10.7%	2,514	10.5%
Total	9,389	100.0%	23,906	100.0%

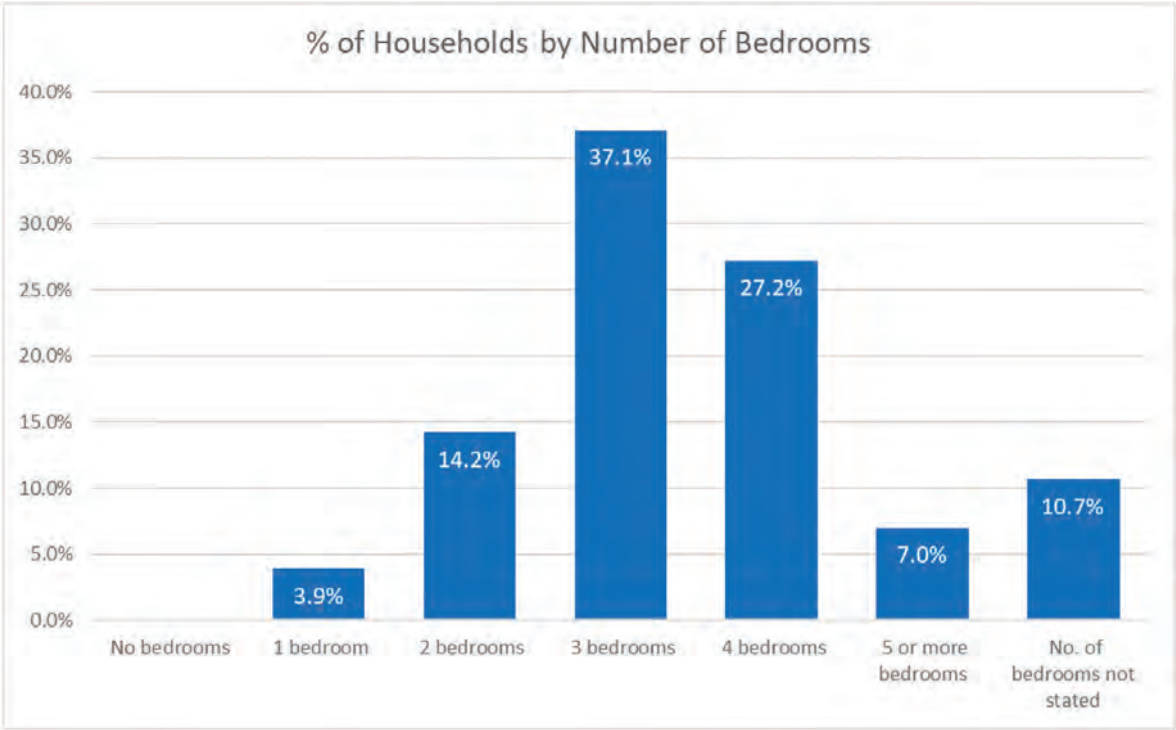


Figure 4.5 Private Households by Number of Bedrooms (%)

4.4.3 Household Occupancy

The majority of households (59%) own their homes, either with a mortgage or outright. 23% of households rent their homes from a private landlord with a further 10% renting their homes from the local authority.

90% of homes within the area are occupied with almost 8% vacant on the night of the 2022 census.

Table 4.3 Permanent Private Households by Type of Occupancy

	Households		Persons	
	Number	%	Number	%
Owned with mortgage or loan	2,408	25.6%	7,142	29.9%
Owned outright	3,133	33.4%	6,583	27.5%
Rented from private landlord	2,111	22.5%	5,719	23.9%
Rented from Local Authority	947	10.1%	2,637	11.0%
Rented from voluntary/co-operative housing body	226	2.4%	534	2.2%
Occupied free of rent	129	1.4%	255	1.1%
Not stated	435	4.6%	1,036	4.3%
Total	9,389	100.0%	23,906	100.0%

Table 4.4 Occupancy Status of Permanent Dwellings on Census Night

	Households	Households %
Occupied	9,422	90.15%
Temporarily absent	186	1.78%
Unoccupied holiday homes	52	0.50%
Other vacant dwellings	792	7.58%
Total	10,452	100.00%

4.4.4 Employment

According to the 2022 census, 55.1% of the local population aged over 15 years were at work, which is just slightly below the national rate of 56.1%. 16.6% are retired which is slightly above the national rate of 15.9%.

The majority of population aged over 15 (37.7%) are engaged in non-manual work and 8.8% are engaged in manual skilled work. 11.7% of the population are employers and managers.

26.14% of the population at work stated that they work from home in the 2022 census.

Table 4.5 Population Aged 15 years and over by principal economic status and sex

	Male		Female		Total	
	Number	%	Number	%	Number	%
At work	5,538	27.9%	5,387	27.2%	10,925	55.1%
Looking for first regular job	105	0.5%	92	0.5%	197	1.0%
Short term unemployed	212	1.1%	175	0.9%	387	2.0%
Long term unemployed	328	1.7%	289	1.5%	617	3.1%
Student	952	4.8%	1,058	5.3%	2,010	10.1%
Looking after home/family	137	0.7%	1,066	5.4%	1,203	6.1%
Retired	1,509	7.6%	1,786	9.0%	3,295	16.6%
Unable to work due to permanent sickness or disability	482	2.4%	546	2.8%	1,028	5.2%
Other	70	0.4%	109	0.5%	179	0.9%
Total	9,333	47.0%	10,508	53.0%	19,841	100%

Table 4.6 Population aged 15 years and over by working from home

	Number	%
Persons who work from home	2,817	26.14%
Persons who never work from home	6,610	61.34%
Work From Home status - Not stated	1,349	12.52%
All working persons	10,776	100.00%

4.4.5 Land Use and Amenity

The subject site is currently divided into several fields by hedgerow boundaries. There is a recently constructed housing development located to the immediate south of the site and there are seven detached houses along the eastern and southern boundaries of the site.

The N85 bounds the site to the west and the Ennis Golf Club bounds the site to the east.

4.4.6 Transport and Accessibility

The majority of the population (63.11%) aged over 5 have a commute time of less than 30 minutes to work, school, or childcare.

The most common mode of transport is the car with 38.7% of all commuters travelling as the driver of a car and another 24% travelling as a car passenger. 14% of all commuters travel by foot, with 20.8% of all school/college commuters travelling by foot.

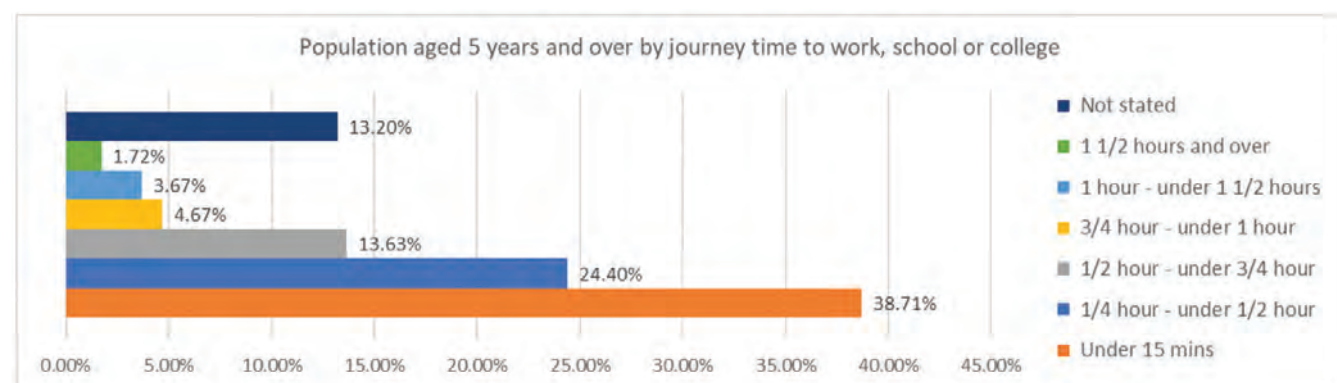


Figure 4.6 Population aged 5 years and over by journey time to work, school or college

4.4.7 Education

There are 7 no. primary schools, 4 no. post primary schools, and 2 no. special schools in Ennis. In addition to the two special schools, four of the primary schools had a special class in 2023/24.

Coláiste Mhuire is a girls post primary school while the other four are mixed schools. Gaelcholaiste an Chlair is part of the Ennis Community College.

A total of four primary schools are located within 2km of the site with the other three within 3km. While four of the post primary schools are located within 2km of the site with the other school just beyond 2km. The two special schools are located to the north of Ennis town centre are just below 3km from the site. These two schools are within a 10-minute drive of the site.

The locations of these schools are shown in the map below and details of the schools are provided in the table below.

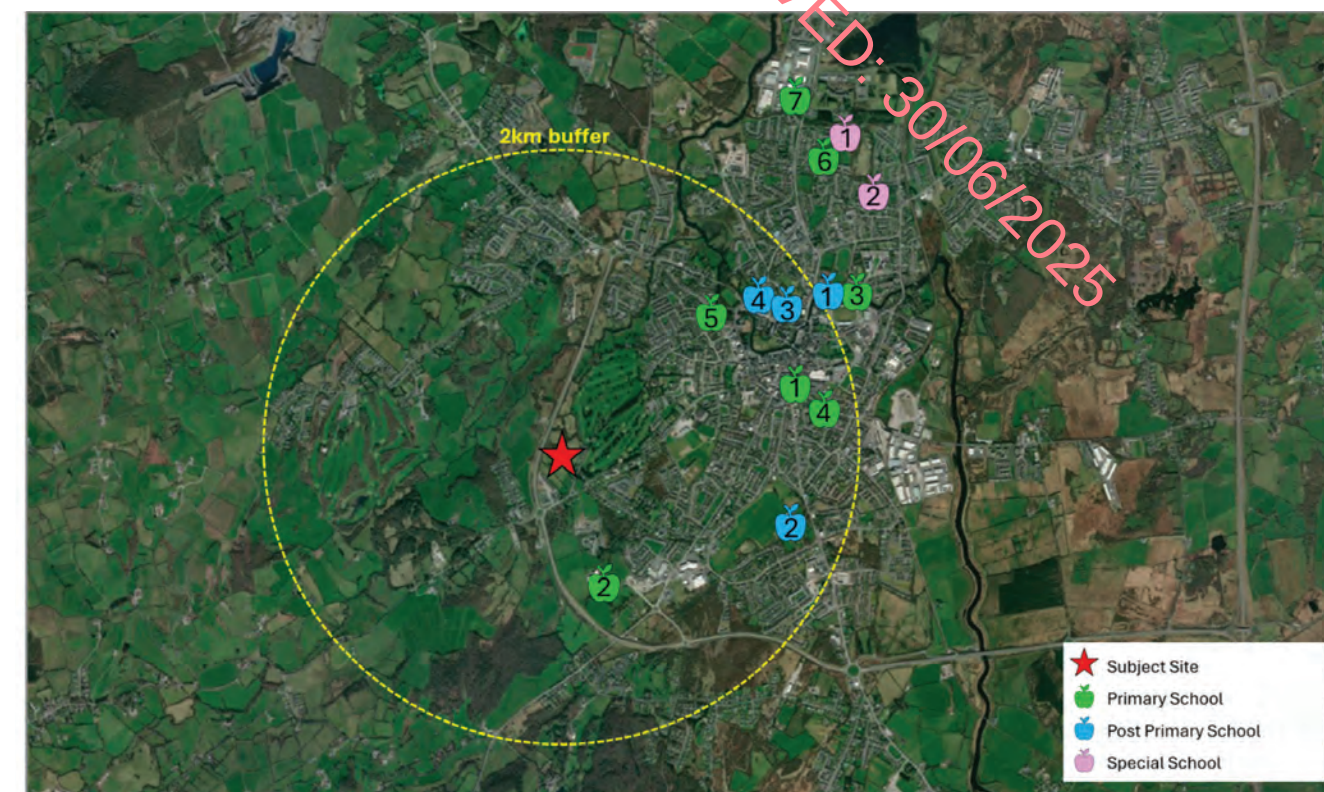


Figure 4.7 Location of Schools in relation to subject site

The Department of Education publishes detailed enrolment figures for primary and post primary schools. The enrolment figures for the last 5 years have been reviewed for each of the schools identified. It should be noted that the 2024/2025 figure are preliminary results and were published in December 2024. The final enrolment figures for 2024/25 are due to be issued in June 2025.

The primary schools had a combined enrolment of 2,606 no. students for the 2024/25 academic year. The 2023/24 academic year had the highest enrolment between 2020/21 and 2024/25 with 2,617 no. pupils.

The post primary schools had a combined enrolment of 3,585 no. pupils in 2024/25. This was the highest enrolment between 2020/21 and 2024/25.

The two special schools had a combined enrolment of 247 no. pupils in 2024/25 which is just below the highest enrolment between 2020/21 and 2023/24.

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Table 4.7 Schools wihtin Ennis

No.	School	Location	Distance from Site	2023/24 Enrolment
Primary School				
	Holy Family SNR	Station Rd, Clonroad Beg, Ennis, Co. Clare	1.74km	299
	Ennis National School	11 Kilrush Rd, Cahircalla More, Ennis, Co. Clare	925m	634
	Bunscoil na mBraithre (CBS Primary School)	New Rd, Lifford, Ennis, Co. Clare	2.25km	661
	Holy Family Junior School	Station Rd, Clonroad Beg, Ennis, Co. Clare	1.78km	184
	Scoil Chríost Rí	Cloughleigh Rd, Cloghleagh, Ennis, Co. Clare, V95 YD26	1.43km	246
	Gaelscoil Mhichil Chiosog	Gort Rd, Lifford, Ennis, Co. Clare	2.67km	476
	Ennis Educate Together NS	Gort Rd, Dulick, Ennis, Co. Clare	2.83km	117
Post-Primary				
	St. Flannan's College	Clonroad More, Ennis, Co. Clare, V95 NT72	1.63km	668
	Rice College	New Rd, Lifford, Ennis, Co. Clare	2.19km	1,200
	Coláiste Muire	Lifford, Ennis, Co. Clare	1.81km	988
	Ennis Community College (incl Gaelcholaiste an Chlair)	Harmony Row, Lifford, Ennis, Co. Clare	1.65km	576
Special Schools				
	St. Clare's	Gort Rd, Lifford, Ennis, Co. Clare, V95 YP83	2.87km	106
	St. Anne's	Lifford, Ennis, Co. Clare, V95 YY26	2.74km	142

In addition to primary and post primary education, there are 6 no. further education centres in Ennis. These are listed and identified in the table and map below. These provide training and education following the completion of primary and post primary education.

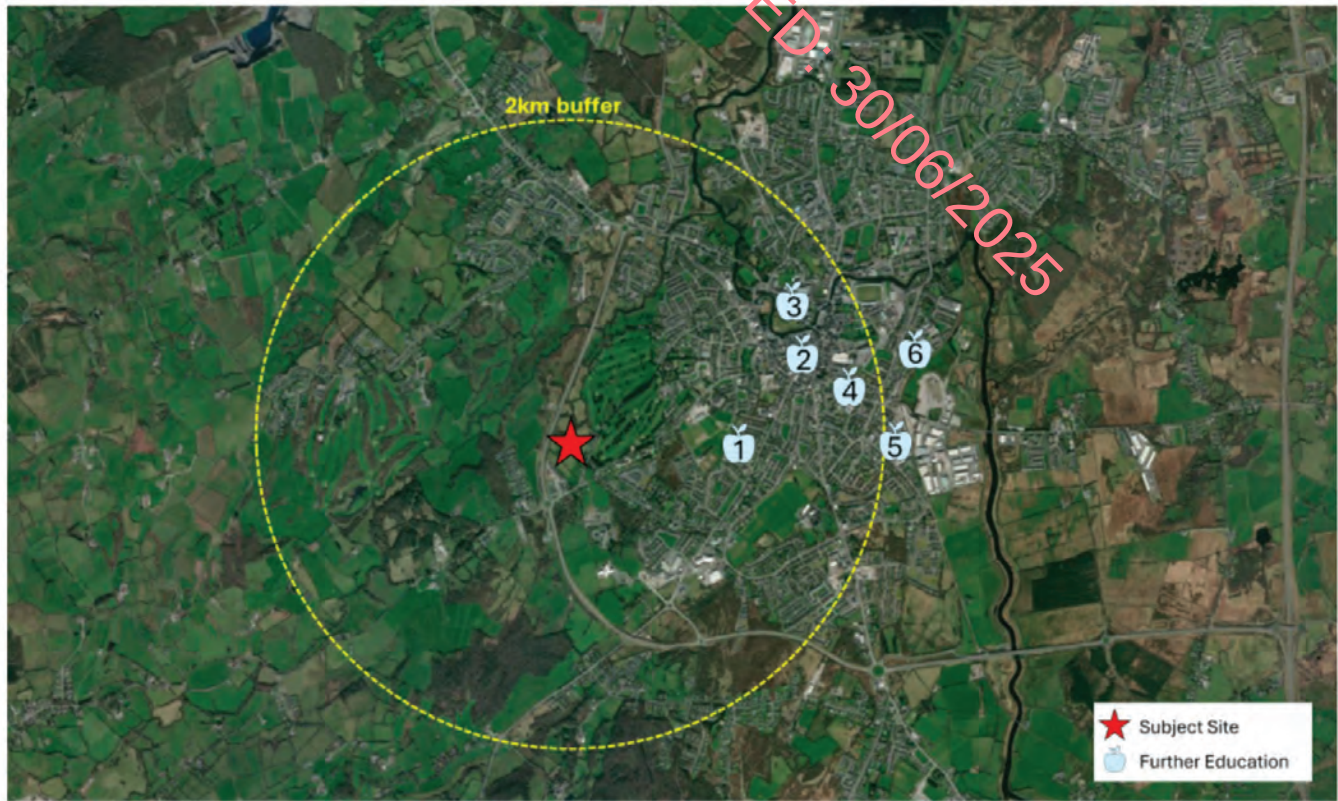


Figure 4.8 Location of Further Education in relation to subject site

Table 4.8 List of Further Education in Ennis

	Further Education	Location	Distance from Site
1.	Clare Education Centre	Government Buildings, Kilrush Road, Ennis, Co. Clare	1.8km
2.	Rahoo	56 O'Connell Street, Clonroad Beg, Ennis, Co. Clare, V95 V3KD	1.7km
3.	TUS Ennis Campus	Bindon Court, Bindon St, Lifford, Ennis, Co. Clare	1.8km
4.	Limerick and Clare Education and Training Board	Station Rd, Clonroad Beg, Ennis, Co. Clare, V95 D32F	1.9km
5.	Pitman Training Clare	Unit 10, Tracklands Business Park, Ennis, Co. Clare, V95 F3C5	2.2km
6.	College of FET, Ennis	Clon Road Business Park, Clon Rd, Clonroad More, Ennis, Co. Clare, V95 KT95	2.3km

4.4.8 Childcare Facilities

There are a total of 13 no. existing childcare facilities within 2km of the site and an additional 4 no. facilities just over 2km from the site. These facilities are mapped and listed in the figure and table below.



Figure 4.9 Location of Childcare Facilities in relation to site (red star)

	Facility Name	Distance to Site
1.	Catherine Fitzpatrick	1.99km
2.	Woodstock Montessori and Preschool	1.26km
3.	Redeemers Preschool	1.15km
4.	Cloughleigh Community Playgroup	1.18km
5.	Cuddles Early Years Service	1.05km
6.	Nurture Childcare	1.04km
7.	Woodhaven Montessori and Childcare	986m
8.	Réalta Draíochta Preschool	952km
9.	Rockmount Montessori	1.51km
10.	Connolly Pre-School	1.71km
11.	Miss Grainne’s Holy Family Montessori School	1.90km

	Facility Name	Distance to Site
12.	ABC Creche	2km
13.	Clare Family Resource Centre	1.97km
14.	Tiny Tots Montessori	2.31km
15.	Lifford Childcare Creche	2.35km
16.	Spraoi Early Learners Centre Ennis	2.23km
17.	First Steps Montessori	2.05km

4.4.9 Health Services

There are a wide range of medical and health services available in Ennis town including the following:

- 2 no. hospitals
- 1 no. nursing home
- 15 no. medical/primary care centres
- 4 no. dental practices
- 13 no. pharmacies
- 4 no. mental health centres
- 3 no. acupuncture clinics
- 4 no. skincare clinics.

The table below provides the details of 56 no. health and medical facilities in the town and their distance from the subject site. This distance between each facility and the subject site has been measured from the centre of the site, in a straight-line distance. The travel distance and time for walking, cycling, and driving would vary depending on the route taken. However, it is worth noting that all of the services listed below are within a 15min cycle of the site and the majority are within a 30min walk of the site.

Table 4.9 Medical Facilities in Study Area

No.	Medical Facility	Location	Distance
Hospitals			
1.	Cahercalla Community Hospital	Cahercalla Rd, Cahircalla More, Ennis, Co. Clare	605m
2.	Ennis Hospital Outpatient Department	West Point Retail Park, Kilrush Rd, Cahircalla More, Ennis, Co. Clare, V95 D9KW	1.2km
3.	Ennis Hospital	Gort Rd, Lifford, Ennis, Co. Clare, V95 HN29	2.1km
Nursing Homes			
4.	Ennis Nursing Home	Showgrounds Rd, Drumbiggil, Ennis, Co. Clare, V95 R968	755m
Medical Centre and GPs			
5.	Abbey Medical Centre	Westgate Business Park, 6 Kilrush Rd, Cahircalla More, Ennis, Co. Clare, V95 D60V	1km
6.	River Walk Medical Centre	Parnell St, Clonroad Beg, Ennis, Co. Clare, V95 WFD7	1.6km
7.	Ardlea Medical Practice	79 O’Connell Street, Clonroad Beg, Ennis, Co. Clare	1.6km

No.	Medical Facility	Location	Distance
8.	Fergus Medical Centre	2 St Anthony's Terrace, Ennis, Co. Clare	1.6km
9.	Ennis Health Centre	Harmony Row, Lifford, Ennis, Co. Clare	1.7km
10.	Dooctor.ie	Victoria Terrace, 4 Springfield Court, Lifford, Ennis, Co. Clare, V95 NV97	1.7km
11.	Ennis Primary Care Centre	Station Rd, Clonroad Beg, Ennis, Co. Clare, V95 TY4E	1.8km
12.	Sonas Medical Centre	Station Rd, Clonroad Beg, Ennis, Co. Clare, V95 TY4E	1.8km
13.	Bugler's Medical Practice	Árd Na Gréine, Clonroad Beg, Ennis, Co. Clare	1.9km
14.	Plexus Bio Energy Ireland Limited	4 Limerick Rd, Clonroad More, Ennis, Co. Clare	2.1km
15.	Sandfield Centre	Sandfield Centre, Highfield Park, Lifford, Ennis, Co. Clare	2.2km
16.	Ennis Medical Centre	Francis St, Clonroad Beg, Ennis, Co. Clare	2.2km
17.	The Ennis Family Medical Centre	Gort Rd, Clonroad Beg, Ennis, Co. Clare	2.2km
18.	Elm Medical Centre	Gort Rd, Lifford, Ennis, Co. Clare, V95 F2NK	2.2km
19.	HSE Primary Care Ennis	Gort Rd, Lifford, Ennis, Co. Clare, V95 F2NK	2.2km
20.	Clare Ambulatory Care Hub for Older Persons ICPOP	Lifford, Ennis, Co. Clare, V95 RT99	2.5km
Dental			
21.	Ennis Orthodontic Practice	Westgate Business Park, 12a Kilrush Rd, Cahircalla More, Ennis, Co. Clare	977m
22.	Emi-Dent Dental Clinic	Walnut House, Unit 3, Turnpike Rd, Ennis, Co. Clare, V95 AE4C	1.5km
23.	Ennis Dental Health Centre	Wood Quay, Clonroad Beg, Ennis, Co. Clare	1.5km
24.	Ennis Dental Surgery	16 Merchants Square, Clonroad Beg, Ennis, Co. Clare, V95 Y0TY	1.6km
Physiotherapy and Injury Clinics			
25.	Conor Barry Chartered Physiotherapy Clinic	Community Hospital, Cahercalla Dr, Cahercalla Rd, Ennis, Co. Clare	664m
26.	Ennis Physiotherapy Clinic	3A Barrack Cl, Barrack St, Clonroad Beg, Ennis, Co. Clare, V95 X437	1.6km
27.	Ennis Injury Clinic & Pilates	2 Greendale, Clon Rd, Ennis, Co. Clare, V95 EKKO	2.1km
28.	The Clare Podiatry Centre	Walnut House, Turnpike Rd, Clonroad Beg, Ennis, Co. Clare, V95 P461	1.5km
Opticians and Audiologists			
29.	Specsavers Opticians & Audiologists - Ennis	1 Market Pl, Clonroad Beg, Ennis, Co. Clare, V95 DV70	1.6km
30.	Audiology Medical Services	Francis St, Clonroad Beg, Ennis, Co. Clare, V95 KC3H	2.2km
Pharmacies and Medical Supplies			
31.	Rochford Pharmacy Westgate Business Park	Westgate Business Park, 6 Kilrush Rd, Cahircalla More, Ennis, Co. Clare, V95 D60V	1km
32.	Homecare Medical Ennis	Unit 7, Westgate Business Park, Cahircalla More, Ennis, Co. Clare, V95 C443	1km

No.	Medical Facility	Location	Distance
33.	C & F Pharmacy	Market Pl, Clonroad Beg, Ennis, Co. Clare	1.6km
34.	Rochford's Pharmacy	21 Parnell St, Clonroad Beg, Ennis, Co. Clare, V95 RK3C	1.6km
35.	Irish Chartered Physiotherapy Clinic & Medical Supplies	Saint Anthony's Terrace, Orchard wellness centre, 1 Harmony Row, Lifford, Ennis, Co. Clare, V95 TN80	1.6km
36.	Normoyle's Allcare Pharmacy	47 O'Connell Street, Clonroad Beg, Ennis, Co. Clare, V95 C780	1.7km
37.	Boots Pharmacy	40-42, O'Connell St, Clonroad Beg, Ennis, Co. Clare, V95 C7YY	1.7km
38.	O'Sullivan's Pharmacy	Bank Pl, Clonroad Beg, Ennis, Co. Clare	1.7km
39.	O'Sullivan's Pharmacy	6 O'Connell Street, Clonroad Beg, Ennis, Co. Clare, V95 PX64	1.8km
40.	Fennell's Pharmacy	O'Connell Street, Clonroad Beg, Ennis, Co. Clare	1.8km
41.	O'Connell's Medical Hall Pharmacy	19 Abbey St, Clonroad Beg, Ennis, Co. Clare, V95 YA34	1.9km
42.	Haven Pharmacy Hollys	23 Abbey St, Clonroad Beg, Ennis, Co. Clare	1.9km
43.	Rochford's Pharmacy	Francis St, Clonroad Beg, Ennis, Co. Clare	2.2km
44.	Duffy's Pharmacy	Unit 16/17, Tesco Shopping Centre, Clonroad Beg, Ennis, Co. Clare	2.3km
45.	Flynn's Life Pharmacy Ennis	Gort Rd, Lifford, Ennis, Co. Clare	2.3km
Mental Health			
46.	Ennis Therapy Centre	No. 16, Carmody Street Business Park, Carmody St, Clonroad Beg, Ennis, Co. Clare	1.4km
47.	Dr Stephen Quigley Clinical Psychologist	3 Carmody St, Clonroad Beg, Ennis, Co. Clare, V95 RKN2	1.4km
48.	Grace Harrison Psychotherapy	Carmody Street Business Park, Carmody St, Clonroad Beg, Ennis, Co. Clare, V95 K850	1.4km
49.	Clement Counselling & Psychotherapy	Old Mill Street, Clonroad Beg, Ennis, Co. Clare	1.4km
Skincare			
50.	Enhance Your Beauty Aesthetics	Carmody Street Business Park, 13 Carmody St, Clonroad Beg, Ennis, Co. Clare	1.4km
51.	House of Sparkle - Kelly McGrath Beauty & Aesthetics	Unit 1 Summerhill, Market Pl, Clonroad Beg, Ennis, Co. Clare, V95 WDX4	1.5km
52.	Dr. Nadine Aesthetics	Chapel Ln, Clonroad Beg, Ennis, Co. Clare, V95 PXH3	1.7km
53.	Laserderm clinic	2 Salt House Ln, Clonroad Beg, Ennis, Co. Clare, V95 YN77	1.7km
Acupuncture			
54.	Turnpike Acupuncture Clinic	Turnpike Rd, Clonroad Beg, Ennis, Co. Clare, V95 VXT0	1.5km
55.	Chinese acupuncture & massage	71 O'Connell Street, Clonroad Beg, Ennis, Co. Clare, V95 WR6Y	1.6km
56.	Ann Killeen @ Clareacuherb Acupuncture	Bank Pl, Clonroad Beg, Ennis, Co. Clare, V95 NVF1	1.7km

4.4.10 Sports and Recreational Facilities

There is a wide sports and recreational facilities in the area, which are identified in the table below. The distances in the table are measured from the centre of the subject site to the centre of identified facilities.

The Ennis Golf Club bounds the western boundary of the site, and the Ennis Rugby Club is located a short distance to the east of the site. The remaining identified facilities are all within 3km of the subject site.

Table 4.10 Sports and Recreational Facilities in Study Area

No.	Facility	Address	Distance from Site
Sports Clubs			
1.	Ennis Golf Club	Golf Links Rd, Drumbiggil, Ennis, Co. Clare	670m
2.	Ennis Rugby Football Club	Drumbiggie Rd, Drumbiggil, Ennis, Co. Clare	850m
3.	Coote Park United Soccer Pitch	Stone Ct, Clonroad Beg, Ennis, Co. Clare	1.1km
4.	Éire Óg (Ennis) GAA Club	Clonroad More, Ennis, Co. Clare	1.2km
5.	Ennis Tennis & Badminton Club	Cornmarket St, Cloghleagh, Ennis, Co. Clare, V95 PN81	1.5km
6.	Cusack Park GAA Pitch	Clonroad Beg, Ennis, Co. Clare	2.2km
7.	All Weather Pitch	Cloghleagh, Ennis, Co. Clare	1.1km
8.	Marian Athletic Club	Lahinch Rd, Drumcliff, Co. Clare	2.7km
Hiking Areas/Walking Trails			
9.	Rocky Road Hiking Area	Cahircalla Beg, Co. Clare	1.4km
10.	Clareabbey/River Fergus Walk	Western bank of River Fergus to east of site	2.8km
11.	Ballybeg Woods Hiking Area	3 Clonroadbeg, Ballybeg, Ennis, Co. Clare, V95 K8KX	2.5km
12.	Fairgreen Ennis (Pitch & Track)	Fairgreen, Lifford Rd, Lifford, Ennis, Co. Clare	2.3km
13.	Tim Smythe Park Athletic Field	Lifford Rd, Lifford, Ennis, Co. Clare	2.2km
14.	Lifford Road Playground	Lifford Rd, Lifford, Ennis, Co. Clare	2.3km
15.	John O'Sullivan Park	Drumcliff, Lee's Road, Co. Clare, V95 W560	2.6km
16.	Ennis Track A.C	Drumcliff, Co. Clare	2.7km
17.	Ennis Skatepark	Drumcliff, Co. Clare	2.7km
18.	Lees Road Amenity Park	Drumcliff, Co. Clare	3km

4.5 Impact Assessment

For the purpose of this chapter, the primary sensitive receptors are local residents, and the community facilities and services identified in the area.

This section describes the environmental effects that are likely to arise during the construction and operation of the proposed development. Section 4.6 sets out the mitigation measures required to alleviate identified effects.

Potential Impacts are considered under the following headings in line with the EPA Guidelines:

- Land Use Patterns
- Demographics and Settlement Pattern
- Employment and Economics
- Human Health
- Residential Amenity
- Local Amenity

Specific effects with respect to matters such as air quality, noise, traffic, visual impact etc. are dealt with in the respective assessments in this EIAR.

4.5.1 Construction Phase

The potential impacts of the proposal during the construction phase of the development are outlined below.

4.5.1.1 Land Use Patterns

The construction phase is temporary in nature and the impact on the land use patterns of the area is expected to be short-term and imperceptible.

4.5.1.2 Demographics and Settlement Pattern

Due to the short-term nature of the construction phase, the impact on the local demographics and settlement patterns is expected to be short-term and imperceptible.

4.5.1.3 Employment & Economics

The construction phase of the development is anticipated to result in a short-term boost to the local economy as workers employed at the site can be expected to make use of local retail facilities and other services. If the application is successful, construction works will continue until the final phase of the development is completed. There will be indirect benefits to other industries as a result of demand for construction materials and services.

The construction phase will generate increased employment and capital spend on materials and services, which will benefit the local economy. In addition to direct employment, there will be substantial off-site employment and economic activity associated with the supply of construction materials and the provision of services such as professional firms supplying financial, architectural, engineering, legal and a range of other professional services to the project. The impact of the construction phase will at least extend to the county in terms of the requirement for labour, goods and services.

Overall, the impact during the construction phase on the local economy will be slight, positive, and short-term.

4.5.1.4 Human Health

As with any construction site, there will be potential risks to the health and safety in terms of injury or death of construction personnel on-site due to the usage of large, mobile machinery as well as heavy equipment and materials.

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During construction, it is estimated that there will be up to 60-70 workers active on site per day, which would equate to c. 60 vehicle (vans and cars) trips to and from the site per day. There is an estimated maximum of 12 no. HGV vehicle movements per day which will be transporting construction material and cut and fill material to and from the site.

The emissions from the construction vehicles has the potential to negatively impact the local air quality and in turn negatively impact health of those living in the area. In addition, the construction phase is likely to generate dust that would negatively impact the air quality. These are explored further in Chapter 13 Air Quality.

4.5.1.5 Residential Amenity

The construction phase has the potential to result in dust and noise emissions that could impact the amenity of the nearby residential dwellings. These are explored further in Chapter 12 Noise and Vibration and Chapter 13 Air Quality.

4.5.1.6 Local Amenity

The construction phase is not expected to have a significant impact on local amenities in the area including schools, childcare facilities, sport and recreation amenities, or health services. Any potential impact on these during the construction phase is likely to be related to dust and noise emissions which are detailed in Chapter 12 Noise and Vibration and Chapter 13 Air Quality.

4.5.2 Operational Phase

4.5.2.1 Land Use Patterns

The proposed development will replace the existing fields with a residential development, in line with the land use zoning and national objectives for compact growth and increased densities. The provision of the additional homes in Ennis is expected to have a permanent, positive impact on the town.

The loss of the agricultural lands is anticipated to have a permanent, neutral effect as the lands were under the ownership of the applicant and were not in active agricultural use.

4.5.2.2 Demographics and Settlement Pattern

Based on the local household size (2.5 no. persons), the proposed 300 no. houses will increase the local population by 750 no. persons.

Based on the 2022 population, the proposal will likely result in c. 46 no. children aged 0-4, c. 81 no. primary school aged children, and c. 60 no. post primary school aged children.

The majority of the proposed houses (54.7%) are 3 bed homes and another 30.3% are 2 bed homes which supports the decrease in household size to 2.5 persons seen in the 2022 census. The provision of the 14 no. 1 bed homes, in addition to the 91 no. 2 bed homes, will support smaller households, including individuals and couples.

The provision of 300 no. homes on this site will help to fulfill the requirement for housing in Ennis, without the need for one-off housing outside the settlement area, thereby support the creation of a compact settlement in line with national policies.

Overall, the impact on the demographics and settlement pattern is considered long term and positive.

4.5.2.3 Employment and Economics

The local population increase as a result of the proposed development will support the local economy by providing new homes for potential employees and also increasing the customers in the area. This is considered a long-term, positive impact.

4.5.2.4 Human Health

There are no significant impacts expected on human health during the operational phase.

The expected in traffic will result in an increase in the associated greenhouse gas emissions, which can in turn decrease the local air quality and impact on human health. This is assessed in Chapter 13 Air Quality.

4.5.2.5 Residential Amenity

The residential amenity of the existing houses adjacent to the site has been considered during the design of the proposed development. The proposed houses along the southern and eastern boundaries have been appropriately set back to minimise the potential for overlooking between the existing and proposed homes.

The visual change to the landscape and its impact on the nearby residential houses is assessed in Chapter 5 Landscape and Visual Impact Assessment.

4.5.2.6 Local Amenity

4.5.2.6.1 Schools

The Department of Education calculates enrolment projections for primary and post primary level on a regular basis. The most recent national projections were published in March 2024 and includes projections for 2023 to 2042. This publication includes the first set of national projections developed since the COVID-19 pandemic and since the beginning of the war in Ukraine.

This report notes that prior to COVID-19 net migration into Ireland was at its lowest and has seen its largest increase since. Despite this, national enrolment figures for both primary and post primary level are expected to decrease.

At primary level, this report notes that enrolment levels increased by over 3,500 between 2021 and 2022, due to increased inward migration resulting from Ukrainian pupils. Despite the recent high levels of inward migration, enrolment levels at primary level are expected to fall over the coming years. In each modelled scenario, peak enrolment at primary level has already been reached.

These projections appear to be true for Ennis where the academic year 2022/23 had a peak enrolment at primary level with 2,617 no. pupils. Assuming the modelling is correct, it can be expected that the primary school enrolment levels in Ennis will decrease and there will be a downward trajectory experience over the next 10 years.

Based on a 20.3% decrease on the 2020/21 enrolment of 2,538 no. pupils, the projected enrolment in 2036/27 is expected to be 2,023 no. pupils. With the proposed development included, primary school enrolment in 2036 is projected to be 2,104 in 2036 which is significantly below the peak primary enrolment of 2,617 no. pupils in 2023/24.

At post primary level, the Department's report noted that enrolments have risen nationally by 12% from 2018 to 2022 and are expected to peak in 2025 before decreasing to a low point in 2042. The projected increase between 2020 and 2024 appears

to have been true for Ennis with the highest enrolment figures for the period in 2024/2025.

Based on a 17.9% decrease on the 2020/21 enrolment of 3,329 no. pupils, the 2036 enrolment is expected to be 2,733 no. pupils. With the proposed development included, post primary enrolment is projected to be 2,793 which is also significantly below the peak of 3,585 no. pupils seen in the 2025/25 enrolment.

Overall, it is expected that the impact on the schools is long-term and neutral.

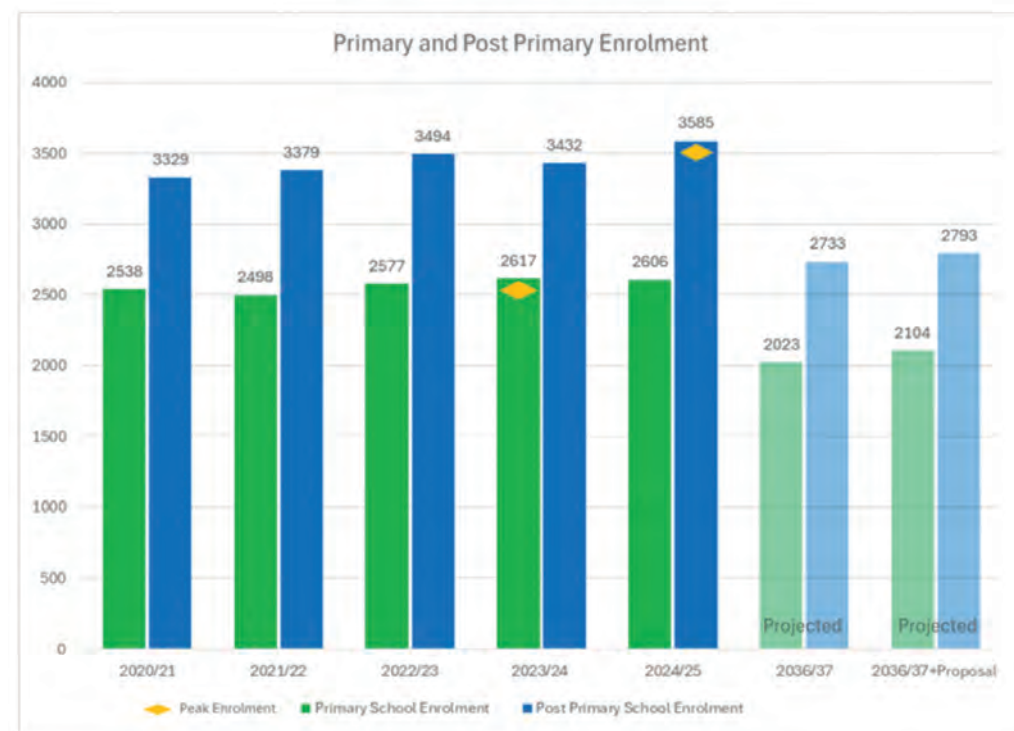


Figure 4.10 School Enrolment in Ennis – Actual and Projected

4.5.2.6.2 Childcare Facilities

The proposed 300 no. houses are expected to increase the local population by 750 no. people, c. 47 no. are expected to be aged 0-4 (6.2% of the population).

The proposed development included a creche with 80 no. childcare spaces which is more than sufficient to accommodate the demand generated by the proposed residential units. Therefore the impact is expected to be long-term and neutral.

4.5.2.6.3 Health Services

The local increase in population as a result of the proposed development will increase the demand for health and medical services. Due to the extent of health and medical services in the area, it is expected that there is sufficient capacity in the area to cater for the increased demand resulting from the proposed development. Therefore, the impact is expected to be long-term and neutral.

4.5.2.6.4 Sports and Recreational Amenities

The increase in local population from the proposed development will increase the demand for social and recreational amenities. This will support the ongoing development of these facilities in the area and ensure the various groups and clubs continue to thrive in the town.

4.5.3 Cumulative Effects

There have been three recent applications submitted and/or granted in Ennis for further residential units:

- Reference: 24/60086
48 no. residential units, c. 3.7km from the site, were permitted on the 25th September 2024.
- Reference: 24/122
An extension of duration to permission reference 17/977, relating to 51 no. residential units, was permitted on the 10th June 2024.
- Reference: 24/60652
An application for 74 no. residential units was submitted on the 19th December 2024 and the council requested further information on the 21st February 2025.

Assuming these three applications are permitted and constructed, they will provide a combined total of 173 no. residential units with a total population of 433 no. people.

Combined with the proposed development for 300 no. units, it can be expected that the above application will provide a total of 473 no. residential units and increase the local population by 1,183 no. people.

It can be estimated that that 73 no. of the combined population will be aged 0-4, 128 no. will be primary school age, and 96 no. will be post primary school age. This is considered an overall slight increase in the population of each age group and is not expected to have a significant negative impact on the area.

4.6 Mitigation Measures

4.6.1 Incorporated Design Mitigation

The proposed development has been designed to avoid negative impacts in relation to local amenities and recreational facilities by:

- Incorporating the provision of a creche within the design proposal
- Incorporating amenity facilities within the layout, including various park/parklet areas, play areas and provision for walking and cycling throughout the development.
- Providing appropriate set back distances between the existing and proposed houses.

4.6.2 Phase Mitigation

It is anticipated that that the construction phase will have a short term slight positive economic impact on the area due to the influx of construction workers to the town.

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Health and safety risks will be managed in accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, 2013. Measures are also set out in the CEMP, and include;

- Securing of site boundary and erecting of fencing or hoarding as required
- Minimising disruption of services through adequate engagement with utility and service providers;
- Restriction of construction working hours and traffic access;
- Personnel, pedestrian and vehicle segregation;
- Preparation of a site-specific Safety Statement;
- Preparation of an Emergency and Evacuation Plan.

The design of the proposed development will be subject to safety design reviews to ensure that all requirements of the project are safe. A Project Supervisor for the Design Process (PSDP) will be appointed as part of this process. Where issues are identified, corrective actions will be implemented to amend design issues prior to the issuance of final design for construction.

A contractor safety management programme will be implemented identifying potential hazards associated with the proposed works.

Temporary contractor facilities and areas under construction will be fenced off from the public with adequate warning signs of the risks associated with entry to these facilities. Entry to these areas will be restricted and they will be kept secure when construction is not taking place.

Measures to ensure public safety, with respect to construction traffic will be included in the final Construction Traffic Management Plan, to be agreed with the Planning Authority prior to commencement of development.

4.6.3 Operational Phase Mitigation

Measures to avoid potential negative impacts on population and human health have been fully considered in the design of the project and are integrated into the final layout and design. Compliance with the layout and design will be a condition of the permitted development. As such no mitigation measures are required.

4.7 Monitoring

No specific monitoring is proposed. In general, monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process (PSCP).

4.8 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

4.8.1 Construction Phase

Following the implementation of the mitigation measures, the construction phase is expected to have a short term slight positive impact with a benefit to the local economy.

4.8.2 Operational Phase

During the operational phase, the proposed development is expected to have a moderate positive impact with overall economic and social benefits for the local community and the wider Ennis area. The delivery of much needed housing will realise a likely significant positive effect for the local area.

4.9 Risk of Major Accidents or Disasters

The risk of major accidents and disasters is described in Chapter 16.

4.10 The ‘Do Nothing’ Scenario

If the development were not to proceed there would be no immediate impact on the existing population, or economic activity for residents living in the area. However, it would also prevent the development of a greenfield site which will be a catalyst for development within proximity to Ennis town. This would have a very significant negative long-term impact on both Ennis town centre and the projected population targets of both the National Planning Framework and Clare County Development Plan.

This development will facilitate an appropriate, sustainable settlement pattern which will accommodate residential, community, leisure and recreational facilities to satisfactorily match the level of population growth and household generation envisaged by the NPF 2040.

The land would likely remain vacant, with occasional agricultural use. The impacts on the land use are therefore envisaged to be a neutral ‘do nothing scenario’.

4.11 Worst Case Scenario

The worst-case scenario, in terms of the impact on population and human health, would be where construction on the proposed development was started, but not completed, and the site fails to provide the necessary housing in Ennis to support the local population while leaving an incomplete construction site in place of the current agricultural fields.

During the construction phase, the worst-case scenario would be where the mitigation measures are not implemented resulting in an unmitigated impact on noise, air quality, and traffic during the construction phase. When considering the mitigation measures that will be in place, the event of a worst-case scenario is deemed to be unlikely.

4.12 Interactions

4.12.1 Air Quality

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. 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 not significant, therefore, air quality impact from the proposed development are not expected to have a significant impact on population and human health

4.12.2 Landscape and Visual

During the Construction Phase there will be visual changes associated with removal of some vegetation and emerging plant and machinery. During the Operational Phase there will be permanent visual changes to the landscape transition of the site from an agricultural field to a residential development. A full impact assessment has been carried out in Chapter 5 Landscape and Visual Impact to quantify this impact.

4.12.3 Material Assets: Traffic and Transport

There can be a significant interaction between population and human health 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 thus Population and Human Health have been deemed as not significant

4.12.4 Material Assets: Services

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.

4.12.5 Material Assets: Waste

The improper removal, handling, and storage of hazardous waste could negatively impact on the health of construction workers. Similarly, the incorrect removal and storage of waste during the operational phase has the potential to negatively impact on the future residents of the development.

4.13 References and Sources

- National Planning Framework, Ireland 2040 – Our Plan (Government of Ireland, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Central Statistics Office (CSO) website www.cso.ie
- Department of Education and Sciences (DES) website www.education.ie.

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CHAPTER FIVE

LANDSCAPE AND VISUAL



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CHAPTER FIVE

Table of Contents

Landscape and Visual

5.1 Introduction 5-1

5.2 Research Methodology 5-1

5.3 Receiving Landscape Environment 5-2

5.4 Characteristics of the Proposed Development 5-8

5.5 Potential Impacts of the Proposed Development..... 5-9

5.6 Mitigation Measures..... 5-9

5.7 Predicted Impacts of the Proposed Development..... 5-10

5.8 Residual Impacts 5-13

5.9 Interactions..... 5-13

5.10 References..... 5-13

Table of Tables

Table 5.1 Photomontage Viewpoint Locations, Ballymacaula, Ennis, Co. Clare..... 5-10

Table of Figures

Figure 5.1 ENNIS LRD: Site location and Context (OSI Maps)..... 5-2

Figure 5.2 Ennis LRD: National Monuments adjoining site (OSI Maps)..... 5-3

Figure 5.3 Ennis LRD: Protected Sites in local area (OSI Maps)..... 5-3

Figure 5.4 Ennis LRD: Landscape Character Types (Landscape Character Assessments of Co. Clare 2004)..... 5-4

Figure 5.5 Ennis LRD: Landscape Character Areas (Landscape Character Assessments of Co. Clare 2004)..... 5-5

Figure 5.6 Ennis LRD: Clare County Development Zoning Map 2023 - 2029 5-5

Figure 5.7 Site Images (Google Maps)..... 5-6

Figure 5.8 Image 1 View Southwest over Golf Course 5-7

Figure 5.9 Image 2 View Travelling Southwest along R474..... 5-7

Figure 5.10 Image 3 View North west to site from junction of R474 and Drumbiggle Rd..... 5-7

Figure 5.11 Image 4 View North east into site from Ballymacaula View. 5-7

Figure 5.12 Image 5 View travelling South west along N85. 5-8

Figure 5.13 Receptors (Google Maps) 5-8

Figure 5.14 Ennis LRD: -Landscape Masterplans – (JMC Design) 5-9

Figure 5.15 Ennis LRD,10 Photomontage locations (Microsoft Image)- See Appendix 5.1 of this EIAR..... 5-11

CHAPTER 5 | Landscape and Visual

5.1 Introduction

This Landscape and Visual Impact Assessment (LVIA) has been prepared by Jane McCorkell Landscape Architect. The report provides an assessment of the landscape character and visual impact of the proposed development along with a description of the proposed mitigation measures.

This LVIA has been prepared by Jane McCorkell, Landscape Architect, MLA, B.Sc. (Hort), member of the Irish Landscape Institute, and experience is preparing a range of Visual Impact Assessments covering large and small residential developments, and commercial developments.

The definition of Landscape set out by the Council of Europe shall form the basis of the report:

‘Landscape as an area, as perceived by people, whose character is a result of action and interaction of natural and/or human factors’.

The assessment should be read in conjunction with the photomontages prepared by GNet3D for the scheme and included in the planning application. No. 10 photomontages have been prepared, and all views were taken in mid-January 2025. Positions of photomontages were selected following a site visit and consideration as to the extent of overlooking from adjoining properties, and what could be deemed as creating a visual impact.

5.2 Research Methodology

This assessment is based on the following guidelines -:

- Guidelines on the Information to be contained in Environmental Impact Statements (EIAR) Environmental Protection Agency, 2022.
- Guidelines on the Information to be contained in Environmental Impact Assessment Report, 2022.
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements, Environmental Protection Agency, 2003.
- Guidelines for Landscape and Visual Assessment, 3rd Ed., The Landscape Institute and Institute of Environmental Management and Assessment, 2013.
- Urban Development & Building Heights, Dept. of Housing Planning & Local Government 2018.

The assessment involved:

- 1 Visiting the site and the surrounding area.
- 2 A review of statutory planning and other documentation to ascertain the local and wider significance.
- 3 A study of ordnance survey mapping and aerial photography; a review of plans, sections, and elevations of the proposed development.

5.2.1 Nature of Impacts

Impacts on the landscape arise in two distinct but closely related aspects. The first impact is on the character of the landscape arising from the insertion of new development or the alteration of elements within an existing context. The second is a visual impact, which arises from changes or insertions within a view. The impact on the view depends on the degree and nature of the change and such changes may rise from either ‘visual intrusion’ (i.e. alteration without appreciable blocking) or ‘visual obstruction’ (i.e. alteration with a notable extent or full blocking).

It is recognised, as with all landscape and visual considerations, that impacts will be influenced and informed to some degree by subjective perceptions of how the overall change(s) matter to any given individual.

The assessment of landscape and visual impacts includes:

- Direct impacts upon specific landscape elements within and adjacent to the site.
- Effects of the overall pattern of the landscape elements which give rise to the character of the site and its surroundings.
- Impacts upon any special interests in and around the site.
- Direct impacts of the scheme upon views; and
- Overall impact on landscape character and visual amenity.

5.2.2 Significance Criteria

Where appropriate and in accordance with the EPA Advice Notes and Guidelines, the below terms are used to describe the degree, quality, and duration of an impact:

Impact Criteria	Description
Profound	An impact which obliterates sensitive characteristics.
Significant	An impact which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Moderate	An impact that alters the character of the environment in a manner that is consistent with the existing and emerging needs.
Slight	An impact which causes noticeable changes in character of the environment without affecting its sensitivities.
Imperceptible	An impact capable of measurement but without noticeable consequences.

Terms relating to the duration of impacts as described in the EPA Guidelines are listed as follows:

Momentary:	lasting seconds to minutes
Brief:	lasting up to one day
Temporary:	lasting up to one year
Short-term:	lasting one to seven years
Medium-term:	lasting seven to fifteen years
Long-term:	lasting fifteen to sixty years
Permanent:	lasting over sixty years

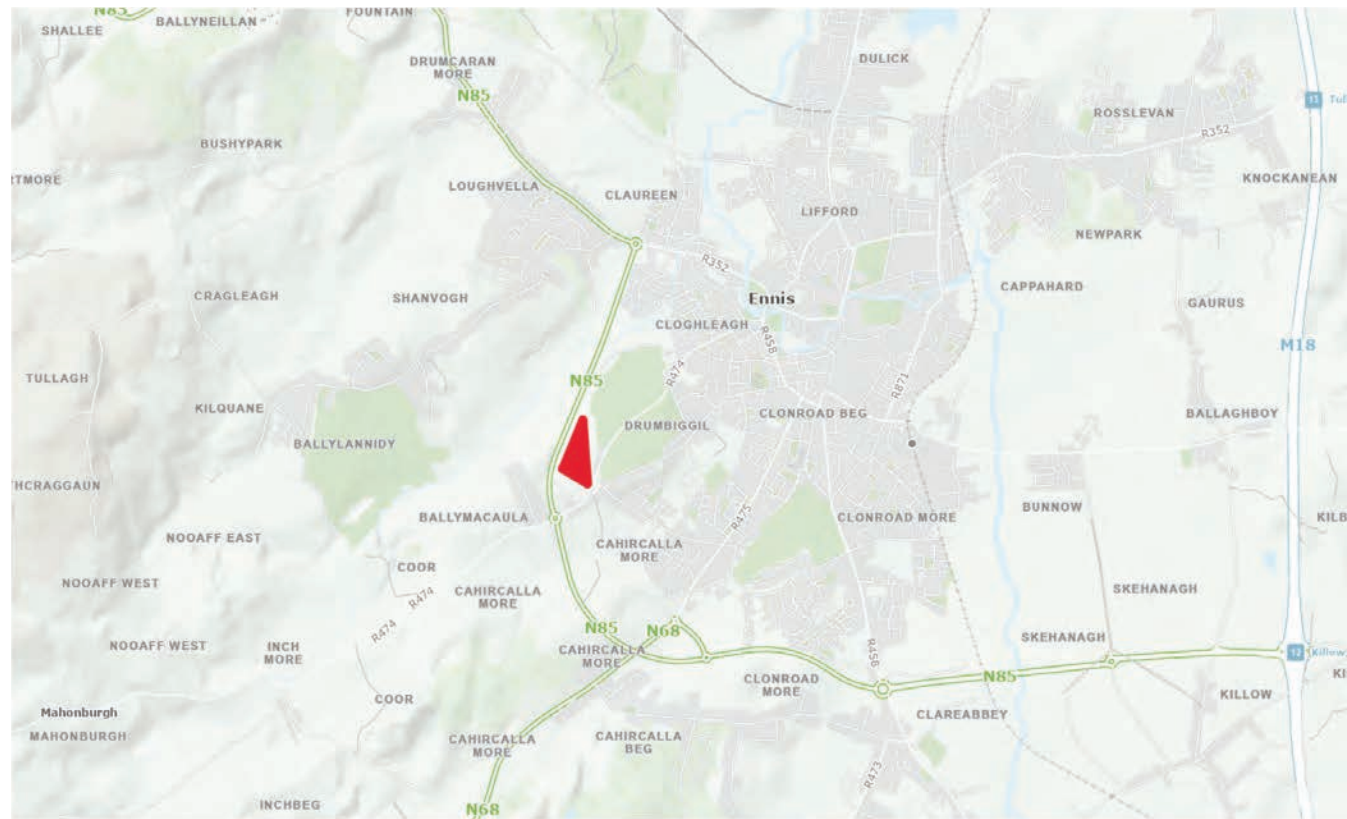


Figure 5.1 ENNIS LRD: Site location and Context (OSI Maps)

5.3 Receiving Landscape Environment

The full description of the proposed development is outlined in Chapter 2 'Development Description' of this EIAR.

Surrounding Environment

The site is located at Ballymacaula, Circular Road, Ennis, Co. Clare approximately 1.5 kilometres west of the town centre of Ennis. The N85 road bounds the west of the site with the R474 Circular Road, passing to the east. Ennis Golf Club adjoins the eastern boundary of the site and the Ballymacaula View housing estate adjoins the western boundary.

5.3.1 Policy and Planning

Policy Considerations

The relevant designated sites, local authority designations, archaeological features and protected sites were assessed from a landscape and visual impact basis, with respect to the development proposals as contained in this submission.

Designated Sites

National Heritage Sites – National Monuments

There are several National Monument sites that are close to the site and have some potential to be visually impacted by the development proposals. In this case however, distance from site and intervening vegetation and buildings generally screen views of the monuments from the site.

CLO33-171 Ringfort Rath. This feature is located approximately 200 metres to the south of the site. Intervening vegetation and buildings screen views of this national monument. Therefore, there would be no visual impact on this feature from the proposed development

CLO33-170 Lime Kiln. This recorded monument is screened by the berm that runs parallel to the N85 and therefore there are no views of this feature from the site.

CLO33-081 18/19C House. The house is approximately 500 metres to the northeast of the site and is surrounded by screening vegetation. There would be no visual impact on this feature from the proposed development due to separation and intervening vegetation.

CLO33-078 Enclosure. This monument is 600 metres to the west of the site. It is described as not being visible at ground level and therefore there would be no visual impact from the development proposals.

CLO33-074 House. The house is approximately 1 kilometre from the site and is screened from the site by the roadside berm and intervening vegetation.

CLO33-075 Ringfort. This Ringfort is located 700 meters to the west of the site and is screened by topography and vegetation.

CLO33-114002 – Described in Archaeology.ie as a Ringfort / Cashel. It is located 600 metres to the west of the site and is screened from view by the Beechpark housing development.

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Figure 5.2 Ennis LRD: National Monuments adjoining site (OSI Maps)

National Inventory of Architectural Heritage (NIAH)

There is several NIAH records located in the centre of Ennis, approximately 1.5 kilometres to the northeast of the site. The distance from the site, along with intervening vegetation and buildings, screen views of these buildings from the site.

Cahircalla House 1800-1820 (NIAH Ref. 20403310) The house is situated 400 metres to the south of the site and is screened from the site by topography, vegetation, and intervening buildings. Therefore, there would be no visual impact from the development proposals on this feature.

Designated Natura 2000 Sites

There are several Designated Natura 2000 Sites in the vicinity of the site:

Pouladatig Cave SAC (Ref. 000037) and pNHA. Located over 1.8 kilometres to the west of the site and is screened by topography and vegetation. Therefore, no visual impact would arise from the development proposals.

Cahircalla Wood pNHA. This feature is 700 metres southwest of the site and is screened from the site by topography. Therefore, no visual impact would arise from the development proposals.

Newhall & Edenvale SAC (Ref. 002091) & pNHA. This designated site is 1.8 kilometres south of the site and there is no visual connection between the location and the site.

Fergus Estuary and Inner Shannon North Shore SPA (Ref. 004077) & pNHA. The distance of 4 kilometres southeast of the site means that this protected site is not visible.

Lower River Shannon SAC (Ref. 002165). The Lower River Shannon flows through the centre of Ennis 1.2 kilometres to the west of the site. The river is not visible from the site and therefore no visual impact would arise.

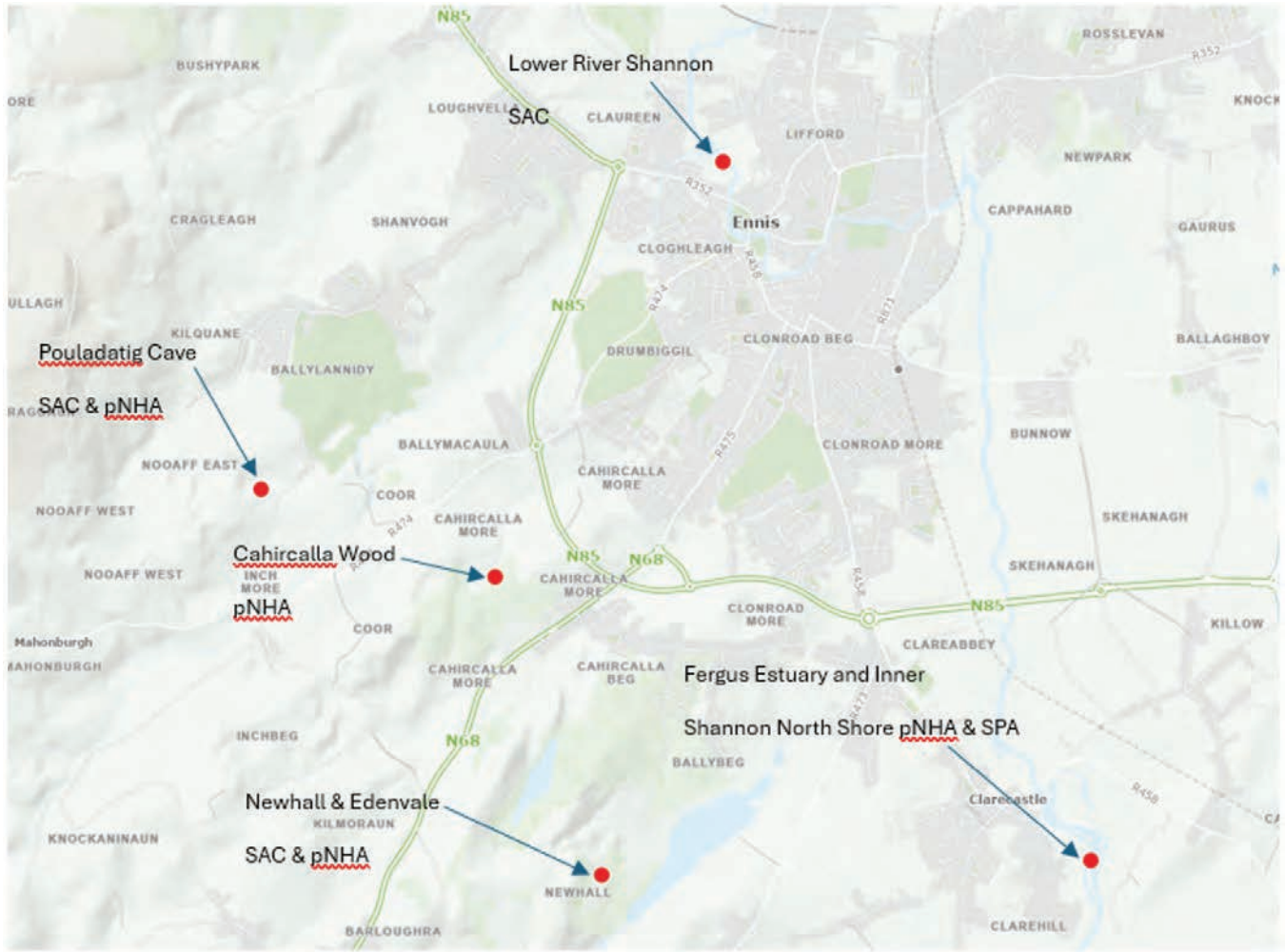


Figure 5.3 Ennis LRD: Protected Sites in local area (OSI Maps)

Clare Co. Co. Development Plan 2023-2029

Chapter 14 of the Clare Co. Development Plan (CDP) sets out the objectives required to

sustainably manage the diverse landscapes of the county:

Clare Co. Co. – Landscape Character Assessment

Clare Co. Co. stated Objective (CDP14.1) is to encourage the utilisation of the Landscape Character Assessment of County Clare and other relevant landscape policy and guidelines and to have regard to them in the management, enhancement, and promotion of the landscapes of County Clare. The Development Plan also lists a range of strategic objectives related to landscape: -

- To ensure the implementation of the National Landscape Strategy for Ireland 2015-2025 in County Clare.
- To implement the 'Clare's Living Landscapes' approach to landscape management and enhancement throughout the County.
- To encourage the utilisation of the Clare County Landscape Character Assessment in both the preparation and assessment of planning applications.
- To utilise the 'Clare Living Landscapes' approach to ensure that development in the County takes place in the location /landscape deemed most appropriate.
- To sustain the natural and cultural heritage of the County.

Landscape Character Types

County Clare is divided in 26 distinct types of landscape, i.e., distinct types of landscape that are relatively homogenous in character.

The site is located in Type 20, Low Drumlin Farmland and is adjacent to Type 1 Built up Areas.

The presence of adjoining residential development and road networks would put the site into the Built-up category rather than in open drumlin farmland.

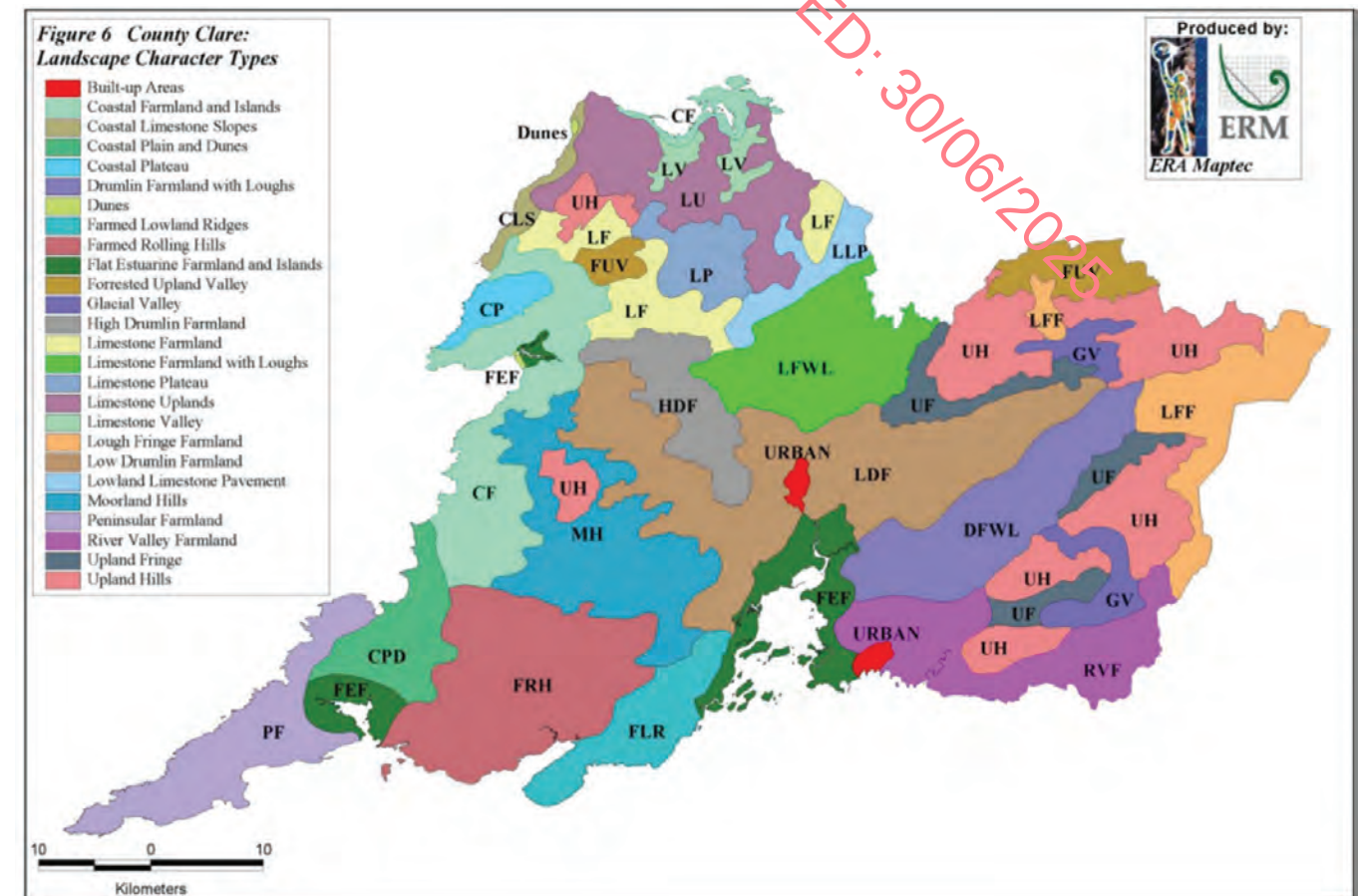


Figure 5.4 Ennis LRD: Landscape Character Types (Landscape Character Assessments of Co. Clare 2004)

Landscape Character Areas

The site location is classified as Character Area 13 Ennis Drumlin Farmland. While the drumlin farmland character is visible to the west of the site, the site is more of an urban character rather than a farmland area with housing, with roads and a golf course being the dominant features of the immediate area around the site.

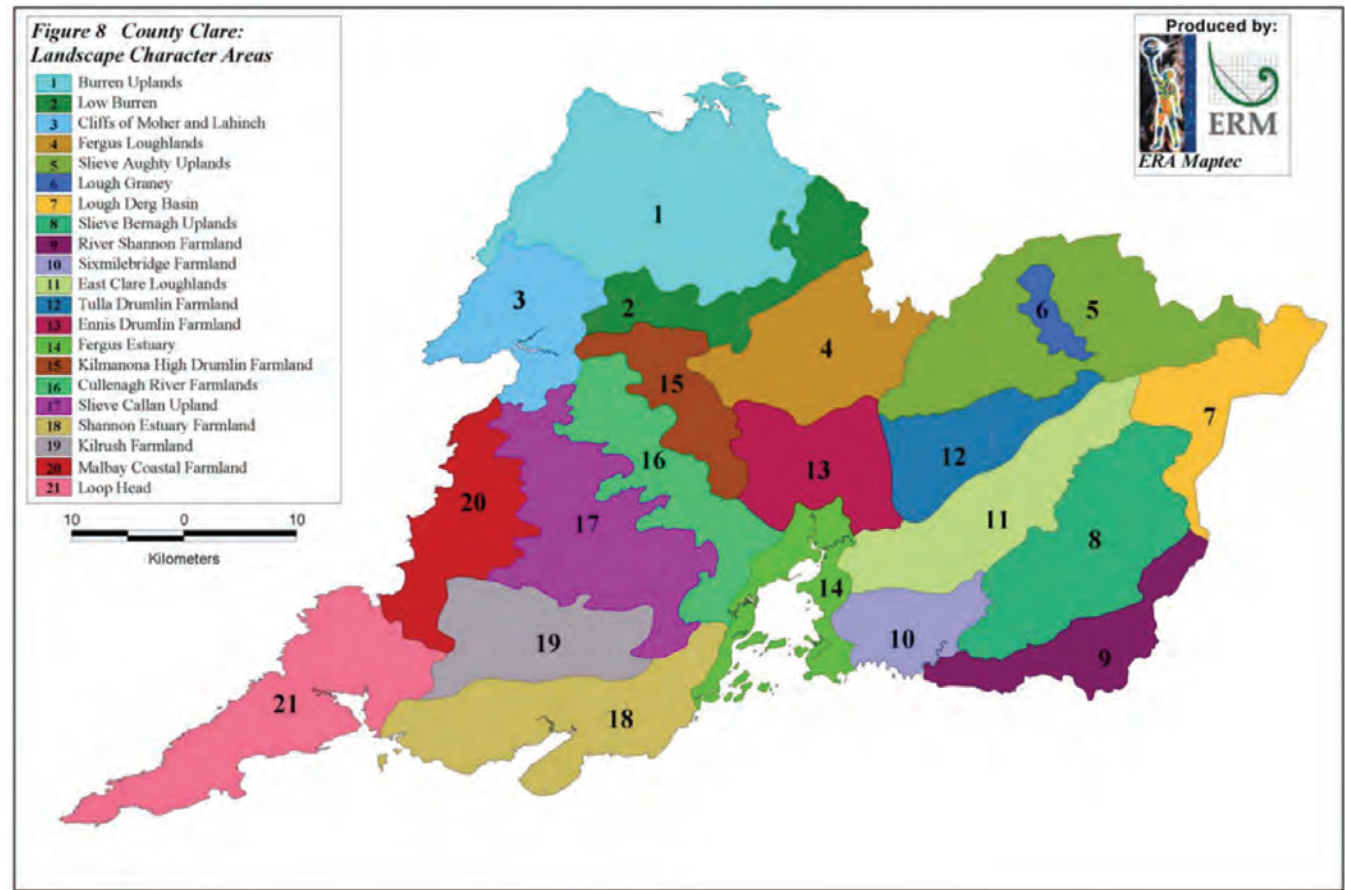


Figure 5.5 Ennis LRD: Landscape Character Areas (Landscape Character Assessments of Co. Clare 2004)

Living Landscapes

The CDP refers to the fact that the word ‘Landscape’ can be seen as a restrictive term which often refers only to appearance with little regard for communities that shape it. The CDP describes the concept of ‘Living Landscapes’ where different parts of the County are regarded as having different potential in terms of how communities can pursue their ambitions and aspirations. The Living Landscapes are further classified as: -

Settled Landscapes – area where people live and work

Working Landscapes – intensively settled and developed areas within settled landscapes

Heritage landscapes - natural and cultural heritage are given priority and where development isnot precluded but happens more slowly and carefully.

The site is located in Western Corridor Working Landscape where It is an objective (CDP14.2) of the Development Plan: A To permit development in these areas that will sustain economic activity and enhance social well-being and quality of life - subject to conformity with all other relevant provisions of the Plan and the availability and protection of resources.

Woodlands Trees & Hedgerows

The CDP refers to the fact that townscapes and landscapes generally benefit from the presence of trees as they soften the line of buildings, contribute to a sense of place, act as wildlife habitats and corridors and provide scale to buildings and streets. They also filter out noise, dust, and pollutants. Plant and soil cover act as important carbon sink, retain moisture and prevent flooding. The CDP states that where felling of trees is necessary for development that: where possible, that all trees felled because of development proposals be replaced at a minimum ratio of 10 new native species per 1 tree felled. A number of trees and sections hedgerow are to be removed as part of the development proposals, but a significant number of trees are being proposed as well as areas of native species planting to enhance future biodiversity on the site.

Views & Prospects

There is a scenic route according to the Co Clare CDP is located on the R474 Miltown Malbay road approx. 15Kms to the west of the site. Other listed views are located towards Corofin and the Burren Area approx. 13Kms northwest of the site. Distance from site and intervening topography means there would no visual impact on these views from the development proposals.

Zoning

The site is Zoned Low Density Residential, with Recreational Zoning to the east and Agricultural Zoning tothe west.

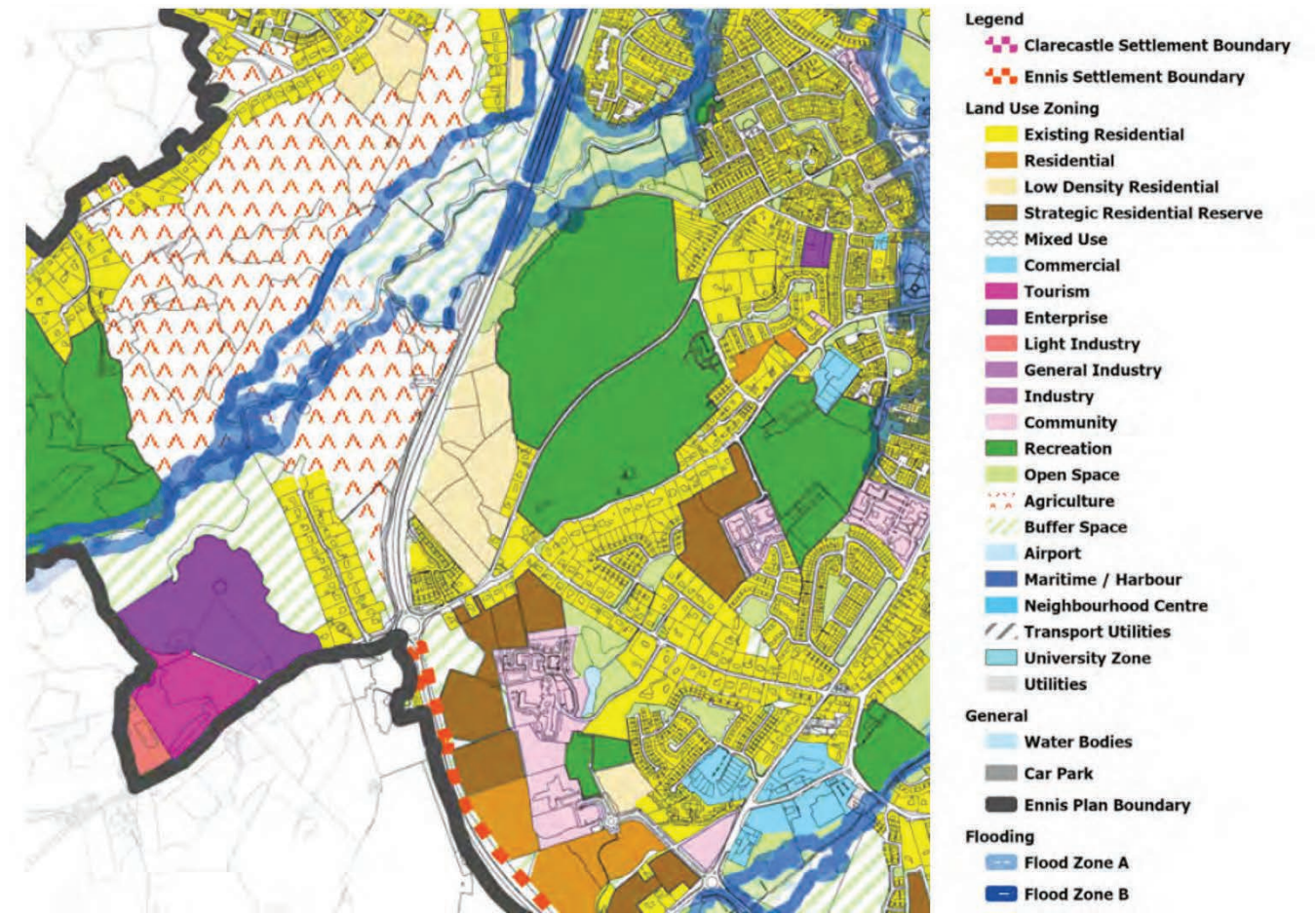


Figure 5.6 Ennis LRD: Clare County Development Zoning Map 2023 - 2029

Urban Development and Building Heights

In the Guidelines for Planning Authorities, The Department of Housing, Planning and Local Government, 2018 refers to the National Planning Framework and policy objectives to provide more compact forms of urban development. It quotes National Planning Objective 13 'In urban areas, planning, and related standards, including, building height and car parking will be based on performance criteria that seek to achieve well-designed high-quality outcomes to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected.' It is proposed that this development adheres to these guidelines while respecting the environment and the case of this report the Landscape & Visual Impacts of the development.

Pre-Planning Meeting with Clare Co. Co

An S247 pre-planning meeting was held on the 12th December 2024 and an S32B pre-planning meeting was held on the 10th of March 2025. These meetings included Clare Co Council, Glenveagh Homes, and consultant Planners, Architects, Engineers and Landscape Architects.

The main landscape related issues included in the discussion were open space layout and function, permeability of site and boundary treatment.

A detailed landscape plan which clearly identifies 'kick about areas' in open spaces, along with the consideration for protecting and emphasising the buffer planting along the N85 is required for the application.

5.3.2 Site Description

The total developable site area is 8.57 Hectares, and is composed of rough agricultural grazing lands which are set out in 8 small field units with extensive spreading hedgerows. The site area is a mixture of localised high ground and hollows, with frequent rock outcrops visible in the ground.

The ground generally slopes from the south (31M) to the north (9M), with the ground rising also towards the R474 to the east. There are panoramic views of the surrounding countryside from the higher parts of the site, with the drumlin landscape and spreading suburbs of Ennis visible to the west and north. The N85 is in a cutting with associated roadside tree screen planting reducing its visibility from the site. The R474 is set on rising ground and the one-off group of housing to the east backs onto the site have clear views into parts of the site. There is an estate of houses at Beechpark, Ballymacaula, set on high ground to the southwest of the site which are visible from the site. The recently constructed houses at Ballymacaula View to the southwest of the site are set on rising ground and have views into the site albeit screened by an existing hedgerow.

Site Images

A selection of 5 No. views (See Fig. 5.7 for locations) has been prepared to show the character of the existing site, and how it is experienced by neighbouring receptors. The images were taken in March 2025.



Figure 5.7 Site Images (Google Maps)



Figure 5.8 Image 1 View Southwest over Golf Course



Figure 5.10 Image 3 View North west to site from junction of R474 and Drumbiggle Rd.



Figure 5.9 Image 2 View Travelling Southwest along R474



Figure 5.11 Image 4 View North east into site from Ballymacaula View.



Figure 5.12 Image 5 View travelling South west along N85.

5.3.3 Receptors



Figure 5.13 Receptors (Google Maps)

NORTHERN RECEPTORS – These receptors are composed of housing estates to the northwest of Ennis Town, namely Shanvogh and Cloghleagh. Some of the houses in the elevated housing of Aisling and Ros na Ri approximately 1Km distant are clearly visible from the site, however given their elevated position with panoramic views, any development works to the south of this location would be visible. The proposed development in this case would be seen as a natural extension of urban Ennis.

EASTERN RECEPTORS – The main receptors from the east are the group of houses that back onto the site from the R474. As the houses are on higher ground above the site, they will have clear views of the development. Proposed house type selection and boundary treatment will mitigate visual impact on these houses. The higher ground of the golf club lands obscure views further to the east at Drumbiggle and therefore there would be no visual impact arising from this location.

SOUTHERN RECEPTORS – The houses at Beechpark, Ballymacaula are set on elevated ground and have views over a wide area including the site. The newly developed houses at Ballymacaula View will also have views into the site where it is proposed to have a line of housing backing onto Ballymacaula View.

WESTERN RECEPTORS – Some of the houses at Beechpark, Ballymacaula which back out towards the site will have views across the N85 to the site. The elevated housing at Killnacally and Ballylannidy, approximately 1Km to the west, will have views of the site from their elevated location.

ROADS – The N85 road which passes to the west of the site is in a cutting close to the site but is visible from the site where it passes over the Claureen River to the north of the site. The road has significant screen planting along its length and is generally screened from the site but additional planting along with suitable boundary treatments will help screen views of the development from the N85. It is proposed to create 4 no. ramped pedestrian connections with the N85 and these will provide permeability for existing and proposed residents. The R474 is on elevated ground compared to most of the site and the development will be visible from views across the golf course.

TOURIST ROUTES – The Wild Atlantic Way is located along the coast and does not come close to the site.

WALKING ROUTES – The Mid Clare Way follows a route around Ennis but it over 12Kms distant at its nearest point to the site.

5.4 Characteristics of the Proposed Development

The proposed Large Scale Residential Development will consist of the following components:

- The construction of 300 no. residential units
- A 80 no. creche/childcare facility.
- The provision of landscaping, amenity walkway and open spaces.
- All associated infrastructure and services including a pump station, ESN substations, pedestrian improvements to Drumbiggle Road

A full description is provided in the statutory notices and in Chapter 2 of the EIAR.

5.5 Potential Impacts of the Proposed Development

The site is in an area of typical drumlin landscape, with frequent hills and valleys and associated rivers and wetlands. There is potential for the development to be visible from a distance as parts of the site are on elevated ground. The site adjoins the N85 along its western boundary, where there are intermittent views into the site. The site is also visible along the eastern boundary from a busy regional road R474, and its existing residential properties, which are visually prominent due to their location and the hilly nature of the landscape.

There is a considerable amount of screening on site from the mature hedgerows within and around the perimeter of the site. However, the majority of the internal site hedgerows are to be removed as part of the development plans. This will open the site up to views from a range of directions. It is proposed to retain some stretches of existing hedgerow and incorporate these into landscape open space areas. Additional significant native species tree planting will be undertaken (See Jane McCorkell Design Planting Plans which form part of the planning submission) to mitigate the potential loss of trees and hedgerows.

5.6 Mitigation Measures

5.6.1 Design Stage

The mitigation proposals commenced at the design stage. There are a number of measures that can and have been taken to ensure that the impacts of the proposed development on the surrounding area are minimised during construction and subsequent commission.

- Retention of sections of hedgerow within the site and the provision of suitable supplemental native species planting to incorporate the hedgerows into the landscape design of the scheme.
- The provision of a public footpath at the western edge linking with the existing Ballymacaula View development. This will provide pedestrian connectivity between the site and the wider area.
- Planting of semi-mature trees and ornamental planting, with many flowering varieties which are beneficial for pollinators.
- Planting diverse meadow mixes, including naturalised bulb planting and managing key grass areas zones as meadows where possible.
- The provision of a landscaped attenuation area with the emphasis on the provision of a biodiverse area to compensate for the loss of existing ecology.



Figure 5.14 Ennis LRD: -Landscape Masterplans – (JMC Design)

5.6.2 Construction Stage

This mitigation process was developed to address any residual adverse effects of the development.

- The protection of existing retained trees and screening vegetation on the boundaries to BS 5837:2012 standards with the Root Protection Area (RPA) protected by secure fencing for the duration of the development.
- Soil stripping and correct stockpiling method will ensure that where existing topsoil is to be reused it is stripped and stored in dry conditions and placed in a suitable area of the site where it is not trafficked or contaminated with building spoil.
- Site works are carried out in consideration of neighbouring houses and roadways are and site warning signage are properly maintained.
- Planting operations are carried out to the best horticultural practices and an irrigation and weed control maintenance operations are put in place during the defect's liability period.

5.6.3 Operational Stage

Grass cutting, tree, shrub and hedge maintenance and leaf and litter clearing are the main operations carried out in such a development. Periodic tree surveys are also important where there are existing mature trees retained on site to ensure the safety of residents and public where trees adjoining housing and roadways.

5.7 Predicted Impacts of the Proposed Development

The impacts on the landscape initially will be the erection of hoarding and the installation of a site compound followed by removal of sections of existing hedgerows and the excavation of rock and topsoil. The visual impacts of the proposed development can be divided into short term construction impacts and operational impacts. The site clearance and level reduction works will have the most negative visual impacts on the houses adjoining the site.

5.7.1 Construction Phase Impacts

Consideration shall be made to mitigate any potentially adverse construction related impacts on the surrounding lands. The normal operations at construction phase would include the erection of visually sensitive site hoarding, site excavation and service connection trenches followed by a period of construction activity.

The operation of a well-managed organised and planned construction site following a specific Construction Management Plan, with adequate control of construction traffic and working activity, will be key to avoiding and or minimising impact. Other control measures will include:

- Adequate measures to protect the existing vegetation and retained features on site and on neighbouring lands.
- Warning signage as per the Traffic Management Plan.
- Use of hoarding for screening works as appropriate.
- Ensure all construction operations are carried out during daylight hours but where site lighting is required it will be directed away from adjoining roadways and dwellings.

5.7.2 Operational Stage Impacts

Once completed the development should integrate visually with the existing landscape and the newly planted trees and shrubs should develop and anchor the development in its surrounds.

Once established the proposed planting should provide additional screening of the new development. The existing trees and retained vegetation on site would be maintained subject to the relevant Wildlife Acts and subject to BS 5387: 2012 Standards. A selection of sections (included with the Jane McCorkell landscape drawings submission) through the site shows the relationship of the development with adjoining properties and the N85 roadway. Section A-A shows the dwelling and terraced pathway with planting adjoining the N85. Section B-B describes the relationship between the site and the housing at Ballymacaula View. Section H-H on the eastern side of the site showing the relationship with the housing on Circular Road and the development.

5.7.3 Photomontage Analysis

A set of 10 no. photomontages have been prepared surrounding the site to fully illustrate the visual nature of the proposed development. The views were taken in the winter 2025 when deciduous leaf growth is non-existent and a low level of screening is provided by the branch and tree form. The views have been prepared from publicly accessible locations that are representative of views of the site from the surrounding areas. These photomontages together with a site location map are presented in Appendix 1 (See also the GNet3D photomontage submission with this application for full sized photomontage images). For each of the views taken a Photomontage has been prepared illustrating the development within the defined view. Since the whole or parts of the development will not be visible from some of the viewpoints, red lines are used to indicate the relative positions of the proposed site buildings.

Table 5.1 Photomontage Viewpoint Locations, Ballymacaula, Ennis, Co. Clare

View	Description	Location
1	View southwest from R474, Drumbiggle	Northeast
2	View southwest from R474	Northeast
3	View southwest from R474	Northeast
4	View northwest from R474	Southeast
5	View Northeast from Ballymacaula View Estate	Southeast
6	View northeast from N85	Southeast
7	View northeast from Beechpark Estate, Ballymacaula	Southeast
8	View southeast from N85	Northwest
9	View south from N85	North
10	View southeast from Killnacally	Northwest



Figure 5.15 Ennis LRD,10 Photomontage locations (Microsoft Image)- See Appendix 5.1 of this EIAR

Photomontage View 1 View southwest from R474, Drumbiggle	
Existing View The are clear views over the golf course and countryside beyond due to the low boundary wall along eth boundary with the R474. Existing intervening vegetarian offers partially screening, but houses along Beechpark are visible in eth distance due to eth elevation of ground.	
Proposed View With a 500m distance the proposed development integrates with the existing houses of Beechpark and sits into the landscape without breaking the horizon. From this viewpoint the existing vegetation provides screening.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 2 View southwest from R474	
Existing View The view across the golf course, with site to the rear of the golf course boundary hedgerow. Views to the distant countryside to the southwest.	
Proposed View The site commences about 100m from this viewpoint. The development is set at a lower level, which results in the roofs of the proposed development being visible between intervening trees and vegetation. The development does not interfere with the views to the distant countryside to the southwest.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 3 View southwest from R474	
Existing View View is generally screened by existing vegetation, with some Beechpark houses and countryside beyond visible. House to the left adjoins the site boundary.	
Proposed View The site commences about 50m from this viewpoint. The development is set at a lower level resulting in partial views to the rear of some houses. The existing dense vegetation effectively screens the proposed development	
Impact (Construction Stage)	Short term & Moderate negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 4 View northwest from R474	
Existing View View from houses facing the site on the R474. Site rises from this point, with existing site hedgerow and stone wall along the boundary. Rear elevation of adjoining houses is visible, however sperate from roadway due to adjoining lands.	
Proposed View Potential to Introduce mitigation screening is reduced due to adjoining rear gardens and intervening landscape not within the development. The proposed development will visually link with the existing urban form surround this road junction	
Impact (Construction Stage)	Short term & Moderate negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 5 View Northeast from Ballymacaula View Estate	
Existing View New development backing onto the site lands. Pedestrian/ cycleway links are proposed between the sites. Site vegetation and golf course trees are visible from this viewpoint.	
Proposed View There are glimpse views between the existing houses, with proposed tree planting reducing the visual impact of the proposed development.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 6 View northeast from N85	
Existing View The views to the site from the N85 embankment are heavily obscure by the existing roadside vegetation and intervening Ballymacaula View development.	
Proposed View There are very partial views at roof level from this viewpoint. The development would link visually with the existing development.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 7 View northeast from Beechpark Estate, Ballymacaula	
Existing View Due to the lands rising above the 40m contour these houses are visible from the site. The view also shows the countryside and housing estate to the northeast, with intervening vegetation on the site.	
Proposed View The proposed housing along the western boundary with the N85 will be visible in the distance between the Beechpark houses. The proposed development sits into the existing landscape and would read as an extension of the surrounding housing. Proposed tree planting will visually integrate the development into the surrounds over time.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 8 View southeast from N85	
Existing View Land from the N85 are rough in their appearance and rise steeply towards the site. The creates an isolation of the roadway to surrounding lands.	
Proposed View The proposal links the housing units to the roadway through an attractively landscaped setting. The mitigation planting to connect the roadway and the development aims to retain the biodiverse quality of the existing vegetation and provide additional safe access to existing and proposed residents. Short term negative visual impact during construction phase will be mitigated with the use site hoarding	
Impact (Construction Stage)	Short term & Moderate negative visual impact
Impact (Operation Stage)	Neutral to positive long term visual impact

Photomontage View 9 View south from N85	
Existing View The N85 road is visible from the site at this location as it rises to cross the Claureen River. The 350m view toward the site includes significant tree cover, and Beechpark housing is visible to the right.	
Proposed View Due to the existing vegetation the development is partially visible. With the additional proposed tree planting the development will visually link to the surrounding landscape.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

Photomontage View 10 View southeast from Killnacally	
Existing View Views west from site includes the Killnacally area with scattered housing visible. The high ground at Beechpark partially screens the site from this viewpoint.	
Proposed View The development is visible and set in the landscape with sections of the golf course forming the backdrop above the development. The proposed tree planting in the development will further integrate the development into its surrounding landscape.	
Impact (Construction Stage)	Short term & Slight negative visual impact
Impact (Operation Stage)	Imperceptible neutral long term visual impact

5.8 Residual Impacts

The residual impacts of this proposed development will be associated with the introduction of a concentrated housing development into hilly rough agricultural lands with existing housing developments and passing roads. Existing residences close to the site that formerly had views of agricultural land will have a residential development as part of their aspect. The proposed development will create an attractive landscaped vista to the N85 replacing the existing secluded feeling of the roadway.

The development has been designed with the CDP Objectives relating to development with respect to the retention of Woodland, Trees and Hedgerows which were set out in conjunction with the project Ecologist. The proposed replacement tree planting numbers is also in line with the recommendations in the County Development Plan. The development also complies with the Landscape Character Area being in a Working Landscape and the proposed siting of the development close to existing residential areas. The County Clare Development Plan references a number of Views and Prospects to be protected, and the development does not conflict with any of the listed views. While it is inevitable that the development will be visible to existing residents and road users, the nature of the generally low-lying site, the design and layout of the buildings and the proposed extensive landscape planting helps create a setting for the development that will be acceptable from a landscape and visual perspective.

5.9 Interactions

Population and Human Health. The proposed development provides a high-quality mixed density residential neighbourhood well served by public and communal open space in within the Cahircalla More neighbourhood. The related change to the landscape character i.e. planned expansion of the urban into a peri-urban landscape, would have significant positive population and human health benefits (providing homes offering a high level or residential amenities).

Biodiversity. The proposed landscape masterplan includes arrange of open spaces, of varying character, which, in addition to providing recreational amenities and contributing to the areas place-identity, would deliver a range of ecosystem services. These include habitat provision and water management (through SUDs measures). The open spaces and surrounding boundaries include the provision of native woodland planting, rain gardens and swales, trees and plant material in line with National Pollinators Guide – all habitats of high biodiversity value. A total of 408 no. trees, 5620 sqm of woodland and 3650 sqm of meadow planting is proposed across the site.

Water. The proposed SUDs measures include large swales, rain gardens and permeable paving for all parking spaces in private realm.

5.10 References

Clare County Council Development Plan 2023-2029

Landscape Character Assessments of Co. Clare 2004

National Parks and Wildlife Service – Interactive Mapping and Aerial Photography - www.npws.ie

Ordnance Survey Ireland – Interactive Mapping and Aerial Photography – www.osi.ie

Landscape and Landscape Assessment Draft Guidelines, Department of Environment, Heritage and Local Government (DoEHLG) 2000

Guidelines for Landscape and Visual Impact Assessment, The Institute of Environmental Assessment / Landscape Institute (2nd& 3rd Ed 2002, 2013);

Guidelines on the Information to be contained in Environmental Impact Statements (EIA), Environmental Protection Agency, 2022.

Guidelines for Landscape and Visual Assessment, 3rd Ed., The Landscape Institute and Institute of Environmental Management and Assessment, 2013.

Urban Development & Building Heights, Dept. of Housing Planning & Local Government 2018.

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CHAPTER SIX

MATERIAL ASSETS: TRAFFIC AND TRANSPORT



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CHAPTER SIX

Table of Contents

Material Assets: Traffic and Transport

6.1 Introduction 6-1

6.2 Expertise and Qualifications 6-1

6.3 Proposed Development 6-1

6.4 Methodology 6-2

6.5 Difficulties Encountered..... 6-4

6.6 Existing Receiving Environment 6-4

6.7 Potential Impact of the Proposed Development 6-5

6.8 Mitigation Measures..... 6-9

6.9 Residual Impact 6-9

6.10 Summary..... 6-10

6.11 Conclusion 6-10

Table of Tables

Table 6.1 Car Parking Requirements 6-1

Table 6.2 Classification of Passenger car Units 6-2

Table 6.3 Significance Criteria for Impacts on Traffic
or Transportation 6-3

Table 6.4 Growth Factors for light vehicles (LV) and heavy
vehicles (HV)..... 6-5

Table 6.5 Traffic Generation..... 6-6

Table 6.6 Junction 1: Existing Roundabout Junction 6-6

Table 6.7 Junction 2: Existing Priority Junction 6-7

Table 6.8 Junction 3: Existing Roundabout Junction 6-7

Table 6.9 Junction 4: Existing Priority Junction 6-8

Table 6.10 Junction 5: Proposed Priority Junction 6-8

Table 6.11 Summary of Impact Assessment 6-8

Table of Figures

Figure 6.1 Ennis Settlement Zone Commuter Trips - Modal Split
(2022 Census) 6-2

Figure 6.2 Junction Locations 6-3

Figure 6.3 Site Location and Surrounding Road Network 6-4

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CHAPTER 6 | Material Assets: Traffic and Transport

6.1 Introduction

This chapter describes the material assets from a traffic and transport perspectives that could potentially be impacted by the Proposed Project.

The purpose of this Traffic and Transport EIAR Section is to assess the potential impact of the proposed Strategic Housing Development at Circular Road, Ennis, Co. Clare on the existing local transport network and to review whether the proposed site access (and the existing junctions which fall within the scope of the study) will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond and to also identify possible mitigation measures to reduce traffic impacts. An assessment of the accessibility of the site for cyclists, pedestrians and public transport users has also been made.

This section is written as a concise summary of the Traffic and Transportation Assessment, submitted with the LRD planning application. Rather than repeat the detailed traffic assessments carried out within this Traffic and Transport Statement, it is referred to throughout this chapter, with the impact assessment findings discussed below.

6.2 Expertise and Qualifications

This EIAR Section was written by Micheál Geraghty of TOBIN. TOBIN has been in operation for over 60 years and has carried out numerous Traffic and Transportation Assessments (TTA's) for various residential, commercial, business, retail and leisure developments. TOBIN has also Traffic Chapters for a number of EIAR's for various project types. The drafting of TTAs and Traffic Chapters involves the followings tasks:

- Liaising with Local Authorities, TII, clients and other key stakeholders,
- Analysis of the suitability of haul routes,
- Design and analysis of access points to all types of developments,
- Access and site layout arrangements using AutoTRACK, swept path analysis software,
- Junction analysis on uncontrolled, signalised and roundabout junctions

6.3 Proposed Development

The proposed development will consist of 300 residential units and a childcare facility, and a full description of the development can be found in Chapter 2 of the EIAR. The development will deliver a residential neighborhood within proximity of Ennis Town Centre. The site will have direct vehicle access to the R474 Circular Road.

Site access for the proposed development will be gained through a new priority T-junction onto the R474 circular road. The new priority junction will tie into the existing pedestrian footpath located along the northern side of the R474 circular road, which provides pedestrians with a direct linkage to Ennis town. The proposed development will be constructed in 3 no. phases as outlined in Section 6.8.4 of this chapter. The internal roads and footpath layouts of the development have been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS).

6.3.1 Parking Provision

The maximum parking provisions at the site have been calculated in accordance with the parking Guidelines set out in the following:

- Clare County Development Plan (CCDP) 2023 - 2029

The required and provided car parking breakdown for the proposed development (300 units) is illustrated in Table 6-1 below.

Table 6.1 Car Parking Requirements

Car Parking	CCDP	No of Units / Staff and Children	Required	Parking Provided
1 & 2 bed houses	Table A3 – 1 Space per Unit + 1 Visitor Space per 3 Units	105	140	525
≥3 bed houses	Table A3 – 2 Spaces Per Unit + 1 Visitor Space per 3 Units	195	455	
Creche (80-child capacity)	Table A3 – 1 per employee and 1 per 4 children	5 / 80	25	11
Totals	-		620	536

A total of 536 no. car parking spaces will be provided onsite. The parking provision is below the maximum parking requirement for a residential development in County Clare.

All dwellings with on-curtilage parking spaces (265 units) will be pre-wired to enable future EV charging capabilities. The remaining dwellings (35 units) do not have on-curtilage parking and therefore it is proposed to install 2 no. of EV charging hubs. There are 11 parking spaces proposed for the creche of which include 1 EV charging space, with an additional space ducted for future EV charging capabilities.

6.3.2 Road Safety Audit

A Stage 1 Road Safety Audit has been carried out by CST Group Chartered Consulting Engineers independently from the design team on the proposed development. The Audit identified a number of items which were reviewed by the Design Team and the design amended where necessary. The recommended measures and proposals were agreed and signed off by the Designers, Client and Auditors. The final site layout provides a roads network throughout the development which incorporates measures (such as curved alignments, surface materials to differentiate pedestrian and vehicle routes etc.) that ultimately provide a high level of safety for both the pedestrian and the driver without comprising the overall quality of the development. Swept path analysis has also been carried out to ensure vehicles can manoeuvre safely within the site.

Please refer to the CST Road Safety Audit included as part of this application for further details

6.3.3 Existing Traffic Flows on the Local Network and the Traffic Impact of the Proposed Development

In the absence of any specific local traffic growth information, it was assumed that baseline traffic will continue to grow at the levels recommended by TII in the Project Appraisal Guidelines (PAG) – Unit 5.3 ‘Travel Demand Projections’ publication (PE-PAG-02017) – latest revision dated October 2021. The Project Appraisal Guidelines describe three levels of transport model functionality. The simple model, which reflects traffic volumes on the basis of link flows, is best suited to the proposed development. Such models do not attempt any route assignment, and hence are applicable for networks where no change in traffic flows will result from a proposed scheme. Growth rates recommended in PAG – Unit 5.3 have been used to determine future traffic flows on the road network within the vicinity of the development. Growth Rates for County Clare were used in the analysis.

The year of opening of the scheme was assumed to be 2026. The central growth factors from the Project Appraisal Guidelines – Unit 5.3 publication were used and are detailed below: -

- TII Link Based Growth Rates: Annual Growth Factor for 2016-2030 = 1.0156 (LVs) and 1.0417 (HVs);
- TII Link Based Growth Rates: Annual Growth Factor for 2030-2040 = 1.0038 (LVs) and 1.0157 (HVs);
- TII Link Based Growth Rates: Annual Growth Factor for 2040-2050 = 1.0029 (LVs) and 1.0197 (HVs).

The annual growth factors for Light Vehicles (LVs) and Heavy Vehicles (HV) were applied to surveyed values of vehicles counted.

With regards to the volume of traffic using the road, the passenger car is adopted as the standard unit and other vehicles are assessed in terms of PCU’s. Cars and Light Goods Vehicles are grouped together as Light Vehicles (LV). All other Goods Vehicles, Buses and Coaches are defined as Heavy Vehicles (HV).

The classification of vehicles in PCU’s is shown below:

Table 6.2 Classification of Passenger car Units

Vehicle	PCU
Car	1
Light Goods Vehicle	1
Other Goods Vehicle (2 -3 axle)	1.5
Other Goods Vehicle (4 -5 axle)	2.3
Bus	2
Cycle	0.4

The C.S.O. Travel Census data for Ennis was obtained for the 2022 census under the section E6013: Population Usually Resident and Present in the State 2022 by Sex, Means of Travel, Towns by Size, At Work School or College and Census Year. This data is presented in the Figure below. The data excludes the census data for the ‘not stated’ as these are not applicable for the analysis – the figures below are adjusted accordingly.

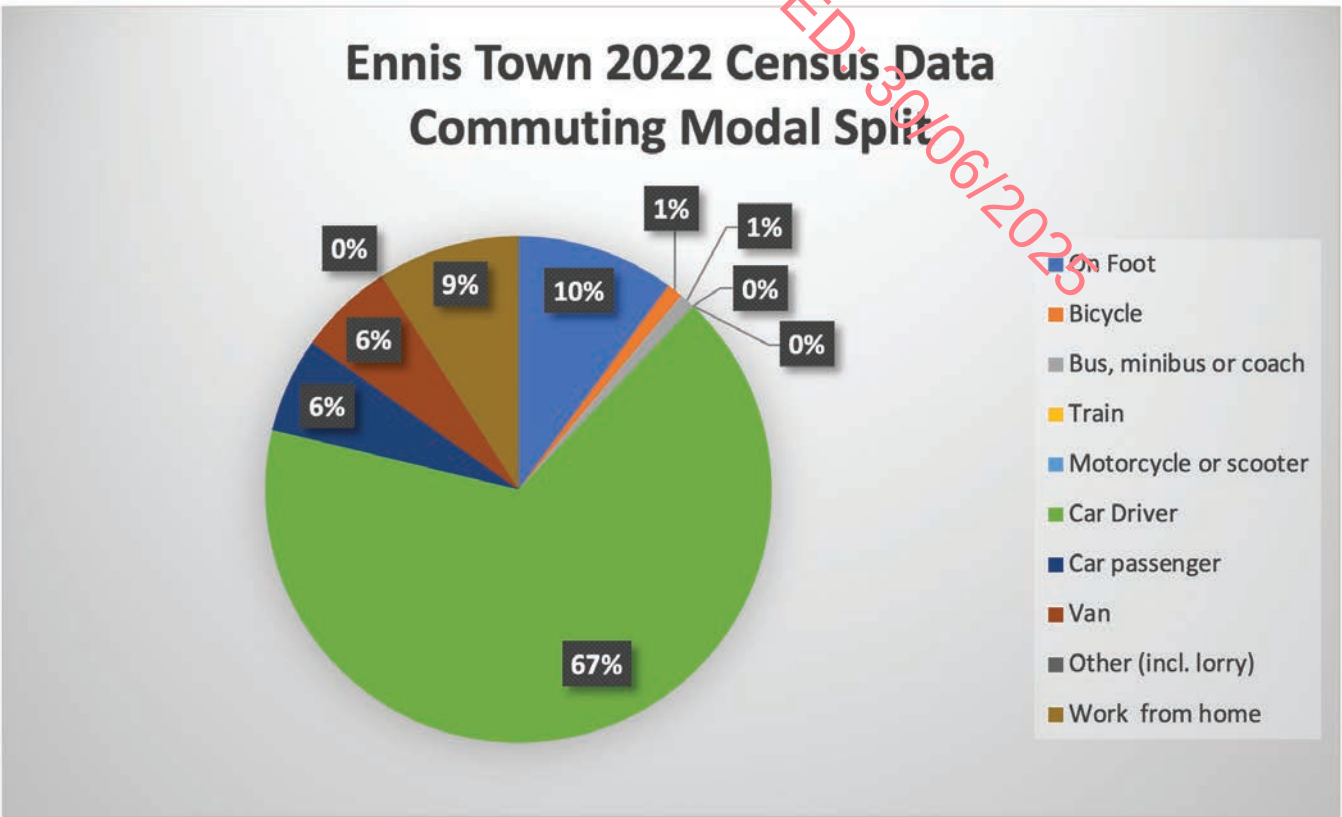


Figure 6.1 Ennis Settlement Zone Commuter Trips - Modal Split (2022 Census)

One of the main objectives for the site will be to reduce the number of car trips and in cases where there is no other option but to travel by car, to increase the number of people carpooling and travelling as passengers.

6.4 Methodology

The approach to the assessment of likely significant impacts on traffic and transportation in this chapter accords with policy and guidance at National, Regional and Local level. The methodology responds to best practices, current and emerging guidance, all of which advocate this method of analysis. Key publications consulted include:

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR (2022);
- TII ‘Traffic and Transport Assessment Guidelines’ (May 2014);
- TII Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections;
- Design Manual for Urban Roads and Streets;
- Clare County Development Plan 2023 – 2029;

A Traffic and Transport Assessment (TTA) has been prepared in accordance with the TII’s 2014 publication ‘Traffic and Transport Assessment Guidelines’ and the ‘Guidelines for Traffic Impact Assessments’ as published by the Institution of Highways and Transportation U.K in 1994 and is included submitted with the LRD application. The scope and extent of the TTA was discussed and agreed with Clare County Council (as outlined further in Section 6.4.1) and also considered a no. of relevant points and recommendations issued by Transport Infrastructure Ireland (TII) in response to an EIAR scoping request.

Key parameters relating to the traffic modelling carried out included: junctions to be assessed, trip generation, modal shift targets, trip distribution and assessment years. The traffic and transport impact of the proposed development is discussed as part of the assessment. The traffic and transport significance levels and criteria definitions are outlined in the Table below.

Table 6.3 Significance Criteria for Impacts on Traffic or Transportation

Significance Level	Criteria
Profound	Profound impacts occurs where there is permanent disruption to transport network.
Significant	Significant impact occurs where there is sever disruption to traffic and/or transport
Moderate	Moderate impact occurs where there is medium term disruption to the network or significant increase of traffic flow
Slight	Slight impact occurs where there is noticeable description or an increase in wait times
Imperceptible	Imperceptible impact occurs where there is temporary distribution or no quantifiable increase in traffic.

6.4.1 Consultation/Scoping

As part of the previous SHD application associated with the subject site, a scoping document was issued on the 2nd of November 2021 to Ennis Municipal District’s Roads Department. Clare County Council requested that analysis be carried out at the following junctions:

- Junction 1: Roundabout Junction (Beechpark) N85 / R474
- Junction 2: Priority Junction R474 / Drumbiggle Road
- Junction 3: Roundabout Junction R474 / Cloughleigh Rd / Davitt Terrace
- Junction 4: Priority Junction R474 / R458
- Junction 5: Priority Junction Proposed Access / R474

For this LRD application, updated traffic surveys were conducted on 2nd April 2025 at the junction locations above.

The outcomes of this exercise were incorporated into the Traffic and Transport Assessment and design drawings. The scheme design and access options were also reviewed and discussed at the Stage 1 meeting held between Clare County Council and the Client / Design Team in October 2021 and further at the Stage 2 Tripartite meeting held between An Bord Pleanála, Clare County Council and the Client / Design Team in April 2022. The resulting comments were taken on board and amendments to the design were incorporated where possible.

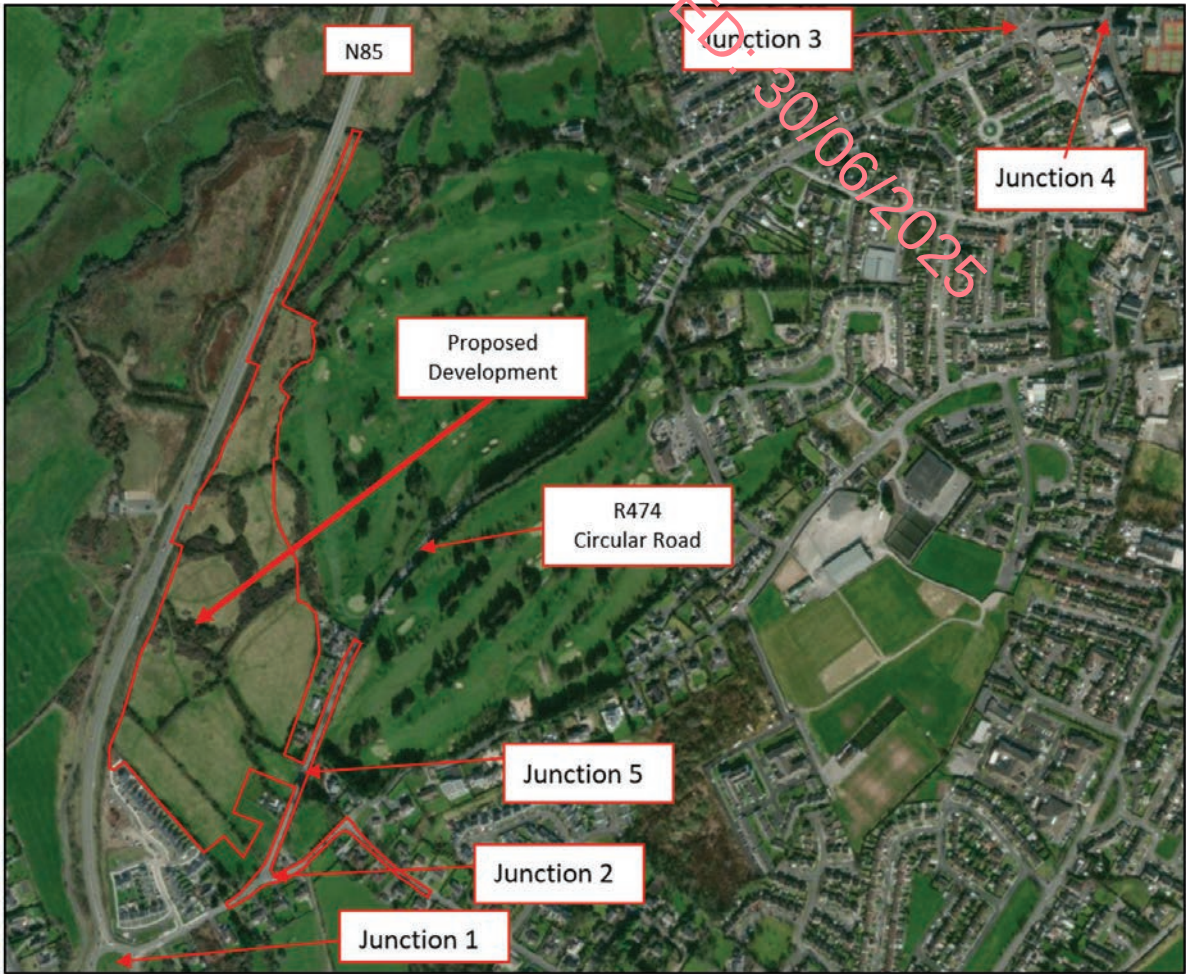


Figure 6.2 Junction Locations

As part of the EIAR scoping exercise, a EIAR scoping request was also sent to TII. The response identified a number of items relating to the roads / civils aspects of the proposed development. The recommendations of the letter have been addressed within the application as follows:

1. Consultations have been completed with the relevant Local Authority.
2. A Traffic and Transport Assessment was carried out for the proposed development to investigate the impacts the proposed development will have on the surrounding road network, including the adjacent national road network.
3. A Road Safety Audit was completed on the proposed road design element for the project.
4. The road and junction layouts have been designed to the relevant standards.
5. Pedestrian connectivity to the N85 footpath network has been provided.
6. No surface water generated on the proposed development site will be discharged to any national roads drainage structure.

As part of the current LRD application, the proposed development was discussed during the S247 pre-planning meeting on December 12th, 2024, and the S32B pre-planning meeting on March 10th, 2025. These consultations included detailed discussions with the Roads Department of Ennis Municipal District. .

6.4.2 Traffic Counts

In order to determine the magnitude of the existing traffic flows, the results of a manual classified junction turning counts was used. The traffic surveys were carried out by Nationwide Data Collection. The junction count was undertaken on Wednesday 2nd April 2025 between the hours 07:00 and 19:00. The count information was obtained on the following locations:

- Junction 1: Roundabout Junction (Beechpark) N85 / R474
- Junction 2: Priority Junction R474 / Drumbiggle Road
- Junction 3: Roundabout Junction R474 / Cloughleigh Rd / Davitt Terrace
- Junction 4: Priority Junction R474 / R458

This survey distinguished between light good vehicles and heavy good vehicles. The results of this survey indicated that the peak traffic levels through the junction occurred between the hours of 08:15 and 09:15 and between 17:00 and 18:00.

6.5 Difficulties Encountered

There were no difficulties encountered preparing this chapter.

6.6 Existing Receiving Environment

6.6.1 Location and Network Summary

Land Use

The site is located approximately 1.6km west of Ennis Town Centre and is an existing 11.3 ha greenfield site at Drumbiggle, Ennis, Co. Clare. Site access is proposed via a new access junction onto the R474 Circular Road. The site was previously granted conditional planning permission for residential developments for 99 no. of residential units (Planning Ref: 18/811) and 289 no. residential units (ABP Ref: 314448) which is discussed further in Chapter 3 of this EIAR.

Existing Road Network

The layout of the local road network is presented in the Figure below. The proposed development is bounded to the West by the N85 Road. To the east of the site the land abuts the R474 regional road also known as the Circular Road, with several existing oneoff houses located immediately east of the subject site. Ennis Golf Club lies to the northeast of the site and the Claureen river lies to the northeast. The southern boundary of the site abuts a residential housing estate.



Figure 6.3 Site Location and Surrounding Road Network

A brief description of the local road network and associated junctions is provided as follows:

N85 National Road

The N85 National Road is a single carriageway road (one lane in each direction) with a hard shoulder on both sides of the road. The N85 Road forms part of the Ennis outer ring road and connects to the M18. The N85 connects to the R474 Circular Road via a roundabout junction. A pedestrian footway is provided along the eastern side of this road which connects to pedestrian infrastructure located to the east and onwards into Ennis town centre.

R474 Circular Road

The R474 Circular Road is a single carriageway road with one lane in each direction. The R474 Circular Road connects to the N85 National Road at its south-western end and with Ennis Town Centre at its north-eastern end. Both junctions are roundabout junctions.

The walking network in Ennis is comprised of existing footpaths adjoining public roads. The main approaches to the town have footpaths for pedestrian use only. There is no dedicated cycling network within the centre of the town and cyclists utilise the existing roadway.

There is a pedestrian footway provided along the northern side R474 Circular Road which connects to the proposed development with pedestrian infrastructure to the east (Ennis town centre).

Public Transport

Ennis town is served by a number of regional and local bus routes. Local Link operates a number of local bus routes, Bus Eireann operates a number of local and regional bus routes to Shannon, Limerick, Galway and Cork City. Dublin Coach also operates bus services to Dublin.

Ennis town is also served by a number of train services which is located approximately 2.7km from the proposed development. Iarnród Eireann operate a number of services from this station of which include Dublin Heuston – Limerick, Galway – Limerick, and Waterford – Clonmel – Limerick Junction.

Future Transportation Environment

The possibility of the extension of the current local link bus route to serve the proposed development can be considered. Clare County Council are currently reviewing the cycling infrastructure in the vicinity of the site and are working on proposals for the upgrading of same. Additional pedestrian linkages into Ennis town are also being proposed as part of the overall development proposals.

6.7 Potential Impact of the Proposed Development

The following section outlines the Traffic and Transportation Assessment undertaken in accordance with the TII Traffic and Transportation Assessment Guidelines – August 2014 publication (PE-PDV-02045).

The predicted impact, the mitigation measure required, and the residual impacts are considered under the following headings:

- Do Nothing Scenario
- Construction Phase
- Operational Phase
- Cumulative Impacts

6.7.1 Worst Case Scenario

The proposed development will impact on the surrounding roads network during construction and operational stages. It is broadly accepted that operational stage traffic will exceed that of construction stage traffic and will be potentially less manageable in terms of avoiding peak hour traffic periods. Therefore, traffic models of the proposed development access junctions as well as the existing Junctions 1, 2, 3 and 4 have been developed with operational phase traffic presenting a worst-case scenario.

6.7.2 Assessment Periods

6.7.2.1 Assessment Year

TII Traffic and Transportation Assessment Guidelines sets out the required assessment years and time periods to be assessed. In accordance with this guideline document, the following sections detail those proposed in this assessment.

6.7.2.2 Construction Phase

The assessment years typically include for the construction phase and operational phase. It is broadly accepted that the operation stage traffic will exceed the construction stage traffic hence no Construction Phase has been assessed.

6.7.2.3 Operational Phase

For this application, the Operational Phases as per TII Traffic and Transportation Assessment Guidelines (PE-PAV-02045) are:

- Operational Phase
 - 2026 – Envisaged Year of Opening;
 - 2031 – Year of Opening plus 5 years;
 - 2041 – Year of Opening plus 15 years.

6.7.3 Traffic Growth

Annual growth indices were updated in 2019 by the TII, with annual indices and cumulative growth forecasts shown for Clare in the Table below. The derived growth factors were applied to 2025 flows to determine background traffic flows for the assessment years. The assessment is split into light vehicles and heavy vehicles. These growth factors were applied to the traffic volumes measured during the traffic survey.

Table 6.4 Growth Factors for light vehicles (LV) and heavy vehicles (HV)

	2026	2031	2041
LV	1.016	1.084	1.125
HV	1.042	1.247	1.463

6.7.4 Do Nothing Scenario

It shall be noted that the Do-Nothing scenario is equivalent to the baseline environment. The assessment of the existing environment/Do Nothing Scenario, would be a scenario where there is no change to the environment. (i.e., if the development does not proceed).

6.7.4.1 Baseline Traffic

Traffic count data have been utilised in accordance with the Transport Infrastructure Irelands (TII) Project Appraisal Guidelines (PAG) - Unit 16 in order to estimate the Annual Average Daily Traffic (AADT) two-way traffic flow on the associated road network. This method is an industry standard as it takes account of seasonal variations that is typically experienced during national public holidays and tourist seasons. In turn, this allows for an informed and representative basis for comparison of project related impacts.

6.7.5 Construction Phase

Construction traffic travelling to the proposed development site will use the N85 Road and R474 Circular Road. A Traffic Management Plan (which will be completed by the Contractor appointed to the project) for the construction stage will identify haulage routes and restrictions as appropriate in discussion with the Local Authority. A draft Construction Traffic Management Plan is included with the planning application which outlines the preliminary management plan and what will be expected of the Main Contractor's Management Plan at construction stage.

It is estimated a total of 920 no. HGV delivery trips will be generated during the total construction stage of the development. It is also envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 12 no. HGV's will deliver to the site on a daily basis for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase but these are expected to be at a lower frequency. It is estimated that for a development of this size, 60 – 70 site operatives will be employed at the height of the construction works. This would equate to an approx. 60 PCU vehicle (Vans and Cars) trips to and from the site during the construction days.

The increase in traffic volumes, as a result of construction vehicles visiting the site, is not considered to be excessive and will be spread out over a three-year period over the three phases of the development. The development has also been designed to minimize cut and fill throughout the site, in keeping the proposed finish floor levels of the units and the proposed road levels as close to the existing ground levels as possible. As a result the trip generation associated with the exporting and importing of cut and fill material to site is minimised. For further detail on the cut and fill, please refer to Chapter 09 Land & Soils Chapter of this EIAR.

Due to the designated access point off the R474 Circular Road, allowing delivery vehicles to pull off the road into the site, there will be no significant disruption on the traffic flows on the R474 Circular Road as a result of the construction of the development. It is recommended that all delivery drivers and haulage companies serving the proposed development are provided with instructions / directions on accessing the site from the R474 Circular Road and the surrounding local road network. Overall, there will be a short-term imperceptible negative impact to local traffic during the construction phase.

6.7.6 Operational Phase

The Operational Phase of the development has the largest impact. TOBIN have procured Trip Rate Information Computer System (TRICS) data for similar sized residential developments in order to inform the trip rate associated with such a development. The estimated total number of vehicular trips generated by the proposed development is shown in the Table below which details the generated traffic for the AM and PM peak hours.

The Table demonstrates the expected AM/PM traffic generation figures from the various uses of the scheme and a total of 203 trip movements in the AM peak and a total of 153 trip movements in the PM peak are expected to result from the proposed development.

A total of 41 AM peak trips and 9 PM peak trips are allocated to the creche element of the development. Once the development is fully operational, it is expected that this is an over exaggeration of creche related trips. It is estimated that creche trips will predominately be self-contained within the development, with most of the creche users walking from within the development site. The creche trip rate shown in the table above has been implemented in the design for a more conservative traffic analysis.

It was envisaged the proposed development trip distribution matches the existing traffic distribution observed during the traffic surveys conducted at each of the junctions.

Table 6.5 Traffic Generation

	Residential Units / GFA	AM Arrivals	AM Departures	PM Arrivals	PM Departures
Proposed Residential Dwellings (TRICS)	300 units	40	122	97	47
Proposed Creche (TRICS)	400 m ² GFA	25	16	4	5
Total		65	138	101	52

The JUNCTION 10 (PICADY) assessment of each junction illustrated below. A complete set of outputs from JUNCTION 10 are included in the TTA submitted with the application.

Table 6.6 Junction 1: Existing Roundabout Junction

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2025 Baseflow									
Arm 1	D1	1.9	9.19	0.65	A	D2	0.8	5.21	0.45	A
Arm 2		0.4	4.75	0.25	A		0.4	4.58	0.31	A
Arm 3		1.0	5.04	0.48	A		1.9	7.41	0.65	A
Arm 4		0.8	6.55	0.44	A		0.3	4.78	0.20	A
	2026 Baseflow									
Arm 1	D3	2.0	9.59	0.66	A	D4	0.9	5.31	0.46	A
Arm 2		0.4	4.81	0.26	A		0.5	4.64	0.31	A
Arm 3		1.0	5.14	0.49	A		2.0	7.70	0.66	A
Arm 4		0.9	6.71	0.45	A		0.3	4.84	0.21	A
	2026 Baseflow + Dev									
Arm 1	D5	2.1	10.03	0.67	B	D6	0.9	5.51	0.47	A
Arm 2		0.5	5.14	0.31	A		0.5	4.76	0.33	A
Arm 3		1.1	5.28	0.50	A		2.1	8.06	0.67	A
Arm 4		0.9	6.98	0.47	A		0.3	5.00	0.23	A
	2041 Baseflow									
Arm 1	D7	3.3	14.40	0.77	B	D8	1.1	6.06	0.52	A
Arm 2		0.5	5.39	0.31	A		0.6	5.13	0.36	A
Arm 3		1.4	6.04	0.56	A		3.0	10.54	0.75	B
Arm 4		1.2	8.21	0.53	A		0.3	5.34	0.24	A
	2041 Baseflow + Dev									
Arm 1	D9	3.6	15.52	0.78	C	D10	1.2	6.34	0.53	A
Arm 2		0.6	5.79	0.35	A		0.6	5.28	0.38	A
Arm 3		1.4	6.23	0.57	A		3.2	11.13	0.76	B
Arm 4		1.3	8.64	0.55	A		0.4	5.52	0.26	A

The summary of performance analysis indicates that during the Operational Phase Junction 1 (existing roundabout junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

Table 6.7 Junction 2: Existing Priority Junction

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2025									
Stream B-C	D1	0.2	7.88	0.17	A	D2	0.4	8.86	0.26	A
Stream B-A		0.2	16.22	0.18	C		0.3	13.97	0.22	B
Stream C-AB		1.9	11.94	0.59	B		0.4	7.31	0.24	A
	2026 Baseflow									
Stream B-C	D3	0.2	7.95	0.18	A	D4	0.4	8.95	0.27	A
Stream B-A		0.2	16.51	0.19	C		0.3	14.14	0.22	B
Stream C-AB		2.0	12.28	0.61	B		0.4	7.36	0.25	A
	2026 Baseflow + Dev									
Stream B-C	D5	0.4	9.52	0.28	A	D6	0.4	9.70	0.31	A
Stream B-A		0.4	20.02	0.29	C		0.4	15.78	0.27	C
Stream C-AB		2.6	14.73	0.67	B		0.6	8.38	0.34	A
	2041 Baseflow									
Stream B-C	D7	0.3	8.46	0.21	A	D8	0.4	9.71	0.31	A
Stream B-A		0.3	18.83	0.23	C		0.3	15.53	0.26	C
Stream C-AB		3.2	16.29	0.71	C		0.5	7.63	0.28	A
	2041 Baseflow + Dev									
Stream B-C	D9	0.5	10.54	0.32	B	D10	0.5	10.67	0.35	B
Stream B-A		0.6	23.93	0.35	C		0.4	17.61	0.31	C
Stream C-AB		4.4	21.22	0.77	C		0.7	8.79	0.37	A

The summary of performance analysis indicates that during the Operational Phase Junction 2 (existing priority junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

Table 6.8 Junction 3: Existing Roundabout Junction

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2025 Baseflow									
Arm 1	D1	0.2	2.86	0.19	A	D2	0.1	2.33	0.09	A
Arm 2		0.3	3.72	0.22	A		0.4	3.88	0.30	A
Arm 3		0.1	4.87	0.07	A		0.3	6.09	0.20	A
Arm 4		0.9	7.39	0.46	A		0.5	6.23	0.32	A
	2026 Baseflow									
Arm 1	D3	0.3	2.88	0.20	A	D4	0.1	2.34	0.10	A
Arm 2		0.3	3.75	0.22	A		0.4	3.91	0.30	A
Arm 3		0.1	4.89	0.07	A		0.3	6.15	0.21	A
Arm 4		0.9	7.52	0.47	A		0.5	6.29	0.33	A
	2026 Baseflow + Dev									
Arm 1	D5	0.3	3.01	0.21	A	D6	0.1	2.37	0.10	A
Arm 2		0.3	3.90	0.24	A		0.5	4.13	0.33	A
Arm 3		0.1	5.03	0.07	A		0.3	6.55	0.22	A
Arm 4		1.2	8.89	0.55	A		0.6	6.62	0.36	A
	2041 Baseflow									
Arm 1	D7	0.3	3.05	0.22	A	D8	0.1	2.40	0.11	A
Arm 2		0.3	3.98	0.25	A		0.5	4.17	0.34	A
Arm 3		0.1	5.10	0.08	A		0.3	6.69	0.24	A
Arm 4		1.1	8.55	0.53	A		0.6	6.83	0.37	A
	2041 Baseflow + Dev									
Arm 1	D9	0.3	3.19	0.24	A	D10	0.1	2.43	0.11	A
Arm 2		0.4	4.14	0.28	A		0.6	4.42	0.37	A
Arm 3		0.1	5.26	0.09	A		0.3	7.17	0.26	A
Arm 4		1.6	10.40	0.61	B		0.7	7.23	0.41	A

The summary of performance analysis indicates that during the Operational Phase Junction 3 (existing roundabout junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

Table 6.9 Junction 4: Existing Priority Junction

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2025 Baseflow									
Stream B-ACD	D1	0.0	13.77	0.04	B	D2	0.1	13.11	0.06	B
Stream A-BCD		1.0	14.58	0.47	B		1.7	18.78	0.62	C
Stream D-ABC		2.4	22.91	0.71	C		0.8	12.77	0.44	B
Stream C-ABD		0.0	9.34	0.02	A		0.0	9.41	0.03	A
	2026 Baseflow									
Stream B-ACD	D3	0.0	14.12	0.04	B	D4	0.1	13.38	0.06	B
Stream A-BCD		1.0	14.91	0.48	B		1.8	19.44	0.64	C
Stream D-ABC		2.6	24.21	0.73	C		0.8	13.05	0.45	B
Stream C-ABD		0.0	9.43	0.02	A		0.0	9.50	0.03	A
	2026 Baseflow + Dev									
Stream B-ACD	D5	0.0	15.21	0.04	C	D6	0.1	13.95	0.07	B
Stream A-BCD		1.2	16.19	0.53	C		2.5	23.00	0.70	C
Stream D-ABC		4.5	37.95	0.83	E		0.9	14.11	0.49	B
Stream C-ABD		0.0	9.60	0.02	A		0.0	9.79	0.03	A
	2041 Baseflow									
Stream B-ACD	D7	0.1	17.64	0.06	C	D8	0.1	15.81	0.08	C
Stream A-BCD		1.4	17.54	0.56	C		2.8	24.76	0.73	C
Stream D-ABC		4.8	41.05	0.84	E		1.1	16.14	0.53	C
Stream C-ABD		0.0	10.14	0.02	B		0.0	10.23	0.04	B
	2041 Baseflow + Dev									
Stream B-ACD	D9	0.1	20.01	0.07	C	D10	0.1	17.05	0.09	C
Stream A-BCD		1.7	19.19	0.60	C		4.4	30.23	0.80	D
Stream D-ABC		10.6	80.94	0.95	F		1.3	17.54	0.57	C
Stream C-ABD		0.0	10.34	0.02	B		0.0	10.59	0.04	B

The summary of performance analysis indicates that during the Operational Phase Junction 4 (existing priority junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

Table 6.10 Junction 5: Proposed Priority Junction

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2026 Baseflow + Dev									
Stream B-AC	D1	0.6	13.20	0.35	B	D2	0.1	9.46	0.13	A
Stream C-AB		0.1	6.01	0.08	A		0.2	5.86	0.12	A
	2041 Baseflow + Dev									
Stream B-AC	D3	0.6	13.83	0.36	B	D4	0.2	9.70	0.13	A
Stream C-AB		0.2	5.93	0.08	A		0.3	5.78	0.13	A

The summary of performance analysis indicates that during the Operational Phase Junction 5 (existing priority junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

The existing and proposed junction are projected to operate well within capacity as demonstrated in the tables above; therefore, the Project will have an imperceptible effect on the road network during operations. The Table below summaries the impact of the proposed development on the surrounding transport network and users.

Table 6.11 Summary of Impact Assessment

Mode	Cause	Impact
Construction Stage		
Traffic	Increased construction traffic flows onto existing roads network	Short-Term Slight Negative
Walking	Increased construction traffic flows resulting in an increased risk to existing pedestrian movements	Short-Term Imperceptible Negative
Cycling	Construction Traffic Flows resulting in an increased risk on the existing cycle network	Short-Term Imperceptible Negative
Operational Stage		
Traffic	Development-Generated Traffic added onto surrounding Road Network	Long-Term Imperceptible Negative
Walking	An increase in pedestrian traffic to local schools, shop amenity and sports facilities, and to Ennis town centre	Long-Term Imperceptible Positive
Cycling	An increase in cycle activity utilising existing network	Long-Term Imperceptible Positive

6.7.7 Cumulative Assessment

The cumulative assessment considered all committed developments within the vicinity of the site and those which will have an impact on the junctions as identified previously. This includes sites which have previously been granted planning permission, but which are yet to become operational.

Although there are a number of granted planning application within Ennis they are deemed to have a very minor impact on the selected junctions. Therefore it is assumed that no major committed developments have been granted planning permission within the immediate vicinity of the proposed development.

There are a number granted permissions in the last 5 years for one-off houses and extensions to existing dwellings.

6.8 Mitigation Measures

6.8.1 Mitigation Measures During the Construction Phase

The Construction Environmental Management Plan (CEMP) includes proposed mitigation measures to minimise the impact of constructed related traffic on the modelled roads network. The construction stage of the proposed development will be complete in three phases as described in CEMP and the project is scheduled to begin construction in 2026 for a three-year period. It is envisaged that working hours will be 07:00am to 19:00pm Monday to Friday (08:00am to 14:00pm for Saturday) for construction personnel through each phase of the development. Generally, construction workers will travel to site before the measured peak hour of 08:00 to 09:00, to be on site for a 08:00 start-time. It is envisaged that a very limited number of construction employees are likely to travel to the site during peak hours.

It is anticipated that heavy goods vehicles, HGV's, will be restricted to movements on the local road network during the off-peak periods. It is estimated that truck movements and general deliveries would arrive/leave at a steady rate during the course of the day. It is envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 12 no. HGV's will deliver to the site on a daily basis for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase but these are expected to be at a lower frequency. An estimated total of 920 HGV trips are envisaged throughout the course of the construction phase of the works.

- A number of mitigation measures are proposed during the construction phase to minimise the impact, the measures are as follows;
- A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site.
- All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc.
- Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods.
- No vehicle will be allowed to stop or park on the access road to the proposed development site.
- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development.
- Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles.
- Routine sweeping/cleaning of the road and footpaths in front of the site; and
- No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity.

There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising.

6.8.2 Mitigation Measures During the Operational Phase

Mitigation measures proposed during the operational stage are as follows;

- Provision of "STOP" road markings at the access junctions in accordance with Figure 7.35 of the Traffic Signs Manual (TII, 2019).
- Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways.

- It is proposed to provide advanced warning signs on the R474 Circular Road as it approaches the site entrance. The signage will be in accordance with Chapter 6 of the Traffic Signs Manual (TSM) for road users travelling in the northern and southern direction towards the entrance to the development.
- The connection of the proposed development footpaths to the existing footpath network on the R474 Circular Road. This will allow connectivity to the existing Bus Stops in Ennis Town.
- The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling.
- Charging points for electric vehicles are being provided
- A Mobility Management Chapter has been included as part of the Traffic and Transport Assessment, submitted as part of this application. This outlines the mobility strategy for the proposed development and includes measures for guiding the delivery and management of coordinated mobility management initiatives by the scheme promotor
- Provision of upgrade works on Circular Road (pedestrian facilities) as part of the proposed development

6.9 Residual Impact

6.9.1 Construction Phase

Following the implementation of the mitigation measures outlined in the Construction Environmental Management Plan (CEMP), the residual impact of construction related traffic on the local and national road network is expected to be temporary, minor, and manageable.

Construction traffic will be distributed over a three-year period commencing in 2026 and delivered in three defined phases. The majority of construction worker trips will occur outside of the peak morning traffic period (08:00–09:00), thereby limiting their impact on peak hour congestion. Furthermore, heavy goods vehicle (HGV) movements are planned to occur during off-peak periods, with the highest volume of activity, estimated at up to 12 HGVs per day, limited to the groundworks phase. Over the course of the construction programme, approximately 920 HGV trips are projected in total, which equates to a modest volume when dispersed over the full construction phase.

The implementation of a robust haulage plan, strict delivery scheduling, and the prohibition of on-road waiting or parking will ensure that the risk of localised congestion and disruption to the road network is minimal. Additional mitigation, including on-site vehicle staging areas, routine road cleaning, and the prevention of uncontrolled runoff, further supports the containment of potential environmental and operational impacts.

Importantly, the construction programme includes ongoing monitoring of traffic effects to enable the early identification and resolution of any emerging issues. This adaptive management approach is expected to provide further assurance that no significant long-term or residual impacts on the local or national road network will occur as a result of construction activities.

In summary, with the mitigation measures in place and maintained throughout the construction phase, the residual impact on the road network is considered to be negligible to minor in significance, and strictly limited to the duration of the construction phase.

6.9.2 Operational Phase

As population grows throughout Ireland and in particular, in popular commuting hub areas like Ennis, a continued increase in traffic volumes is not sustainable. The governments modal shift targets are outlined in the Smarter Travel: A Sustainable Transport Future. The key targets of Smarter Travel are to reduce work-related commuting by car to 45%, and increase other modes such as walking, cycling, public transport and carpooling to 55%. As a result, an ever-increasing approach by designers

and planners to providing sustainable commuting alternatives is required. The use of public transport and promotion of walking and cycling will ultimately increase the overall quality of life for the people living in these fast paced, busy towns and villages located within commuter belts.

The proposed development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2019 and the Cycle Design Manual, which promotes the use of sustainable travel to and from the site. The Road Safety Audit carried out for the site allowed the design team to address any concerns initially flagged in the Road Safety Audit. A continued and collaborative approach with the road safety auditors meant that a desirable and safe site layout could be achieved without negatively impacting the overall quality of the development.

The use of the private car will still be maintained as a primary mode of transport for a number of the residents in the development. Trip generations to and from the proposed development are 203 in the morning peak and 153 in the evening peak as noted above. The internal roads on the development to be constructed have been suitable designed in accordance with the DMURS manual.

Progressive and regular liaising with Clare County Council Roads Department in relation to the internal roads and the permitted link roads layouts contributed to the final road design for the development.

As noted previously, mitigation measures are to be implemented to promote and encourage more sustainable transport modes. Footpaths on the R474 Circular Road will encourage pedestrians to walk to the Ennis Town Bus Stops which are 1.5km away from the site. The proximity of the Bus Stops will encourage pedestrians to utilise the higher frequency Public Transport options. Dedicated cycle routes and secure bicycle parking spaces are also provided throughout the development.

The proposed development is located close to a number of amenities such as local shops to the east of the proposed development, some 19 minutes walking (approx. 1.6km).

6.9.3 Significance of Effects

The junctions are predicted to operate below capacity without the development traffic in the future design years. The analysis predicts that the inclusion of the development traffic will result in a slight increase in the degree of saturation for the junctions, with all junctions forecast to continue to operate below capacity.

6.10 Summary

An assessment of the traffic impact of the proposed development in Ennis Co. Clare was undertaken. The site is forecast to generate 203 vehicle movements during the AM peak and 153 movements during the PM peak times.

A Stage 1 Road Safety Audit has been carried out for the proposed development during the planning stage and considered various aspects such as, junction design, provision for pedestrians, provisions for cyclists and road signage, marking and lighting. Recommendations noted from the independent company undertaking the road safety audit, CST Group Chartered Consulting Engineers, have been taken into account and the concerns raised have either been designed out or will be considered and suitable measures put in place during the detailed design stage.

The proposed development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2019 and the Cycle Design Manual, which promotes the use of sustainable travel to and from the site.

6.11 Conclusion

Based on this assessment it is considered that in general, the traffic generated by the proposed development in Ennis, Co. Clare will be adequately accommodated on the local highway network in the vicinity. The junctions are predicted to operate below capacity without the development traffic in the future design years. The analysis predicts that the inclusion of the development traffic will result in a slight increase in the degree of saturation for the junctions, however all junctions are forecast to continue to operate below capacity.

The implementation of the Operational Phase mitigation measures, such as the pedestrian, public transport and cycling measures, a shift in the modal split can be accomplished resulting in a reduction in the impact on the junction capacities.

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CHAPTER SEVEN

MATERIAL ASSETS: BUILT SERVICES



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CHAPTER SEVEN

Table of Contents

Material Assets: Built Services

7.1 Introduction 7-1

7.2 Author Information & Competency 7-1

7.3 Reference to Guidelines Relevant to Discipline 7-1

7.4 Methodology 7-1

7.5 Description of Existing Environment..... 7-2

7.6 Characteristics of Proposed Development 7-3

7.7 Predicted Impacts 7-4

7.8 Mitigation and Monitoring Measures..... 7-6

7.9 Residual Impacts 7-7

Table of Tables

Table 7.1 Significance Criteria for Impacts on
Material Assets - Utilities 7-2

RECEIVED: 30/06/2025

CHAPTER 7 | Material Assets: Built Services

7.1 Introduction

The purpose of this chapter is to describe the environmental impact of material assets of the proposed residential development. This report details the existing environment, the proposed development, and the predicted impact on the environment. It will describe the methodology used to assess the potential impacts from the proposed development on the material assets in the study area, to describe baseline environment of the material assets in the study area, assess the likely impacts on these material assets, and sets out mitigation measures to be put in place to reduce the likely impacts of the material assets on the environment. This chapter considers the impacts on the material assets and not the people using the assets. People along with issues and impacts are discussed in Chapter 4 (Population and Human Health).

Material Assets are resources that are valued and that are intrinsic to specific places. These may be economic assets of human or natural origin. With regard to Material Assets, the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022) published by the Environmental Protection Agency (EPA) state:

“In Directive 2011/92/EU this factor 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.”

Material Assets of a human origin include:

- Wastewater Network
- Surface Water Network
- Water Main Network
- Electricity Network
- Gas Network
- Telecom’s infrastructure

The proposed project is described in detail in Chapter 2 ‘Proposed Development’.

7.2 Author Information & Competency

This chapter has been prepared by Michael Naughton, TOBIN Consulting Engineers and James Molloy of Molloy Consulting.

Michael Naughton is a project engineer in the Building & Infrastructure sector with TOBIN with over 5 years’ experience. He also has over 22 years’ experience in the building services industry also working across a number of projects in various sectors. Michael has an honours degree in Civil Engineering from National University Galway and is a member of Engineers Ireland.

James Molloy is a Building Services engineer with Molloy Consulting Engineers. He qualified with a Building Services degree from Munster Institute of Technology. James has 15 years’ experience in the building services industry. James is skilled in Mechanical and Electrical design with a specialisation in street & sport lighting design.

7.3 Reference to Guidelines Relevant to Discipline

The Material Assets Assessment was prepared in accordance with relevant European Union and Irish legislation and guidance, and in accordance with Schedule 6 of the Planning and Development Regulations 2001 as amended (S.I. No. 600 of 2001) and conforms to the relevant requirements as specified therein.

The following guidelines were referred to while preparing this appraisal:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA) (EPA 2022)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003) (and revised advice notes (EPA 2015b).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, 2020)
- Code of Practice for Water Infrastructure (IW-CDS-5020-03, 2020)
- Recommendations for Site Development Works for Housing Areas, 1998
- ESB Networks’ Planning and Development Guidelines for Connection to the Electricity Network and Guidelines for Development Near Overhead Lines.
- Gas Networks Ireland’s Code of Practice for Gas Transmission and Distribution Networks and Guidelines for Development Near Gas Pipelines.
- ComReg’s Code of Practice for Telecommunications Antennae and Support Structures and Guidelines for Telecommunications Infrastructure Deployment.
- Relevant EU Directives, including Directive 2019/944/EU (electricity), Directive 2009/73/EC (gas), and Directive 2018/1972/EU (telecommunications).

7.4 Methodology

The study area regarding utilities for the subject site comprises the main area of proposed construction works. The proposed project is described in detail in Chapter 2 ‘Project Description’.

The proposed residential development at Ennis, Co. Clare is in the administrative area of Clare County Council.

7.4.1 Identification of Utilities

As part of the compilation of this EIAR chapter, the previously discussed guidance and advice, documents were studied to fully understand the constraints in a study area around the proposed development.

The scope of the investigation consists of a desk study, surveys and correspondence with utility providers. Water Services information (surface water drainage, foul water drainage and watermains supply) was received from Uisce Éireann, formerly known as Uisce Éireann , and Clare County Council.

Molloy Consulting reviewed the existing utilities (i.e., ESB, Gas & Telecoms) in the vicinity of the site to identify the serving of the development from same and any potential impacts of existing infrastructure. They also engaged with local engineers from Gas Networks Ireland and ESB to ascertain this information and access existing records in the vicinity of the development.

Mapping, where provided by these organisations, was overlaid with the project mapping and assessed.

7.4.2 Significance Criteria

Significance criteria for impacts on utilities are set out in Table 7.1 in accordance with the requirements of the following EPA guidance documents:

Guidelines to Planning Authorities and An Bord Pleanála on carrying out EIA (Department of Housing, Planning and Local Government, 2018)

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

Table 7.1 Significance Criteria for Impacts on Material Assets - Utilities

Significance Level	Criteria
Profound	Profound impact occurs where there is permanent disruption to a utility service or where there is significant surcharging of an existing system.
Significant	Significant impact occurs where there is long-term disruption to a utility service or where there is minor surcharging of an existing system.
Moderate	Moderate impact occurs where there is medium-term disruption to a utility service or significant increase of flow within an existing system
Slight	Slight impact occurs where there is short-term disruption to a utility service or minor increase of flow within an existing system.
Imperceptible	Imperceptible impact occurs where there is temporary disruption to a utility service or no quantifiable increase of flow within an existing system.

7.4.3 Difficulties Encountered in Compiling Information

No difficulties were encountered in compiling the information

7.5 Description of Existing Environment

The Proposed Project is described in detail in Chapter 2 'Proposed Development'. The site of the proposed development is currently a greenfield site. The site is adjacent to Ennis Golf Club, North/North-East of the site. The west boundary is bounded by the N85 Ennis Bypass/Western Relief Road and the eastern boundary by the R474 Regional Road, Circular Road, into Ennis. There are seven private residential homes between the eastern boundary of the site and the R474 and a small, recently built residential estate along the southern boundary of the site.

7.5.1 Wastewater Drainage

There are no records or evidence of any foul water infrastructure within the proposed site. The nearest existing foul sewer is a concrete, 225mm diameter located southeast of the site on the Cahercalla Road. This existing Sewer was surveyed by Land Surveys. The sewer is Uisce Éireann owned and flows to the Uisce Éireann owned Ennis North Wastewater Treatment Plant.

7.5.2 Surface Water Drainage

There is no existing surface water network within the existing site. It is evident that existing rainwater drainage from the site is by means of direct infiltration and percolation into the existing agricultural ground. The local groundwater flow direction is likely to mirror the site topography and catchment drainage. The greenfield run off from the site, due to the existing topography, travels in a north and northwest direction towards the Claureen River.

7.5.3 Water Main Network

There is an existing 600 mm diameter ductile iron water main located on the western boundary of the N85. This is on the opposite side of the National Road to the site. There is also a 350 mm diameter Asbestos watermain on the R474 circular Road on the eastern boundary of the site. Both watermain are owned and controlled by Uisce Éireann.

7.5.4 Electricity Supply

There are existing power lines running along the eastern boundary of the site and a 10kV line running from south to north through the site. The development proposes to underground/divert these power lines. Ultimately the ESB Engineer will decide what route the lines will take following an application for underground through the ESB networks portal.

Three new substations are proposed to be constructed within the new development area. All three are strategically positioned along the eastern portion of the site to efficiently service the estate:

- Northeast Substation – Located in the northeastern corner of the site, adjacent to the proposed pump station.
- Centre-East Substation – Positioned centrally along the eastern boundary of the development.
- Southeast Substation – Situated in the shared space area in the southeast corner of the site.

These substations will each supply power to several mini pillars distributed throughout the site. In turn, the mini pillars will provide electricity to the residential dwellings within the development.

7.5.5 Natural Gas

There is no existing gas infrastructure near the proposed development and all of the proposed residential units and the creche will be served by electric air-to-water heat pumps due to the requirement to meet Part L of the Building Regulations, of which L1 states 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". Heat pumps run at an energy efficiency of approximately four times greater than gas and are a renewable form of energy which is a requirement of the building regulations. No connections to the natural gas network will be required.

7.5.6 Telecoms / Communications

Virgin and eircom networks are installed along the central local road and the design of the network has allowed for a connection to the proposed residential development.

7.6 Characteristics of Proposed Development

The proposed project is described in detail in Chapter 2 ‘Project Description’.

7.6.1 Proposed Wastewater Drainage

The proposed wastewater drainage system for the development will consist of a combination of gravity and pumped discharge to a local gravity wastewater sewer. Due to site topography a pumping station is required to service the development which will be located to the north of the site.

Existing levels on the site won’t allow a gravity connection to the existing 225 mm wastewater sewer on Cahercalla Road, therefore all wastewater from the development will flow via gravity to the pumping station, located strategically in the North of the site. A new 150 mm wastewater sewer will also be laid on the R474 circular road, connecting to the proposed wastewater sewer network within the development. This is to enable seven existing dwellings connect to the sewer mains should they require to in the future.

From the pump station the wastewater will convey through a 110 mm diameter Rising Main to the existing gravity sewer. Before discharging to the existing sewer, the wastewater will first discharge to a newly constructed discharge manhole, with a vent stack to eliminate odour, located near the existing gravity network, as per Uisce Éireann standards.

The pumping station will be designed to be capable of facilitating the proposed development while also allowing for possible future connection for the seven existing dwellings facing onto the R474, Circular Road and the small parcel of lands adjoining the applicants site boundary to the south.

The proposed foul network has been designed in accordance with the Uisce Éireann Specification and has been designed to cater for 6 times the dry weather flow rate. A Statement of Design Acceptance has been obtained from Uisce Éireann and forms part of this application as an appendix of the Civil Works report.

The laying/construction of the foul network will be a standard trench excavation and kept as shallow as possible, adhering to Uisce Éireann’s Codes of Practice. All wastewater designs will be fully vetted by Uisce Éireann prior to receiving an offer to connect. Refer to Engineer’s Proposed Drainage Layout drawings for the proposed wastewater layout and details.

- **Possible Effect:** Release of effluent from wastewater systems has the potential to impact on groundwater and surface water
- **Significance of effect:** No significant effects on surface water or groundwater quality are anticipated. No groundwater encountered during site investigation.
- **Effect on European Site:** No effect on European Site is anticipated.

7.6.2 Proposed Surface Water Drainage

It is proposed to use a nature-based Sustainable Urban Drainage Systems, (SuDS) approach to surface water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed nature-based SuDS features in the development are Tree Pits, Rain Gardens, Filter Strips/Infiltration Trenches, an open swale, an infiltration basin, permeable paving on driveways, cellular underground soakaways, petrol interceptors, a hydro brake flow control and drainage kerbs.

The proposed surface water drainage network has been designed into seven catchment areas for the development. The surface water will flow to soakaways for 6 of the catchment areas and to an infiltration basin for the northernmost catchment area. The soakaways and the infiltration basin have been designed to a cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc.

The soakaways have been designed using infiltration rates from a site investigation carried out by Grounds Investigation Ireland, attached in Appendix 7.1. The infiltration rates were obtained by Soakaway Testing to BRE Digest 365. A conventional infiltration rate for each soakaway was used in the design and a factor of safety of 2. The surface water in each soakaway will infiltrate to the ground, as it would naturally in a green field site. Prior to entering each soakaway, the surface water will flow through petrol interceptors to remove any hydrocarbons the water may contain.

An infiltration basin has been designed to cater for the northernmost catchment area of the development. The surface water will also flow through a petrol interceptor before entering the basin. An outfall from the basin is proposed at invert level, which will connect to a hydro brake manhole, controlling the discharge at an allowable greenfield runoff rate, which will in turn utilise the full capacity of the basin when required.

The infiltration basin has been designed to cater for the catchment area and the overflows from each of the soakaways if needed. The basin is relatively shallow at 1.5 m, designed with 4No. step formations at a 1/4 slope. Refer to engineers drawing for details.

The infiltration basin provides several forms of treatment to the collected water within it. As a result of the size of the basin, much of the bacteria and pollutants that enter the basin settle over time prior to reaching the outfall pipe. Furthermore, infiltration basins can support vegetation and plant life, which provide further pollutant treatment and removal. The plants absorb dissolved pollutants and convert them into less harmful materials. Microorganisms present in the basin can further treat and breakdown pollutants that include bacteria, nitrogen, phosphorus, total suspended solids, oil and particulate matter from vehicles.

Energy from inflowing stormwater as it enters the infiltration basin is absorbed by any water already in the basin, thus inflowing water does not cause erosion of materials at the base of the basin. Infiltration basin also provide water quantity control as they retain the runoff and release it into watercourses at a pre-development flow rate.

Surface water from the infiltration basin shall discharge into the Claureen River via a hydro brake manhole. The hydro brake will discharge surface water at an allowable controlled greenfield runoff rate to the Claureen River, located North of the site. The outfall pipework conveying the surface water discharge will run along the corridor of the N85. A letter of consent has been received from Clare County Council for this and forms part of this application. The amount of water discharging will be under the allowable Greenfield Runoff rate, which is calculated at 17.14 l/s, using the conventional 2 litres per second per hectare due to the developable area, 8.57 Ha, of the site. Alternatively, the runoff rate can also be determined using QBar calculations and the HR Wallingford Greenfield Runoff Rate Estimation Tool which provides location-specific data. The Greenfield Runoff

rate for the proposed site can be found in Appendix 7.2. The surface water will flow through a bar screen at either end of the outfall pipe which will mitigate against debris/litter entering the Claureen River.

The storm drainage has been designed using the 30 and 100-year return period plus an additional 20% to account for the effects of climate change.

- **Possible Effect:** Replacement of the greenfield surface with hardstand surfaces will result in an increased risk of pluvial flooding due to low permeability surfaces which will inhibit any downward percolation of rainwater. All surface water arising on site will drain to the Claureen River via a stormwater infiltration basin at a controlled rate.
- **Significance of effect:** The risk of pluvial flooding is minimised by the drainage network set-up, Controlled discharge rate as per the greenfield runoff-rate, gullies strategically located and the use of the infiltration and soakaways for surface water storage.
- **Effect on European Site:** No effect on European Site is anticipated
- **Possible Effect:** Release of pollutants and hydrocarbons from surface water runoff on impermeable areas.
- **Significance of effect:** The risk of hydrocarbons and pollutants entering the natural watercourse is eliminated by nature-base SuDS solutions and the introduction of a petrol/oil interceptor prior to discharging to the infiltration basin. The infiltration basin will also act as a pollutant treatment.
- **Effect on European Site:** No effect on European Site is anticipated

7.6.3 Proposed Water Main Network

It is proposed to connect a 150 mm diameter water main to an existing 350 mm asbestos watermain, at the site entrance on the R474 Circular Road. All water main designs will be fully vetted by Uisce Éireann prior to receiving an offer to connect. The 150 mm diameter water main will be constructed and connected in accordance with Uisce Éireann requirements.

The water supply required for the proposed development shall be via a 150 mm diameter water main along the main spine road of the development. A 100 mm diameter PE watermain will breach off this spine main to service the clusters of houses/Cul-de-sacs.

- The watermain will be constructed via shallow excavation.
- **Possible Effect:** Excavations will be relatively shallow and temporary. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.
- **Significance of effect:** Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses.
- **Effect on European Site:** No impacts on water quality or downstream designated sites are anticipated.

7.6.4 Electricity Overview

New electricity services infrastructure will be put in place to serve the proposed housing development. We will need to undertake the preparatory work such as installation of ducting and provision of substation plinth or building. All installations to be carried out in accordance with IS10101. Trench and duct installation in relation to the ESB Scope of Works to be carried out in accordance with ESB Networks Technical Guidance Document Current Edition Code of Practice. Prior to back filling and making good ESB Trench the contractor shall request ESB attendance to site to review and approve ducting provision.

7.6.5 Natural Gas Overview

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

7.6.6 Telecoms Overview

New telecom services infrastructure will be put in place to serve the housing development. Trench and duct installation in relation to the Eircom Scope of Works to be carried out in accordance with Eircom White Guidance Document current edition. Prior to back filling and making good Eircom trench the contractor shall request Eircom attendance to site to review and approve ducting provision.

7.6.7 Estimated Earthwork Volumes

Removal of the existing topsoil layer will be required. It is expected that all stripped topsoil will be reused on site. Estimated volumes have been stated in chapter 8 of this EIAR. It is noted that these volumes are estimations based off the site area and similar construction developments and that a full cut and fill exercise would be needed to establish exact volumes.

A construction waste management plan has been prepared and forms part of this application as a separate document. Soil and stones typically make up a significant proportion of construction waste. It is anticipated that the majority of excavation wastes will be re-used on site for landscaping and site restoration purposes. Any bedrock excavated shall be tested and if suitable re-used as fill under roads and footpaths.

7.7 Predicted Impacts

This section provides a description of the specific, direct and indirect impacts that the proposed development may have during the construction and operational phase of the proposed project. The mitigation measures for the construction and operational phase are outlined in section 7.8 of this chapter.

7.7.1 Do Nothing Scenario

The “Do Nothing” scenario refers to what would happen if the proposed development was not implemented.

Upgrade works are required at the Wastewater Treatment Plant as part of Uisce Éireann's Capital Investment (CIP). The works, as stated, are to be carried out by Uisce Éireann. It has also been stated by Uisce Éireann that these works will not affect the development should it go ahead as there is sufficient capacity to accept the development.

7.7.2 Do Something Scenario

Should the proposed development proceed as planned, it will impact upon material assets in the vicinity of the proposed works. The development has been designed to take account of the identified material assets and the implementation of the mitigation measures outlined in this chapter and will help reduce any negative impact on these material assets.

7.7.3 Construction Phase

7.7.3.1 Wastewater Infrastructure

The contractors’ operations will generate effluent and sanitary waste from facilities provided for the work force on site. The laying of underground wastewater pipes as part of the project works has the potential to directly impact the wastewater service network. These impacts will be slight to moderate.

Traffic will also be affected during the construction phase when connecting the proposed wastewater network to the existing as the connection location to the existing wastewater network is circa 350m away from the site entrance. Therefore, will consist of a rising main being constructed on the public road to this network. A new discharge manhole will also need to be constructed prior to the wastewater discharging to the existing network, as per Uisce Éireann standards.

These works will have a significant effect on traffic as a section of the road will need to be closed during the works until completion. Traffic movements associated with the proposed development are addressed within Chapter 6 Material Assets – Traffic & Transport of this EIAR, this chapter specifically deals with traffic and the impact of the development on road infrastructure. A construction traffic management plan (CTMP) has been prepared by TOBIN to help reduce the impact of traffic during the works period. The CTMP will also form part of this application which will protect local amenities and the operation of the local road network. No long-term impacts are envisaged on the existing wastewater network from the construction stage.

7.7.3.2 Surface Water Infrastructure

Surface water run-off from construction activities has the potential to be contaminated. There is a potential for unrestricted surface water runoff from the site, ingress of groundwater and overland flows into excavations during construction. This has the potential to directly negatively impact the receiving waters immediately adjacent the site as well as the downstream receiving waters, i.e., the Claureen River. This could result in a moderate short-term negative impact on the quality of water in the adjacent watercourses as well as increased flood risk in the adjacent lands and will require appropriate environmental controls. The laying of underground surface water pipes as part of project works has the potential to directly impact the surface water drainage within the site. Replacement of the greenfield surface with hardstand surfaces will result in an increased risk of pluvial flooding due to low permeability surfaces which will inhibit any downward percolation of rainwater. Gullies will be strategically located in the roadways at local low points to collect the surface water and discharge it to the surface water sewer network.

7.7.3.3 Water Mains Infrastructure

During the construction of the water main network, there is likely to be brief disruption to the quality of the local water supply to facilitate connections to the network. All such temporary shutdowns will be agreed with Uisce Éireann in accordance with the appropriate procedures and people that will be affected will be advised in advance of the short-term impacts that they may experience.

There is a slight risk of contamination to the existing water supply during the construction phase when the development is being connected to the water supply. Uisce Éireann Codes of practice will be adhered to during the connection works to ensure minimal disruption to the network and to ensure the water supply avoids contamination.

7.7.3.4 Electricity Infrastructure

The laying of underground electrical cables as part of project works has the potential to directly impact the electrical network service. There is potential for unidentified electrical cables to be damaged during the construction phase. Utilities will be further identified and mapped during the detailed design stage. Potential slight negative temporary impacts on electrical power could arise during the construction of the proposed development. The outage will be agreed with the ESB, local residents and businesses will be notified in advance and the potential impact from the construction phase of the proposed development on the local electrical supply network is likely to be brief and imperceptible.

7.7.3.5 Natural Gas Infrastructure

There is no proposed gas component or existing natural gas infrastructure that will be affected by our proposed development.

7.7.3.6 Telecoms Infrastructure

The laying of underground electrical and telecoms cables as part of project works has the potential to directly impact the electrical and telecoms network services. Communications infrastructure is present throughout the subject area. There is potential for unidentified utilities to be damaged during the construction phase. Utilities will be further identified and mapped during the detailed design stage. Potential brief imperceptible impacts on public utilities could arise during the construction of the proposed development.

7.7.4 Operational Phase

The proposed project is described in detail in Chapter 2 ‘Project Description’.

7.7.4.1 Wastewater Infrastructure

The operation of the development will result in the increase of generation of effluent and sanitary waste from the proposed development. This has the potential to impact the existing wastewater infrastructure directly negatively in the vicinity of the site and result in a significant long-term impact on the capacity of the existing infrastructure.

7.7.4.2 Surface Water Infrastructure

Surface water runoff from operational activities has the potential to be contaminated. The operation of development has the potential to result in a large volume of surface water discharge in the absence of controls and measures to limit off-site discharge. This has the potential to impact the adjacent watercourses directly negatively. It could cause significant long-term negative impact on the water quality and quantity within the adjacent watercourses if appropriate controls are not put in place.

7.7.4.3 Water Main Infrastructure

The operation of the development will result in the increase in the quantity of water to be treated and supplied through the network. This has the potential to impact the existing water infrastructure directly negatively in the vicinity of the site and result in a significant long-term impact on the capacity of the existing infrastructure.

7.7.4.4 Electricity Supply

The impact of the operational phase of the proposed development on the electricity supply network is likely to increase the demand on the existing supply. The existing network has the capacity to cater for the proposed development. There are no impacts to be considered.

7.7.4.5 Natural Gas Infrastructure

All houses will utilise Air to Water Heat pumps which will negate the need for gas. No impacts on supply are anticipated.

7.7.4.6 Telecoms Infrastructure

The installation of the telecoms will be in accordance with the requirements of the utility provider and will be carried out by approved contractors. There will be no impact in the operational phase of the telecoms network. The existing network has the capacity to cater for the proposed development.

7.7.5 Cumulative effects

Material assets will interact with other EIAR topics given the nature of the works. Project related traffic will also interact with the land resource in the area which is predominately urban and agricultural. Mitigation measures have been proposed within this EIAR to eliminate and reduce any adverse effects from this interaction on the land. The raw materials needed for the project also interact with the project traffic. Materials will be reused where possible. The methodologies chosen at design stage will result in a decrease in the amount of imported material, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries.

Where roads are opened for the installation of cables or pipelines, interaction will occur between material assets (namely the local road network and utility providers), traffic and population. Further consultation will be undertaken with utility providers in the project detailed design stage and mitigation measures put in place to minimise any adverse impacts.

The cumulative effect of the development on the foul, surface water, watermain and waste management systems are anticipated to be short term, neutral, and imperceptible. No significant impacts are anticipated.

Regarding the cumulative impact of the interactions of impacts, it is unlikely that any of these interactions will result in significant additional impacts that are not already anticipated in this EIAR. It is predicted that the proposed development will contribute to the improvement of the overall urban environment.

7.8 Mitigation and Monitoring Measures

Following an assessment of the potential impacts the proposed development was methodically reviewed and mitigation methods were developed that will avoid, prevent or reduce any negative effects on the environment.

All possible measures will be taken to avoid unplanned disruptions to any services within the site during construction of the proposed development. It should be noted that several mitigation measures are proposed in other chapters of this EIAR.

7.8.1 Construction Phase Mitigation

The following mitigation measures are proposed for the construction phase of the development with respect to Material Assets:

- The proposed development should comply with the provisions of the Construction Waste Management Plan with respect to construction waste.
- The proposed development will comply with the provisions of the Construction Environmental Management Plan.
- Water metering will be provided during the construction phase to record consumption.
- All new services will be constructed and provided in strict accordance with the codes of practice of the relevant utility company and new connections to have an agreed permit for the works where required.
- To minimise impact of the wastewater/water infrastructure required for the development, best practise construction practices should be adhered to, and Uisce Éireann procedures followed.
- Temporary measures such as silt traps will be put in place to limit the rate of surface water runoff from site.
- The quality of surface water runoff to be managed and ensure the run-off from the site does not result in excessive siltation of the receiving drainage channels.
- Excavations are to be kept to a minimum, with excavated material stockpiled for reuse or removed off-site following removal of waste material regulations.
- The contractor also will be obliged to put measures in place to ensure that there are minimal or no interruptions to existing services, and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority.
- All watermains will be cleaned and tested in accordance with Uisce Éireann guidelines and standards prior to connection to the public watermain.
- All works in the vicinity of the local authority will be in compliance with any requirements or guidelines.
- Road opening licences will be applied for and a temporary traffic management plan to be implemented when connecting utilities in the public road.

Consideration will be given to the sustainable sourcing of all materials and will be reused where possible. The methodologies chosen at design stage, will result in a decrease in the amount of imported material, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries.

Other mitigation measures which will be employed in relation to raw materials are as follows:

- Design will be optimised to minimise the requirements for raw materials.
- Materials will be reused where possible.
- Raw materials will be sourced locally where possible; and
- Raw materials will be managed in accordance with the CEMP for construction.

7.8.2 Operation Phase Mitigation

The following section discusses the mitigation approaches that will be followed during the operational phase of the development:

- All new foul and surface water drainage pipes to be pressure tested and CCTV to identify any possible defects.
- Water conservation measures to implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments.
- Ensure that all hydro brakes are designed to limit the flow of water from the development to the greenfield run off.
- All water main pipes to be pressure tested in accordance with Uisce Éireann details.
- All water mains will be cleaned and tested in accordance with Uisce Éireann guidelines and standards prior to connection to the public water main.

Uisce Éireann have confirmed that a wastewater connection for the development is feasible and have issued a confirmation of feasibility letter (COF), Refer to Appendix 7.3. They have also stated that upgrade works are to be carried out downstream of the development as part of Uisce Éireann’s Capital Investment Plan (CIP), however they have noted that the latest capacity register can accept the proposed development. Connection agreements will be made with Uisce Éireann regarding wastewater discharge off site. As Uisce Éireann have confirmed that the system has capacity to accommodate the proposed development significant impacts to the system therefore not considered likely. No additional mitigation measures will be required.

The surface water drainage has been designed to accommodate the greenfield run-off from the proposed development. As the flow will be generated by seven catchment areas and it will be limited to the existing greenfield runoff rate of each catchment and will be attenuated to reflect the greenfield run off rate. Due to measures already incorporated in the design as outlined in Section 7.7.3, no additional mitigation measures will be necessary on surface water during the operational phase.

Uisce Éireann have confirmed that there is enough capacity in the Uisce Éireann network to supply the development Refer to Appendix 7.3. All plumbing fixtures and fittings to be installed within the development should be to the current best practice for water consumption to minimize future water usage. As Uisce Éireann have confirmed that the existing Uisce Éireann watermain has capacity to accommodate the proposed development, significant impacts to the system therefore not considered likely. No additional mitigation measures will be required.

7.9 Residual Impacts

7.9.1 Construction Phase

The construction stage of the proposed development will comprise of site clearance and preparation, excavation and the construction of the proposed development. The potential impacts associated with the construction stage of the proposed development on material assets are likely to be temporary and will cause minor/short term disturbance. Provided mitigation measures are adhered to as part of this development, there is unlikely to be any adverse impacts on material assets during the construction stage and any residual impacts on the existing foul and waste systems would be temporary and slight?

7.9.2 Operational Phase

The proposed development will have a positive impact on the surrounding environment by providing much needed housing in the area and meeting the needs of the growth population.

The loading in the wastewater and watermains from the proposed development will be adequately accommodated in the foul and watermain network. Upgrade works to the nearby wastewater treatment plant will be beneficial to developments in the surrounding area.

In compliance with the SUDS manual the runoff from the development will mimic the existing greenfield run off and hence have no impact in the surrounding network. Improved controls on the surface water along with silt management and/or silt traps the proposed development will result in an improvement in the quantity and quality of discharge off site.

7.9.3 Monitoring

The only monitoring proposed is of water storage. Once operational water usage will be monitored by a bulk meter and compared to anticipated usage. This will allow Uisce Éireann to monitor any potential leaks.

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CHAPTER EIGHT

MATERIAL ASSETS: WASTE



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CHAPTER EIGHT

Table of Contents

Material Assets: Waste

8.1 Introduction 8-1

8.2 Expertise & Qualifications 8-1

8.3 Proposed Development 8-1

8.4 Methodology 8-1

8.5 Difficulties Encountered..... 8-3

8.6 Baseline Environment 8-3

8.7 The ‘Do nothing’ Scenario..... 8-5

8.8 Potential Significant Effects 8-5

8.9 Mitigation Measures..... 8-6

8.10 Residual Impact Assessment 8-7

8.11 Reinstatement 8-8

8.12 Risk of Major Accidents or Disasters 8-8

8.13 Significant Interactions 8-8

8.14 Monitoring 8-9

8.15 Summary of Mitigation and Monitoring 8-9

8.16 Conclusion 8-10

8.17 References & Sources 8-10

Table of Tables

Table 8.1 Estimated off-site reuse, recycle and disposal rates for construction waste 8-4

Table 8.2 Estimated waste generation for the proposed development for the main waste types 8-4

Table 8.3 Summary of Construction Phase Likely Significant Effects in the Absence of Mitigation. 8-5

Table 8.4 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation. 8-6

Table 8.5 Summary of Construction Phase Effects Post-Mitigation. 8-7

Table 8.6 Summary of Operational Phase Effects Post-Mitigation..... 8-8

Table 8.7 Summary of Development Applications That Have Been Considered in the Cumulative Impacts. 8-8

Table 8.8 Summary of Construction Phase Mitigation and Monitoring. 8-9

Table 8.9 Summary of Operational Phase Mitigation and Monitoring. 8-9

Table of Figures

Figure 8.1 Waste Hierarchy (Source: European Commission)..... 8-2

Figure 8.2 Circular Economy (Source: Repak) 8-2

RECEIVED: 30/06/2025

CHAPTER 8 | Material Assets: Waste

8.1 Introduction

This chapter evaluates the impacts, if any, which the proposed development may have on Material Assets - Waste as defined in the EIA Directive (Directive 2011/92/EU *as amended* by Directive 2014/52/EU) and the EPA 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports during the construction and operational phases of the proposed development, as described in Chapter 2 (Project Description).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting to guide and manage the waste generated during the construction (including demolition and excavation) phase of the proposed development (including excavation, refurbishment and demolition works) and has been included as Appendix 8.1. The RWMP was prepared in accordance with the Environmental Protection Agency’s (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (2021)*.

A separate Operational Waste Management Plan (OWMP) has been prepared for the operational phase of the proposed Development and is included as Appendix 8.2 of this Chapter.

This Chapter has been prepared in accordance with European Commissions Guidelines, *Guidance on the preparation of the Environmental Impact Assessment Report (2017)*, the EPA Guidelines on the Information to be contained in EIAR (2022).

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

8.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Chonaill Bradley and Laura Berry of AWN Consulting Ltd.

Chonaill Bradley (Bsc ENV, PGDip Circ Econ, AssocCIWM) of AWN Consulting. Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia and a Postgraduate Diploma in Circular Economy Leadership for the Built Environment from the Atlantic Technological University, Galway. He is an Associate Member of the Institute of Waste Management (AssocCIWM). Chonaill has over 10 years’ experience in the environmental consultancy sector and specialises in sustainability, resource and waste management.

Laura Berry holds a BSc (Hons.) in Environmental Management from Technological University Dublin. Laura has two years of experience completing Operational Waste Management Plans, Resource and Waste (formerly Construction & Demolition Waste) Management Plans, Construction Environmental Management Plans, EIAR chapters, EIA Screening Reports and waste permit applications.

8.3 Proposed Development

The subject site is located at Ballymacaula, Drumbiggle, Keelty, Circular Road, Ennis, Co. Clare. The proposed development will consist of 300 no. residential units, an 80 child crèche and all associated ancillary development works. A full description of the proposed development is outlined in Chapter 2 ‘Project Description’ of this EIAR.

8.3.1 Aspects Relevant to this Chapter

The aspects of the development that will be considered as part of this chapter are the existing site conditions, existing site use and the waste that will be generated as part of the construction and operation of the proposed development. These aspects will be considered together with the proposed development use. This section should be read in conjunction with the design drawings and reports which accompany this planning application.

8.4 Methodology

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management, including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 of this EIAR (Project Description) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation and excavation works);
- Operational phase; and
- Reinstatement Phase

A desktop study was carried out which included the following;

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in section 8.6 of this Chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and the National Waste Statistics.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 8.9

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 9 of this EIAR (Land, Soils and Geology).

8.4.1 Relevant Legislation & Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the *Waste Framework Directive (2008/98/EC) as amended* which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is

the *Waste Management Act 1996* (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 8.1).



Figure 8.1 Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 8.2).



Figure 8.2 Circular Economy (Source: Repak)

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy (WAPCE)* – Waste Management Policy in Ireland, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less'* (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The *Circular Economy and Miscellaneous Provisions Act 2022* was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects*' (2021). The guidance documents, *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006) and *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *National Waste Management Plan for a Circular Economy 2024 - 2030* (NWMPCE) (2024), *BS 5906:2005 Waste Management in Buildings – Code of Practice*, Clare County Council (CCC) *County Clare Waste Management Bye-Laws* (2018), the *EPA National Waste Database Reports 1998 – 2020*, the *Circular Economy and National Waste Database Report 2021 - 2024* (2024) and the EPA National Waste Statistics Web Resource.

8.4.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows: -

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

8.4.3 Site Surveys/Investigation

A site investigation was undertaken by Ground Investigations Ireland Ltd., between July and September 2021 at the proposed site in Ennis, Co Clare to investigate the subsurface conditions utilising a variety of methods such as trial pits, soakaways, dynamic probes, cable percussion, and rotary core boreholes. Geotechnical and environmental laboratory testing including the Rilta Suite testing was carried out by Element Materials Technology Laboratory in the UK. Ten (10 no.) samples were tested and were found to be under the inert waste criteria when compared to the waste acceptance limits.

The assessment of the impacts of the proposed development, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

8.4.4 Consultation

No specific consultation with relevant bodies was undertaken as part of the waste assessment.

8.5 Difficulties Encountered

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Site Investigation (SI) process provides spot samples, and further testing may be required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There is a number of licensed, permitted and registered waste facilities in the Clare County region, in the surrounding counties, the southern waste region and in Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which will be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can import as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost.

8.6 Baseline Environment

In terms of waste management, the receiving environment is largely defined by CCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the NWMPCE 2024 – 2030 and the WAPCE.

The waste management plans set out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Waste Management Planning Offices issued the *National Waste Management Plan for a Circular Economy 2024 - 2030* (NWMPCE) in March 2024, which supersedes the southern regional (SR) waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The Clare County Development Plan 2023 – 2029 (2023) sets out the objectives for the CCC area which reflect those set out in the regional waste management plan and can be found in Appendix 8.1 and 8.2.

In terms of physical waste infrastructure, CCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the SR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which will be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

A full description of the proposed development can be found in Chapter 2 (Project Description). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

8.6.1 Demolition Stage

There will be no demolition as part of the proposed development.

8.6.2 Construction Stage

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be topsoil and subsoil excavated to facilitate site clearance, construction of new foundations and installation of underground services. The project engineers (Tobin) have estimated that c. 15,000 m³ of material will need to be excavated to do so. It is currently envisaged that c. 13,500 m³ of excavated will be retained on site for reuse as fill and/or landscaping purposes while the remaining c. 1,500 m³ of excavated material will be removed off site for reuse, recycling or disposal, as appropriate. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers or the environment.

If any material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 (By-products), *as amended*, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (previously Article 27 of the European Communities (Waste Directive)). For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix 8.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018).

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

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 8.1). The RWMP provides an estimate (of the main waste types likely to be generated during the Construction phase of the proposed development. These are summarised in Table 8.1.

Table 8.1 Estimated off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse/Recycle		Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	618.3	10	61.8	80	494.6	10	61.8
Timber	524.6	40	209.8	55	288.5	5	26.2
Plasterboard	187.4	30	56.2	60	112.4	10	18.7
Metals	149.9	5	7.5	90	134.9	5	7.5
Concrete	112.4	30	33.7	65	73.1	5	5.6
Mixed Waste	281.0	20	56.2	60	168.6	20	56.2
Total	1873.6		425.3		1272.2		176.1

8.6.3 Operational Stage

As noted in Section 8.1, an OWMP has been prepared for the development and is included as Appendix 8.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable (MNR) waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the development for the main waste types based on the AWN waste generation model is presented in Table 8.2 below and is based on the uses and areas as advised by the project architects (Dedy Gahan Architects Co. Ltd). Further breakdowns can be found with in Appendix 8.2 OWMP.

Table 8.2 Estimated waste generation for the proposed development for the main waste types

Waste Type	m ³ per week	
	Residential Waste (Combined)	Crèche Waste
Organic Waste	5.58	0.04
DMR	40.88	1.47
Glass	1.08	0.01
MNR	19.46	0.80
Total	66.99	2.32

The residents and crèche staff will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. As required, the residents and crèche staff will need to bring these segregated wastes from their units to their respective Waste Storage Areas (WSAs). All WSA's can be viewed on the plans submitted with the application and in the OWMP (Appendix 8.2). [

The OWMP seeks to ensure the development contributes to the targets outlined in the NWMPCE and the CCC Waste Bye-laws.

8.7 The ‘Do nothing’ Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no excavation or construction at this site. There would continue to be no operational waste generated from at the site. There would, therefore, be a **neutral effect** on the environment in terms of waste.

The site is zoned for development, and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national and regional policies, which can be found in appendix 8.1 and appendix 8.2, and therefore the likely significant effects would be similar to this proposal.

8.8 Potential Significant Effects

8.8.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction (see appendix 8.1 for further detail). General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored in the construction site compound or adjacent to it, on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is possible this could lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, it is possible the effect on the local and regional environment could be **long-term, significant and negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the SR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, it is possible the effect on the local and regional environment could be **short-term, significant and negative**.

There is a quantity of topsoil and subsoil will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 9. Excavated material that cannot be reused onsite will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, it is possible the effect on the local and regional environment could be **short-term, significant and negative**.

8.8.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily

to landfill. In the absence of mitigation, it is possible the effect on the local and regional environment could be, **long-term, significant and negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, it is possible the effect on the local and regional environment could be **long-term, significant and negative**.

It is anticipated that waste contractors will be required to service the proposed development on a scheduled basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, it is possible the effect on the local and regional environment could be **long-term, significant and negative**.

8.8.3 Cumulative Effects

If waste material are not managed and stored correctly and in the absence of mitigation, it is possible the effect on the local and regional environment could be **long-term, significant and negative**.

8.8.4 Summary

The following Table summarises the identified likely significant effects during the construction phase including site excavations and demolition works of the proposed development before mitigation measures are applied.

Table 8.3 Summary of Construction Phase Likely Significant Effects in the Absence of Mitigation.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Litter Pollution	Negative	Significant	Local	Likely	Short-Term	Indirect & Direct
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Insufficient Waste Facilities	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct
Lack of waste Classification	Negative	Significant	Local & Regional	Likely	Short-Term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 8.4 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Poor Waste Segregation	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Litter Pollution	Negative	Significant	Local & Regional	Likely	Short-Term	Direct

8.9 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concepts of the ‘waste hierarchy’ and “circular economy” are employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. A circular economy is a model of resource production and consumption in any economy that involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible.

8.9.1 Construction Phase Mitigation

The following mitigation measures will be implemented during the construction phase of the proposed development: -

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the EPA ‘Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects’ (2021) and is included as Appendix 8.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 8.1) in agreement with CCC and in compliance with any planning conditions, or submit an addendum to the RWMP to CCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil and sub soil will be excavated to facilitate the proposed development. The project engineers (Tobin) have estimated that c. 1,500 m³ of excavated material will be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to ‘design out waste’;
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;
 - Glass; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with *Regulation 27 (By-products)*, as amended, and the *European Union (Waste Directive) Regulations 2011-2020*. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations and the *Litter Pollution Act 1997* and the NWMCP. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

8.9.2 Operational Phase Mitigation

The following mitigation measures will be implemented during the operational phase of the proposed development: -

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

As previously stated, a project specific OWMP has been prepared and is included as Appendix 8.2. The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the

targets set out in the NWMPCE, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland* and the CCC Waste Bye-Laws.

The crèche operator and the residents will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to): -
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Waste electrical and electronic equipment (WEEE);
 - Batteries (non-hazardous and hazardous);
 - Cooking oil;
 - Light bulbs;
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time-to-time other bulky waste); and
 - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations.
- Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- The residents and tenants will ensure that all waste collected from the site will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The residents and the crèche operator will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, The NWMPCE and the CCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

8.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

The implementation of the mitigation measures outlined in Section 8.9 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

8.10.1 Construction Phase

A carefully planned approach to waste management as set out in Section 8.9.3 and adherence to the RWMP (which includes mitigation) (Appendix 8.1) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible** and **neutral**.

8.10.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 8.9.4 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be **long-term, imperceptible** and **neutral**.

8.10.3 Summary of Post-Mitigation Effects

The implementation of the mitigation measures outlined in Section 8.9 will ensure that high rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases and the waste will be correctly managed. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

The following Table summarises the identified likely significant residual effects during the construction phase (including site excavation and demolition works) of the proposed development following the application of mitigation measures.

Table 8.5 Summary of Construction Phase Effects Post-Mitigation.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Litter Pollution	Negative	Not Significant	Local	Unlikely	Short-Term	Indirect & Direct
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Unlikely	Long-Term	Direct
Insufficient Waste Facilities	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct
Lack of waste Classification	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 8.6 Summary of Operational Phase Effects Post-Mitigation.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Unlikely	Long-Term	Direct
Poor Waste Segregation	Negative	Not Significant	Local & Regional	Unlikely	Long-Term	Direct
Litter Pollution	Negative	Not Significant	Local & Regional	Unlikely	Short-Term	Direct

8.10.4 Cumulative Residual Effects

8.10.4.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. Multiple developments in the area could potentially be developed concurrently or overlap in the construction phase.

Developments that potentially could overlap during the construction phase:

Table 8.7 Summary of Development Applications That Have Been Considered in the Cumulative Impacts.

Planning Ref	Description	Decision
24/60086	48 no. residential units	Granted 25th September 2024
24/122 extension of duration to 17/977	51 no. residential units	Granted 10th June 2024
24/60652	74 no. residential units	Lodged 19 th December 2024 FI requested 21 st Feb 2025

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, not significant** and **neutral**.

8.10.4.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area and the developments planned for the surrounding land will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

8.11 Reinstatement

In the event that the proposed development is no longer occupied/operational, there is not likely to be any significant impacts on waste management at the site.

The Proposed Development may be decommissioned at some stage in the future. At that time, a demolition or refurbishment plan will be formulated for the decommissioning phase of the Proposed Development to ensure no waste nuisance occurs at nearby sensitive receptors.

8.12 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to waste management associated with the proposed development.

8.13 Significant Interactions

8.13.1 Waste and Land, Soils, and Geology

During the construction phase, c. 15,000m³ of excavated soil and stones will be generated from the excavations required to facilitate site levelling, construction of new foundations and the installations of site services. It is envisaged that c. 1,500 m³ of the excavated material will need to be removed off-site. When material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 8 Waste, Chapter 9 (Land, Soils and Geology) and the requirements of the RWMP (Appendix 8.1), will ensure the effect is **long-term, imperceptible** and **neutral**.

8.13.2 Waste and Traffic and Transport

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be short term in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 6 (Material Assets: Traffic & Transport). Provided the mitigation measures detailed in Chapter 8 and Chapter 6 are adhered to, the predicted effects are **short to long-term, imperceptible** and **neutral**.

8.13.3 Waste and Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and

residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 4 (Population and Human Health) and Chapter 8, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible** and **neutral**.

8.14 Monitoring

The management of waste during the construction phase will be monitored by the Contactor’s appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator / Buildings Manager to ensure effective implementation of the mitigation measures outlined in Section 8.9 internally and by the nominated waste contractor(s).

8.14.1 Demolition and Construction Phases

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation, demolition and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting schedule targets. The RWMP specifies the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the demolition phase of the proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

8.14.2 Operational Phase

During the operational phase, waste generation volumes should be monitored by the Operator / Buildings Management. There may be opportunities to reduce the number of bins and equipment required in the Waste Storage Area (WSA’s), where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

8.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 8.8 Summary of Construction Phase Mitigation and Monitoring.

Likely Significant Effect	Quality	Significance
Litter Pollution	The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.	The Contractor will review and maintain waste records and site audit.
Unlicensed Waste Collection (Illegal Dumping)	All waste leaving the site will be recorded and copies of relevant documentation maintained.	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	All waste leaving the site will be recorded and copies of relevant documentation maintained.	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	All waste material leaving site will be correctly classified and segregation prior to removal where possible.	An appointed Waste Manager will monitor all onsite waste segregation and classification

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 8.9 Summary of Operational Phase Mitigation and Monitoring.

Likely Significant Effect	Quality	Significance
Unlicensed Waste Collection (Illegal Dumping)	The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.	The Operator / Buildings Manager will maintain waste receipts onsite for a period of 7 years and make available to CCC as requested.
Poor Waste Segregation	The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.	Waste generation volumes will be monitored by the Operator / Buildings Manager.
Litter Pollution	The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available	Waste storage areas will be monitored by the Operator / Buildings Manager.

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8.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to waste management. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter and the attached RWMP, the overall predicted impact of the proposed development is **long-term, imperceptible** and **neutral**.

8.17 References & Sources

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RECEIVED: 30/06/2025

CHAPTER NINE

LAND & SOILS



RECEIVED: 30/06/2025

CHAPTER NINE

Table of Contents

Land & Soils

9.1 Introduction 9-1

9.2 Author Information & Competency 9-1

9.3 Reference to Guidelines Relevant to Discipline 9-1

9.4 Methodology 9-1

9.5 Description of Existing Environment..... 9-2

9.6 Predicted Impacts 9-4

9.7 Mitigation and Monitoring Measures..... 9-7

9.8 Residual Impacts 9-8

9.9 Monitoring 9-8

9.10 Potential Cumulative Impacts 9-8

9.11 Reinstatement 9-8

9.12 Interactions 9-8

9.13 References 9-8

Table of Tables

Table 9.1 Sensitivity of Effects..... 9-4

Table 9.2 Magnitude of Effects 9-5

Table 9.3 Effects Matrix..... 9-5

Table 9.4 Estimated Topsoil Volumes 9-6

Table 9.5 Estimated subsoil/reuse Volumes 9-6

Table 9.6 Imported Soil 9-6

Table of Figures

Figure 9.1 Subsoils Map 9-2

Figure 9.2 Geology Map 9-3

Figure 9.3 Geological Heritage Map 9-3

RECEIVED: 30/06/2025

CHAPTER 9 | Land & Soils

9.1 Introduction

This chapter of the EIAR comprises an assessment of the likely impact of the proposed development on soils and the geological environment as well as identifying proposed mitigation measures to minimize any impacts.

The Proposed Project is described in detail in Chapter 2 'Project Description'. The site of the proposed development is currently a greenfield site. The site is adjacent to Ennis Golf Club, North/North-East of the site. The west boundary is bounded by the N85 Ennis Bypass/Western Relief Road and the eastern boundary by the R474 Regional Road, Circular Road, into Ennis. There are 7 no. private residential homes between the eastern boundary of the site and the R474 and a newly built residential estate along the southern boundary of the site.

9.2 Author Information & Competency

TOBIN Consulting Engineers were appointed to complete the Land and Soils Chapter for this Environmental Impact Assessment (EIAR) required for the proposed Strategic Housing Development. The work was completed by John Dillon and John is Professional Geologist (P.Geo.) and chartered waste manager (MCIWM) in the Energy and Environment section of TOBIN. John provides project management, project co-ordination and specialist contribution to hydrogeology reports for Planning Applications, Environmental Impact Statements and waste licence applications. John has over eighteen years' experience in the areas of environmental management and assessment with particular reference to the transmission line projects, energy projects, hydrogeological projects and public consultation. John has been involved with the project management and co-ordination of Environmental Impact Assessment Reports, waste licence/permit applications, design and planning applications for retail/commercial developments, waste management facilities and quarries nationwide. John has contributed to Screening Reports and Natura Impact Statements for wastewater treatment plants, pipeline projects, solar farm and wind energy developments and has defended Appropriate Assessments at Oral Hearings for waste management facilities, high voltage powerline projects.

9.3 Reference to Guidelines Relevant to Discipline

This impact assessment of the Proposed Project has been carried out in relation to the relevant European and National legislation and other statutory policies and guidance. The methodology adopted for this assessment considered the following legislation:

- Planning & Development Acts 2000-2021; European Union (Planning and Development) (Environmental Impact Assessment) Regulation 2018
- Consolidated EIA Directive 2011/92/EU and 2014/52/EU;
- European Commission (EC) Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (EC 2017);
- European Communities (Water Policy) Regulations 2003 [S.I. No. 722/2003];
- Waste Management Act 1996 as amended;
- European Communities Environmental Objectives (Groundwater) Regulations 2010 [S.I. No. 9/2010];
- European Communities (Environmental Impact Assessment) (Amendment) Regulations, 2001 [S.I. No. 538/2001];
- Groundwater Directives (80/68/EEC) and (2006/118/EC); and
- Water Framework Directive (2000/60/EEC).

This Chapter has been prepared using the recommendations set out in the following:

- European Commission (2017) Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)
- Environmental Protection Agency's (EPA) Guidelines on the Information to be contained in Environmental Impact Statements (March 2002);
- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022);
- EPA's Advice Notes on Current Practice in the Preparation of EIS (2003);
- Department of Housing, Planning and Local Government's Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018);
- The guidelines and recommendations of the Institute of Geologists of Ireland (IGI) publication Geology in Environmental Impact Statements – A Guide (IGI 2002 as amended);
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI 2013) were also taken into account in the preparation of this Chapter; and
- The guidelines and recommendations of the National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009) were considered relevant in the preparation of this Chapter.

9.4 Methodology

Assessment of the likely impact of the proposed development on soils and the geological environment includes the following activities:

- Review of information available on the Geological Survey of Ireland (GSI) online mapping service
- Ground Investigations for the proposed development were carried out by GII in July 2021 and included the following scope of work:
 - Visit project site to observe existing conditions
 - 16 No. Trial Pits to a maximum depth of 3.2m bgl
 - 3 No. Soakaways to determine a soil infiltration value to BRE digest 365
 - 63 No. Dynamic Probes to determine soil strength/density characteristics
 - 4 No. Cable Percussion boreholes to a maximum depth of 1.0m bgl
 - 4 No. Rotary Core Boreholes to a maximum depth of 6.90m bgl
 - Geotechnical & Environmental Laboratory testing
 - Report with recommendations

Refer to Appendix 7.1 Ground Investigation Report prepared by GII. A site-specific Site Investigation (SI) on the nature and depth of the subsoil around the site consisting of 16 no. trial pits was completed on the site in November 2021. The trial pit logs from this investigation were provided to TOBIN.

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including An Bord Pleanála (AB), the GSI, Clare County Council and the EPA. A summary of the third-party responses received are included in Chapter 1 of the EIAR and presented in Appendix 1.1.

9.4.1 Difficulties Encountered in Compiling Information

No significant constraints were encountered during the compilation of this Chapter. A robust evaluation of the likely significant effects of all aspects of the Proposed Project has been undertaken for the purpose of preparing this EIAR.

9.5 Description of Existing Environment

The detailed description of the proposed development and construction activities are provided in Chapter 2 'Project Description' of the EIAR. Infill Material will be imported on-site. This material will be either quarried product from quarries that have planning permission; greenfield/inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

Existing ground levels are approximately 5mOD at the northern redline boundary at the River Claureen, with levels within the developable area ranging from approximately 13.4mOD at the northeastern corner to approximately 31.2mOD at the southwestern corner.

The site is predominantly in agricultural use currently with the exception of a few residential properties on the site boundaries. The site comprises of a series of irregularly shaped fields divided by hedgerows and some scrub typical of an agricultural setting. The site does not contain any existing dwellings and farm outbuildings. The western proposed development boundary is bounded by the Ennis western bypass. According to EPA data (2022) there are no licensed activities within the site boundary of the proposed development or directly adjacent to it.

9.5.1 Soils and Subsoils

No significant constraints were encountered during the compilation of this Chapter. A robust evaluation of the likely significant effects of all aspects of the Proposed Project has been undertaken for the purpose of preparing this EIAR.

9.5.2 Soils and Geology

Review of information available on the GSI's online mapping service ("Quaternary Sediments") indicate that the site is underlain predominantly by a sediment type described as "TLs – Till derived from limestones". Refer to Figure 9-1 below.

Ground conditions at the site, as observed during Preliminary Ground Investigations, are summarised as follows:

- Topsoil
- Cohesive Deposits
- Weathered Bedrock
- Bedrock

Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.3m below ground level (m bgl).

Cohesive Deposits: Cohesive deposits were encountered beneath the topsoil and were described typically as brown sandy gravelly SILT or CLAY with occasional cobbles and boulders. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits was

generally Firm below the topsoil but occasionally was soft to firm. These deposits had some, occasional or frequent cobble and boulder content and were noted on the exploratory hole logs. Three boreholes were undertaken as part of the site investigation works and generally observed gravelly SILT from 3.0m (trial pit target depth) to 8.8m below existing ground level. There are no peat soils on site.

Weathered Bedrock: In some of the exploratory holes weathered rock was encountered which was diggable with the large excavator to a depth of up to 1.0m below the top of the stratum in one of the pits. This material was recovered typically as angular gravel and cobbles. Some clay and sand were also present with the rock mass either from weathering or as infilling to fractures which were opened upon excavation.

Bedrock: The rotary core boreholes recovered Strong massive grey fine to medium grained. This is typical of the Aillwee Member, which is noted on the geological underlying the proposed site. The depth to rock varies from 1.06m bgl in RC04 to a maximum of 2.6m bgl in RC03. The total core recovery is good, typically 100%. The SCR and RQD both mostly ok across the site due to rock type massive. Ground water was noted at approximately 4 metres in one of the boreholes and in a small number of trial pits generally below 1 metre.

Infiltration tests were carried out at eight locations. Tests results indicated infiltration rates (f) ranged from 0.00238 m/min. There is a variation in soil type across the site with low percolation noted in clay-based soils and test failures where high water table is present. Infiltration tests in the granular soils indicate that it should be suitable for dispersion of surface water.

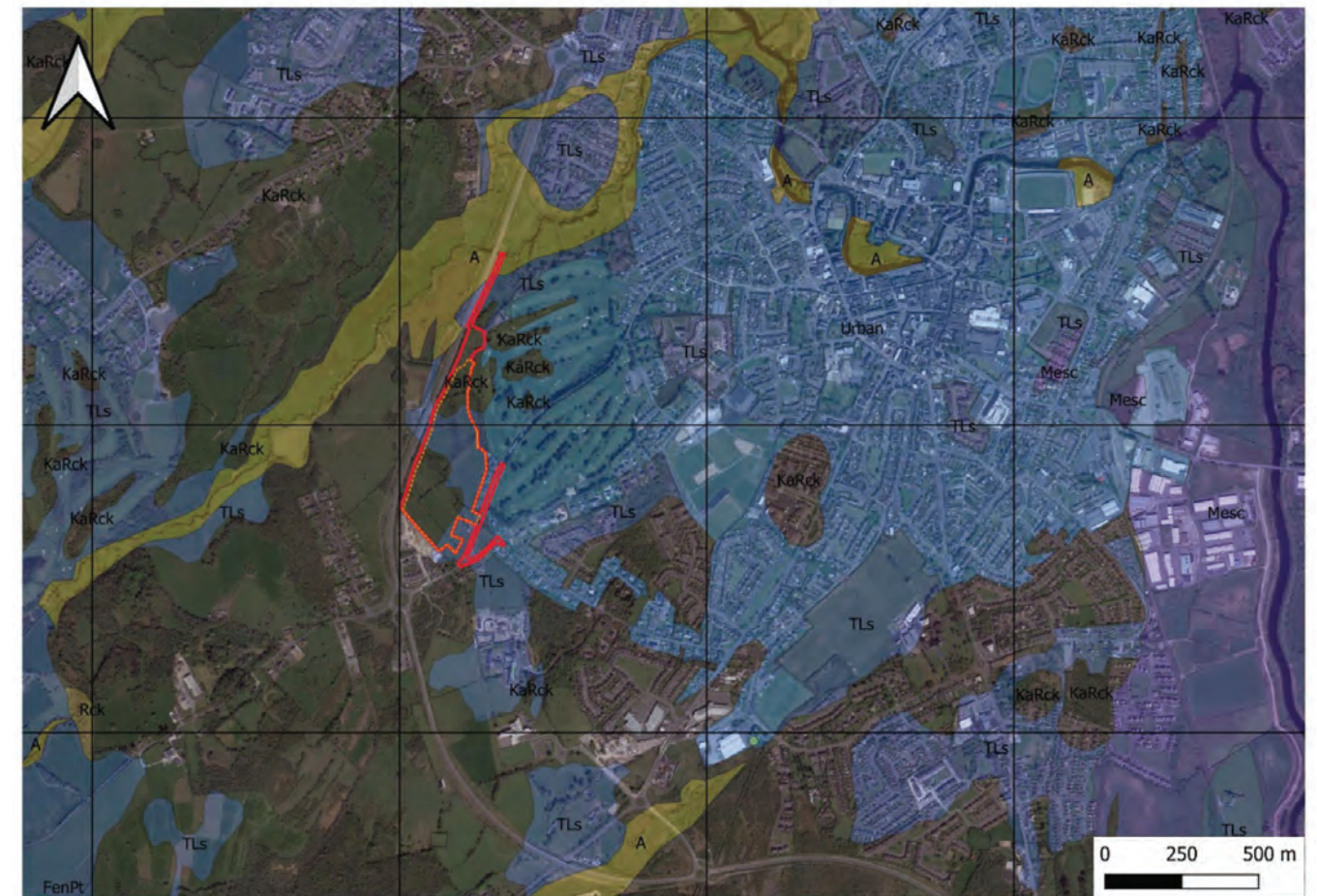


Figure 9.1 Subsoils Map

9.5.3 Geology

Review of GSI’s online mapping service (“Bedrock Geology”) describes geology in the vicinity of the site as Tournaisian to Chadian – Arundian stage which is part of the Dinantian Series of the Carboniferous Era (GSI Bedrock Sheet 14 and on-line mapping database) shows that the bedrock geology of the site.

The site is located over massive limestones - Combined Aillwee (BUaw) and Maumcaha (BUmc) Members of the Burren Formation. The Burren Formation is made up of pale grey clean skeletal limestone. The Burren Formation is bounded by the Tubber Formation to the east and the Slievenaglasha Formation to the west.

GSI have classified the site’s groundwater vulnerability as “extreme to high” for the majority of the site with “extreme” and “Rock at or near surface or Karst” in a small portion of the site. Refer to Chapter 10 (Water & Hydrology) of this EIAR for further comment regarding Hydrogeology.

9.5.4 Geological Heritage

A review of the on-line GSI and EPA web mapping indicates that there are no active or historical quarries or mines in the locality and no geological heritage sites within the proposed development.

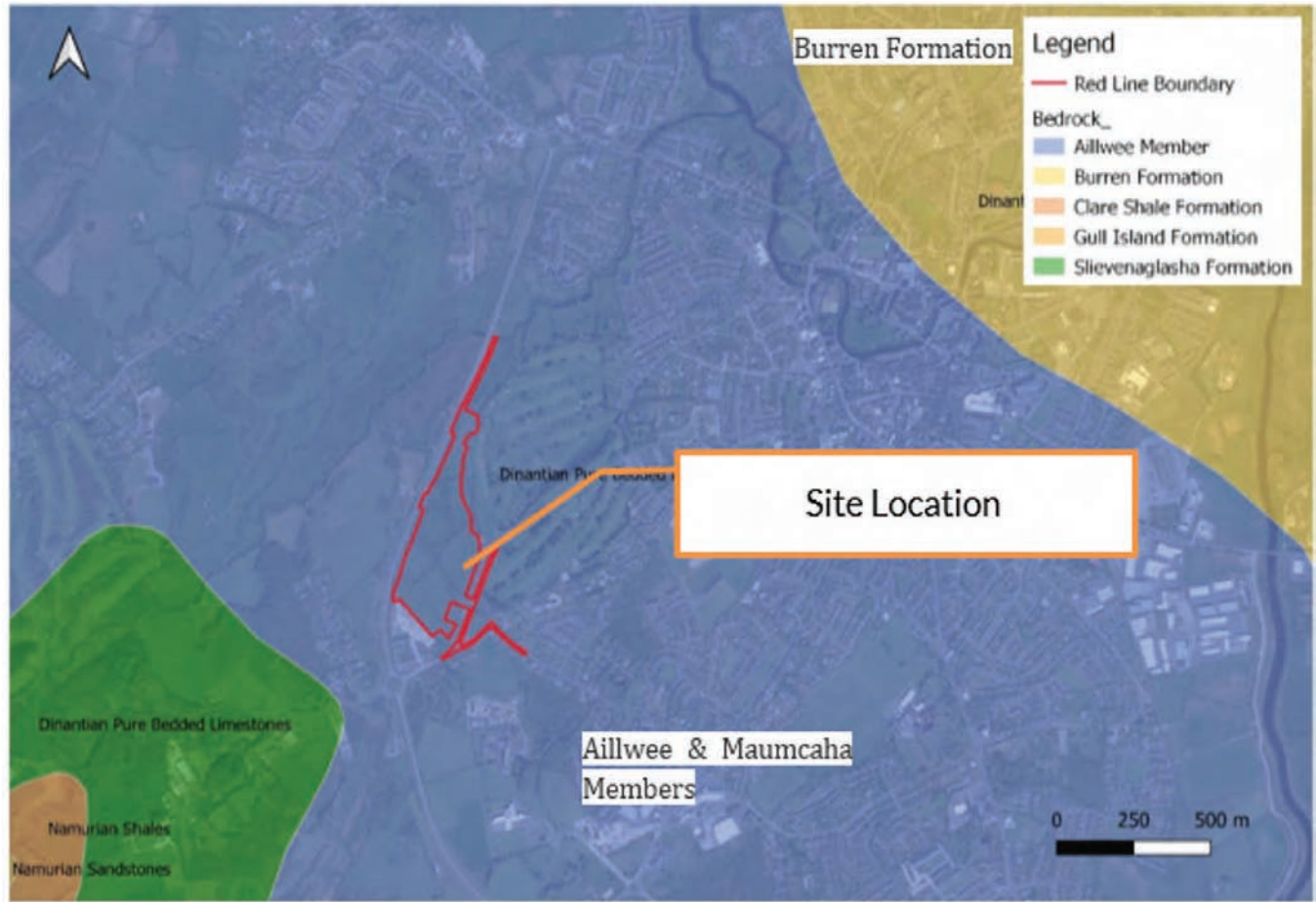


Figure 9.2 Geology Map



Figure 9.3 Geological Heritage Map

9.5.5 Contamination

In 1996 the Environmental Protection Agency (EPA) began licencing certain activities in the waste sector. This includes landfills, transfer stations hazardous waste disposal and other significant waste disposal and recovery activities. The EPA website indicated that there are no waste licenced facilities within the general locality around the site. The proposed development is a greenfield site. No Contamination was encountered during the site investigation.

9.5.6 Economic Reversal

There is no loss of mineral geology reserves as the land is located in an urban area and zoned for residential land use.

9.5.7 Characteristics of Proposed Development

Site development works will include stripping of the 0.3m thick topsoil layer. It is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces).

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In order to get sustainable foundation conditions and achieve the requirements of the Design Manual for Urban Roads and Streets some earthworks and cut and fill operation will be required for the development of all areas of the site. Excavation of subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water. In general, the proposed gradients follow the natural topography of the site. However, a cut and fill operation will be necessary to re-grade certain parts of the site. For instance, grading the internal road network to tie into the link road and raising ends of runs to achieve adequate falls in the drainage network. Underlying subsoil layers generally comprise of gravelly till and are also expected to be suitable for reuse as non-structural fill (e.g., build-up of back gardens areas or build-up of open spaces). The proposed cut fill volumes are outlined in the Construction Waste Management Plan.

A Resource Waste Management Plan has been prepared by AWN Consulting and is included in Appendix 8.1 of this EIAR. The document has been prepared in accordance with the Environmental Protection Agency’s Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for construction and demolition projects. The purpose of the Construction Waste Management Plan (CWMP) is to ensure that waste storage and movement within the development takes place in a manner which complies with relevant legislation and has a minimal impact on the nearby existing commercial and residential areas and ensures, where prevention is not possible, that maximum reuse, recycling and recovery of waste with diversion from landfill, wherever possible.

Importation of fill will be required beneath houses, driveways and to roadways (structural fill). Further information regarding importation of fill is included below.

9.6 Predicted Impacts

This section provides a description of the specific, direct and indirect impacts that the proposed development may have during the construction and operational phase of the proposed project. The mitigation measures for the construction and operational phase are outlined in section 9.7 of this report.

9.6.1 Do Nothing Scenario

There will be no impact on soils and the geological environment if the development does not proceed as the land will remain in agricultural use and the geological regime will remain unchanged.

Criteria for evaluating impact level are shown in Table 9-1. Terminology for impact significance and duration follows those set out in the NRA Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009).

Table 9.1 Sensitivity of Effects

Sensitivity	Examples
Very High	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource Groundwater which supports river, wetland or surface water body ecosystem protected by EU legislation e.g., SAC or SPA status
High	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) Moderately sized existing quarry or pit Regionally Important Aquifer with multiple wellfields Regionally important potable water source supplying >2,500 homes Inner source protection area for regionally important water source
Moderate	Contaminated soil on-site with previous light industrial usage Small recent landfill site for mixed wastes Small existing quarry or pit sub-economic extractable mineral resource Regionally Important Aquifer Groundwater which 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 Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Large historical and / or recent site for construction and demolition wastes Small historical and / or recent landfill site for construction and demolition wastes

The magnitude of any effects considers the likely scale of the predicted change to the baseline conditions resulting from the predicted effect and considers the duration of the effect, i.e., temporary or permanent. Definitions of the magnitude of any effects are provided in Table 9-2 and again are based on the NRA Guidelines (2009).

Table 9.2 Magnitude of Effects

Magnitude	Criteria	Examples
Very High / High adverse	An impact, which obliterates sensitive characteristics of the soil or geology environment	Loss of high proportion of future quarry or pit reserves Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Removal of large proportion of aquifer Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems Potential high risk of pollution to groundwater from routine run-off Calculated risk of serious pollution incident >2% annually
Moderate adverse	Fundamental change to ground conditions, groundwater quality or flow regime	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Requirement to excavate / remediate significant proportion of waste site Removal of moderate proportion of aquifer Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems Potential medium risk of pollution to groundwater from routine run-off Calculated risk of serious pollution incident >1% annually
Low adverse	Measurable change to ground conditions, groundwater quality or flow regime	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in slight change to water supply springs and wells, river baseflow or ecosystems Potential low risk of pollution to groundwater from routine run-off Calculated risk of serious pollution incident >0.5% annually
Negligible	No measurable effects on ground conditions, groundwater quality or flow	No measurable changes in attributes
Low Beneficial	Minor change to ground conditions, groundwater quality or flow regime	Slight enhancement of geological heritage feature.
Moderate Beneficial	Measurable change to ground conditions, groundwater quality or flow regime	Moderate enhancement of geological heritage feature
High Beneficial	Fundamental change to ground conditions, groundwater quality or flow regime	Major enhancement of geological heritage feature

Effect ratings may have positive, neutral, or negative application where:

- Positive impact – A change which improves the quality of the environment;
- Neutral impact – A change which does not affect the quality of the environment; and
- Negative impact – A change which reduces the quality of the environment.

Terms relating to the duration of effects are as described in the EPA’s Guidelines on the Information to be contained in Environmental Impact Statements (2022) as:

- Momentary Effects – Effects lasting from seconds to minutes;
- Brief Effects – 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; and
- Reversible Effects – Effects than can be undone, for example through remediation or restoration.

A degree of confidence is assigned to assess the likelihood of an impact occurring (integration of impact characteristics). The following likelihood scale (as defined within the NRA Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009)) is referred to:

- Certain/Near Certain: >95% chance of occurring as predicted;
- Probable: 50-95% chance as occurring as predicted;
- Unlikely: 5-50% chance as occurring as predicted; and
- Extremely Unlikely: <5% chance as occurring as predicted.

A qualitative approach was used in the evaluation, following the significance classification in Table 9-1 and through professional judgement. The significance of the effect has been determined through the consideration of the importance/sensitivity of the receptor (attribute) likely to be impacted and the magnitude (the degree or level) of that impact. Effects have been identified as beneficial, adverse or negligible, temporary or permanent and their significance as major, moderate, slight or not significant (negligible) as shown in Table 9-3. Both the adverse and beneficial effects are considered.

Table 9.3 Effects Matrix

Sensitivity	Magnitude			
	Very High	High	Moderate	Low
Very High	Profound	Profound	Moderate	Low
High	Profound	Moderate	Moderate / Low	Moderate / Slight
Medium	Moderate	Moderate / Low	Moderate / Slight	Slight
Low	Moderate/Low	Slight	Slight	Negligible
Negligible	Slight	Slight	Negligible	Negligible

In order for a potential effect to be realised, three factors must be present. There must be a source or a potential effect, a receptor which can be adversely affected and a pathway or connection which allows the source to effect the receptor. Only when all three factors are present can an effect be realised.

9.6.2 Construction Phase

The potential impact of the proposed development on the land and soils/geology is primary the removal of the topsoil cover, and in some areas the underlying subsoils, down to the required formation level. The excavation work and soil/subsoil removal during the construction phase will create on-site transport requirements and potential on-site sediment management issued in terms of potential dust generation and suspended sediment run off to surface waters.

The nature of the proposed residential development will result in a number of potential direct and indirect construction phase impacts on the geological environment. There are :

- Removal of existing topsoil and subsoil;
- Excavation of some subsoils to achieve the required formation level;
- Fuel spills from construction machinery working on the site or during re-fueling;
- Uncontrolled sediment runoff.

Geological Heritage, Contamination and Economic resources

There are no Geological heritage sites, contamination sites and economic resources that will be affected by the proposed development

Significance/Sensitivity: Negligible

Description of Impact: Negligible

Hence, the assigned **Significance of effects** is Imperceptible

9.6.2.1 Stripping of Topsoil

Removal of the existing topsoil layer will be required. As noted previously, it is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces).

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.

Table 9.4 Estimated Topsoil Volumes

	Volume (m³)
Topsoil Strip (300mm thick layer)	27,000
Topsoil Reuse (landscaping of open spaces etc.)	27,000

9.6.2.2 Excavation of Subsoil /weathered bedrock Layers

Excavation of existing subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water.

Underlying subsoil layers generally comprise of brown sandy gravelly SILT or CLAY and are expected to be generally suitable for reuse as non-structural fill (e.g., build-up of back gardens areas or build-up of open spaces).

Table 9.5 Estimated subsoil/reuse Volumes

	Volume (m³)
Cut	45,000
Reuse of Excavated Material as Non-Structural Fill	45,000

Soil and stone materials imported to site, will be natural stones sourced from locally available quarries, greenfield / inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by- product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

The majority of imported soil replacement materials will be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds. Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from the indigenous arisings from the site. All excavation to accommodate imported material will be precisely coordinated to ensure no surplus material is brought to site beyond the engineering requirement.

Table 9.6 Imported Soil

	Volume (m³)
Fill (Total)	65,000
Reuse of Excavated Material as Non-Structural Fill	45,000
Imported Fill	20,000

Significance/Sensitivity: Negligible

Description of Impact: Negligible

Hence, the assigned **Significance of effects** is Imperceptible.

9.6.2.3 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

Any excavations associated with development of the site are expected to be relatively shallow (e.g., no basement construction is proposed) and are not expected to significantly impact on the underlying geology.

Earthworks plant and vehicles delivering construction materials to site (e.g., road aggregates, concrete deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network).

Significance/Sensitivity: Low

Description of Impact: Low

Hence, the assigned **Significance of effects** is Not Significant

9.6.3 Operational Phase

On completion of the construction phase, there will be no further impact on soils and the geological environment. In term of land use the change of use will result in less agricultural lands within an urban area. The potential impact is not significant. In relation to topsoil, approximately 8.9 hectares will be removed from agricultural land use. The residentially zoned land will be fenced off and removed from agricultural production from the Construction Phase onwards. The potential loss of agricultural land is considered long term, not significant and certain.

Significance/Sensitivity: Low

Description of Impact: Low

Hence, the assigned **Significance of effects** is Not Significant

9.7 Mitigation and Monitoring Measures

Following an assessment of the potential impacts the proposed development was methodically reviewed and mitigation methods were developed that will avoid, prevent or reduce any negative effects on the environment.

It should be noted that several mitigation measures are proposed in other chapters of this EIAR.

9.7.1 Construction Phase Mitigation

The mitigation measures proposed for implementation during the construction phase are set out in the Construction Environmental Management Plan (CEMP) submitted as part of this application.

9.7.1.1 Soil/Subsoil management

Stripping of Topsoil

- Stripping of topsoil will be managed with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. Topsoil stockpiles will also be located so as not to require double handling.
- Surface water runoff from areas stripped of topsoil will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- On-site settlement ponds will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

Excavation of Subsoil Layers

- Excavation of existing subsoil layers has been minimised. Cut type earthworks operations will not be required to achieve designed site levels.
- Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed will be minimised in order to mitigate against weather effects.
- Stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. Measures will be implemented to capture and treat sediment laden surface water runoff (e.g., sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
- Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

9.7.1.2 Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

No mitigation measures are proposed in relation to the geological environment.

9.7.2 Operation Phase Mitigation

On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment. SuDS measures will be maintained as part of the operational phase.

9.7.3 Do Nothing Scenario

No mitigation measures are proposed in relation to soils and the geological environment if the development does not proceed.

9.8 Residual Impacts

9.8.1 Construction Phase

Implementation of the measures outlined will ensure that the potential impacts of the proposed development on soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term.

9.8.2 Operational Phase

There are no predicted impacts arising during the operational phase.

9.8.3 Do Nothing Scenario

There are no predicted impacts should the proposed development not proceed.

9.9 Monitoring

The proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to Construction Environmental Management Plan (CEMP)
- Construction monitoring of the works (e.g., inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring of contractor's stockpile management (e.g., protection of excavated material to be reused as fill)

Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.) No ongoing monitoring is proposed on completion of the construction phase.

9.10 Potential Cumulative Impacts

A review of planning applications in the area surrounding the site was undertaken as part of the EIAR assessment. Other developments currently under construction and other committed development in the vicinity of the site have been considered and are also listed in the Introduction Chapter of the EIAR and will not result in significant cumulative impacts during the construction or operational phase in relation to soils and geology. Should the construction phase of any developments coincide with development of the site, potential cumulative impacts are not anticipated once similar ameliorative, remedial and reductive measures are implemented.

9.11 Reinstatement

All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings. All construction waste and / unused building materials are to be removed from site on completion of the construction phase.

9.12 Interactions

The assessment of soils, geology, and hydrogeology is intrinsically linked with multiple other chapters within this Environmental Impact Assessment Report (EIAR). These interdisciplinary interactions ensure a comprehensive understanding of the environmental baseline and potential impacts associated with the Proposed Development:

- Chapter 05: Landscape and Visual
Earthworks and soil stripping activities affect landform and terrain stability, which in turn influence landscape character and visual amenity. Soil conservation measures contribute to maintaining landscape integrity.
- Chapter 06: Traffic and Transport
The sourcing and transportation of fill material influence traffic flows and emissions; careful planning reduces disruption and environmental impact.
- Chapter 08: Material Assets - Waste
Soil and subsoil excavation, reuse, and importation tie directly into waste management strategies. The classification of excavated material as waste or by-product affects resource management and compliance with legislation.
- Chapter 10: Water and Hydrology
The hydrogeological characteristics of soils and subsoils directly influence groundwater vulnerability, surface water runoff, and drainage patterns. Soil permeability and infiltration rates inform the design of sustainable drainage systems and attenuation measures.
- Chapter 11: Biodiversity
Soil types and quality affect vegetation patterns and habitat suitability for flora and fauna. Changes in soil properties during construction can impact local ecology, soil microbial communities, and habitat connectivity.
- Chapter 13: Air Quality
Soil disturbance during construction can generate dust emissions, affecting local air quality. The management of exposed soils is crucial to mitigate particulate matter release.
- Chapter 15: Cultural Heritage – Archaeological & Built Heritage
Subsurface soils may contain archaeological deposits or paleoenvironmental records. Excavation impacts on soils are coordinated with archaeological assessments to prevent loss of heritage assets.

By considering these interactions, the EIAR ensures that potential cumulative and secondary impacts related to soil and land are identified, assessed, and mitigated holistically.

9.13 References

Legislation, Regulatory Frameworks and Permitting Authorities

- Planning and Development Acts 2000–2021.
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.
- Consolidated Environmental Impact Assessment (EIA) Directives 2011/92/EU and 2014/52/EU.

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- European Communities (Water Policy) Regulations 2003 [S.I. No. 722/2003].
- Waste Management Act 1996 as amended.
- European Communities Environmental Objectives (Groundwater) Regulations 2010 [S.I. No. 9/2010].
- European Communities (Environmental Impact Assessment) (Amendment) Regulations 2001 [S.I. No. 538/2001].
- Groundwater Directive (80/68/EEC) (now repealed).
- Groundwater Directive (2006/118/EC).
- Water Framework Directive (2000/60/EC).
- European Communities (Waste Directive) Regulations 2011 – particularly Article 27(1) regarding by-product status.
- European Communities (Waste Directive) Regulations 2011, particularly Article 27(1) – criteria for determining when a material is a by-product (approved by the EPA).
- National Waste Collection Permit Office (NWCPO). National authority responsible for the administration of waste collection permits and maintaining the National Waste Permit Register. Available at: www.nwcpo.ie

Guidelines and Technical Standards

- European Commission (2017). *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report* (Directive 2011/92/EU as amended by 2014/52/EU).
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- Environmental Protection Agency (2019). *Guidance on By-product and End-of-Waste under Article 27 and Article 28 of the European Communities (Waste Directive) Regulations 2011*. Wexford: EPA.

Data Sources

- Geological Survey of Ireland (GSI) – Online Mapping and Bedrock Geology Viewer (Bedrock Sheet 14).
- Environmental Protection Agency (EPA) Online Mapping (2022) – Groundwater Vulnerability, Waste Licensing Data.
- Ground Investigation Ireland (GII) (2021). *Ground Investigation Report* – See Appendix 9.1 of the EIAR.
- TOBIN Consulting Engineers – Review and assessment of trial pit logs and supporting data.
- AWN Consulting – *Resource Waste Management Plan* (Appendix 8.1 of the EIAR).

Site Investigation and Technical Works

- GII (2021). Ground investigation campaign including:
 - 16 No. Trial Pits (max depth 3.2m bgl)
 - 3 No. Soakaways (BRE 365)
 - 63 No. Dynamic Probes
 - 4 No. Cable Percussion Boreholes (to 1.0m bgl)
 - 4 No. Rotary Core Boreholes (to 6.90m bgl)
 - Geotechnical & Environmental Laboratory Testing
- Site-specific follow-up investigation (November 2021) consisting of 16 No. Trial Pits – Logs reviewed by TOBIN.

Consultation

- An Bord Pleanála (ABP)
- Geological Survey of Ireland (GSI)
- Clare County Council
- Environmental Protection Agency (EPA)

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CHAPTER TEN

WATER AND HYDROLOGY



RECEIVED: 30/06/2025

CHAPTER TEN

Table of Contents

Water and Hydrology

10.1 Introduction..... 10-1

10.2 Methodology 10-1

10.3 Description of existing Environment 10-3

10.4 Predicted Impact of the Project..... 10-7

10.5 Mitigation and Monitoring 10-8

10.6 Residual Impacts..... 10-9

10.7 Monitoring..... 10-10

10.8 Interactions..... 10-10

10.9 References..... 10-10

Table of Tables

Table 10.1 Criteria for Rating Project-specific Receiving Surface
Water Attributes 10-2

Table 10.2 Criteria for Estimating Description of Impact on
Receiving Surface Water Attributes 10-2

Table of Figures

Figure 10.1 Significance/Magnitude Matrix 10-3

Figure 10.2 Site Photo Facing North..... 10-4

Figure 10.3 Hedgerows Within the Site..... 10-4

Figure 10.4 Surface Water Features and Sub-Catchments..... 10-5

Figure 10.5 Drumcliff SPZ Figure 10-6

RECEIVED: 30/06/2025

CHAPTER 10 | Water and Hydrology

10.1 Introduction

This Chapter presents the assessment of potential significant effects of the proposed housing development on the surface water receiving environment during Construction and Operational Phases. It describes the methodology applied and documents the existing environmental conditions which serves as baseline for the impact assessment. It also identifies suitable mitigation measures and describes the Project’s anticipated residual effects.

This Chapter should be read in conjunction with:

- Chapter 2 (Project Description);
- Chapter 11 (Biodiversity); and
- Chapter 9 (Land & Soils).

This Chapter sets out to describe the potential effects that a housing development may have on the baseline environment in terms of soils, geology and hydrogeology. Within that context, it identifies mitigation measures which can serve to avoid or minimise any adverse effects and documents geological and hydrogeological conditions which can still influence the implementation planning of the Project.

A considerable volume of geological and hydrogeological information was already presented in the 2017 EIAR for the previous planning application (Tobin 2017). This serves as relevant background information for the current EIAR.

10.1.1 Author Information and Competency

John Dillon is Professional Geologist (P.Geo.) and chartered waste manager (MCIWM) in the Energy and Environment section of TOBIN. He holds a degree in Environmental Science from the National University of Ireland, Galway and a Masters in Science in Environmental Engineering from the Imperial College London. John provides project management, project co-ordination and specialist contribution to hydrogeology/hydrological reports for Planning Applications, Environmental Impact Assessment Reports and waste licence applications. John has twenty years’ experience in the areas of environmental management and assessment with particular reference to the transmission line projects, energy projects, hydrogeological projects and public consultation in Ireland and the UK. John has been involved with the waste licence/permit applications, design and planning applications for retail/commercial developments, waste management facilities and quarries nationwide. John has contributed to Screening Reports and Natura Impact Statements for wastewater treatment plants, pipeline projects, solar farm and wind energy developments and has defended Appropriate Assessments at Oral Hearings for waste management facilities and road projects.

Dr. Aristotelis Tegos, Aristoteles has over 18 years’ Civil Engineering experience in multidisciplinary water related works in Ireland and abroad (Greece, U.K, Rwanda, Lesotho) – including flooding protection modelling and design, hydrology engineering, dam design, sewer networks, water supply systems. He is currently Flood and Dam Lead at TOBIN responsible for the technical project management of Flood Relief Schemes, Flood Risk Assessment and Dam construction supervision and surveillance. He has an extensive published scientific work (co-author of more than 20 peer-reviewed articles) in several high IF peer-reviewed journals (Journal of hydrology, Hydrological Sciences Journal, Water, Hydrology etc.) with the aim to explore new and innovative engineering approached in the field of hydrology, flood engineering, natural disasters, environmental flows and water resources management. He is a Fellow member of Engineer’s Ireland.

10.2 Methodology

10.2.1 Scope of Assessment

This methodology and scope of assessment considers involved the completion of a Desk Study and Site Walkover and includes the following:

River Flow:

- Effects on (fluvial) flood risk

River Water Quality:

- Effects on the water quality of the Claureen River (Inch River)
- Effects on the WFD status classification of the Claureen/Fergus River

10.2.2 Legislation and Guidance

The impact assessment for the Water chapter for the EIAR has been conducted in the context of the following relevant directives, regulations and guidance:

Directives:

- European Commission (2017) Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).
- European Union (2000/60/EC) Water Framework Directive.
- European Union (2006/188/EC) Groundwater Directive.
- European Union (1992/43/EEC) Habitats Directive.

National Legislation:

- S.I. number 349 of 1989, European Communities (Environmental Impact Assessment) Regulations, with amendments.
- S.I. number 722 of 2003, European Communities (Water Policy) Regulations.
- S.I. number 272 of 2009, European Communities Environmental Objectives (Surface Waters) Regulations, with amendments.

Guidance:

- EPA (2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May 2022).
- Department of Housing, Planning and Local Government (2018): Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018).
- National Roads Authority (NRA) (2009): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

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10.2.3 Appraisal Methodology

The appraisal methodology is based on the source-pathway-receptor model of environmental risk assessment. For potential effect to be realised, there must be a source or a cause of effect, a receptor which can be adversely affected, and a pathway or connection which allows the source to affect the receptor.

The rating criteria considers the importance or sensitivity of the receiving surface water(s) of the Project site, and the magnitude of predicted impacts is judged for each attribute considered.

10.2.3.1 Rating Attributes and Magnitude of Effects

A criteria rating scheme which was tailored to the Project site was developed as presented in Table 10.1 and Table 10.2 below. The magnitude of the predicted effect is judged by scale and extent, duration, timing (e.g., seasonality) and frequency (e.g., permanent or seasonal).

Table 10.1 Criteria for Rating Project-specific Receiving Surface Water Attributes

Attribute Importance/ Sensitivity	Criteria	Attributes Considered
Very High	Important at a national or international scale	Receiving water is a designated Protected Area. Receiving water is protected under EU/ Irish legislation (SAC, cSAC, SPA, pSPA, NHA, pNHA). Receiving water is a WFD High Status water body.
High	Important at a national or regional scale	Receiving water is part of a designated Protected Area. Receiving water is a WFD Good Status water body and/or a Good biological quality river (Q4 to Q5). Receiving water is important for social or economic uses, including navigation.
Medium	Important at a regional or local scale	Receiving water is part of a designated Protected Area and may support a small / limited population of protected species. Receiving surface water is a WFD Good or Moderate Status water body where significant pressures are partly or wholly unrelated to the Project site. Receiving water has limited social or economic uses.
Low	Important at a local scale	Receiving water is not part of or is far removed (>5 km) from, a downstream, designated Protected Area. Thus, receiving water has no specific conservation requirements. Receiving surface water is a WFD Moderate or Poor Status water body where significant pressures are partly or wholly unrelated to the Project site.
Negligible	Important at a local scale	Receiving water is not part of or is far removed (>5 km) from, a downstream, designated Protected Area. Receiving water has naturally low aquatic fauna and flora biodiversity. Receiving water has minimal importance for social or economic uses.

Table 10.2 Criteria for Estimating Description of Impact on Receiving Surface Water Attributes

Description of Impact	Criteria	Attributes Considered
High	Adverse: Results in loss of attribute and/or quality and integrity of attribute	Loss of or extensive change to a designated Protected Area, including the conservation objectives of a designated water-dependent SAC/SPA. Loss of fishery production. Significantly reduces streamflow conditions. Significantly alters river morphology. Causes deterioration of WFD status, especially failure to meet good status objectives. Induces a negative chemical quality trend. Calculated risk of serious pollution incident >2% annually. ¹ Effects cannot be mitigated.
Medium	Adverse: Results in effect on integrity of attribute or loss of part of attribute	Manageable change to a designated Protected Area Manageable change to streamflow conditions. Some alteration to river morphology. May cause a deterioration of WFD water body status or may prevent improvement in WFD status. May induce a negative chemical quality trend. Calculated risk of serious pollution incident >1% annually. ¹ Effects can be mitigated.
Low	Adverse: Results in a manageable effect on integrity of attribute or loss of part of attribute	Small measurable and acceptable loss of streamflow. Alteration to river morphology is minor and acceptable. Unlikely to cause a change to WFD water body status Unlikely to cause a negative chemical quality trend. Effects can be mitigated.
Negligible	Imperceptible alteration to one or more characteristics, features or elements of attribute	No measurable effect on receiving surface water body Calculated risk of serious pollution incident <0.5%. ¹
Low Positive	Beneficial: Results in some positive effect on attribute or a reduced risk of negative effect occurring	Maintains Protected Area environmental requirements. Maintains WFD water body status. May contribute to reversing a negative chemical quality trend.
Medium Positive	Beneficial: Results in moderate improvement in attribute quality integrity	Maintains or is likely to meet Protected Area environmental requirements. Maintains WFD water body status and may improve a "less than Good" status classification. Activity improves river morphological conditions.
High Positive	Beneficial: Results in major improvement in quality and integrity of attribute	Results in Protected Area environmental requirements being met (when they previously did not do so). Helps achieve a WFD High or Good status objective. Reverses a negative chemical quality trend. Activity significantly improves river morphological conditions.

Notes: ¹ Based on NRA guidelines (2009)

With reference to Tables 10.1 and 10.2, designated Protected Areas are:

- Bathing Waters
- Shellfish Waters
- Salmonid Waters
- Freshwater Pearl Mussel Waters
- Nutrient Sensitive Areas
- European (Natura) Sites
- Drinking Water Protected Areas

Protected Areas have environmental requirements which are stipulated in Protected Area regulations, as follows:

- Bathing Water Quality Regulations 2008, S.I. number 79 of 2008, as amended
- Quality of Shellfish Waters Regulations 2006, as amended
- Salmonid Regulations, S.I. number 293 of 1998, as amended
- Freshwater Pearl Mussel Regulations, S.I. number 296 of 2009
- Urban Wastewater Treatment Regulations S.I. number 208/1999, as amended
- Birds and Natural Habitats Regulations, S.I. number 477 of 2011, as amended
- Drinking Water (number 2) Regulations, S.I. number 278 of 2007, as amended Judging the Significance of Effects

The significance of a predicted effect is determined from the Significance/Sensitivity and the assigned magnitude of effects using the matrix provided in Figure 10.1.

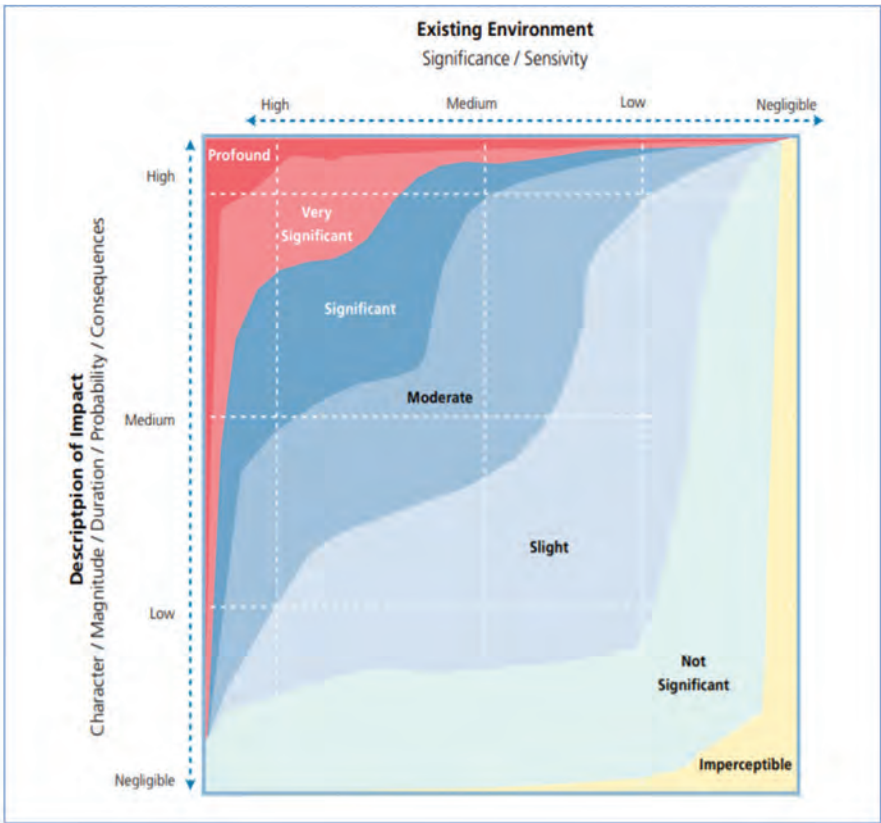


Figure 10.1 Significance/Magnitude Matrix

10.2.4 Desk Study

A desk study was undertaken as part of the characterisation of baseline conditions. This involved an examination of past reports and publicly available sources of information that include the resources listed in Appendix D of the IGI guidance (IGI 2013). Specific reports from the Proposed development which are of immediate relevance to this Chapter are:

- GII report (2021). Site investigation report

10.2.5 Difficulties Encountered in Compiling Information

No significant constraints were encountered during the compilation of this Chapter. A robust evaluation of the likely significant effects of the Project has, therefore, been undertaken for the purpose of preparing this Chapter.

10.2.6 Worst Case Scenario

The ‘worst case scenario’ has been considered in assessing the likely significant effects of available ranges of options or design parameters.

Where a worst-case scenario has been assessed in this Chapter, details are provided outlining the maximum dimensions or volumes associated with particular activities, the maximum emissions predicted, and the range of technologies and processes anticipated to be employed.

10.3 Description of existing Environment

The detailed description of the proposed development and construction activities are provided in Chapter 1 (Introduction) and Chapter 2, (Project Description). The details of the sites proposed connectivity to the existing water supply network, wastewater and drainage infrastructure are presented in Chapter 7 (Material Assets: Built Services).

10.3.1 Receiving Surface Waters

The proposed development at Circular Road, Ennis is located approximately 1.6km from Ennis town centre , on agricultural lands within the development boundary of the town.

The site is a gently undulating site comprised of open field and encroaching scrub from overgrown/rank hedgerows. Figure 10.2 and Figure 10.3 show the existing site conditions.

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Figure 10.2 Site Photo Facing North



Figure 10.3 Hedgerows Within the Site

Two streams are located in the surrounding area see Figure 10.4:

- Fergus River, which is located 2km northeast and east of the Project location.
- Claureen River, which is a tributary of the Fergus River 0.4km west of the Project location.

Surface water drainage comprises the Claureen River which runs to the northwest of the northern development site boundary, and which generally flows in a NE direction. The river is also known as the Inch River (EPA name, 2022) and converges with the river Fergus farther to the NE which in turn ultimately discharges into the Fergus and Shannon Estuary.

Regional and local hydrology is intrinsically connected to the hydrogeological setting within the greater development area.

According to the EPA (2021) on-line mapping, the proposed development site lies within the Shannon Estuary North Catchment (Hydrometric Area number 27) and the River Fergus sub-catchment – Fergus_060, See Figure 10.4. While the greater area contains several karst features, there are no known karst features on site.

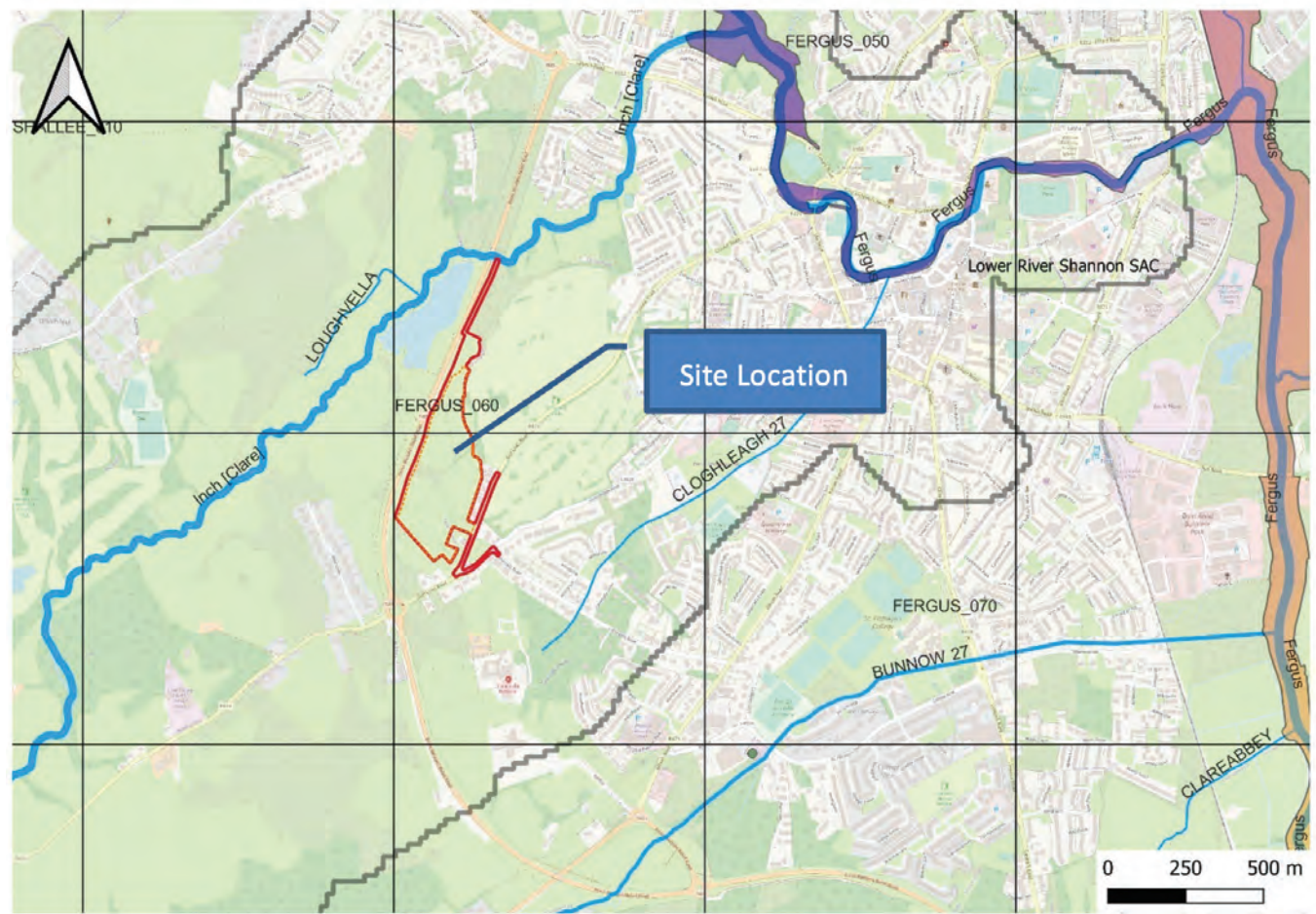


Figure 10.4 Surface Water Features and Sub-Catchments

The Claureen River is the closest surface water body to the proposed development. Prior to development, the Ordnance Survey Ireland (OSI) six-inch to 1-mile scale field sheets indicate that there were no natural surface water streams within the site. The site slopes towards the Claureen River.

10.3.2 Aquifer and Groundwater body

The bedrock underlying are classified as Dinantian Pure Bedded Limestones (GSI, 2022). The bedrock comprises predominantly thinly bedded, pale and dark grey limestones with some chert in places.

The aquifer type is a Regionally Important Aquifer (Rkc) aquifer on bedrock which is Karstified. The groundwater vulnerability is predominantly extreme with a small area of High along the east of the Site, and the northern area of Golf Links Road is designated as Moderate. The site is situated on the Ennis groundwater body, which at good status but is At Risk of not meeting its WFD objectives.

10.3.3 Designated Protected Areas

The nearest relevant Protected Areas downstream of the site are:

- Drinking Water Protected Area – Drumcliffe Source and Source Protection zone.
- Natura Site: Lower River Shannon SAC, which the Fergus River flows into at a location just downstream of Claureen Bridge in Ennis, 2 km (straight line) to the north of proposed development. Although the Claureen River is not a designated Salmonid Water, the tidal section of the river Fergus downgradient is a Salmonid River.

There are no protected Bathing Waters, Shellfish Waters, Freshwater Pearl Mussel Waters, Nutrient Sensitive Areas or Drinking Water Protected Areas downgradient of the site.

10.3.3.1 EPA/GSI Source Protection Zones

As reported by the EPA and GSI, groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. Consequently, the objective of source protection zones is to provide protection by placing tighter controls on activities within all or part of the zone of contribution (ZOC) of the source.

There are two main elements to source protection land surface zoning:

- Areas surrounding individual groundwater sources; these are termed source protection areas (SPAs)
- Division of the SPAs based on the vulnerability of the underlying groundwater to contamination.

These elements are integrated to give the source protection zones.

Two source protection areas are recommended for delineation:

Inner Protection Area (SI). This area is designed to protect against the effects of human activities that might have an immediate effect on the source and, in particular, against microbial pollution. The area is defined by a 100-day time of travel (TOT) from any point below the water table to the source. In karst areas, it will not usually be feasible to delineate 100-day TOT boundaries, as there are large variations in permeability, high flow velocities and a low level of predictability. In these areas, the total catchment area of the source will frequently be classed as SI.

Outer Protection Area (SO), encompassing the remainder of the groundwater source catchment area or ZOC. It is defined as the area needed to support an abstraction from long-term groundwater recharge i.e., the proportion of effective rainfall that infiltrates to the water table.

According to the GSI/EPA Source Protection Zone Map (www.epa.ie), the site is not located within the Inner Source Protection Zone of the Drumcliff Spring Catchment, which supplies the public drinking water for the town of Ennis, Co. Clare. The delineated Source Protection Zone is shown on Figure 8.5. Based on the SPZ and site investigation works, there is no direct link between the proposed development and the Drumcliff Spring. No major conduits/faults were detected in the site.

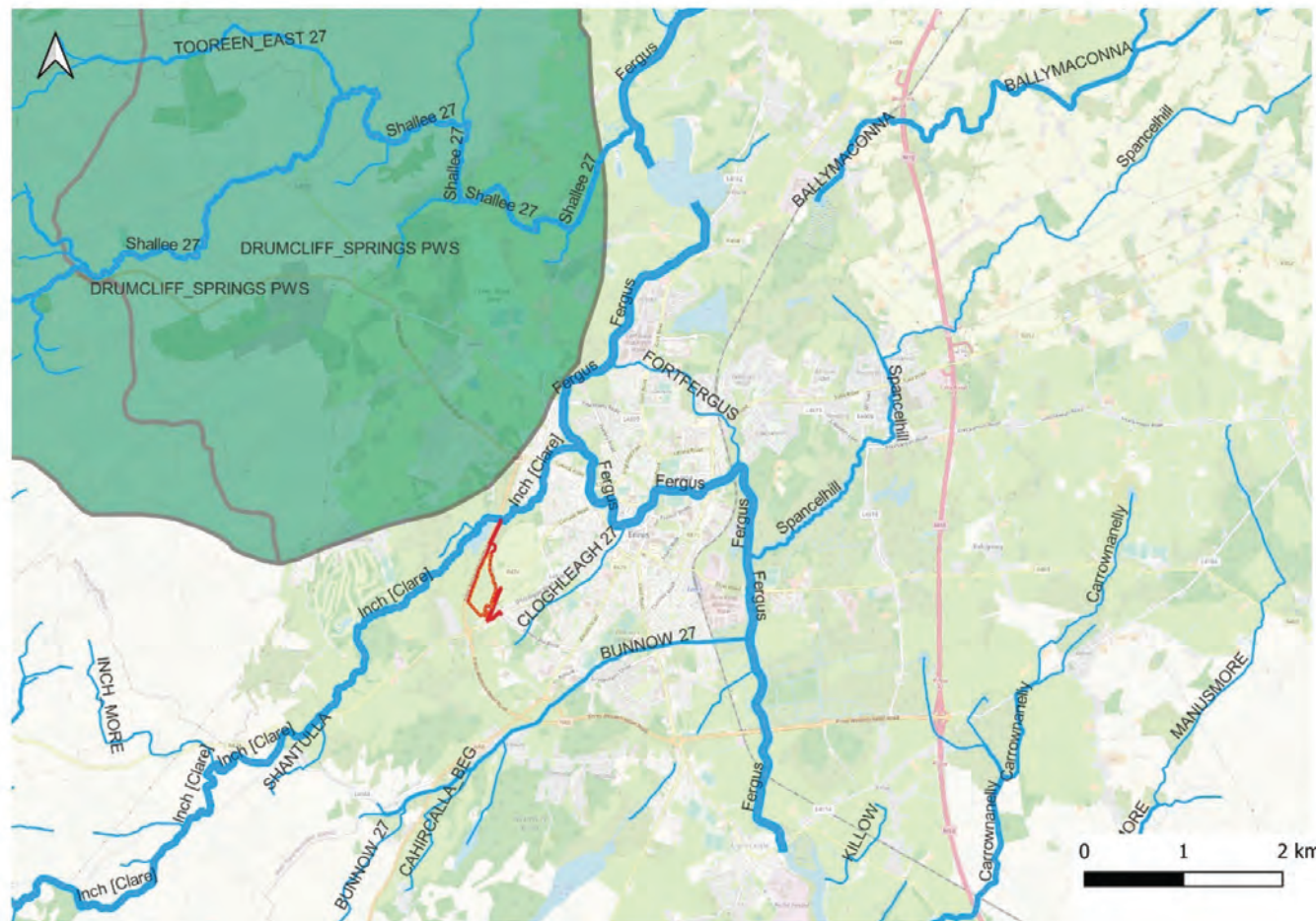


Figure 10.5 Drumcliff SPZ Figure

10.3.4 Claureen River - WFD Status

The Claureen River which flows out of proposed development is part of the larger Fergus River, which in turn is part of the Shannon Estuary North catchment. For WFD reporting purposes, the EPA refers to the subcatchment of the Claureen River as the “Fergus_060” water body. The Fergus_060 subcatchment also incorporates other tributaries.

Heavy siltation was identified within Fergus_060 with channelisation and combined sewer outflows identified as significant pressures. Channelisation and embankment are impacting the Fergus_070, a heavily modified water body.

According to EPA’s latest WFD status classification for the period 2013-2018, the section of the Claureen River to the west of the proposed development is at “Moderate ecological status”, Based on information provided by EPA for the “Fergus_060” subcatchment, the main cause of the “Poor ecological status” classification is “Poor invertebrate status”.

The latest available EPA biological Q-value for macroinvertebrates was 3 (“moderately polluted, unsatisfactory condition”) in 2019 at a location 1km just downstream of the landholding at Claureen Bridge. Nutrient conditions at Claureen Bridge are within the WFD limits in terms of Ammonium, Total Oxidisable Nitrogen and Orthophosphate. Station 0540 recorded an improvement to Moderate ecological quality from Poor status in 2020.

EPA’s latest available local catchment assessment report for the “Fergus_060” subcatchment (EPA 2019) identifies the following significant pressures in the subcatchment:

- Urban runoff
- Hydromorphology (channelisation and embankment)

The “Fergus_060” water body is “At Risk” of meeting the WFD good status objective in 2027.

The nearest routine EPA water quality monitoring station on the Claureen River is at Claureen Bridge. The station is part of EPA’s WFD operational monitoring network for rivers, and is downstream of the site, suburban areas as well as agricultural lands.

10.3.5 Flooding

TOBIN Consulting Engineers undertook a Flood Risk Assessment (FRA) for their lands and proposed residential development at Drumbiggle in Ennis, Co. Clare. The greenfield site is located approximately 2km southwest of the town centre, alongside Ennis Golf Club and the N85, adjacent to the River Claureen (also known as the River Inch).

Existing ground levels are approximately 5mOD at the northern redline boundary at the River Claureen, with levels within the developable area ranging from approximately 13.4mOD at the northeastern corner to approximately 31.2mOD at the southwestern corner.

The PSFRM Guidelines classify residential development as “highly vulnerable” in terms of its sensitivity to flooding. Such developments should be constructed in Flood Zone C, where there is less than a 0.1% Annual Exceedance Probability (AEP) of fluvial, pluvial, groundwater and coastal flooding. Based on the results of the Clare Strategic Flood Risk Assessment, and OPW modelling (PFRA, CFRAM) the developable area is located outside the predicted flood extents of the Claureen River.

A drainage impact assessment was undertaken by Tobin Consulting Engineers as part of the project. This report deals with the following aspects associated with this development:

- Existing Site and Hydrological Features
- Site Investigation Testing
- Soil Type Classification
- Storm Water Drainage Design
- Sustainable urban Drainage Systems (SuDS)
- Flood Risk Assessment and Exceedance Flows
- SuDS Maintenance

Based on the results of the Drainage impact Assessment by TOBIN, the Clare Strategic Flood Risk Assessment, and OPW modelling (PFRA, CFRAM) the developable area is located outside the predicted flood extents of the Claureen River and the proposed drainage is considered ‘appropriate’ in line with the PSFRM and SuDS Guidelines.

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10.4 Predicted Impact of the Project

Infill Material will be imported on-site. This material will be either quarried product from quarries that have planning permission; greenfield/inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA’s criteria for determining a material is a by-product, under the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

It is proposed to use a Sustainable Urban Drainage Systems, (SuDS) approach to surface water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of stormwater runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed SuDS features in the development are permeable paving on driveways, cellular underground soakaways, bioswales, petrol interceptors and a hydro brake flow control.

Energy from inflowing stormwater as it enters the pond is absorbed by the water already in the pond, thus inflowing water does not cause erosion of materials at the base of the pond. Detention ponds also provide water quantity control as they retain the runoff and release it into watercourses at a pre-development flow rate.

The storm drainage has been designed using the 100-year return period plus an additional 20% to account for the effects of climate change.

10.4.1 Do Nothing Scenario

In the Do Nothing scenario, housing development does not occur. In this case, there are no further or likely significant effects arising to receiving waters. Agricultural activity would remain and contribute to the baseline water quality and flow.

10.4.2 Construction Phase

10.4.2.1 Water Quality

(i) Hydrocarbons

Risk of impact to the Claureen River during construction is temporary and can be managed by way of establishing suitable water management and sediment control practices (Section 10.6 of this chapter).

Significance/Sensitivity: Low

Description of Impact: Brief to Short Term, Unlikely and indirect.

Hence, the assigned Significance of effects is Slight.

(ii) Sediment

The construction works may release sediment/organic matter to the local surface drains. This can affect the water chemistry of the Claureen River. It is a temporary to short-term effect, localised and water management measures can be implemented to mitigate potential effects (Section 10.6 of this chapter).

Significance/Sensitivity: Low

Description of Impact: Brief to Short Term, Unlikely and indirect.

Hence, the assigned Significance of effects is Imperceptible.

Excavation activity and associated earthworks may release organic matter and sediments into the drainage network around the proposed development. The existing drainage will only be impacted in areas where construction occurs. The drained water will be directed to new SuDS measures followed by detention pond before water is further conveyed via a bioswale to the Claureen River. There are no surface water abstractions within the site. The river is at Moderate status and is affected by hydromorphology pressures and urban wastewater discharges further downstream.

Construction activity can lead to accidental spills of chemicals and fuels which can affect surface water quality. This is temporary and risks are manageable by following standard best construction practices (Section 10.6 of this chapter).

Significance/Sensitivity: Low

Description of Impact: Brief to Short Term, unlikely and indirect.

Hence, the assigned Significance of effects is Imperceptible.

(iii) Flow

The subject site is located within the Claureen River catchment, and generated runoff will be discharged at greenfield runoff rates to the stormwater outfall downstream of the N85 bridge. The developable area and open attenuation pond are located outside the predicted flood extents of the Claureen River.

The storm drainage has been designed using the 100-year return period plus an additional 20% to account for the effects of climate change.

Significance/Sensitivity: Medium

Description of Impact: Low/Negligible, Short Term

Hence, the assigned Significance of effects is Imperceptible.

(iv) Flooding

The subject site is located within the Claureen River catchment, and generated runoff will be discharged at greenfield runoff rates to the stormwater outfall downstream of the N85 bridge. The developable area and open attenuation pond are located outside the predicted flood extents of the Claureen River. All works within the floodplain are drainage associated, and will not impact existing ground levels, fluvial flow routes or floodplain storage. Therefore, it is estimated that risk of fluvial flooding associated with the proposed development is minimal.

Significance/Sensitivity: High

Description of Impact: Negligible, short term, unlikely

Hence, the assigned Significance of effects is Imperceptible.

10.4.3 Operations Phase

The storm drainage may potentially release sediment and potential pollutants to the local drainage channels. Such constituents can affect the water chemistry of the Claureen River. This is a long-term risk, but water management measures can be established to mitigate potential effects (Section 10.5).

There are no surface water abstractions within 5 km of the site and the site is not located downgradient. The river is at Poor/Moderate status and is affected by urban wastewater discharges further downstream.

Significance/Sensitivity: Low

Description of Impact: Low/Negligible, long term, unlikely

Hence, the assigned Significance of effects is Imperceptible.

Because the drainage is contained and treated, the Claureen River will not be during operations.

Significance/Sensitivity: Low

Description of Impact: Low/Negligible, long term, unlikely

During operational phase, there will be a minor reduction in recharge to groundwater and a minor increase to the surface water environment, as rainwater falling on areas will be diverted to the drainage network. This change is negligible when compared to the flow in the Claureen River.

Significance/Sensitivity: Low

Description of Impact: Negligible

Hence, Significance of effects is Imperceptible.

Operational activity can result in accidental spills which, like the construction phase, can result in temporary to short-term impacts to surface water. Repeated offences could cause cumulative effects but associated risks of spills are manageable by following standard best operational practices (Section 8.6).

Significance/Sensitivity: Low

Description of Impact: Low/Negligible, long term, unlikely

Hence, Significance of effects is Imperceptible.

10.5 Mitigation and Monitoring

10.5.1 Do Nothing Scenario

In the Do Nothing Scenario, there are no further effects to receiving waters, and further mitigation measures are not required.

10.5.2 Construction Phase

The use of plant and machinery during construction works will require the storage and use of fuels and oils. Any servicing of vehicles on-site will be confined to designated areas. Spill kits will be retained on-site to ensure that all spillages or leakages are dealt with immediately and staff will be trained in their proper use. Storage tanks, used to store fuel for plant and machinery, will be self-contained, bunded, and double-walled. Refuelling plant and equipment will be carried out from these tanks or from delivery vehicles at designated refuelling areas. The design of all bunds will conform to EPA bunding specifications. Details of spill protection measures and emergency spill response procedures are included in the Construction and Environmental Management Plan (CEMP) submitted as part of this application.

Programming of works will need to be such that earthworks are not scheduled during severe (wet) weather conditions. Where such weather is forecast, suitable measures will be taken to secure the works.

Construction activities will be confined to the footprint of the development site.

The following measures are proposed during the construction phase to mitigate against risks to the surrounding hydrological environment.

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Weather conditions will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply will be protected from contamination by any construction activities or materials.
- Water sediment and colour will be monitored extensively during construction. Trigger values will be established to shut works down, namely 25mg/l Total Suspended Solids.

The division of work areas in phases (outlined Chapter 9 - Land & Soils) reduces the areas of exposed soil materials at any given time, which reduces the likelihood or risk of sediment mobilization and transport further.

Water intercepted from constructed roads and hardstanding areas will be similarly managed to ensure that uncontrolled water discharges do not take place to the receiving environment.

Stormwater collected in this manner will be diverted through a sediment grit trap and oil interceptor, prior to discharge to the settling ponds. Construction vehicles leaving the site will pass through a wheel wash, to ensure that debris and soil from the site do not impact on the roads.

All imported soils and stones shall be sourced from a licenced/permitted facility with suitable documentation to confirm the material is inert and fit for purpose. The contractor shall ensure the material is fit for use before importing to the site.

10.5.3 Operations Phase

The design of proposed site levels (roads, FFL etc.) has been carried out to ensure the proposed development is elevated and set in such a way as to avoid concentrating additional surface water flow in a particular location.

Following the Site Specific Flood Risk Assessment, it has been determined that the site / zoned developable area is located in Flood Zone C as defined by the Guidelines. No proposed dwellings are located in Flood Zone A or B Surface water runoff from the site will be attenuated to the greenfield runoff rate. Surface water discharge rates will be controlled by a hydro brake type vortex control device in conjunction with below ground attenuation storage. There are four critical objectives that SuDS seek to meet:

- Quantity: managing flows and volumes to match the rainfall characteristics before development.
- Amenity: integrated design that provides useful and attractive multifunctional spaces.
- Quality: preventing and treating pollution to ensure that clean water is available as soon as possible to provide amenity and biodiversity benefits and protecting watercourses and groundwater.
- Biodiversity: maximising the potential for wildlife through design and management of SuDS.

The following methodologies are being implemented as part of a SuDS surface water treatment train approach:

- Permeable paving in driveway areas
- Surface water runoff from roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways
- Attenuation of the 30- and 100-year return period storms
- Installation of a hydro brake
- Surface water discharge will also pass via a fuel / oil separator (sized in accordance with permitted discharge from the site) A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, hydro brake and full retention fuel / oil separator noted above.
- Bioswale following discharge from the final settlement pond

All new foul drainage lines will be pressure tested and be subject to a CCTV survey in order to identify any possible defects prior to being made operational. No specific mitigation measures are proposed in relation to water supply. Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.

It is proposed to use a Sustainable Urban Drainage Systems, (SuDS) approach to surface water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of stormwater runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed SuDS features in the development are permeable paving on driveways, cellular underground soakaways, petrol interceptors and a hydro brake flow control.

The proposed surface water drainage network has been designed into 7 number catchment areas for the development. The surface water will flow to soakaways for 6 of the catchment areas and to a detention pond for the northernmost catchment area. The soakaways and the detention pond have been designed to cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc.

The soakaways have been designed using infiltration rates from a Site Investigation carried out by Grounds Investigation Ireland (see appendix 7.1 of this EIAR). The infiltration rates were obtained by Soakaway Testing to BRE Digest 365. A conventional infiltration rate for each soakaway was used in the design and a factor of safety of 2. The surface water in each soakaway will infiltrate to the ground, as it would naturally in a green field site. Prior to entering each soakaway, the surface water will flow through petrol interceptors to remove any hydrocarbons the water may contain.

The pond has been designed to cater for the catchment area and the overflows from each of the soakaways if needed. The pond is relatively shallow at 1.5m, designed with 4 number step formations at a 1/4 slope. Refer to engineers drawing for details.

The detention pond provides several forms of treatment to the collected water within it. As a result of the size of the pond, much of the bacteria and pollutants that enter the pond settle over time prior to reaching the outfall pipe. Furthermore, retention ponds can support vegetation and plant life, which provide further pollutant treatment and removal. The plants absorb dissolved pollutants and convert them into less harmful materials. Microorganisms present in the pond can further treat and breakdown pollutants that include bacteria, nitrogen, phosphorus, total suspended solids, oil and particulate matter from vehicles.

Surface water from the retention pond shall discharge into the Claureen River via a hydro brake manhole, which will limit the amount of water discharging to the river. The amount of water discharging will be under the allowable greenfield Runoff rate, which has been calculated at 17.8 l/s due to the developable area of the site. The surface water will flow through a bar screen at either end of the outfall pipe which will mitigate against debris/litter entering the Claureen River. The outfall from the retention pond will run along the corridor adjacent to the N85 route via a bioswale further improving water quality.

10.6 Residual Impacts

The nature of the development dictates that the greatest potential impact on the underlying hydrogeology associated with the proposed development will be in the operational phase. It is predicted that the impacts to the hydrogeological and hydrological environments associated with the construction phase of the development will be imperceptible and short term. With regard to the operational phase of the development, although the discharge of pollutants from runoff to the aquifer could pose a potential risk to groundwater, the proposed drainage system design in conjunction with natural subsoil protection of the sand and gravel aquifer across the site will ensure that no significant impacts on the local hydrogeological geological environment are predicted

10.7 Monitoring

All surface water drainage works will be approved by Clare County Council, Sanitary Services Division, and will be carried out in accordance with the Code of Practice for Drainage Works. Foul and potable water works will be carried out in accordance with Uisce Eireann's latest Codes of Practice. During construction daily inspections of the site drain shall be undertaken.

10.7.1 Oil/Petrol Interceptor

Petrol Interceptor requires periodic inspection and removal of the separated oils and petrol residues to ensure it continues to operate effectively. Safe access must be provided for the provision of maintenance to the petrol interceptor.

10.7.2 Soakaway

Soakaways are designed to allow storm water to permeate through to the ground, periodic inspections are required to ensure that the water is draining freely through the system and that it has not been impacted by silts and other debris which may reduce the permeability of the soakaway. Any build-up of silts should be removed during dry weather conditions.

10.7.3 Infiltration Basin

Infiltration basins can also be affected by silts and debris if not maintained. This reduces the permeability of the basin and could cause overflow in storm conditions if not properly maintained along with the inflow and discharge pipes which must be inspected to ensure there are no obstructions.

10.8 Interactions

The potential for interrelationships arises with the environmental topic of biodiversity. Soils, geology and hydrogeology have an important interrelationship with the water and ecological environment, as a determinant of water chemistry, river flow regimes, water storage capacity and watercourse location. It also has an impact on water quality through the ability of bedrock and surface deposits to filter potential pollutants. Potential ecological impacts could occur through the mishandling of soils or through the deposition of excavated soils in ecologically sensitive areas.

Any potential impacts have been identified in Section 10.4 and mitigation measures have been proposed in Section 10.5. An evaluation was undertaken based on the identification of potential sources, pathways and receptors across the site. If all three elements (source, pathway and receptor) are present, there is a linkage and there is a potential impact to the receptor(s). In terms of groundwater, hydrology and ecology, there are no groundwater dependent terrestrial ecosystems (GWDTE) receptors downgradient or in close proximity to the site. Therefore, without an environmental receptor being present, the risk is considered to be low.

During construction the potential impacts to the underlying groundwater aquifer from the proposed works could derive from accidental spillages of fuels, which could impact on groundwater quality, if allowed to infiltrate to groundwater.

As described in the application of the identified mitigation measures for the predicted impact on the hydrogeological and hydrological environments will ensure that the residual impact, although long-term will be imperceptible

10.9 References

EPA (2019). Local Catchment Assessment: WFD Cycle 3 Catchment Fergus Subcatchment Fergus_SC_060. Accessible from: https://catchments.ie/wp-content/files/subcatchmentassessments/27_10%20Fergus_SC_050%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf

Quinlan, C. and R. Quinn (2018). – Characterizing Environmental Flows in Ireland and What This Means for Water Resource Management in Ireland. Irish National Hydrology Conference 2018. Accessible from: <https://hydrologyireland.ie/wp-content/uploads/2018/11/05-Quinlan-C-Characterizing-environmental-flows-in-Ireland.pdf>

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CHAPTER ELEVEN

BIODIVERSITY

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CHAPTER ELEVEN

Table of Contents

Biodiversity

11.1 Introduction..... 11-1

11.2 Expertise & Qualifications 11-1

11.3 Proposed Development..... 11-1

11.4 Methodology 11-1

11.5 Difficulties Encountered 11-2

11.6 Baseline Environment..... 11-2

11.7 Habitats and Species 11-9

11.8 The ‘Do Nothing’ Scenario 11-17

11.9 Potential Significant Effects 11-17

11.10 Mitigation Measures 11-22

11.11 Residual Impact Assessment 11-24

11.12 Risk of Major Accidents or Disasters 11-25

11.13 Worst Case Scenario..... 11-25

11.14 Interactions 11-25

11.15 Monitoring 11-26

11.16 Summary of Mitigation and Monitoring 11-26

11.17 Conclusion 11-27

11.18 References and Sources 11-27

Table of Tables

Table 11.1 Survey Details	11-2
Table 11.2 Proximity to designated sites of conservation importance	11-3
Table 11.3 Proximity to NHAs, pNHAs and Ramsar sites.....	11-3
Table. 11.4 Species of interest recorded in the 2km ² grid area.	11-7
Table 11.5. Bird species recorded on site.....	11-13
Table 11.6. Bird species confirmed breeding on site.	11-13
Table 11.7. Birds recorded during the breeding bird surveys on the 1 st of July and 12 th of July 2022 (Source: EIAR, Chap 09 Biodiversity, Enviroguide, 2022).....	11-14
11.8. Bird species recorded in the vicinity of the site during the wintering bird surveys.....	11-14
Table 11.7a. Magnitude of effect and typical descriptions	11-17
Table 11.7b. Criteria for Establishing Receptor Sensitivity/Importance	11-18
Table 11-7c. Quality of Effects.....	11-18
Table 11-7d Significance of Effects.....	11-18
Table 11-7e. Duration and Frequency of Effects	11-18
Table 11-7f. Describing the Probability of Effects	11-18
Table 11.8 Summary of Construction Phase Likely Significant Effects in the absence of mitigation	11-21
Table 11.9 Summary of Operational Phase Likely Significant Effects in the absence of mitigation	11-22
Table 11.3 Summary of Construction Phase Effects Post Mitigation	11-25
Table 11.4 Summary of Operational Phase Effects Post Mitigation	11-25
Table 11.5 Summary of Construction Phase Mitigation and Monitoring	11-26
Table 11.6 Summary of Operational Phase Mitigation and Monitoring	11-26

Table of Figures

Figure 11.1 - Special Areas of Conservation (SAC) within 15km of subject site	11-4
Figure 11.2 - Special Protection Areas (SPAs) within 15km of subject site	11-4
Figure 11.3 - National Heritage Areas (NHAs) and Proposed National Heritage Areas (pNHAs) within 15km of subject site.....	11-5
Figure 11.4 - Ramsar sites within 15km of subject site	11-5
Figure 11.5 - Waterbodies and SACs proximate to subject site	11-6
Figure 11.6 - Waterbodies and SPAs proximate to subject site	11-6
Figure 11.7 - Waterbodies within 1km of the proposed development	11-7
Figure 11.8.- Habitat map according to Fossitt (2000)	11-9
Plate 1. Agricultural grassland.....	11-10
Plate 2. Hedgerow habitat.....	11-10
Plate 3. Stone wall.....	11-11
Plate 4. Scrub habitat.	11-11
Figure 11.9.- Black-headed Gull recorded on site (number denotes the height).....	11-15
Figure 11.10- Herring Gull recorded on site (number denotes the height).....	11-15
Figure 11.11- Meadow Pipit recorded on site	11-16
Figure 11.12- Jacksnipe recorded on site	11-16
Figure 11.13- Whooper Swan recorded on site (number denotes the recorded height)	11-17
Figure 11.14. Badger sett location and construction works exclusion zone	11-23

CHAPTER 11 | Biodiversity

11.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the ecology of the surrounding area and within the potential zone of influence (ZOI).

This Chapter should be read in conjunction with:

- Chapter 2 (Project Description)
- Chapter 6 (Material Assets- Traffic & Transport)
- Chapter 9 (Land & Soils)
- Chapter 10 (Water & Hydrology)
- Chapter 12 (Noise & Vibration)
- Chapter 13 (Air Quality)

The programme of work in relation to biodiversity aspects of the EIAR has been designed to identify and describe the existing ecology of the proposed development site and outline the habitats or species of conservation interest that may be present on site. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements including designated conservation sites and designs mitigation measures to alleviate identified impacts. Mitigation measures and the phasing of the project are contained in the accompanying Outline Construction Environmental Management Plan (CEMP), which has been prepared by TOBIN.

Standard construction and operational phase control measures, in addition to monitoring measures will be carried out to minimise potential impacts and to improve the biodiversity potential of the proposed development site.

11.2 Expertise & Qualifications

This chapter has been prepared by Bryan Deegan (MCIEEM) of Altemar Ltd. Bryan is an environmental scientist and marine biologist with 30 years’ experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry. Bryan Deegan a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture).

The 2025 surveys for this site were undertaken by Bryan Deegan, Jack Doyle, Frank Spellman, Emma Peters and Gayle O’Farrell of Altemar Ltd.

Frank Spellman (BSc Zoology, MSc Zoology).

Frank Spellman has extensive experience in carrying out a wide range of fauna surveys as both a sub-contractor and employee for environmental consultancies and organisations in Ireland and the US. These include both roving and static acoustic bat surveys, terrestrial non-avian mammal surveys, breeding/wintering bird surveys, and freshwater ecology surveys. Frank has been lead ornithologist on numerous development projects within Ireland carrying out full wintering bird and breeding bird assessments.

Emma Peters (BSc Environmental Science)

Emma Peters (BSc) of Altemar Ltd. Emma has carried out a range of wintering and breeding ornithological surveys in Ireland. Emma has experience in bat detection through static detector surveys, dusk emergence, and down re-entry surveys and is a member of Bat Conservation Ireland. She is also skilled in habitat identification, native and non-native species identification and terrestrial mammal surveys.

Gayle O’Farrell (BSc Agri-Environmental Sciences)

Gayle O’Farrell (BSc) is skilled in bat detection through static detector surveys, dusk emergence, and down re-entry surveys. She is also skilled in habitat assessment and has undertaken flora/invasive species surveys, breeding/wintering bird surveys and terrestrial mammal surveys to produce numerous ecological assessments on a range of residential, industrial and commercial projects.

Jack Doyle (MSc Sustainable Environments)

Jack Doyle (MSc) has previous experience in carrying out a wide range of fauna surveys, including both roving and static acoustic bat surveys, terrestrial non-avian mammal surveys, and breeding/wintering bird surveys.

11.3 Proposed Development

The proposed Large Scale Residential Development (LRD) includes the construction of 300 no. residential units, a creche facility, and all associated site development works at Ballymacaula, Drumbiggle, Circular Road, Ennis, Co. Clare. A full description is provided in Chapter 2 of this EIAR and in the statutory notices.

11.4 Methodology

11.4.1 Relevant Legislation & Guidance

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

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Guidelines for Ecological Impact Assessment in the UK and Ireland, (Chartered Institute of Ecology and Environmental Management) (CIEEM, 2018),
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guide to Habitats in Ireland (Fossitt, 2000).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2 (National Roads Authority, 2009).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).
- Bat Mitigation Guidelines for Ireland (Marnell, Kelleher & Mullen, 2022).
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).

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11.4.2 Desk Study

A pre-survey biodiversity data search was carried out in October 2024 and updated in April 2025. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biological Data Centre (NBDC) and the Environmental Protection Agency (EPA), in addition to aerial, 6-inch maps and satellite imagery.

Desk studies were carried out to obtain relevant existing biodiversity information within the Zone of Influence (ZOI). As outlined in Office of the Planning Regulator (2021) “The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source- Pathway-Receptor framework and not by arbitrary distances (such as 15 km).” The proposed development site is a greenfield site located adjacent between Ennis Golf Course and N85. The Inch River (also known as the Claureen River) is located at the northern site boundary. After consultation with TOBIN, surface water drainage from the site will discharge to the Claureen River, outfalling to the River Fergus and ultimately Shannon Estuary. It should be noted that extensive studies were also carried out for a successful planning application within the same site in 2022.

As a result, there is an indirect hydrological pathway from the proposed development to designated conservation sites located downstream of the proposed development, namely Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. Additionally, given the excavation, the scale of the development and construction works are proposed in close proximity to the Claureen River there is the potential for dust and contaminated surface water to enter the watercourse and impact on downstream conservation sites and aquatic biodiversity. In addition, there is an indirect hydrogeological pathway to 14 European sites within 15km of the proposed development via groundwater flow.

In this case, the potential ZOI extends beyond the site, with the potential for impacts to extend beyond the proposed development area via the proposed construction works and the surface water network. Details of the proposed development are seen in Chapter 2 of this EIAR. The proposed project construction methodology, layout, drainage strategy, Construction Management Plan, Site Investigations, design and landscape design were reviewed to inform this assessment. Further, the other chapters within the EIAR were assessed.

11.4.3 Site Surveys

Habitat, flora, bat, mammal, breeding bird and wintering bird surveys were undertaken within the appropriate seasonal timeframes and in compliance with relevant guidelines. Field surveys were carried out as outlined in Table 11.1. All appropriate surveys were carried out in the appropriate seasons (Smith et al., 2011).

Table 11.1 Survey Details

Survey Type	Surveyors	Survey Dates
Field Survey (habitat, flora)	Emma Peters (Altamar)	25 th April 2025
Field Survey (habitat, flora)	Shannen O’Brien (Enviroguide)	11 th of June 2021, 19 th of May 2022, & 8 th of June 2022
Mammal Survey	Frank Spellman & Jack Doyle (Altamar)	14 th March & 27 th March 2025
Bat Survey	Bryan Deegan (MCIEEM), Emma Peters, Gayle O’Farrell & Jack Doyle (Altamar)	23 rd May 2025, 5 th June 2025 & 10 th June 2025

Survey Type	Surveyors	Survey Dates
Bat Survey	Tina Aughney (Bat Eco Services)	6 th & 7 th August 2022
Bat Survey	Ash Ecology	7 th September 2021
Static Surveillance Bat Survey	Bryan Deegan (MCIEEM), Gayle O’Farrell (Altamar)	5 th June 2025- 8 th June 2025
Static Surveillance Bat Survey	Tina Aughney (Bat Eco Services)	1 st August 2022-6 th August 2022
Breeding Bird Surveys	Jack Doyle, Emma Peters & Gayle O’Farrell (Altamar)	25 th May, 6 th June, 9 th June 2025
Breeding Bird Surveys	Brian McCluskey (Enviroguide)	11 th of June 2021, 19 th of May 2022 & 8 th of June 2022
Wintering Bird Surveys	Jack Doyle & Emma Peters (Altamar)	20 th January 2025, 13 th February 2025, 26 th February 2025, 14 th March 2025, & 27 th March 2025

11.4.4 Consultation

This chapter effectively addresses items set out by Clare County Council in the LRD Opinion in relation to biodiversity on site.

11.5 Difficulties Encountered

No difficulties were encountered in compiling this chapter. All ecological surveys were carried out within optimal survey seasons.

11.6 Baseline Environment

11.6.1 Designated Sites

As can be seen from Figures 11.1 – 11.6., the nearest Natura 2000 site is 932m away (Lower River Shannon SAC). There is an indirect hydrological pathway to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA via the proposed surface water drainage strategy during the construction phase of the development. Out of an abundance of caution, it is considered that this indirect hydrological pathway has the potential to significantly affect the conservational objectives of nearby Natura 2000 sites.

In addition, the proposed development site is hydrogeologically connected via groundwater flow, to 14 European Sites located within a 15km radius. These include Lower River Shannon SAC, Newhall and Edenvale Complex SAC, Pouladatig Cave SAC, Ballyallia Lake SAC, Dromore Woods and Loughs SAC, Ballycullinan Lake SAC, East Burren Complex SAC, Poulmagordon Cave (Quin) SAC, Lough Gash Turlough SAC, Moyree River System SAC, Ballyogan Lough SAC, Ballyallia Lough SPA, River Shannon and River Fergus Estuaries SPA, and Corofin Wetlands SPA. Out of an abundance of caution it is considered that in the absence of mitigation, there is a potential for pollutants to migrate through the aquifer and surface waterbodies into these European Sites.

The distance and details of the Natura 2000 sites (SAC & SPA) within 15km are set out in Table 11.2 and pNHAs & Ramsar sites within 15km of the proposed development are seen in Table. 11.3.

The proposed development site lies within the 2.5 km foraging range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) populations associated with both the Newhall and Edenvale Complex SAC and the Pouladatig Cave SAC, which are designated for the conservation of this species.

Table 11.2 Proximity to designated sites of conservation importance

Site Code	European Site	Distance (km)
Special Areas of Conservation		
IE002165	Lower River Shannon SAC	0.9 km
IE000037	Pouladatig Cave SAC	1.7 km
IE002091	Newhall and Edenvale Complex SAC	1.7 km
IE000014	Ballyallia Lake SAC	2.7 km
IE002247	Toonagh Estate SAC	4.8 km
IE000032	Dromore Woods and Loughs SAC	6.6 km
IE002318	Knockanira House SAC	6.7 km
IE002010	Old Domestic Building (Keevagh) SAC	7.7 km
IE002246	Ballycullinan, Old Domestic Building SAC	8.5 km
IE000016	Ballycullinan Lake SAC	8.5 km
IE001926	East Burren Complex SAC	9.5 km
IE000064	Poulnagordon Cave (Quin) SAC	10.1 km
IE000051	Lough Gash Turlough SAC	10.6 km
IE000057	Moyree River System SAC	11.2 km
IE002314	Old Domestic Buildings, Rylane SAC	12 km
IE002157	Newgrove House SAC	12.3 km
IE000019	Ballyogan Lough SAC	12.5 km
Special Protection Areas		
IE004041	Ballyallia Lough SPA	2.7 km
IE004077	River Shannon and River Fergus Estuaries SPA	3.6 km
IE004220	Corofin Wetlands SPA	10.8 km

Table 11.3 Proximity to NHAs, pNHAs and Ramsar sites

Designation	Site	Distance
NHAs		
	Oysterman’s Marsh NHA	10.8 km
	Lough Acrow Bogs NHA	11.6 km
	Lough Naminna Bog NHA	14.4 km
pNHA		
	Cahircalla Wood	655m
	Newhall And Edenvale Complex	1.7 km
	Pouladatig Cave	1.7 km
	Ballyallia Lake	2.5 km
	Lough Cleggan	2.8 km
	Newpark House (Ennis)	3.3 km
	Fergus Estuary And Inner Shannon, North Shore	3.6 km
	Dromore Woods And Loughs	6.6 km
	Old Domestic Building (Keevagh)	7.7 km
	Dromoland Lough	8.2 km
	Ballycullinan Lake	8.5 km
	Inchicronan Lough	9.3 km
	Durra Castle	9.3 km
	East Burren Complex	9.5 km
	Lough Gash Turlough	10.6 km
	Ballycar Lough	11.1 km
	Moyree River System	11.2 km
	Ballyogan Lough	12.5 km
	Fin Lough (Clare)	12.1 km
	Fort Fergus (Ballynacally)	12.1 km
	Rosroe Lough	13.6 km
Ramsar		
	Ballyallia Lough	2.6 km

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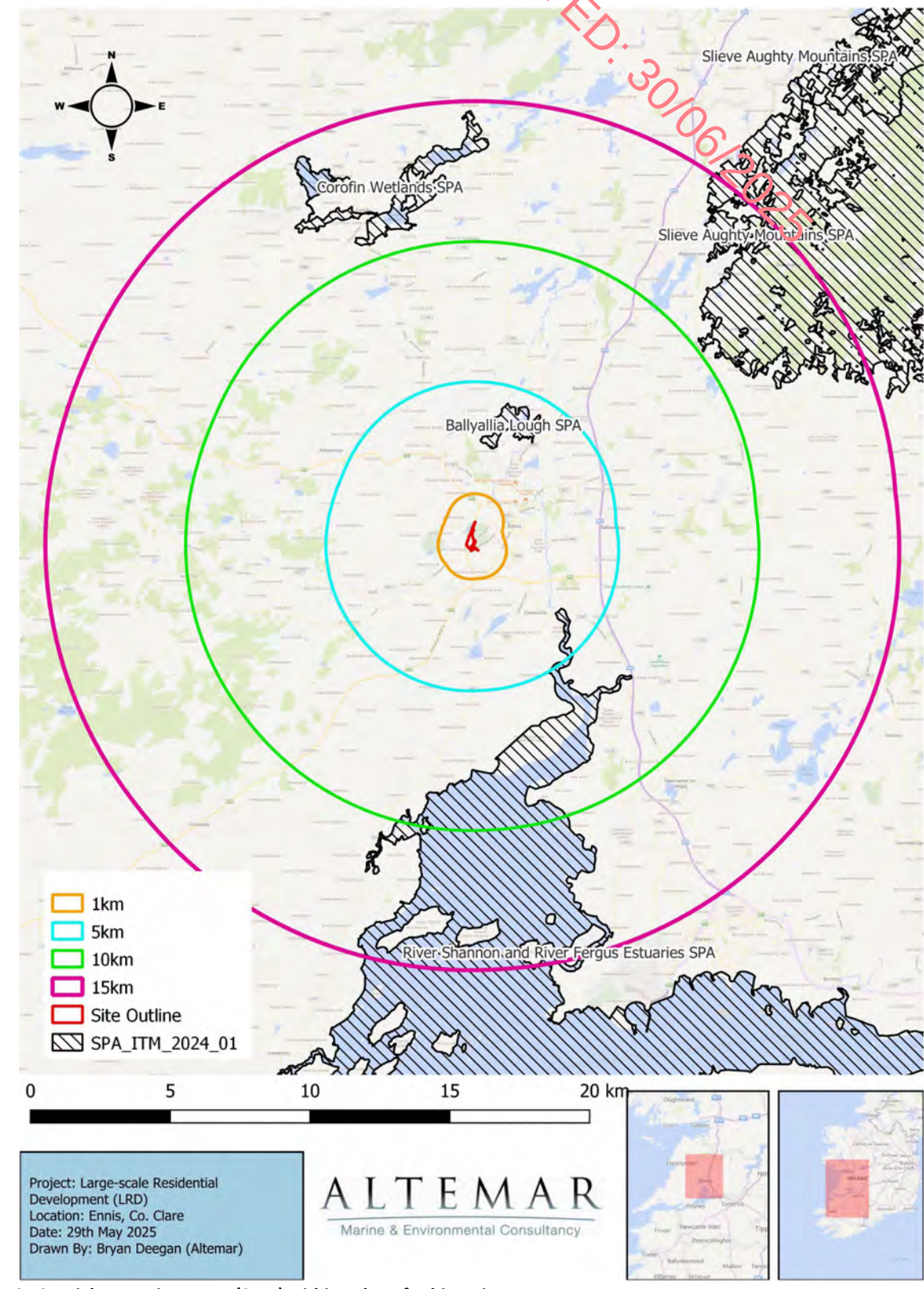
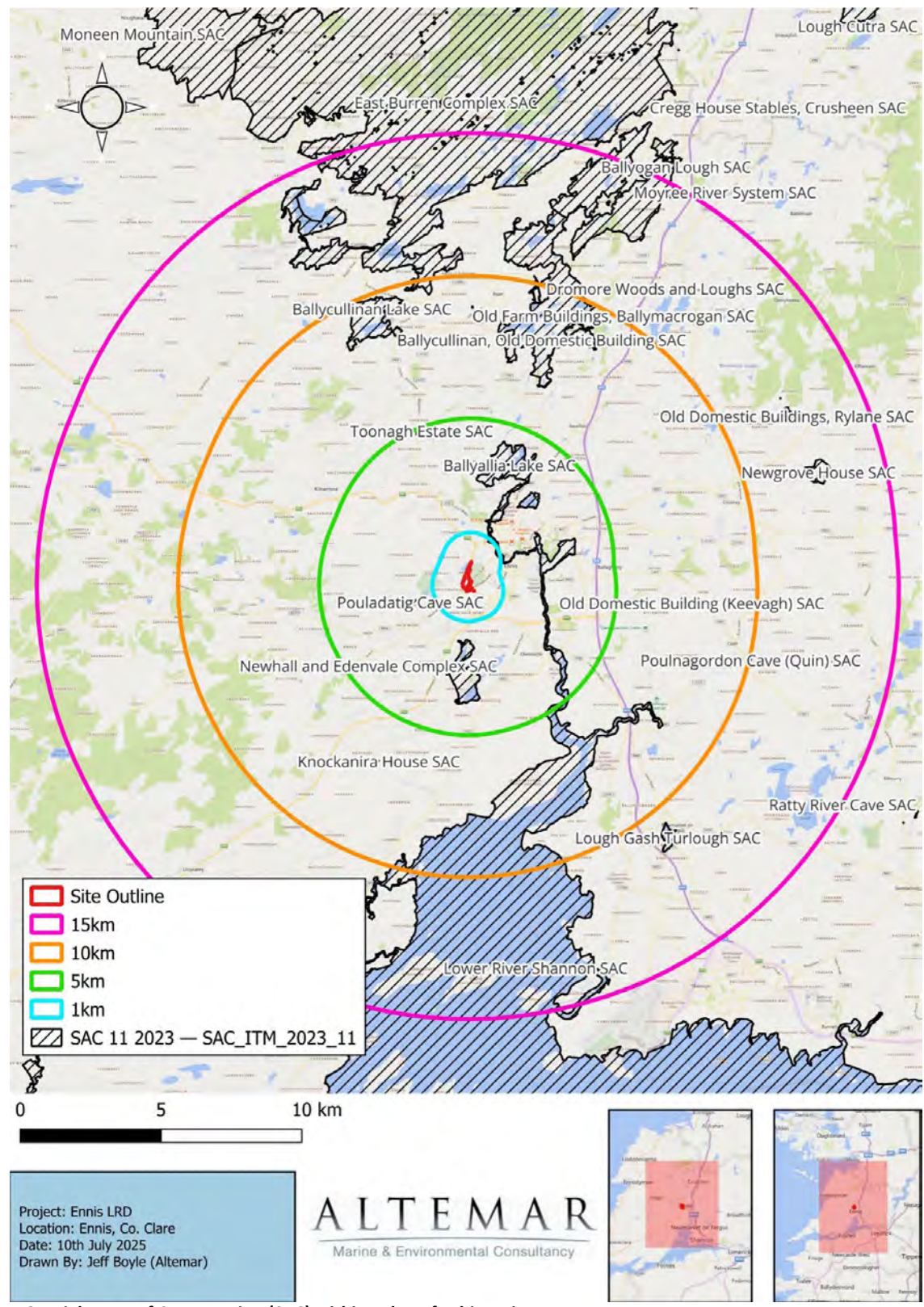


Figure 11.1 - Special Areas of Conservation (SAC) within 15km of subject site

Figure 11.2 - Special Protection Areas (SPAs) within 15km of subject site

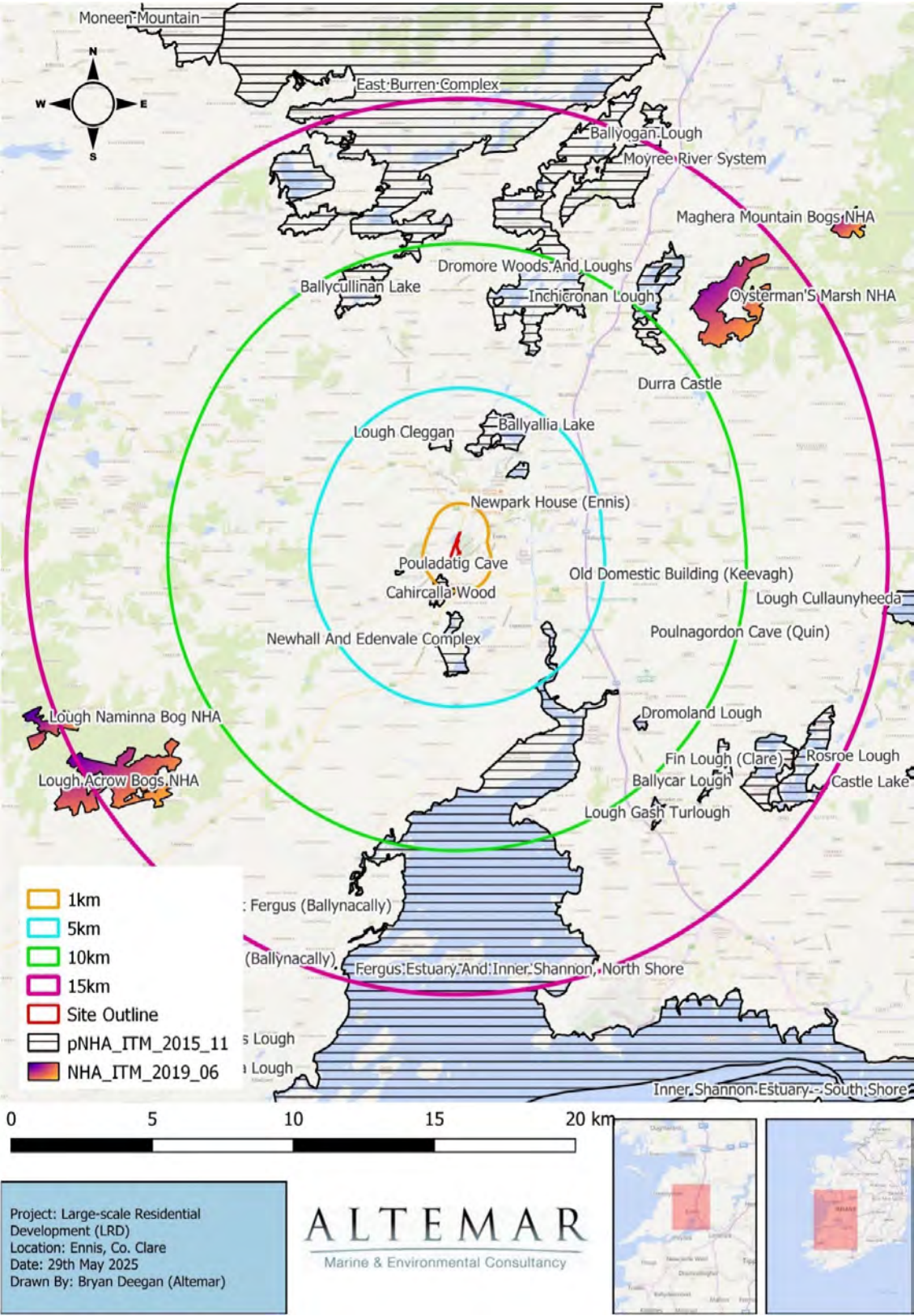


Figure 11.3 - National Heritage Areas (NHAs) and Proposed National Heritage Areas (pNHAs) within 15km of subject site

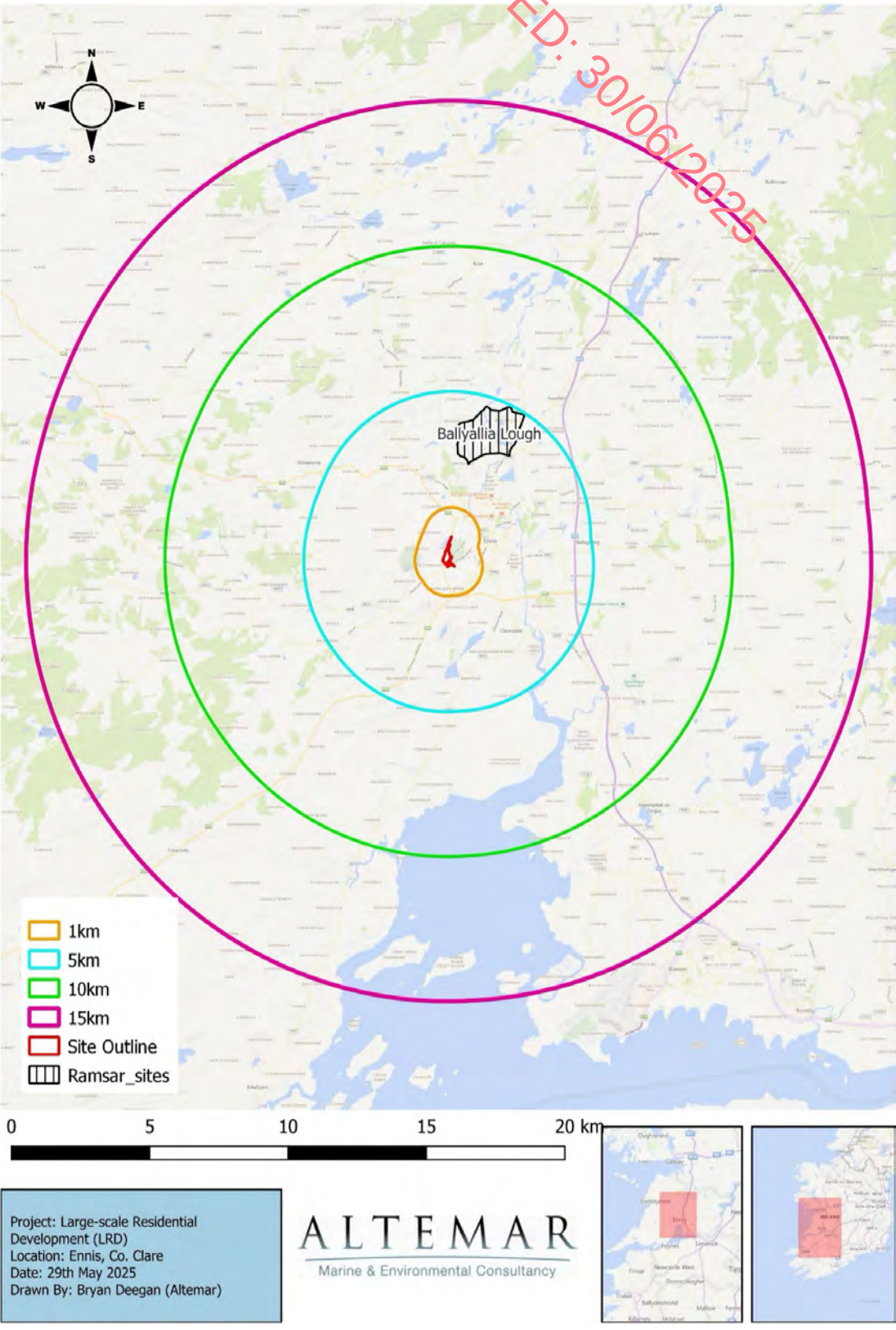


Figure 11.4 - Ramsar sites within 15km of subject site

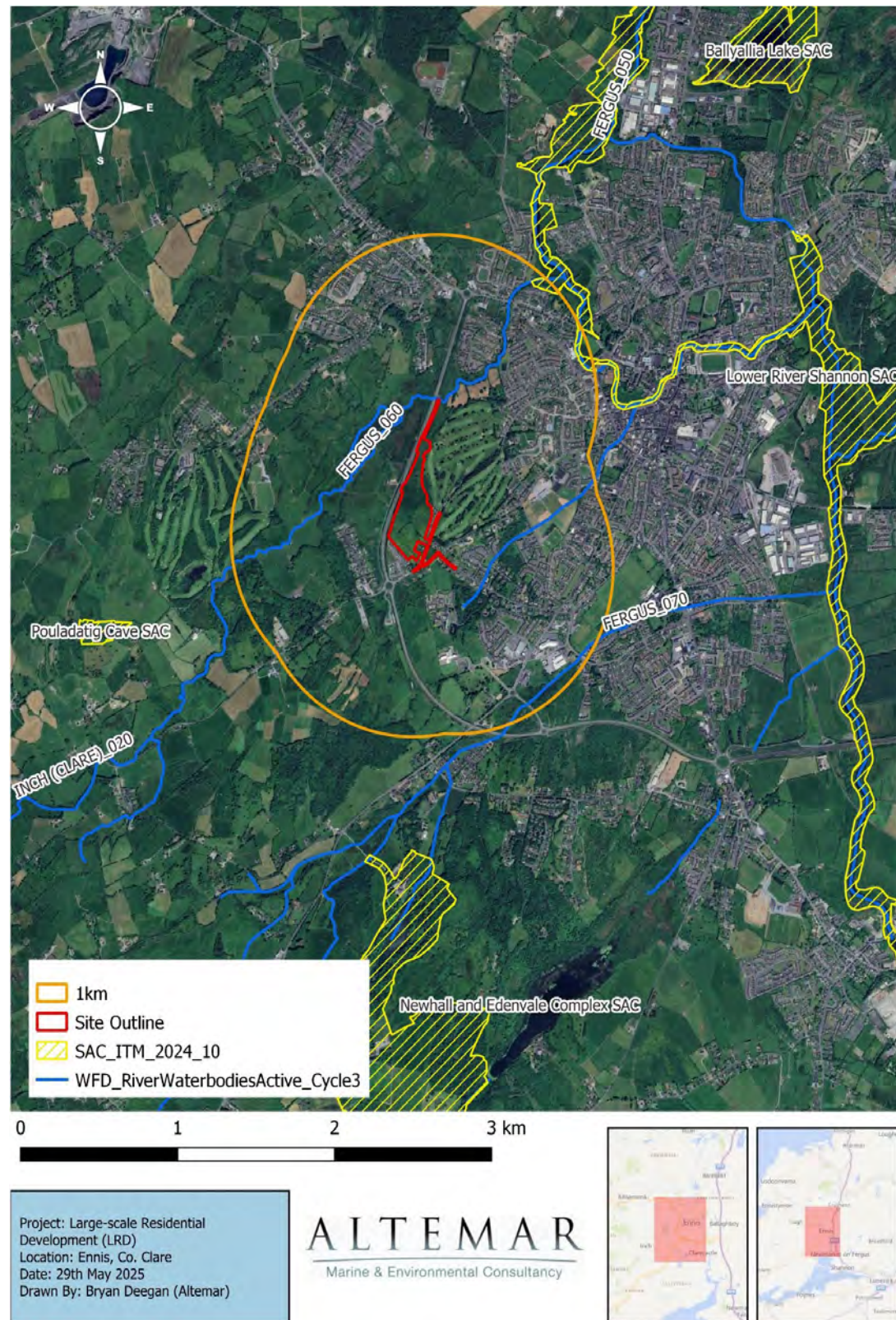


Figure 11.5 - Waterbodies and SACs proximate to subject site

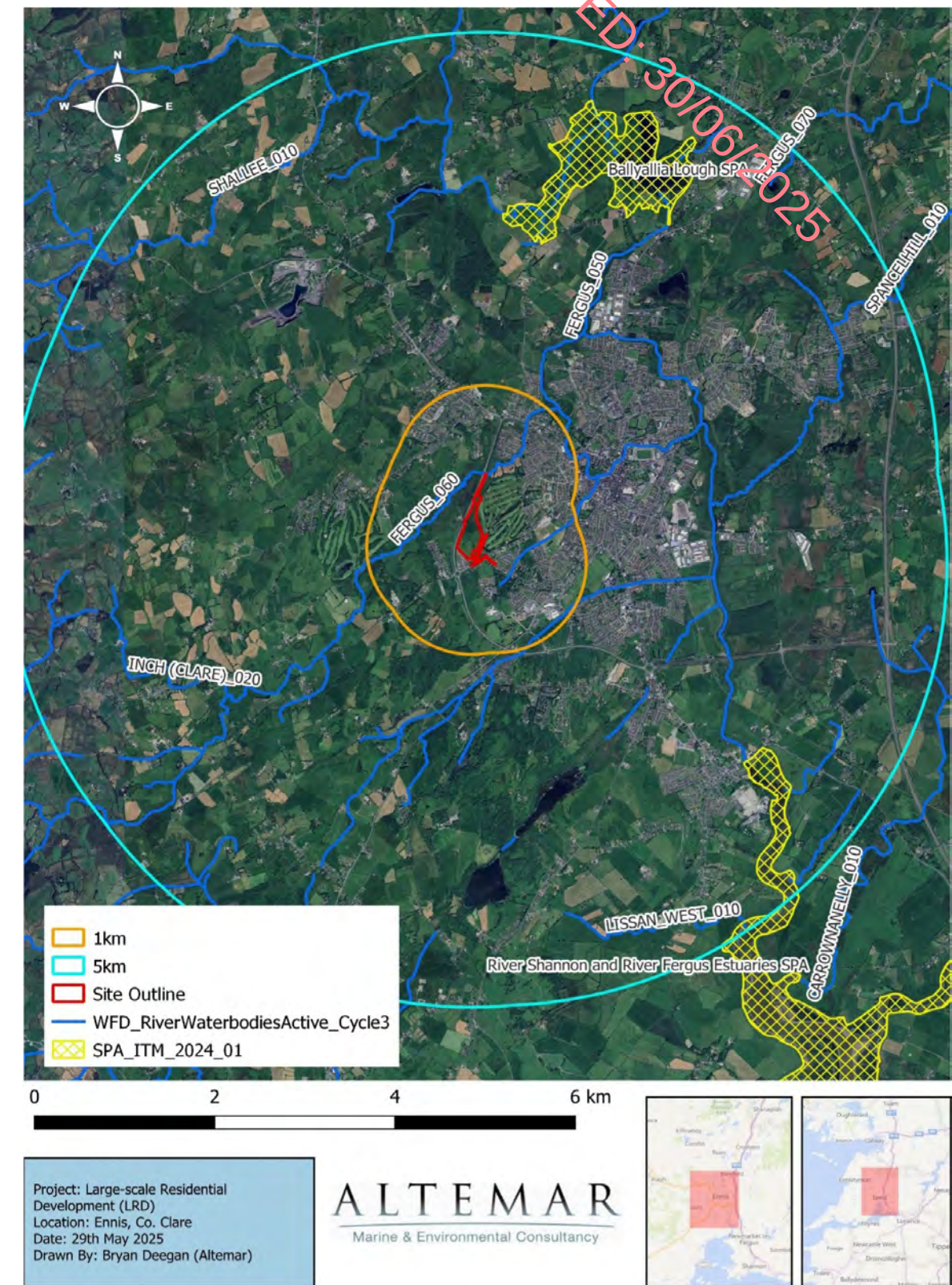


Figure 11.6 - Waterbodies and SPAs proximate to subject site

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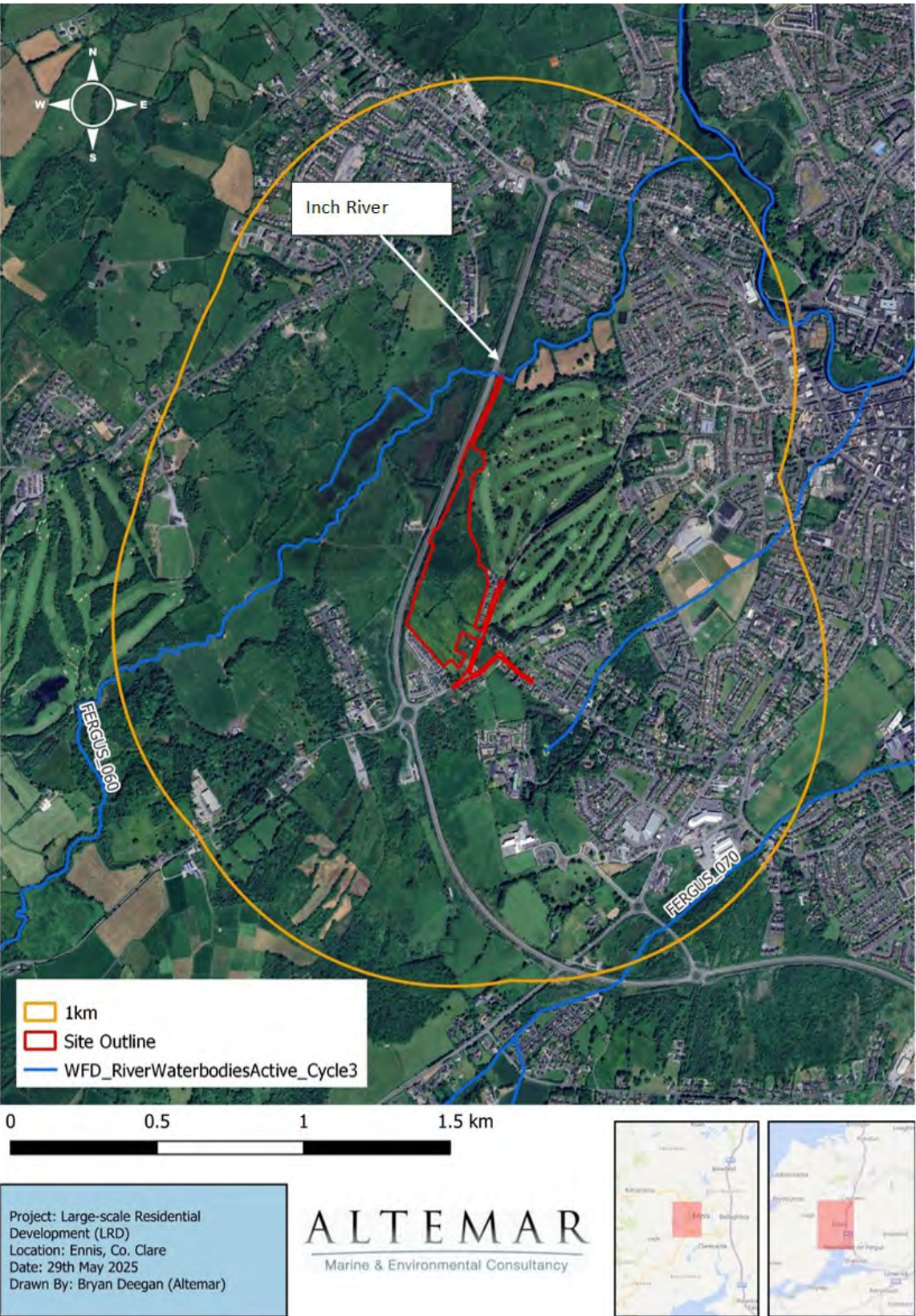


Figure 11.7 - Waterbodies within 1km of the proposed development

11.6.2 Species Data

The National Biodiversity Data Centre’s online viewer was consulted to determine the extent of biodiversity and / or species of interest in the area. A desk-based assessment was carried out and it recorded no species of interest within the site area. Following this, a 2km² grid was assessed (R37I) Table. 11-4 provides a list of all species of interest recorded in the 2km² grid area.

Table. 11.4 Species of interest recorded in the 2km² grid area.

Species name	Date of last record	Title of dataset	Designation
Common Frog (<i>Rana temporaria</i>)	02/03/2003	Irish National Frog Database	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	16/12/2020	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Canada Goose (<i>Branta canadensis</i>)	23/04/2019	Birds of Ireland	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Common Gull (<i>Larus canus</i>)	21/05/2016	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Cormorant (<i>Phalacrocorax carbo</i>)	19/11/2015	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Herring Gull (<i>Larus argentatus</i>)	09/04/2019	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
House Martin (<i>Delichon urbicum</i>)	08/06/2020	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
House Sparrow (<i>Passer domesticus</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species name	Date of last record	Title of dataset	Designation
Kestrel (<i>Falco tinnunculus</i>)	17/11/2020	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kingfisher (<i>Alcedo atthis</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lapwing (<i>Vanellus vanellus</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Linnet (<i>Linaria cannabina</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Mallard (<i>Anas platyrhynchos</i>)	08/06/2020	Birds of Ireland	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Mute Swan (<i>Cygnus olor</i>)	19/11/2015	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Pheasant (<i>Phasianus colchicus</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Rock Dove (<i>Columba livia</i>)	16/12/2020	Birds of Ireland	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Sand Martin (<i>Riparia riparia</i>)	04/07/2024	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species name	Date of last record	Title of dataset	Designation
Snipe (<i>Gallinago gallinago</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Starling (<i>Sturnus vulgaris</i>)	12/09/2017	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Swallow (<i>Hirundo rustica</i>)	06/09/2023	Birds of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Swift (<i>Apus apus</i>)	08/08/2023	Swifts of Ireland	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Tree Sparrow (<i>Passer montanus</i>)	31/12/2011	Bird Atlas 2007 - 2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Woodpigeon (<i>Columba palumbus</i>)	21/05/2016	Birds of Ireland	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Japanese Knotweed (<i>Fallopia japonica</i>)	06/10/2017	National Invasive Species Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Japanese Rose (<i>Rosa rugosa</i>)	26/05/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Sycamore (<i>Acer pseudoplatanus</i>)	27/10/2006	Clare Biological Records Centre Dataset 2004-2007	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species

Species name	Date of last record	Title of dataset	Designation
Brown Long-eared Bat (<i>Plecotus auritus</i>)	07/08/2022	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Daubenton's Bat (<i>Myotis daubentonii</i>)	26/08/2019	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Hedgehog (<i>Erinaceus europaeus</i>)	27/07/2023	Hedgehogs of Ireland	Protected Species: Wildlife Acts
Leisler's Bat (<i>Nyctalus leisleri</i>)	07/08/2022	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)	06/08/2022	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Nathusius's Pipistrelle (<i>Pipistrellus nathusii</i>)	06/08/2022	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Otter (<i>Lutra lutra</i>)	15/09/2018	Mammals of Ireland 2016-2025	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	21/09/2010	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Red Squirrel (<i>Sciurus vulgaris</i>)	01/01/2023	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	07/08/2022	National Bat Database of Ireland	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts

11.7 Habitats and Species

Habitat surveys were carried out on the 11th of June 2021, 19th of May 2022, 8th of June 2022, and updated on the 25th April 2025. Habitats were classified according to Fossitt, 2000 based on the 25th April 2025 site visit.



Figure 11.8.- Habitat map according to Fossitt (2000)

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GA1- Agricultural Grassland

The majority of the surface area of the subject site was agricultural grassland with areas subject to periodic flooding (**GS4**). The fields were under use from grazing horses and dog walkers. The species noted within this habitat include dame's-violet (*Hesperis matronalis*), Kidney vetch (*Anthyllis vulneraria*), creeping buttercup (*Ranunculus repens*), daisy (*Bellis perennis*), broad-leaved dock (*Rumex obtusifolius*), hogweed (*Heracleum sphondylium*), meadow buttercup (*Ranunculus acris*), thistles (*Cirsium* spp.), dandelions (*Taraxacum officinale* agg.), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), Cuckoo-flower (*Cardamine pratensis*), lesser stitchwort (*Stellaria graminea*), cleavers (*Galium aparine*), nettle (*Urtica dioica*), , white clover (*Trifolium repens*), red clover (*Trifolium pratense*), common sorrel (*Rumex acetosa*), hard rush (*Juncus inflexus*), common ragwort (*Jacobaea vulgaris*), lesser celandine (*Ficaria verna* (*Ranunculus ficaria*)), mouse-ear (*Cerastium fontanum*), meadow foxtail grass (*Alopecurus pratensis*), field bindweed (*Convolvulus arvensis*), compact rush (*Juncus conglomeratus*), silverweed (*Potentilla anserina*), common knapweed (*Centaurea nigra*), curled dock (*Rumex crispus* ssp. *crispus*), primrose (*Primula vulgaris*), meadowsweet (*Filipendula ulmaria*), cowslip (*Primula veris*), creeping cinquefoil (*Potentilla reptans*), ox-eye daisy (*Leucanthemum vulgare*), yarrow (*Achillea millefolium*), wood anemone (*Anemone nemorosa*), bluebell (*Hyacinthoides non-scripta*) and black medic (*Medicago lupulina*) and common spotted-orchid (*Dactylorhiza fuchsii* subsp. *Fuchsia*). Saplings of willow (*Salix* sp.), blackthorn (*Prunus spinosa*) and alder (*Alnus glutinosa*) grew throughout this habitat. The wildflowers within this habitat supported a variety of invertebrates such as the orange tip butterfly (*Anthocharis cardamines*), the drinker moth (*Euthrix potatoria*) and the multiple spider species.



Plate 1. Agricultural grassland

WL1- Hedgerow

Native mature hedgerows lined the fields within the subject site. The species included brambles (*Rubus fruticosus* agg), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), willow (*Salix* sp.), alder (*Alnus glutinosa*), rose-hip (*Rosa canina* agg.), ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*). The ground layer consisted of greater stitchwort (*Stellaria holostea*), nettle (*Urtica dioica*), bracken (*Pteridium aquilinum*), Atlantic ivy (*Hedera hibernica*), winter heliotrope (*Petasites pyrenaicus*), bluebell (*Hyacinthoides non-scripta*), Clematis spp. Mature and young trees were also in this habitat including species such as ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and sycamore (*Acer pseudoplatanus*). Within the hedgerows were **BL1- Stones wall**'s which had become the overgrown with the hedgerow species.



Plate 2. Hedgerow habitat.

BL1- Stones wall

The majority of stone walls on site are featured within the hedgerow field boundaries and are covered by the overgrown hedgerow.



Plate 3. Stone wall

WS1 -Scrub

Scrub was managed and divided by the paths the horses had created. Bramble (*Rubus fruticosus* agg), and blackthorn (*Prunus spinosa*) encroached from the perimeter of the subject site and in areas ungrazed by horses. Additional species in this habitat include hawthorn (*Crataegus monogyna*), willow (*Salix* sp.), hedge bindweed (*Calystegia sepium*), cowslip (*Primula veris*), Lords and ladies (*Arum maculatum*), ivy (*Hedera helix*), Atlantic ivy (*Hedera hibernica*) and gorse (*Ulex europaeus*).



Plate 4. Scrub habitat.

Discussion of habitats.

The subject site is a greenfield site on the outskirts of the townlands of Ennis. The site is predominantly unmanaged grassland habitats (GA1/GS4) with each field bordered by hedgerows (WL1), scrub (WS1) and low stone walls (BL1).

Plant Species

The plant species encountered at the various locations on site are detailed above. No plant species protected under Irish or international legislation were noted on site. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened plant species were recorded within the proposed development site.

Invasive Plant species

No invasive species, that are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) which makes it an offence under Regulation 49 to plant, disperse, allow or cause to grow these plants, were noted on site.

Terrestrial mammals

A mammal survey was undertaken on the 14th March 2025 & 27th March 2025 by Frank Spellman and Jack Doyle of Altemar Ltd. that covered the site and the immediate surrounding areas including the Inch River to the north of the site. All areas of the site were accessible. Full survey coverage of the site was possible and there are no limitations. The surveys were supported by the use of trail cameras. The survey revealed one active badger sett within the lands of Ennis Golf Course to the east of the site approximately 20 metres from the site boundary. The layout of the development was altered to provide a 30m exclusion zone at this sett. A disused badger sett was noted in the centre scrub area of the site which is currently being utilised by foxes. Otters (*Lutra lutra*) were not observed during the survey, but evidence was recorded of otter along the bank of the Inch River (prints and spraint). No active otter holts were noted during the survey along the Inch River. A series of burrows were noted within the floodzone (surrounding vegetation was coated in silt) to the east of the site. Camera traps revealed no otter activity at the burrows. No evidence of deer was noted on site. No hedgehogs (*Erinaceus erinaceus*) were seen during the site visit but may be present on site.

Bat Fauna

Emergent detector surveys were carried out by Emma Peters on the 23rd May 2025 and Bryan Deegan (MCIEEM) & Gayle O'Farrell on the 5th of June 2025. A dawn re-entry survey was carried out by Jack Doyle on the 10th June 2025. In addition, a static detector survey was carried out between the 5th June -10th June 2025. As outlined in Bat Fauna Impact Assessment (Appendix 11.1), the following bat species were noted on site:

- Common Pipistrelle (*Pipistrellus pipistrellus* sensu lato)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Leisler Bat (Lesser Noctule (*Nyctalus leisleri*))
- Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- Nathusius' Pipistrelle (*Pipistrellus nathusii*)
- Brown Long-eared Bat (*Plecotus auritus*)

Common Pipistrelle (*Pipistrellus pipistrellus* sensu lato), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Leisler Bat (Lesser Noctule (*Nyctalus leisleri*)) were recorded during the emergent and dawn re-entry surveys as well as the static detector survey. Lesser Horseshoe Bat (*Rhinolophus hipposideros*), Nathusius' Pipistrelle (*Pipistrellus nathusii*) and Brown Long-eared Bat (*Plecotus auritus*) were only recorded during the static detector survey. No confirmed bat roosts were noted on site, however a number of trees of moderate bat roosting potential are located on site.

It should be noted that the site is utilised by Lesser Horseshoe Bat (*Rhinolophus hipposideros*) which is an Annex II species and a Qualifying Interest of the nearby Pouladatig Cave SAC and the Newhall and Edenvale Complex SAC. It is assumed that this species commutes to the site via the Claureen River to the north of the site and enters the site along the eastern site boundary which adjoins Ennis Golf Course. This site is considered a suitable foraging habitat for this species due to the absence of artificial lighting or light spill on site and the presence of substantial treeline, scrub and hedgerow habitats.

Previous bat surveys

Previous bat surveys on site have similar findings. A preliminary bat survey for the site was carried out on the 7th September 2021 by Ash Ecology. Six bat species were recorded during the survey, namely common pipistrelle, soprano pipistrelle, Leisler's bat, lesser horseshoe bat, Natterer's bat and brown long-eared bat.

In addition, dusk, dawn and walking transect bat surveys were carried out by Dr. Tina Auhney (Bat Eco Services) on the 6th and 7th August 2022. A static detector survey was also carried out on the 1st to 6th August 2022. As outlined in the bat assessment report (Appendix 11.2), *'Six species of bat was recorded within the survey area: Leisler's bat, soprano pipistrelle, common pipistrelle, lesser horseshoe bat, Natterer's bat and brown long-eared bat. The first three species were recorded during bat detector surveys and static surveillance bat activity levels were indicative of commuting and foraging individuals. The latter three bat species were recorded at a lower level of bat passes, which is to be expected as these three bat species are less common.'*

Overall, the survey results demonstrate that bats commuted to the proposed development site from an easterly, westerly and northerly direction and foraged, primarily along the boundary habitats. The eastern boundary, with Ennis Golf Course, is particularly important for foraging local bat populations and this may be due to the mature hedgerow and the fact that there is no outdoor lighting in this area.

A medium level of bat activity common and more light-tolerant bat species were recorded along the boundary with the N85, where outdoor lighting is present. None of the three light sensitive bat species (lesser horseshoe bat, brown long-eared bat and Natterer's bat) were recorded along this boundary. All bat species were generally recorded at a Low level of bat activity during the static surveillance.

However, due to the quiet echolocation calls of lesser horseshoe bats, Natterer's bats and brown long-eared bats, their presence is significant. There are no recorded bat roosts within the proposed development site but there are four trees recorded as Potential Bat Roosts (PBRs) are proposed to be felled. The majority of the internal network of hedgerows and the scrub habitat will be removed as part of the proposed development.'

Breeding Birds

Three breeding bird surveys were carried out by Altemar during the bird nesting season in 2025. Surveys were carried out on the 25th April, 5th June and 10th June 2025, which covered the entire site area. The dense scrub and hedgerows were areas on site of high breeding potential. Bird activity was especially high in the central dense scrub area of the site throughout the surveys.

In total, 28 species of bird were recorded within, adjacent and over the survey area: 20 green listed, six amber, and two red-listed Birds of Conservation Concern in Ireland (BoCCI) (Table 11-5). Of these species, eight were confirmed breeding within the outline of the proposed development, of which six are green listed BoCCI (blackbird, blackcap, blue tit, robin, woodpigeon & wren) and remaining two breeding species were amber-listed BoCCI (goldcrest & house sparrow). No red-listed species were recorded breeding within the proposed site outline.

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Table 11.5. Bird species recorded on site

Common name	BTO	Latin name	BoCCI
Blackbird	B.	<i>Turdus merula</i>	Green
Blackcap	BC	<i>Sylvia atricapilla</i>	Green
Blue Tit	BT	<i>Cyanistes caeruleus</i>	Green
Bullfinch	BF	<i>Pyrrhula pyrrhula</i>	Green
Chiffchaff	CC	<i>Phylloscopus collybita</i>	Green
Dunnock	D.	<i>Prunella modularis</i>	Green
Goldcrest	GC	<i>Regulus regulus</i>	Amber
Goldfinch	GO	<i>Carduelis carduelis</i>	Green
Great Tit	GT	<i>Parus major</i>	Green
Hooded Crow	HC	<i>Corvus cornix</i>	Green
House Martin	HM	<i>Delichon urbicum</i>	Amber
House Sparrow	HS	<i>Passer domesticus</i>	Amber
Jackdaw	JD	<i>Corvus monedula</i>	Green
Jacksnipe	JS	<i>Naoscach bhídeach</i>	Green
Long-eared Owl	LE	<i>Asio otus</i>	Green
Long-tailed Tit	LT	<i>Aegithalus caudatus</i>	Green
Magpie	MG	<i>Pica pica</i>	Green
Meadow Pipit	MP	<i>Anthus pratensis</i>	Red
Robin	R.	<i>Erithacus rubecula</i>	Green
Rook	RO	<i>Corvus frugilegus</i>	Green
Song Thrush	ST	<i>Turdus philomelos</i>	Green
SpottedFlycatcher	SF	<i>Muscicapa striata</i>	Amber
Starling	SG	<i>Sturnus vulgaris</i>	Amber
Swift	SI	<i>Apus apus</i>	Red
Whitethroat	WH	<i>Sylvia communis</i>	Green
Whopper Swan	WS	<i>Cygnus cygnus</i>	Amber
Woodpigeon	WP	<i>Columba palumbus</i>	Green
Wren	WR	<i>Troglodytes troglodytes</i>	Green

Table 11.6. Bird species confirmed breeding on site.

Common name	BTO	Latin name	BoCCI
Blackbird	B.	<i>Turdus merula</i>	Green
Blackcap	BC	<i>Sylvia atricapilla</i>	Green
Blue Tit	BT	<i>Cyanistes caeruleus</i>	Green
Goldcrest	GC	<i>Regulus regulus</i>	Amber
House Sparrow	HS	<i>Passer domesticus</i>	Amber
Robin	R.	<i>Erithacus rubecula</i>	Green
Wren	WR	<i>Troglodytes troglodytes</i>	Green
Woodpigeon	WP	<i>Columba palumbus</i>	Green

In addition, breeding bird surveys were carried out on the 11th of June 2021, 19th of May 2022, and 8th of June 2022, by Enviroguide Ornithologist Brian McCluskey, with further surveys carried out on the 1st of July 2022 and 12th of July 2022.

As outlined in the Chapter 09 Biodiversity of the EIAR prepared by Enviroguide (2022),

‘Breeding bird surveys were carried out on Site on the 1st of July 2022 and 12th of July 2022. Five transects were done through the site to record all the species that were present. A final zig-zag walk through the site was done at the end of each survey to ensure no additional species were missed. **26** species were recorded on the Breeding Bird Survey on the 1st of July 2022 and **28** species were recorded on the Breeding Bird Survey on the 12th July 2022. These species are listed in the table below.

Methodology: Each transect was divided up into four parts (all a similar distance) and the transect was walked with all 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.

Meadow Pipit was the only red listed species recorded.’

Table 11.7. Birds recorded during the breeding bird surveys on the 1st of July and 12th of July 2022 (Source: EIAR, Chap 09 Biodiversity, Enviroguide, 2022)

Species	BoCCI Status	BBS Survey 1 & 2 or 1/2	Breeding Activity
Blackbird <i>Turdus merula</i>	Green	1 & 2	Confirmed. Recently fledged young.
Blackcap <i>Sylvia atricapilla</i>	Green	1 & 2	
Bullfinch <i>Pyrrhula pyrrhula</i>	Green	1 & 2	
Blue Tit <i>Cyanistes caeruleus</i>	Green	1 & 2	Confirmed. Recently fledged young
Chaffinch <i>Fringilla coelebs</i>	Green	1 & 2	
Chiffchaff <i>Phylloscopus collybita</i>	Green	1 only	
Collared Dove <i>Streptopelia decaocto</i>	Green	2 only	
Dunnoek <i>Prunella modularis</i>	Green	1 & 2	Confirmed. Recently fledged young
Goldcrest <i>Regulus regulus</i>	Amber	1 & 2	Confirmed. Recently fledged young
Goldfinch <i>Carduelis carduelis</i>	Green	1 & 2	Confirmed. Recently fledged young
Great Tit <i>Parus major</i>	Green	2 only	
Hooded Crow <i>Corvus cornix</i>	Green	1 & 2	
House Martin <i>Delichon urbicum</i>	Amber	1 & 2	
House Sparrow <i>Passer domesticus</i>	Amber	1 & 2	Confirmed. Recently fledged young.
Lesser Redpoll <i>Acanthis flammea</i>	Green	1 & 2	
Linnet <i>Linaria cannabina</i>	Amber	1 & 2	
Meadow Pipit <i>Anthus pratensis</i>	Red	1 & 2	Confirmed. Carrying food + recently fledged young present
Pied Wagtail <i>Motacilla alba yarrelli</i>	Green	1 & 2	
Reed Bunting <i>Emberiza schoeniclus</i>	Green	1 & 2	Confirmed. Recently fledged young
Robin <i>Erithacus rubecula</i>	Green	1 & 2	Confirmed. Recently fledged young.
Rook <i>Corvus frugilegus</i>	Green	1 & 2	
Siskin <i>Spinus spinus</i>	Green	2 only	
Stonechat <i>Sturnus vulgaris</i>	Amber	1 & 2	Confirmed. Recently fledged young
Swallow <i>Hirundo rustica</i>	Amber	1 & 2	
Song Thrush <i>Turdus philomelos</i>	Green	1 & 2	Confirmed. Recently fledged young
Whitethroat <i>Sylvia communis</i>	Green	1 & 2	Confirmed. Recently fledged young
Woodpigeon <i>Columba palumbus</i>	Green	1 & 2	
Wren <i>Troglodytes troglodytes</i>	Green	1 & 2	Confirmed. Recently fledged young
Willow Warbler <i>Phylloscopus trochilus</i>	Amber	1 & 2	Confirmed. Recently fledged young

Wintering Birds

A desk and ground level wintering bird habitat assessment were carried and used to examine the structures, features and vegetation on site that could provide wintering bird habitat. Potential features associated with foraging/roosting include agricultural fields, improved/amenity grassland, scrub, watercourses, ponds and drainage ditches, estuaries and intertidal zones. All open areas and vegetated areas were assessed for wintering bird potential.

The grassland on site is considered of low to moderate foraging potential for wintering birds given the unmanaged nature of the grass. The survey area is located between a number of known wintering bird foraging and roosting areas, including a number of SPAs, and so there is a high potential for birds of various species to fly over the site.

Five wintering bird surveys were carried out on site on the 20th January 2025, 13th February 2025, within optimal survey season by Emma Peters & Jack Doyle (Altemar). A total of 19 species were recorded within and above the survey area across 5 surveys. 14 green, four amber and one red listed species of conservation concern were recorded on site. The red-listed meadow pipit was using the site and displaying foraging behaviour consistently throughout the surveys. Other notable species recorded above the site include a Whopper Swan and Black-headed Gull which are Qualifying Interests of the nearby SPA. (River Shannon and River Estuaries SPA). However, only one observation of an individual Whopper Swan was made transiting over the site, and five observations of individual black-headed gulls were recorded transiting over the site across the five surveys. The activity of qualifying interests of SPA's during the wintering bird assessments is seen in 11.9-11.13. Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).

11.8. Bird species recorded in the vicinity of the site during the wintering bird surveys

Common name	BTO	Latin name	BoCCI
Blackbird	B.	<i>Turdus merula</i>	Green
Black-headed Gull	BH	<i>Larus ridibundus</i>	Amber
Blue Tit	BT	<i>Cyanistes caeruleus</i>	Green
Bullfinch	BF	<i>Pyrrhula pyrrhula</i>	Green
Dunnoek	D.	<i>Prunella modularis</i>	Green
Goldfinch	GO	<i>Carduelis carduelis</i>	Green
Great Tit	GT	<i>Parus major</i>	Green
Herring Gull	HG	<i>Larus argentatus</i>	Amber
Hooded Crow	HC	<i>Corvus cornix</i>	Green
Jackdaw	JD	<i>Corvus monedula</i>	Green
Jacksnipe	JS	<i>Naoscach bhídeach</i>	Green
Magpie	MG	<i>Pica pica</i>	Green
Meadow Pipit	MP	<i>Anthus pratensis</i>	Red
Robin	R.	<i>Erithacus rubecula</i>	Green
Rook	RO	<i>Corvus frugilegus</i>	Green
Starling	SG	<i>Sturnus vulgaris</i>	Amber
Whopper Swan	WS	<i>Cygnus cygnus</i>	Amber
Woodpigeon	WP	<i>Columba palumbus</i>	Green
Wren	WR	<i>Troglodytes troglodytes</i>	Green



Figure 11.9.- Black-headed Gull recorded on site (number denotes the height)

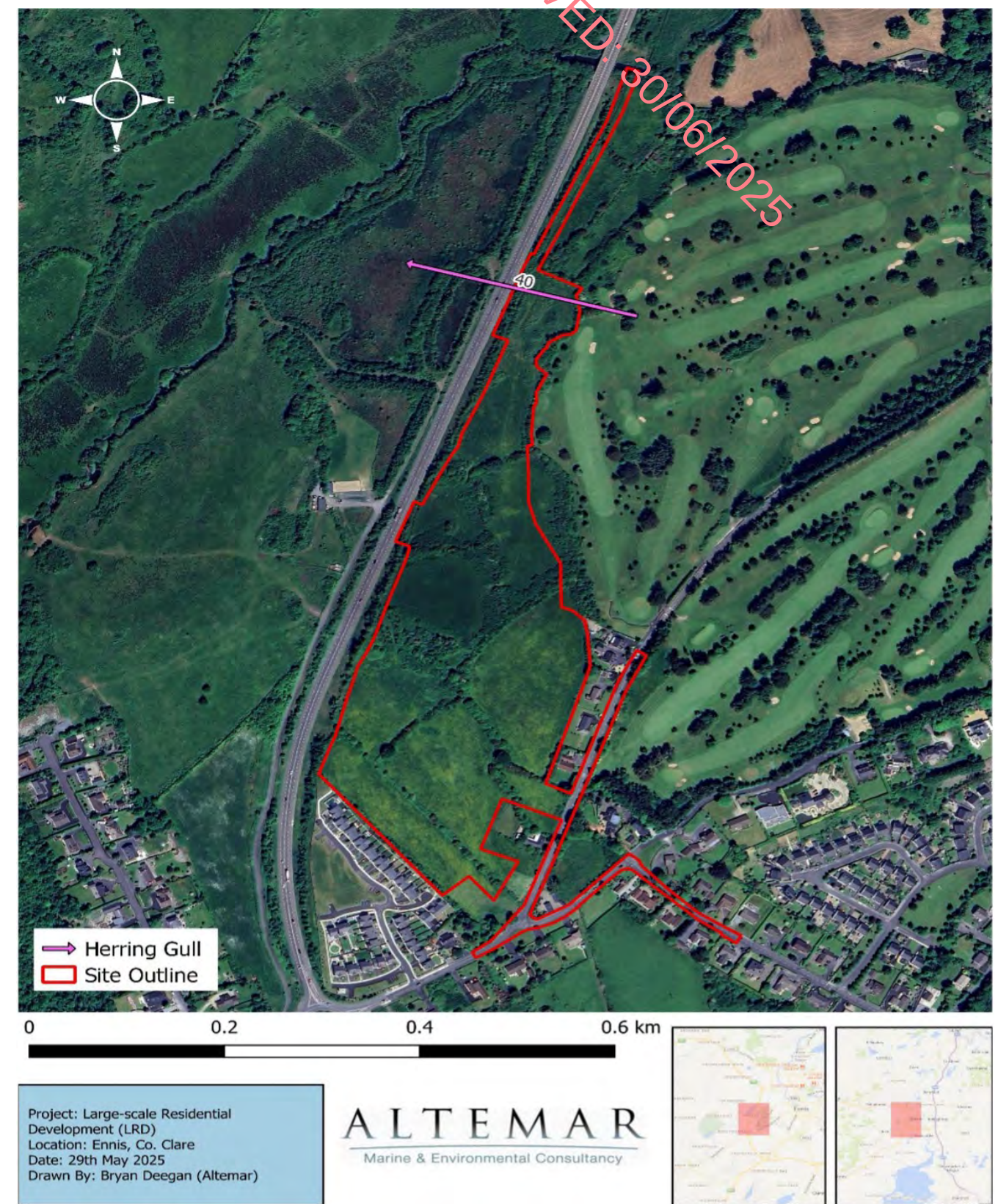


Figure 11.10- Herring Gull recorded on site (number denotes the height)

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Figure 11.11- Meadow Pipit recorded on site



Figure 11.12- Jacksnipe recorded on site



Figure 11.13- Whooper Swan recorded on site (number denotes the recorded height)

11.8 The ‘Do Nothing’ Scenario

Due to the zoning of the subject site, it would be expected that in the absence of this subject proposal a development of similar scale and nature would be progressed. Under this scenario, in the absence of specific development details, it is likely that the effect would be similar to this proposal as outlined below. However, in the absence of any development on the site it would be expected that the hedgerow, scrub and treeline habitats would continue to be utilised by local bird, mammal and bat populations.

11.9 Potential Significant Effects

This section of the EIAR examines the potential causes of impact that could result in positive or negative effects arising on the species and habitats that occur within the ZOI of the proposed development. The following assessment of potential impacts is based on the EPA EIAR Guidelines 2022 (the EIAR Guidelines). These impacts could arise during either the construction or operational phases of the project. The following terms are derived from the EPA EIAR Guidelines and are used to describe the likely significant effects on the ecological receptors arising from the construction and operation of the proposed development.

Table 11.7a. Magnitude of effect and typical descriptions

Magnitude of effect (change)		Typical description
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial effect on attribute or a reduced risk of negative effect occurring
Negligible	Adverse	Very minor loss or alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.

Table 11.7b. Criteria for Establishing Receptor Sensitivity/Importance

Importance	Ecological Valuation
International	Sites, habitats or species protected under international legislation e.g. Habitats and Species Directive. These include, amongst others: SACs, SPAs, Ramsar sites, Biosphere Reserves, including sites proposed for designation, plus undesignated sites that support populations of internationally important species.
National	Sites, habitats or species protected under national legislation e.g. Wildlife Act 1976 and amendments. Sites include designated and proposed NHAs, Statutory Nature Reserves, National Parks, plus areas supporting resident or regularly occurring populations of species of national importance (e.g. 1% national population) protected under the Wildlife Acts, and rare (Red Data List) species.
Regional	Sites, habitats or species which may have regional importance, but which are not protected under legislation (although Local Plans may specifically identify them) e.g. viable areas or populations of Regional Biodiversity Action Plan habitats or species.
Local/County	Areas supporting resident or regularly occurring populations of protected and red data listed-species of county importance (e.g. 1% of county population), Areas containing Annex I habitats not of international/national importance, County important populations of species or habitats identified in county plans, Areas of special amenity or subject to tree protection constraints.
Local	Areas supporting resident or regularly occurring populations of protected and red data listed-species of local importance (e.g. 1% of local population), Undesignated sites or features which enhance or enrich the local area, sites containing viable area or populations of local Biodiversity Plan habitats or species, local Red Data List species etc.
Site	Very low importance and rarity. Ecological feature of no significant value beyond the site boundary

Table 11-7c. Quality of Effects

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

Table 11-7d Significance of Effects

Significance of Effect	Description of Potential Effect
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	An effect which obliterates sensitive characteristics.

Table 11-7e. Duration and Frequency of Effects

Duration and Frequency of Effect	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
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 11-7f. Describing the Probability of Effects

Describing the Probability of Effects	Description
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.

11.9.1 Construction Phase

In the absence of mitigation, the overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora. Direct negative effects will be manifested in terms of the removal of the site’s internal habitats. The removal of these habitats will result in a loss of species of low biodiversity importance. However, the scrub and hedgerows do provide a substantial nesting foraging resource for birds and foraging area for bats. These construction effects however would include effects that may arise during the site clearance, re-profiling of the site and the building phases of the Proposed Development. Potential impacts are assessed below for each of the ecological components:

11.9.1.1 Designated Natura 2000 sites within 15km

The proposed development is not within a designated conservation site. It should be noted that surface water drainage will discharge to the Claureen River to the north of the site, which in turn outfalls to the River Fergus. There is, therefore, an indirect hydrological pathway to the Lower River Shannon SAC and River Fergus Estuaries SPA located downstream of the proposed development. Given the scale of the proposed development and proximity of the Claureen River, it is considered that there is an indirect hydrological pathway to these conservation sites. In the absence of mitigation, runoff during site clearance, re-profiling, the construction and operation of project elements could impact on the Claureen River with water quality or downstream impacts on designated sites.

In addition, the proposed development site is hydrogeologically connected via groundwater flow, to 14 European Sites located within a 15km radius. These include Lower River Shannon SAC, Newhall and Edenvale Complex SAC, Pouladatig Cave SAC, Ballyallia Lake SAC, Dromore Woods And Loughs SAC, Ballycullinan Lake SAC, East Burren Complex SAC, Poulmagordon Cave (Quin) SAC, Lough Gash Turlough SAC, Moyree River System SAC, Ballyogan Lough SAC, Ballyallia Lough SPA, River Shannon and River Fergus Estuaries SPA, and Corofin Wetlands SPA. Out of an abundance of caution it is considered that in the absence of mitigation, there is a potential for pollutants to migrate through the aquifer and surface waterbodies into these European Sites.

The proposed development site lies within the 2.5 km foraging range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) populations associated with both the Newhall and Edenvale Complex SAC and the Pouladatig Cave SAC, which are designated for the conservation of this species. As the majority of vegetation on site is to be removed to facilitate the proposed development, there is a potential loss of foraging and commuting habitat for this species. Furthermore, increased lighting levels during the construction phase may have the potential to disrupt foraging activity, particularly as Lesser Horseshoe Bat is recognised as a light-sensitive species.

The presence of the indirect hydrological and hydrogeological pathways to a number of SACs and SPAs, as well as the site’s location within the foraging range of Lesser Horseshoe Bat gives rise to potential for significant effects on European Sites in the absence of mitigation.

Impacts in the absence of mitigation: negative; moderate adverse, site, permanent. Mitigation is required.

11.9.1.2 Habitats, Botany and Avian Ecology

No flora or habitats of conservation importance were noted during the surveys. During the site visits no bird species of conservation importance as listed on Annex I of the EU Birds Directive were recorded. Localised disturbance due to noise on site is foreseen. Site clearance will result in a reduction in the vegetation cover including dense scrub and hedgerows, and removal of the mature and immature trees which would result in a nesting and foraging resource loss for the bird species noted on site.

Clearance works on site during bird nesting season could impact on bird population within the proposed development site. Dust from reprofiling works could potentially impact on vegetation and nesting birds on site within the remaining hedgerows.

Impacts in the absence of mitigation: negative; moderate adverse, site, short term, not significant. Mitigation is required.

11.9.1.3 Protected Terrestrial Mammals

The protected species badger (*Meles meles*) was not observed within the site boundary. Evidence of badgers utilising the site was noted, including snuffle holes. An active badger sett was identified proximate to the eastern site boundary, within the lands of Ennis Golf Course. Consultation took place between Altamar and then design team to ensure no works are proposed within 30 m of the sett. This exclusion zone will help ensure that the badger sett remains undisturbed and adequately shielded from any potential disturbances that could arise due to construction activities, such as noise, vibration, or physical disruption. It is standard best practice to make special provisions for badgers affected by development. Mitigation is required during construction in relation to badgers on site.

No otters (*Lutra lutra*) or otter holts were noted on site or proximate to the development site. However, evidence that otters are using the Claureen River was recorded (prints & spraints). Standard mitigation measures will be implemented to ensure runoff during site clearance, re-profiling, the construction and operation of project elements could impact on the Inch River and surface water network. The contamination the Inch River and downstream SAC (Lower River Shannon SAC) in which otter is a Qualifying Interest, could potentially impact negatively on otters within the watercourses.

Impacts in the absence of mitigation: negative; moderate adverse, site, short term, not significant. Mitigation is required. A pre-construction survey for protected mammal species will be carried out.

11.9.1.4 Bat Fauna

No bat roosts were recorded on site; however, several trees of bat roosting potential are proposed for felling. The removal of vegetation on site will reduce bat foraging habitat for the six species recorded on site. The site is currently characterised by low illumination, with minimal light spill from surrounding areas. Lighting during construction has the potential to impact on foraging of bats on site in the absence of mitigation. Mitigation measures will be implemented to minimize light spill and protect retained bat foraging areas, particularly along the eastern site boundary adjacent to Ennis Golf Course. This area is considered a likely important commuting corridor for Lesser Horseshoe Bat populations associated with nearby SACs

In the absence of mitigation, the proposed development would be seen to have a negative, moderate adverse, short term, not significant, international and likely effect on bat fauna during construction. Mitigation is required.

11.9.1.5 Aquatic Ecology

The Inch River traverses along the northern boundary of the proposed development site. Standard mitigation measures will be implemented to ensure runoff during site clearance, re-profiling, the construction and operation of project elements could impact on the Inch River and surface water network, with water quality within these watercourses with potential downstream impacts aquatic ecology within this watercourse network and the downstream watercourse (River Fergus).

The contamination of watercourses and surfaces water networks could potentially impact negatively on the biodiversity within the watercourses and within the shallow marine environment.

Impacts in the absence of mitigation: negative; moderate adverse, short term, not significant. Mitigation is required.

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11.9.2 Operational Phase

Once constructed all onsite drainage will be connected to separate foul and surface water systems. Surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures.

11.9.2.1 Designated Sites

During operation, surface water runoff from the development will enter the Claureen River, which will outfall to the River Fergus and ultimately the Shannon Estuary. In the absence of mitigation, pollutants, silt laden run off or dust which enter the surface water network will be dispersed or diluted within the Claureen River, to negligible levels, prior to reaching any European sites.

Petrochemical runoff from the site could potentially negatively directly or indirectly impact the aquatic ecology within the Claureen River. However, runoff from the housing development will comply with standard County Council drainage requirements and will require petrochemical interception which will be attenuated and discharged at greenfield rates to the surface water network.

The proposed development site lies within the 2.5 km foraging range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) populations associated with both the Newhall and Edenvale Complex SAC and the Pouladatig Cave SAC, which are designated for the conservation of this species. As the majority of vegetation on site is to be removed to facilitate the proposed development, there is a potential loss of foraging and commuting habitat for this species. Furthermore, proposed lighting during the operational phase may have the potential to disrupt foraging activity, particularly as Lesser Horseshoe Bat is recognised as a light-sensitive species.

In the absence of mitigation, the proposed development would be seen to have a negative, moderate adverse, permanent, not significant, international and likely effect on designated sites during operation.

11.9.2.2 Habitats, Botany and Avian Ecology

During the operational phase of the development there will be an increase in disturbance including noise and light that could potentially impact on birds on site. As the landscaping elements improve with maturity it would be expected that the biodiversity value of the site to birds and flora would also increase. Light spill on site will increase from the current baseline which would have a negative effect on biodiversity. Landscape, light spill and habitat management will be important to overall impact of the operational phase.

11.9.2.3 Aquatic Ecology

Petrochemical runoff from the site could potentially negatively directly or indirectly impact the aquatic ecology. Runoff from the development and roads will have to comply with County Council drainage requirements and will require petrochemical interception and which will be attenuated and discharged at greenfield rates to the surface water network. The drainage connections and the installations in relation to petrochemical interception will be inspected by the project ecologist.

In the absence of mitigation, the proposed development would be seen to have a negative, minor adverse, long term, not significant, local and likely effect on aquatic ecology during operation. Standard mitigation is required in relation to petrochemical interception.

11.9.2.4 Protected Terrestrial Mammals

Badger (*meles meles*) was noted on site. An active badger sett was confirmed via camera traps within the lands of Ennis Golf Course to the east of the site, outside the site boundary. The badger is a Red Data Book species. It is standard best practice to make special provisions for badgers affected by development. Lighting and increased human presence/disturbance may impact badgers on site and reduce their foraging areas. Otter presence was noted along the river at the northern end of the site. This area would not be seen to have significant increase in human activity.

Impacts in the absence of mitigation: negative; slight, site, long term, not significant. Mitigation is required.

11.9.2.5 Bat Fauna

The removal of trees and hedgerows on site will result in a loss of foraging areas for bats. Loss of foraging sites and commuting habitat may temporarily displace certain species. There is potential for bat foraging to be impacted by the artificial lighting on site, and in particular foraging and commuting of lesser horseshoe bat, given they are considered a 'Light Sensitive' species. The proposed lighting strategy has been discussed and modified to reduce the potential impact of the development on bats. This has included only lighting areas where required and not lighting public open spaces unless necessary. Warm white LED lighting (2700K) with full cut-off optics is proposed to minimise impacts on bat foraging and reduce light spill towards treelines and hedgerow boundaries. Compensatory planting for removal of linear and scrub habitats has been incorporated into the landscape strategy. It should be noted that large linear lengths of woodland planting will be placed on site. These will provide tall linear corridors to provide bat foraging areas.

Impacts in the absence of mitigation: negative, moderate adverse, international, permanent, not significant. Mitigation is required including consultation with the project ecologist in relation to lighting and a post lighting inspection by the ecologist.

11.9.3 Cumulative Effects

There are several proposed developments located in the area immediately surrounding the subject site. The following is a list of planning applications in close proximity to the subject site as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal¹; list of planning applications in close proximity to the subject site as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal²;

¹ <https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>
² <https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>

Reference	Development Description	Decision	Distance to Site
24/60086	for a development comprising 48 no. residential units, (32 no. semi-detached houses, 8 no. terrace houses and 8 no. duplex apartments), ancillary surface car parking, vehicular & pedestrian access to the proposed development including a new road, footpath and cyclepath extensions from the existing development to serve the new units, connection to existing public water supply; foul water drainage services by way of a new foul pumping station including the provision of surface water attenuation outfalling to the west via a headwall and reedbed and all associated site development and landscape works. The planning application is accompanied by an NIS (Natura Impact Statement)	Granted 25th September 2024	3.7km
24/122	to Extend the Appropriate Period of Planning Permission for P17/977 for 51 No. residential units, comprising of 2 No. 2 bedroom detached dwellings; 1 No. 3 bedroom detached dwelling; 42 No. 3 bedroom semi-detached; 6 No. 4 bedroom semi-detached dwellings, all including connection to water supply, public sewer, storm water sewer and all ancillary site services	Granted 10th June 2024	1.5km
24/60652	for a development comprising 74 no. residential units, (3 no. detached houses, 36 no. semi-detached houses, 23 no. terrace houses, 12 no. duplex units), ancillary surface car parking, vehicular & pedestrian access to the proposed development from the Tobarteascáin Road, pedestrian access into both Abbey Ville estate and Abbey Court estate to the south, connection to existing public water supply; foul water drainage services including the provision of surface water attenuation and all associated site development works including the raising of land, and landscape works. The planning application is accompanied by a Natura Impact Statement (NIS).	Lodged 19th December 2024 FI requested 21st Feb 2025	2.1km
25/60265	for a development comprising 54no. residential units, (4no. detached houses, 8no. semi-detached houses, 18no. Terrace houses and 24no. Duplex units), ancillary surface car parking, vehicular & pedestrian access to the proposed development including a new road from the Oakleigh Wood road to join to the Ballycorey road, new footpath along the Oakleigh Wood road, widening of the Ballycorey road, connection to existing public water supply; foul water drainage services including the provision of surface water attenuation outfalling to the North via a headwall and reedbed and all associated site development and landscape works. The planning application is accompanied by an NIS (Natura Impact Statement).	Lodged 14th May 2025 Decision due 8th July 2025	3.3 km

In relation to **Planning Reference. 24/60086**,³ a Natura Impact Statement (NIS) was carried out by Openfield and concluded the following: “In the light of the conclusions of the assessment of the implications for the site, in view of the conservation objectives of the site and in view of best scientific knowledge the project, alone or in combination with other projects, will not adversely affect the integrity of the Ballyallia Lake SAC.”

In relation to **Planning Reference 24/60652**⁴, a Natura Impact Statement (NIS) was carried out by Openfield and concluded the following: “Following the Screening for AA, it was concluded that significant effects to the Lower River Shannon SAC and River Shannon & River Fergus Estuaries SPA could not be ruled out. Specifically, this may arise from pollution during the construction phase. Arising from this assessment, mitigation has been proposed. With the implementation of these measures adverse effects to the integrity of these Natura 2000 sites will not occur. This conclusion is based on best scientific knowledge.”

In relation to **Planning Reference 25/60265**⁵, a Natura Impact Statement (NIS) was carried out by Openfield and concluded the following: “Following the Screening for AA, it was concluded that significant effects to the Ballyallia Lake and Lower River Shannon SAC could not be ruled out. Specifically, this may arise from the impact of the spread of alien invasive species and pollution during the construction phase. Arising from this assessment, mitigation has been proposed. With the implementation of these measures adverse effects to the integrity of the Natura 2000 sites will not occur. This conclusion is based on best scientific knowledge. In the light of the conclusions of the assessment of the implications for the sites, in view of the conservation objectives of the sites and in view of best scientific knowledge the project, alone or in combination with other projects, will not adversely affect the integrity of any Natura 2000 site.”

it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. It is concluded that no significant effects on European sites will be seen as a result of the proposed development alone or combination with other projects.

11.9.4 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 11.8 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Pollution of watercourses and downstream designated sites from sediment runoff	Negative	Moderate	Local/county	Likely	Short-term	Indirect
Construction dust impact	Negative	Moderate	Site	Likely	Short-term	Direct
Habitat loss and Fragmentation	Negative	Moderate	Site	Likely	Permanent	Direct
Disruption to bat commuting routes (Lesser Horseshoe)	Negative	Moderate	Local	Unlikely	Permanent	Direct
Construction lighting Impacts	Negative	Low	Local	Likely	Short-term	Direct
Disturbance from construction noise and vibration	Negative	Low	Local	Likely	Short-term	Direct

3 <https://www.eplanning.ie/ClareCC/AppFileRefDetails/2460086/0>

4 <https://www.eplanning.ie/ClareCC/AppFileRefDetails/2460652/0>

5 <https://www.eplanning.ie/ClareCC/AppFileRefDetails/2560265/0>

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The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 11.9 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Lighting impacts	Negative	Moderate	Local	Likely	Long-term	Direct
Habitat loss and Fragmentation	Negative	Moderate	Site	Likely	Long-term	Direct
Pollution of watercourses from petrochemical runoff	Negative	Moderate	Local	Likely	Long-term	Direct

11.10 Mitigation Measures

Mitigation measures will be incorporated into the proposed development project to minimise the potential negative impacts on biodiversity within the ZOI. Mitigation measures are outlined within the Land & Soils (Chapter 9), Water & Hydrology (Chapter 10), Air Quality (Chapter 13) and Noise & Vibration (Chapter 12) of the EIAR. In addition to these mitigation measures mentioned elsewhere in the EIAR specific mitigation in relation to biodiversity need to be implemented having taken into account the measures outlined elsewhere in the EIAR.

11.10.1 Mitigation by Design

- Retention of 401 linear metres of native hedgerows within the site boundary. In addition, native hedgerows located along the western and eastern boundaries (outside the red line) are to be retained.
- Approximately 344 trees, including species such as oak, ash, and beech, will be planted across the site. These will be arranged in structured treelines, with additional woodland planting areas integrated into the overall landscape design strategy. This planting scheme is intended to support and enhance bat foraging activity on site.

11.10.2 Construction Phase Mitigation

In addition to mitigation measures outlined elsewhere in the EIAR, the following measures will be implemented to protect biodiversity:

- A pre-construction survey for bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Given the nature of the dense scrub on site no machinery access to the site for construction will be allowed without consultation and approval of the project ecologist. The ecologist will oversee site clearance and will be on site during the removal of scrub and hedgerows. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place.
- A 30m construction exclusion zone will be implemented around the active badger sett located proximate to the eastern site boundary. This is demonstrated in figure 11.14. No works will be carried out within this exclusion zone for the duration of the construction phase. Prior to machinery coming on site this exclusion zone will be put in place under the supervision of the project ecologist.

- An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds, mammals including bats, badger and otter will not be significantly impacted.
- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). If removal is required during this season the removal of woody material will be carried out under the supervision of an ecologist. If nesting birds are present NPWS will be contacted, and removal will be subject to conditions outlined by NPWS.
- Lighting during construction will be carried out in consultation with the project ecologist and treelines, boundary hedgerows or wooded areas will not be lit.
- Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal, it will first be surveyed for roosting potential and bat presence if required. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Any tree felling will be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, will be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight.
- Works within 50m of the Claureen River will only be carried out subject to the approval of the project ecologist. Works to connect drainage to the Claureen River will be under the direct supervision of the project ecologist with mitigation in place to prevent silt and contaminated material from entering the watercourse. Works will be carried out in dry weather with no cement works within 20m of the watercourse. A pre-cast headwall will be used.
- Trees to be retained. Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted will be avoided and retained intact. Retained trees will be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing.
- Lighting restrictions. In general, artificial light creates a barrier to bats so lighting will be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill during construction. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only.



Figure 11.14. Badger sett location and construction works exclusion zone

11.10.3 Operational Phase Mitigation

The biodiversity value of the site would be expected to improve as the landscaping matures. The proposed development has a sustainable drainage strategy and detailed landscape strategy and mitigation during operation will be carried out as outlined elsewhere in the EIAR. The following operation mitigation measures will be carried out.

- Post construction an inspection of drainage connections to the watercourse network including petrochemical interception will be carried out by the project ecologist.
- 30 bird boxes to be placed on site in consultation with project ecologist.

Bats

In addition, the following measures in relation to bats, that have been extracted from the Bat Assessment Report (Bat Eco Services, 2022) from the approved scheme will be implemented into the design of the proposed development:

Lighting

“Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018). Consultation was undertaken with the lighting specialists to reduce the potential impact on local bat populations.

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins (i.e. 2200 Kelvins) will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Any external lighting for the Proposed Development should strictly follow the above guidelines and these should be strictly implemented during Construction and Operation phase of the Proposed Development.

Additional measures were also recommended:

- Removal of specific luminaires to prevent light spillage on the boundary with the golf course.”

Bat Box Scheme

“The total number of bat boxes required to mitigate for general conservation of local bat populations:

4 summer bat boxes (Schwegler Woodcrete 1FF bat box or equivalent – source www.nhbs.com or www.veldshop.nl) to be erected on mature trees within the Proposed Development site.

Bat boxes will be erected prior to construction works. The bat specialist will erect the bat boxes with assistance from the contractor. Some general points that will be follow include:

- Straight limb trees (or telegraph pole) with no crowding branches or other obstructions for at least 1 metre above and below position of bat box.
- Diameter of tree should be wide and strong enough to hold the required number of boxes.
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations should be sheltered from prevailing winds.
- Bat boxes should be erected at a height of 4-5 metres to reduce the potential of vandalism and predation of roosting bats.

Locations for bat boxes should be selected to ensure that the lighting plan for the proposed site does not impact on the bat boxes. Therefore, the bat boxes are to be erected mature trees to the rear of the proposed development site and away from public street lighting.”

Lesser Horseshoe Bat Conservation Measures

“Due to the presence of Lesser Horseshoe Bats within the survey area and the fact that the Proposed Development is within 2.5km radius of two SACs, it is important that additional measures are undertaken to conservation local Lesser Horseshoe Bat populations. These measures will entail the following:

- *Compensatory planting for the removal of linear habitats.*
- *Compensatory planting for the removal of scrub habitats.*
- *Specific measures to reduce lighting impacts.*
- *Lesser Horseshoe Bat conservation zone – zone of land along a linear strip to the north of the Proposed Development site and connected to the boundary of the Inch River. This area has been selected because it is outside the Lighting Plan zone and it is adjacent to the Inch River which is deemed as the likely commuting route for Lesser Horseshoe Bats to the Proposed Development area. This river also allows direction commuting to lands with the Ennis Golf Course where Lesser Horseshoe Bat activity was also recorded.*
 - *This area is approximately 20m wide and 170m long and it is proposed that the following measures are undertaken: Erection of Day Roost.”*

A Day Roost consists of a “small structure building of concrete block (externally plastered) with a natural slate roof and bitumous felt. It is designed according to VWT Day Roost recommendations and full details of the plans are provided in the appendices” of the Bat Assessment Report accompanying this application.

“The provision of such features within the 2.5km radius of Lesser Horseshoe Bat SACs is considered by The Vincent Wildlife Trust (VWT) as an important component to the support network for maternity and hibernation roosts.

- *Dark free zone connected to Inch River no lighting permitted withing this area.*
- *Landscaping in vicinity of Day Roost and Inch River.*

- *Approximately 200m of hedge planting (Hawthorn).*
- *Approximately 10 small trees (e.g. Rowan, Birch and Crab Apple).*

Landscape Design

*“It is recommended that native tree, shrub, and plant species are included in the landscaping plan. It is recommended that night-scented planting is also undertaken to encourage foraging areas for local bat populations. As such, night scented-floral species, including Honeysuckle *Lonicera periclymenum* and Star Jasmine *Trachelospermum jasminoides*, will be included within the proposed hedgerows and areas of ornamental planting on Site, as outlined within the Landscape Design Plan, to provide foraging habitat for local bats.*

It is essential that the northern and eastern boundary with the Ennis Golf Course is protected. Any gaps or opportunity to undertaken planting to increase the height and width of this boundary should be undertaken and planting should be with native tree and shrub species. “The retention of the hedgerows along this boundary, along with the proposed compensatory woodland planting and native infilling to these hedgerows, as outlined in the Landscape Design Plan, will protect this ecological corridor.

It should be noted that the proposed development has increased the level of hedgerow planting to include more linear woodland planting across the boundary of the site which includes oak. This will result in taller treelines in the longterm than the granted development which would provide superior foraging corridoes and greater light spill containment.

11.11 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

11.11.1 Construction Phase

Based on the successful implementation of the construction phase controls and the works to be carried out in accordance with this EIAR and the accompanying AA Screening/NIS, it is likely that there will be no significant ecological impact arising from construction works proposed for the proposed project. Designated conservation sites will not be impacted by the proposed development during construction.

A robust series of standard construction phase control measures in addition to design measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses during construction. It is essential that these measures are complied with to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Inch/Claureen River and downstream Natura 2000 sites, which are potentially the primary vector of impacts from the site, are not impacted during construction and operational phases of the proposed development.

No significant environmental impacts are likely in relation to the construction of the proposed development.

Effects: Moderate / National / Negative effect / Not significant /short term/likely. Standard mitigation and enhanced planting of linear woodlands will be in place on site.

11.11.2 Operational Phase

Based on the successful implementation of the operational phase controls and the works to be carried out in accordance with this EIAR and the accompanying AA/NIS, it is likely that there will be no significant ecological impact arising from operation of the proposed project. Designated conservation sites will not be impacted by the proposed development.

Operational phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses. It is essential that these measures are complied with, to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Inch/Claureen River and associated biodiversity, downstream Natura 2000 sites, and Lesser Horseshoe Bats which are potentially the primary vector of impacts from the site, is not impacted during operational phases of the proposed development. Light spill will be introduced into the area but these have been designed to have minimal impact on biodiversity. It would be expected that there would be no significant long-term impact on Lesser Horseshoe bats with the implementation of robust mitigation measures in relation to this species as outlined above.

11.11.3 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 11.3 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Pollution of watercourses and downstream designated sites from sediment runoff	Negative	Low adverse Not significant	Local/county	Likely	Short term	Direct
Construction dust impact from earthworks	Negative	Low adverse Not significant	Site	Likely	Short-term	Direct
Habitat loss and Fragmentation	Negative	Low adverse Not significant	Local	Likely	Long-term	Direct
Disruption to bat commuting routes	Negative	Low adverse Not significant	Local	Unlikely	Short-term	Direct
Construction lighting Impacts	Negative	Low adverse Not significant	Site	Likely	Short-term	Direct
Disturbance from construction noise and vibration	Negative	Low adverse Not significant	Local	Likely	Short-term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 11.4 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Lighting impacts	Negative	Low adverse Not significant	Site	Likely	Permanent	Direct
Habitat fragmentation for species on site (presence of new buildings, infrastructure etc.)	Negative	Low adverse Not significant	Site	Likely	Short-term	Direct
Disturbance from increased human presence and traffic noise	Negative	Low adverse Not significant	Local	Likely	Long-term	Direct
Pollution of watercourses and downstream European sites from petrochemical runoff	Negative	Low adverse Not significant	International	Unlikely	Short-term	Direct

11.12 Risk of Major Accidents or Disasters

The nature, scale, and location of the proposed project do not give rise to a significant risk of major accidents or disasters that would result in significant adverse effects on the environment.

11.13 Worst Case Scenario

- Destruction or collapse of the badger sett located outside the site boundary during site works.
- Significant pollution event during construction (e.g. fuel or concrete spill) entering the adjacent Claureen River and potential adverse effects on downstream designated sites.

11.14 Interactions

The biodiversity elements of this EIAR have involved consultation with a wide section of the Project Team particularly in relation to the Construction Management, design, drainage, lighting and landscape elements of the proposed Project. There are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to the biodiversity chapter. The biodiversity chapter of the EIAR involves interactions with the Land & Soils, Water & Hydrology, Air Quality, Noise and Vibration, and Traffic and Transport. Following the implementation of mitigation measures outlined in the EIAR the following interactions are noted.

11.14.1 Lands & Soils

During the construction phase, excavated soil, stone, clay and made ground will be generated from the excavations required to facilitate site levelling and construction of the new foundations. It is estimated that 27,000m³ of topsoil will be stripped, which is expected to be reused on site. In addition, 45,000m³ of subsoil layers will be excavated, which is also expected to be reused on site. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. As such, there is the potential for impacts on local biodiversity via the proposed excavation and re-profiling works. There will be a loss of some vegetation on site, but this is not expected to impact significantly on surrounding areas Following the implementation of mitigation measures outlined in Chapter 9 and Chapter 11, the predicted effects on biodiversity are

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short to long term, imperceptible, and neutral. The biodiversity of the subject site is likely to improve following the completion of landscaping works

11.14.2 Water & Hydrology

During the construction and operational phases of development, there is the potential for downstream impacts on the proximate watercourses, and designated conservation sites via contaminated surface water runoff. Following the implementation of mitigation measures outlined in Chapter 10 and Chapter 11, the predicted effects on biodiversity are *short term, imperceptible, and neutral.*

11.14.3 Air Quality

During the construction phase of development, given the nature and scale of the proposed works, there is the potential for dust and materials to enter the proximate watercourse during site clearance and re-profiling works with the potential for downstream impacts on biodiversity and designated conservation sites. Following the implementation of mitigation measures outlined in Chapter 11 and Chapter 13 the predicted effects on biodiversity are *short term, imperceptible, and neutral.*

11.14.4 Noise and Vibration

During the construction and operational phases of the development, there will be an increase in disturbance including noise and vibration that could potentially impact on birds on site and mammals proximate to the site. Following the implementation of mitigation measures outlined in Chapter 11 and Chapter 12, the predicted effects are *short term and minor adverse.*

11.14.5 Traffic and Transport

During the construction phase of development, heightened traffic within and immediately surrounding the subject site (resulting from the transport of construction materials and the commuting of workers to the site) has the potential to impact on local biodiversity through increased disturbance. Following the implementation of mitigation measures outlined in Chapter 6 and Chapter 11, the predicted effects on biodiversity are *short and long term, imperceptible, and neutral.*

11.15 Monitoring

11.15.1 Construction Phase

A project ecologist will be appointed to oversee construction works on site. Pre-construction surveys will be carried out for terrestrial mammals and bats.

11.15.2 Operational Phase

Post-construction bat surveys and monitoring will be carried out by the project ecologist. Bat Eco Services recommend the following monitoring methods in relation to bats on site:

- *“Inspection of bat boxes within one year of erection of bat box scheme/rocket box. Register bat box scheme with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years.*

- *Monitoring of Day Roost: Monitoring should involve: Inspection of internal space for evidence of bat usage once per year for two years. Static surveillance for a minimum of 10 days/year to record any bat activity during the summer months in Year 2. Installation of a temperature data logger for 2 year surveillance.*
- *Monitoring of any other bat mitigation measures. All mitigation measures should be checked to determine that they were successful. A full summer bat survey is recommended post-works.*
- *Specific monitoring is recommended in relation to the proposed lighting scheme to determine that a level of <1 Lux is achieved along the boundaries of the Proposed Development site.”*

11.16 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 11.5 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Disturbance or destruction of a badger sett	Pre-construction survey for badger setts and supervision of clearance due to nature of dense scrub on site.	N/A
Disturbance or destruction of bat roost	Pre-construction survey for bats and inspection of trees of bat roosting potential proposed for felling	N/A

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 11.6 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Reduction in bat foraging on site, in particular of Lesser Horseshoe bat	Inspection of bat boxes within one year of erection	Monitoring of day roost
	<1lux along boundaries of development site	Monitoring of lighting scheme to determine if <1lux along boundaries of development site has been achieved.
	Post construction inspection of lighting by project ecologist.	All mitigation measures should be checked to determine that they were successful.
	Inspection of woodland planting by the project ecologist.	Post construction bat surveys

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11.17 Conclusion

The Biodiversity Chapter of the EIAR involved extensive surveys and interactions within the project team being carried out over several years. The flora, fauna and habitats within the proposed development area are outlined in detail and the potential impacts on biodiversity and designated sites were assessed. Detailed mitigation measures have been outlined and will be carried out during the construction and operational phases of the development including measures to ensure the protection of bats on site and badgers proximate to the site. In conclusion, the proposed development has satisfactorily addressed the potential impacts on biodiversity on site and within the potential zone of influence. It is considered that the overall impact on the biodiversity of the proposed development is a long term low adverse not significant residual impact on the existing biodiversity. However, the implementation of the proposed landscaping will provide significant on-site biodiversity enhancement features and provide long term positive benefits to the biodiversity on site.

11.18 References and Sources

Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.

Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009; http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf

Managing NATURA 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision_of_art6_en.pdf

Assessment of Plans and Projects Significantly Affecting NATURA 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC; http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf

Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC https://ec.europa.eu/environment/nature/natura2000/management/pdf/methodological-guidance_2021-10/EN.pdf

Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf

Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging; http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf

The Status of EU Protected Habitats and Species in Ireland. http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf

CHAPTER TWELVE

NOISE AND VIBRATION

RECEIVED: 30/06/2025



RECEIVED: 30/06/2025

CHAPTER TWELVE

Table of Contents

Noise and Vibration

12.1 Introduction..... 12-1

12.2 Expertise & Qualifications 12-1

12.3 Proposed Development..... 12-1

12.4 Methodology 12-1

12.5 Difficulties Encountered 12-5

12.6 Baseline Environment..... 12-5

12.7 The ‘Do Nothing’ Scenario 12-7

12.8 Potential Significant Effects 12-7

12.9 Mitigation Measures 12-12

12.10 Residual Impact Assessment 12-14

12.11 Risk of Major Accidents or Disasters 12-15

12.12 Worst Case Scenario..... 12-15

12.13 Significant Interactions..... 12-15

12.14 Monitoring 12-15

12.15 Summary of Mitigation and Monitoring 12-16

12.16 Conclusion 12-16

12.17 References and Sources 12-17

Table of Tables

Table 12.1 Example Threshold of Potential Significant Effect at Dwellings	12-2
Table 12.2 Interpretation of CNL at Dwelling.....	12-2
Table 12.3 Transient vibration guide values for cosmetic damage.	12-3
Table 12.4 Guidance on Effects of Human Response to PPV Magnitudes.	12-3
Table 12.5 Classification of magnitude of noise impacts in the short-term.....	12-3
Table 12.6 Likely Impact Associated with Long-term Change in Traffic Noise Level (DMRB 2020).	12-3
Table 12.7 Internal Noise Design Range for Residential Buildings (BS 8233:2014).....	12-4
Table 12.8 Survey Locations and Periods	12-5
Table 12.9 Noise Monitoring Equipment	12-6
Table 12.10 Attended Noise Monitoring Results.....	12-7
Table 12.11 Unattended Noise Monitoring Results	12-7
Table 12.12 Indicative CNLs at Closest Distances	12-9
Table 12.13 Summary of Change in Noise Level, for Years 2026 and 2041	12-10
Table 12.14 Projects Considered for Cumulative Impacts.....	12-11
Table 12.15 Summary of Construction Phase Likely Significant Effects in the absence of mitigation	12-11
Table 12.16 Summary of Operational Phase Likely Significant Effects in the absence of mitigation	12-12
Table 12.20 Summary of Construction Phase Effects Post-Mitigation ...	12-14

Table 12.17 Summary of Operational Phase Effects Post Mitigation	12-15
Table 12.18 Summary of Cumulative Construction Phase Effects Post Mitigation	12-15
Table 12.19 Summary of Construction Phase Mitigation and Monitoring	12-16
Table 12.20 Summary of Operational Phase Mitigation and Monitoring	12-16

RECEIVED: 30/06/2025

Table of Figures

Figure 12.1 ProPG Stage 1 - Initial noise Risk Assessment 12-5

Figure 12.2 Noise Monitoring Locations 12-6

Figure 12.3 Closest NSLs to Proposed Development (Phases 1 -3) 12-8

RECEIVED: 30/06/2025

CHAPTER 12 | Noise and Vibration

12.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development with respect to noise and vibration. The proposed development involves the construction of a Large Scale Residential Development (LRD) at Ballymacaula, Drumbiggie, Keelty, Circular Road, Ennis, Co. Clare. A full description of the development is available in Chapter 2. The assessment for noise and vibration is based on the most up to date applicable guidance and assessment documents available both nationally and internationally.

Noise and vibration will be considered in terms of two aspects. The first is the outward effect of the development on its surrounding environment, and the second is the inward effect of the existing noise sources in the surrounding environment on the development itself.

12.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Aoife Kelly (Senior Acoustic Consultant) with AWN Consulting Ltd. Aoife holds a BSc(Hons) in Environmental Health and a PhD in Occupational Noise. She has completed the Institute of Acoustics Diploma in Acoustics and Noise Control. Working in the area of acoustics since 2013, she has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, specialising in infrastructure, wind energy, industrial, commercial and residential.

This chapter of the EIAR was co-authored by Robert Holohan (Acoustic Consultant) has a BA(Hons) in Geography and Business Marketing from Maynooth University as well as an environmental science background from his MSc in Coastal and Marine Environments from the University of Galway. He has completed noise monitoring campaigns across numerous sites and holds a certificate from the Institute of Acoustics in environmental noise monitoring. He has also contributed to various residential, industrial and infrastructure projects across Ireland through surveying, noise modelling and impact assessment.

12.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 ‘Development Description’ of this EIAR.

For the purposes of this Chapter the Proposed Development is a Large Scale Residential Development (LRD,) which includes a mix of residential dwellings ranging over 1-3 storeys and will also include a creche to the north of the development.

12.3.1 Construction Stage

During the construction phase, the main site activities will include site clearance and bulk excavation, foundations, building construction, road works, and landscaping. This phase has the greatest potential noise and vibration impacts on its surrounding environment, however this phase will be of short-term impact e.g. more than 1 year. The construction impact assessment will consider the potential impacts on noise sensitive locations (NSLs) external to the Proposed Development.

NSLs include areas where people spend significant periods of time and where concentration, sleep, and amenity are important considerations. Examples of these sensitive locations include residential dwellings, schools and other educational establishments, hospitals and nursing homes, hotels and other short-term accommodation buildings, buildings of religious sensitivity, recreational and noise-sensitive amenity areas, and offices.

12.3.2 Operational Stage

During the operational phase of the development, no significant sources of noise or vibration are expected with the development. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise used to serve the ancillary elements within the creche buildings and amenity spaces.

12.4 Methodology

The assessment has been undertaken using the following methodology:

- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- An environmental noise survey has been undertaken in the vicinity of the subject site in order to characterise the existing baseline noise environment;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the proposed development at the nearest NSLs to the site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at NSLs surrounding the development site;
- An assessment has been completed of potential cumulative impacts that may arise as a result of the proposed development and other existing or proposed plans and projects;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development; and
- The inward effect of noise from the surrounding environment into the proposed residential buildings has also been assessed to determine the requirements, for additional noise mitigation, where required, to ensure a suitable internal noise environment for residential amenity.

12.4.1 Relevant Legislation & Guidance

The assessment of impacts has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter. In addition to specific guidance documents for the assessment of noise and vibration impacts which are discussed further in the relevant sections, the EPA *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (May 2022) (EPA EIAR Guidelines) were considered and consulted for the purposes of this chapter.

12.4.2 Construction Phase Methodology

12.4.2.1 Criteria for Assessing Construction Phase - Noise Impacts

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phases of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228 – 1: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Noise*.

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The approach adopted here calls for the designation of a NSL into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a Construction Noise Threshold (CNT) that, if exceeded, indicates a potential significant noise impact is associated with the construction activities, depending on context.

The table below sets out the values which, when exceeded, signify a potential significant effect at the façades of residential receptors, as recommended by BS 5228-1:2009+A1:2014.

Table 12.1 Example Threshold of Potential Significant Effect at Dwellings

Assessment Category and Threshold Value Period	Threshold value (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

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.

It should be noted that this assessment method is only valid for residential properties, and if applied to commercial premises without consideration of other factors, may result in an excessively onerous thresholds being set.

Proposed Threshold Levels for Noise

Taking into account the proposed document outlined above and making reference to the baseline noise environment monitored around the Proposed Development site (referred to in Section 12.6.1), CNTs are set using Category A for the closest NSLs to the proposed development.

Interpretation of the Construction Noise Levels (CNL)

In order to assist with interpretation of the significance of a CNL, includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is taken from the UK document Design Manual for Roads and Bridges (2020) LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2 (DMRB: Noise and Vibration - UKHE 2020) and adapted to include the EPA 2022 EIAR Guidelines.

Table 12.2 Interpretation of CNL at Dwelling.

Impact Guidelines for Noise Impact Assessment Significance (Adapted from DMRB)	CNL per Period	EPA EIAR Guidelines	Determination
Negligible	Below or equal to baseline noise level	Not Significant	Depending on range of CNL, baseline noise level and duration
Minor	Above baseline and below or equal to CNT	Slight to Moderate	
Moderate	Above baseline and below or equal to CNT +5 dB	Moderate to Significant	
Major	Above CNT +5 dB	Significant to Very Significant	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely impacts during the construction stages.

12.4.2.2 Criteria for Assessing Construction Phase - Vibration Impacts

There are two aspects to the issue of vibration that are considered for this development: the risk of cosmetic or structural damage to buildings; and human response to vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human response are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

There is no published statutory Irish guidance relating to the maximum permissible vibration levels for either building response. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration (BS 5228 – 2); and
- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings. Part 2: Guide to damage levels from ground borne vibration (BS 7385-2).

Cosmetic or Structural Damage to Buildings

BS 5228-2 and BS 7385 define the following thresholds for cosmetic damage to residential or light commercial buildings: PPV should be below 15 mm/s at 4 Hz to avoid cosmetic damage. This increases to 20 mm/s at 15 Hz and to 50 mm/s at 40 Hz and above. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

The standard also notes that below 12.5mm/s PPV, the risk of damage tends to zero. Historically important buildings that are difficult to repair might require special consideration on a case by case basis, but buildings of historical importance should not be assumed to be more sensitive unless they are structurally unsound. If a building is in an unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground borne disturbance. The vibration limit range for protected and historical buildings are equal to or up to 50% of those for light framed buildings, depending on their structural integrity. Where no structural defects are noted, the same limit to those for light framed buildings apply. This is summarised in Table 12-3 below.

Table 12.3 Transient vibration guide values for cosmetic damage.

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Unsound or Vulnerable Structures	6mm/s	

Note 1: Values referred to are at the base of the building.
Note 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

Human Perception

Humans are sensitive to vibration stimuli, and perception of vibration at high magnitudes may cause concern to building occupants. BS 5228-2:2009+A1:2014 notes that vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known.

Table 12.4 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014 and the DMRB Noise and Vibration (UKHE 2020) document and the associated EPA significant ratings.

Table 12.4 Guidance on Effects of Human Response to PPV Magnitudes.

Criteria	DMRB Impact Magnitude	EPA Significance Rating
≥10 mm/s PPV	Very High	Very Significant
≥1 mm/s PPV	High	Moderate to Significant
≥0.3 mm/s PPV	Medium	Slight to Moderate
≥0.14 mm/s PPV	Low	Not significant to Slight
<0.14 mm/s PPV	Very Low	Imperceptible to Not significant

12.4.2.3 Criteria for Assessing Construction Phase – Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: DMRB Noise and Vibration 2020 and the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the ‘short term’ period in accordance with the DMRB document. Table 12-5 relates changes in traffic noise levels to impact on human perception based on the guidance contained in these documents.

Table 12.5 Classification of magnitude of noise impacts in the short-term.

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

The DMRB guidance outlined will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely impacts during the construction stage.

For both construction noise and construction traffic, a significant effect is deemed to occur where a moderate or major impact is likely to occur for a period of greater than 10 days/nights over 15 consecutive day/nights, or greater than 40 days over 6 consecutive months.

12.4.3 Operational Phase Methodology

12.4.3.1 Criteria for Assessing Operational Outward Noise Impacts

The main potential source of outward noise from the proposed development will be limited to traffic flows to and from the development site onto the public roads. There will also be an element of mechanical and electrical plant required to service creche buildings. The relevant guidance documents used to assess potential operational noise and vibration impacts on the surrounding environment are summarised in the following sections.

Change in Traffic Noise Levels

In the absence of any Irish guidelines or standards describing the effects associated with changes in road traffic noise levels, reference has been made to the DMRB Noise and Vibration (UKHE 2020) document. This document provides magnitude rating tables relating to changes in road traffic noise. For the operational phase of the development, changes in traffic noise are assessed against the long-term magnitude criteria for traffic flows along the surrounding road network. In summary, the assessment looks at the impact with and without development at the nearest noise sensitive locations.

Table 12.6 Likely Impact Associated with Long-term Change in Traffic Noise Level (DMRB 2020).

Change in Noise Level (dB L _{A10})	DMRB Long-Term Term Magnitude	EPA Classification Magnitude of Impact
<0.1	Negligible	Imperceptible
0.1 – 2.9		Not significant
3 – 4.9	Minor	Slight to Moderate
5 – 9.9	Moderate	Moderate to Significant
10+	Major	Significant to Very Significant

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

Mechanical and Electrical Plant

The proposed development is largely residential in nature comprising a mixture of houses, duplex and apartments. There is one creche located to the east of the site in LRD Phase 1. There will be minimal mechanical and/or electrical plant items required to service the development that will generate noise levels outside of the site boundary or at the developments buildings themselves. Plant contained within plant rooms has the least potential for impact, once consideration is given to appropriate design of the space.

The closest NSLs to any operational plant items are the residential dwellings within the proposed development. To ensure there is no adverse impact on the future inhabitants of the proposed development itself, it is appropriate to refer to internal noise targets derived from BS 8233: 2014: *Guidance on Sound Insulation and Noise Reduction for Buildings*. The recommended indoor ambient noise levels and derived external noise levels are set out in Table 12-7 and are based on annual average data.

The derived external levels are based on the approximate attenuation provided by a partially open window of 15 dB, as advised in BS 8233 (BSI 2014c), and represent the appropriate noise level at the external façade of the building. For mechanically ventilated buildings, higher external noise levels will achieve the same internal noise levels with closed windows.

Table 12.7 Internal Noise Design Range for Residential Buildings (BS 8233:2014).

Activity	Location	Internal Noise Design Range dB L _{Aeq,T}	Derived External Levels dB L _{Aeq,T}
Residential Day	Living room	35	50
	Dining room/area	40	55
	Bedroom	35	50
Residential Night	Living room	35	50
	Dining room/area	40	55
	Bedroom	30	45

12.4.3.2 Criteria for Assessing Inward Noise Impacts

Clare County Council Noise Action Plan (NAP) 2024-2028

The Clare County Council Noise Action Plan was revised in 2024 and states the following regarding suitable documents to assist with the assessment of new residential developments in relation to noise:

“Relevant standards and guidance for the consideration of noise where there is proposed new residential development near major transportation sources (roads and railways) include the Professional Planning Guidance on Planning & Noise: New Residential Development (ProPG, 2017), Acoustic Ventilation and Overheating, Residential Design Guide (AVO, 2021), BS 8233:2014 Guidance on sound Insulation and Noise Reduction for Buildings and ISO 19488:2021 Acoustics: Acoustic classification of dwellings”.

The NAP also states the following regarding the interaction between acoustic comfort and thermal requirements:

“The AVO guidelines provide an approach as to how the competing aspects of thermal and acoustic comfort can be managed, which is particularly important in situations where acoustic requirement may call for closed windows. BS 8233:2014 provides recommendations for the control of noise in and around buildings.”

To assist local authorities and in the absence of Irish planning guidance the Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development was compiled in 2021 by the NIECE Local Authority Noise Subgroup with the express purpose:

“that good acoustic design should be implemented from the outset of the design of new residential developments and recommends the use of the ProPG approach to bringing people to noise and cognisance of BS 8233:2014 and the AVO guidelines.”

With reference to new residential developments located in close proximity to major roads the NAP states the following:

“All new applications for residential developments shall be assessed in accordance with and where there is the likelihood of an adverse noise impact near major roads. Guidance on Acoustic Design Statements can be accessed in ‘Professional Practice Guidance on Planning and Noise: New Residential Developments’ (ProPG).”

The BS 8233 criteria has been adopted in this assessment, as explained in the preceding section. The *Professional Practice Guidance on Planning & Noise* (ProPG) guidance has also been adopted to inform the inward impact of the assessment and is described in further detail below.

Professional Practice Guidance on Planning & Noise (ProPG 2017)

The *Professional Practice Guidance on Planning & Noise* (ProPG 2017)¹ has been generally considered best practice guidance adopted in Ireland, in the absence of equivalent Irish guidance for inward noise impact assessments.

The ProPG outlines a systematic risk based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows: -

- **Stage 1:** Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels.
- **Stage 2:** Involves a full detailed appraisal of the Proposed Development covering four “key elements” that include: -
 - **Element 1** – Good Acoustic Design Process
 - **Element 2** – Noise Level Guidelines
 - **Element 3** – External Amenity Area Noise Assessment
 - **Element 4** – Other Relevant Issues

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk, based on the pre-existing noise environment. Figure 12.1 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and / or predicted on site.

¹ Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH).

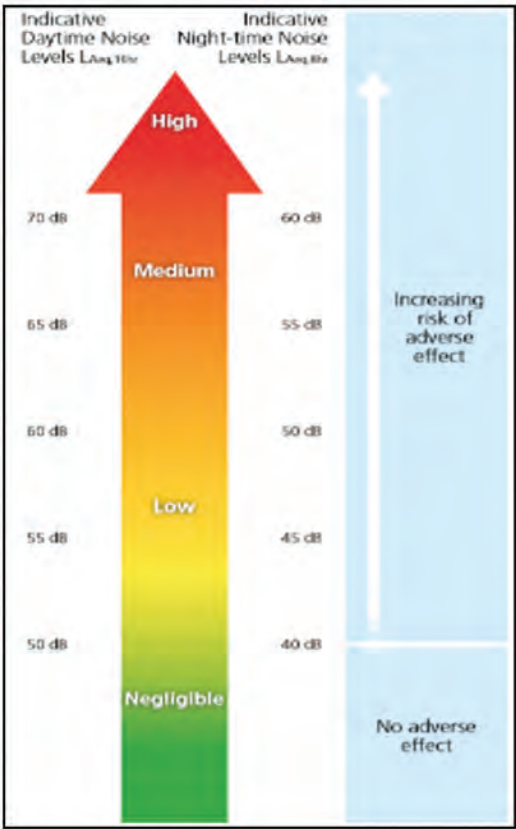


Figure 12.1 ProPG Stage 1 - Initial noise Risk Assessment

It should be noted that a site should not be considered a negligible risk if more than 10 no. L_{AFMax} events exceed 60 dB during the night period, and the site should be considered a high risk if the L_{AFMax} events exceed 80 dB more than 20 times a night.

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233: 2014. The recommended indoor ambient noise levels are set out in Table 12.7 previously and are based on annual average data.

In addition to these absolute internal noise levels, ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

ProPG provides the following advice with regards to external noise levels for amenity areas in the development: -

“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$ ”

Appendix 12.1 Acoustic Design Statement presents the ProPG assessment for the Proposed Development. Mitigation measures identified from the ProPG assessment are presented in Section 12.9.2.3 of this EIAR chapter. A glossary of acoustic terminology is available in Appendix 12.2.

12.4.3.3 Operational Phase – Vibration

The development is residential in nature and there are no vibration sources associated with the proposed development. Therefore, there will be no outward impacts associated with vibration for the operational phase, and accordingly such impacts have been scoped out.

12.5 Difficulties Encountered

There were no difficulties encountered in compiling this assessment.

12.6 Baseline Environment

The Proposed Development LRD (Phases 1, 2 and 3) is a greenfield site located in Ennis, to the west of the Ennis Golf Club and to the east of the N85. For the Proposed Development the existing noise and vibration environments across the sites and in the vicinity of the nearest existing NSLs are dictated by transportation sources in the study area.

The receiving environment in terms of baseline noise and vibration is expected to be the same for the cumulative development and each individual Phase of the site within the development. Therefore, the baseline environment outlined in the following section does not differentiate between the Proposed Development or cumulative site of the development being assessed within this EIAR chapter.

12.6.1 Baseline Survey

12.6.1.1 Survey Locations and Periods

The monitoring locations for this survey are described below and illustrated in Table 12.8 and Figure 12.2

Table 12.8 Survey Locations and Periods

Ref	Description	Survey Period
UN1	Located on the western side on the development site near the N85 national road.	20 to 21 January 2025, logged over 15 minute intervals
AN1	Located at the south east boundary of the development site in close proximity to the Ballymacaula View residential estate, and the R474 roadway.	3 x 15 minute daytime attended measurements, 21 January 2024
AN2	Located at the eastern boundary of the development site in close proximity to nearby detached residential homes on the R474 roadway.	3 x 15 minute daytime attended measurements, 21 January 2024
AN3	Located on the western side on the development site near the N85 national road.	3 x 15 minute daytime attended measurements, 21 January 2024

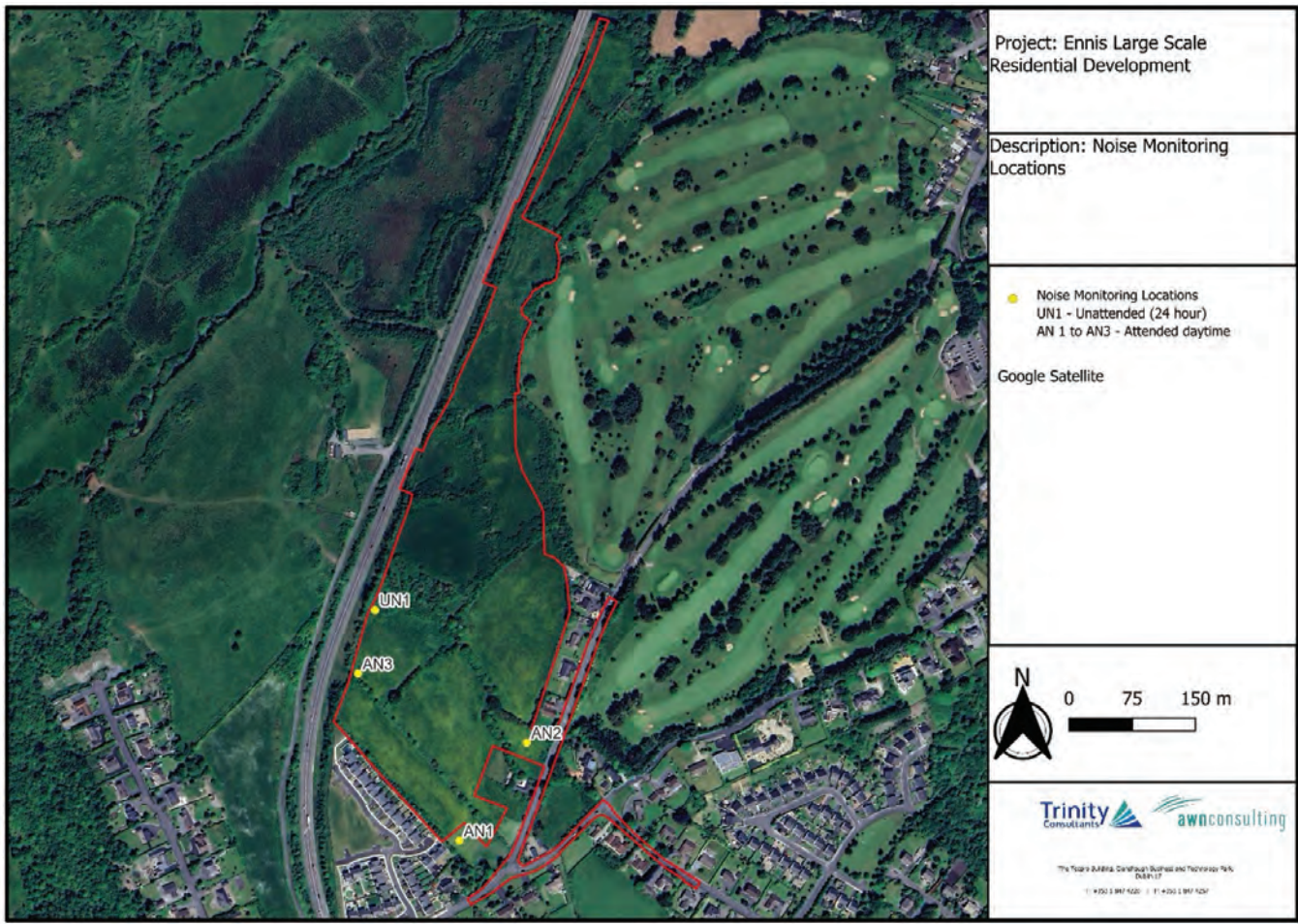


Figure 12.2 Noise Monitoring Locations

12.6.1.2 Survey Procedures

Baseline noise monitoring has been undertaken across the development site from 20 to 21 January 2025 to determine the range of noise levels at varying locations across the development site and to establish the existing noise climate the nearest existing noise sensitive locations as outlined in Table 12-8 and detailed further in Figure 12-3.

The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

12.6.1.3 Survey Equipment and Personal

The unattended and attended noise surveys were undertaken by Awn Consulting using Rion NL-52 sound level meter and a Larson Davis LxT1 sound level meter respectively and were calibrated using Bruel & Kjaer 4231 type calibrator.

Table 12.9 Noise Monitoring Equipment

Equipment	Serial Number	Calibration Date
Rion NL-52	186667	13/06/2023
Larson Davis LxT1	6122	29/03/2023
Bruel & Kjaer 4231	2394086	06/06/2024

12.6.1.2 Survey Parameters

The following measurement parameters were measured and are discussed within this chapter.

$L_{Aeq,T}$ is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value over the defined measurement period, T.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the ‘F’ time weighting.

$L_{A90,T}$ is the A-weighted sound level that is exceeded for 90% of the sample period; generally used to quantify background noise. The T is the sample period the parameter is measured over.

The “A” suffix denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

12.6.1.5 Weather Conditions

Weather conditions during the unattended and attended surveys were calm and dry and did not adversely affect noise measurements.

12.6.1.6 Survey Results

Attended Survey Results

The survey results for the attended monitoring locations are presented in Table 12.10.

Table 12.10 Attended Noise Monitoring Results

Date	Location	Start Time	Measured Noise Levels (dB re.2x10-5Pa)		
			L _{Aeq}	L _{AMax}	L _{A90}
21 January 2025	AN1	09:58	52	64	45
		11:03	52	64	44
		12:03	53	64	44
	AN2	09:36	57	72	49
		10:43	56	68	43
		11:43	56	76	44
	AN3	10:19	55	72	49
		11:23	55	62	45
		12:23	55	64	46

The noise environment at location AN1 was dominated by road traffic noise on the R474. Road traffic on the R474 was intermittent in nature during the noise survey and during traffic lulls distant N85 road traffic became the dominant noise source in the environment. Other noise sources during the measurements included birdsong and trees rustling in a light breeze.

The noise environment at location AN2 was the similar to location AN1, dominated by road traffic noise on the R474 but the monitoring position was in closer proximity to the road side, representative of the rear facades of the existing NSLs facing on to the R474.

The noise environment at location AN3 was dominated by N85 road traffic noise. The traffic on this road was constant in nature and therefore for the duration of the measurements the N85 road traffic dominated the noise environment. Other audible noise in the environment were birdsong and foliage rustling in the light breeze.

12.6.1.6.1 Unattended Survey Results

Table 12.11 summarises the measured day, evening and night-time noise levels for location UN1. Subjective observations during the setup and removal of the monitoring equipment noted that the primary contributor to noise build-up was road traffic noise.

Table 12.11 Unattended Noise Monitoring Results

Date	Time	Measured Noise Levels (dB re.2x10-5Pa)		
		L _{Aeq,T}	L _{Amax}	L _{A90,T}
20 January 2025	Day (07:00 – 19:00)	64	73	52
	Eve (19:00 – 23:00)	61	72	44
	Night (23:00 – 07:00)	55	70	26
21 January 2025	Day (07:00 – 19:00)	65	74	55
Average	L _{Aeq 16hr} (07:00-23:00)	64	-	51
	L _{night} (23:00 – 07:00)	55	-	26

12.7 The ‘Do Nothing’ Scenario

The Do Nothing scenario includes retention of the current site without the Proposed Development in place. In this scenario, noise levels at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

In the absence of the Proposed Development it is likely that a development of a similar nature would be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase impacts outlined in this assessment are likely to occur in the future even in the absence of the implementation of the development proposed in this EIAR.

12.8 Potential Significant Effects

The general commentary presented in the following sections are the same across the Proposed Development, unless otherwise indicated under the relevant headings.

12.8.1 Demolition Phase

It is understood that there is no demolition works taking place during the construction phase.

12.8.2 Construction Phase

12.8.2.1 Noise

A variety of items of plant will be in use for the purpose of site clearance and construction works. There will also be vehicular movements to and from the site that will make use of existing roads. Due to the nature of these activities, there is potential for the generation of elevated levels of noise in the vicinity of existing NSLs. It is estimated that the overall duration of the three phase construction period will be approximately 36 months and hence impacts are temporary to short-term in nature at any one NSLs.

The proposed general construction hours are 08:00 to 18:00 hrs, Monday to Friday and 08:00 to 14:00 hrs on Saturdays.

As discussed in Section 12.4.2, the construction noise threshold (CNT)s are set using Category A from BS 8233-1 for the closest NSLs which sets the following threshold values.

- Daytime (07:00 – 19:00hrs weekdays) /Saturday AM: 65dB L_{Aeq,12hr}
- Evening and Weekends: 55dB L_{Aeq,12hr}

The main stages of construction will be progressed based on the following activities over the three construction stages (Phase 1,2,3). As the construction programme has been established in outline form only, construction noise associated with activities on site during this phase are reviewed for the purposes of determining the likely significant effects. Indicative ranges of noise levels associated with construction may be calculated in accordance with the methodology set out in BS 5228-1:2009+A1:2014. This standard sets out sound power and sound pressure levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels. However, it is not possible to conduct detailed accurate prediction calculations for the construction phase of a project due to the level of variability during different construction stages over short periods of time.

The following activities have been assessed to determine the likely potential noise impacts associate with the planned works across the three construction phases of the site.

Site Clearance, Bulk Excavation, Foundations and Road Works

For site clearance, bulk excavations and fill work, foundation and road works using excavators, loaders, dozers, concreting works, mobile cranes, generators, noise source levels are quoted in the range of 70 to 80 dB L_{Aeq} at distances of 10 m within BS 5228-1.

For ongoing construction activity associated with the above activities, a total construction noise level of 85 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations representing a variety of plant items and activities over this stage. This would include, for example two items of plant at 80 dB L_{Aeq} and three items of plant at 75 dB L_{Aeq} operating simultaneously within one work area resulting in a total noise level of 85 dB L_{Aeq} .

This scenario is a robust assumption made for a development of this size, on the basis that it is unlikely that more than 5 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL.

Superstructure and Landscaping Works

Given the nature of the proposed construction phases which will include standard residential house building techniques across the site, once the ground preparation and foundation works have been completed, a large portion of the work will involve manual labour and cranes with lower overall noise levels. For this phase of work, smaller items of mobile plant (excavators, cranes, dozers), landscaping and concreting works with lower noise emissions, a total construction noise level of 78 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would include, for example one item of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area.

Indicative Construction Noise Calculations at Distance from Works

During Phase 1 of the construction works the closest NSLs (NSL 1 and 2) to the Proposed Development are residential dwellings to the south of the site between the N85 and R474, at distances ranging between 10m to 35m from the closest site works.

During Phase 2 of the construction works the closest NSLs (NSL 3) to the Proposed Development are residential dwellings to the east of the site along the R474, at distances ranging between 10m to 15m from the closest site works.

During Phase 3 of the construction works to the north of the site, the closest NSLs (NSL 3) to the southeast of the site are at 75m from the closest site works.

Further south east, the closest NSL (NSL 4) to the landscaping works along footpaths are along the Showgrounds Road approximately 10m from the closest site boundary.

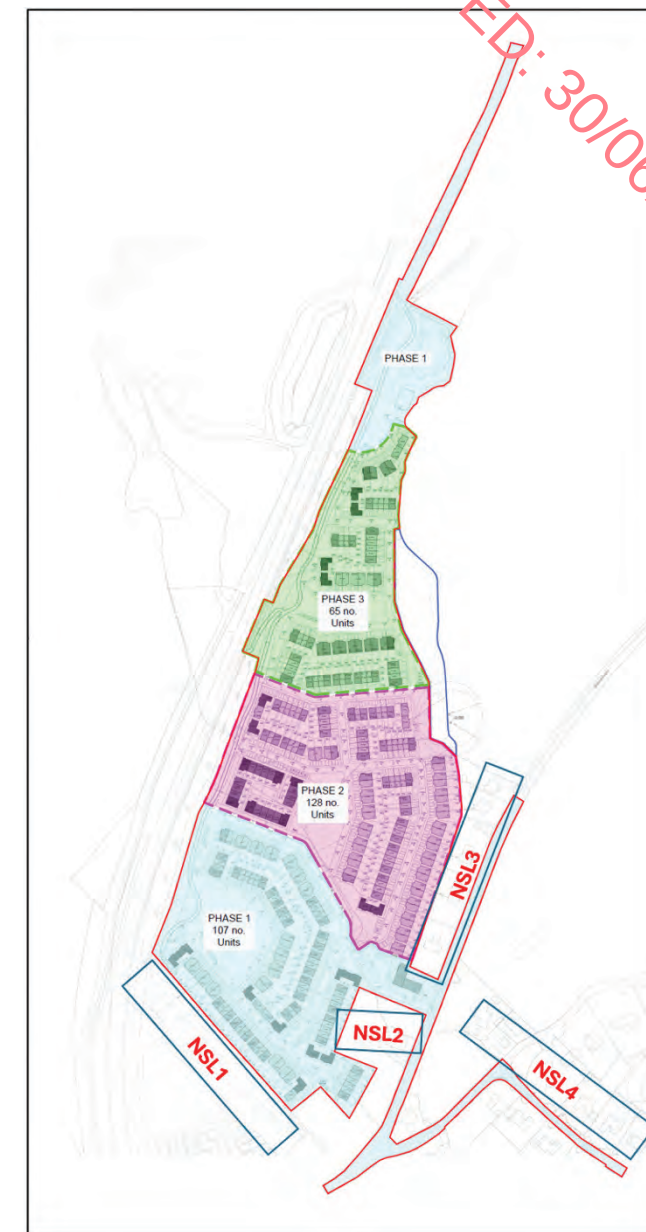


Figure 12.3 Closest NSLs to Proposed Development (Phases 1 -3)

Construction noise levels (CNL) have been calculated at the closest NSLs, assuming the construction noise activities and source noise levels discussed previously. The calculations assume that the equipment will operate for 66% of the working time. Table 12-12 summarises the result of this assessment.

Table 12.12 Indicative CNLs at Closest Distances

Construction phase	Sound pressure level at construction works, dB L _{Aeq}	Calculated noise levels at varying distances, dB L _{Aeq,T}					
		10m	15m	20m	35m	60m	75m
Site Clearance, Bulk Excavation, Foundations, and Road Works	85	82	78	75	70	65	63
Superstructure, Compounds and Landscaping Works	78	75	71	68	63	58	56

Site Clearance, Bulk Excavation and Foundations

The worst case predictions detailed in Table 12.12 indicate that construction activities can operate within the adopted construction noise thresholds of 65 dB L_{Aeq,T} at the closest NSLs located at greater than 60m from building works with higher noise emissions associated with site clearance, excavations, road works etc, thus resulting in a negative, significant to very significant and temporary effect at NSLs immediately south and east of Phases 1 and 2 (NSL 1, 2 and 3). At all remaining NSLs the CNT will not be exceeded, thus resulting in a negative, not significant to slight and short-term effect at distances of 60m and beyond.

Superstructure and Landscaping Works

During the general construction working associated with house construction, compounds and landscaping works etc. the calculated noise levels in Table 12.12 indicate that construction activities can operate within the adopted construction noise thresholds of 65 dB L_{Aeq,T} at distances greater than 25m from the general construction works. Therefore resulting in a negative, significant to very significant and temporary effect at NSLs immediately south and east of Phases 1 and 2 (NSL 1, 2, 3 and 4). At all remaining NSLs the CNT will not be exceeded, thus resulting in a negative, not significant to slight and short-term effect at distances of 25m and beyond.

The construction phase will be controlled through the use of construction noise threshold values which the contractor will be required to work within as much as is practicable. In this regard, the choice of plant, scheduling of works on site, provision of screening and other best practice control measures will be employed. Further discussion on construction noise and vibration control measures are included in Section 12.9.1.

12.8.2.2 Vibration

During site clearance and excavations activities, there is the potential for vibration to be generated through the ground. Empirical data for this activity is not provided in BS 5228-2, however the likely levels of vibration from this activity will be significantly below the vibration criteria for building damage based on monitoring data and experience from other sites. AWN Consulting has previously conducted vibration measurements under controlled conditions, during trial construction works on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances.

Peak vibration levels during staged activities using the 3 tonne breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10 to 50m respectively from the breaking activities. Using a 6 tonne breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10 to 50m respectively.

Whilst these measurements relate to a solid concrete slab, the range of values recorded provides some context in relation to typical ranges of vibration generated by general construction activity.

With respect to the potential vibration impact, the only significant source of vibration is expected to be due to excavations and foundation activities. The distance between the areas where these activities are to occur and the nearest NSLs are such that all vibration transmission would be orders of magnitude below recommended guideline criteria for building response in Table 12.3.

In terms of human response within buildings, there is potential for vibration magnitudes during breaking to be perceptible at low level at NSLs within 50m (NSLs 1, 2 and 3). Therefore, it is expected in the absence of specific mitigation measures that there will be a negative, slight to moderate and temporary impact at the closest NSLs within 50m and a negative, not significant and temporary impact at NSLs at further distances.

Mitigation measures and recommended good practices have been outlined in Section 12.9.1.

12.8.2.3 Construction Traffic

Based on the information provided by Tobin Consulting Engineers it is anticipated that during the busiest period onsite, namely the groundworks element of the works, an estimated 12 no. HGV's will deliver to the site on a daily basis for the duration of this work element. Therefore it has been assumed that no more than 8 no. HGV peak vehicle movements will be carried out in a one hour period during the construction works. It is assumed that all of the HGVs will enter / exit the site via R474. The nearest NSL to the site entrance is at 10m (NSL2).

The noise level associated with an event of short duration, such as a passing vehicle movement, may be expressed in terms of its Sound Exposure Level (L_{AX}). The mean value of Sound Exposure Level (SEL) for a truck at low to moderate speeds (i.e. 15 to 45km/hr) is of the order of 85 dB L_{AX} at a distance of 10 metres from the vehicle. This figure is based on a series of measurements conducted under controlled conditions. The SEL can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.

The appropriate formula is given below.

$$L_{Aeq,T} = L_{AX} + 10Log_{10}(N) - 10Log_{10}(T) + 20Log_{10}\left(\frac{r_1}{r_2}\right) dB$$

where: -

- L_{Aeq,T} is the equivalent continuous sound level over the time period T in seconds).
- L_{AX} is the "A-weighted" Sound Exposure Level of the event considered (dB).
- N is the number of events over the course of time period T.
- r₁ is the distance at which L_{AX} is expressed.
- r₂ is the distance to the assessment location.

The predicted noise level at the nearest residential NSLs (10m) is in the order of 58 dB $L_{Aeq,1hr}$ and is therefore below the CNT of 65 dB $L_{Aeq,1hr}$ at the closest residential NSLs along R474. This is comparable to the baseline monitoring results that were in the range between 56 to 57 dB $L_{Aeq,1hr}$ at 10m from the road side and remains below the CNT of 65 dB $L_{Aeq,1hr}$.

Therefore, it is expected in the absence of specific mitigation measures that there will be a negative, not significant and medium-term impact at the closest receptors.

No further mitigation measures would therefore be required.

12.8.3 Operational Phase

Once the proposed development is operational, the potential noise impacts to the surrounding environment are predicted to be minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (road traffic noise, estate vehicle movements, children playing, etc.) and, hence, no significant impact are predicted in this regard.

The main potential noise impact associated with the proposed development is considered, therefore, to relate to the generation of additional traffic to and from the site as a result of the new residential buildings. Potential noise impacts from the Proposed Development also relate to operational plant serving the creche building.

Once operational, there are no noteworthy sources of vibration associated with the development site.

12.8.3.1 Additional Vehicular Traffic on Surrounding Roads

For the purposes of assessing the potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the proposed development, given that traffic from the development will make use of the existing road network.

A traffic impact assessment relating to the proposed development has been prepared by Tobin Consulting Engineers as part of this EIAR.

Traffic flows along the surrounding road network in terms of Annual Average Daily Traffic (AADT) for the Do Nothing (DN) and Do Something (DS) scenarios have been reviewed to calculate the change in traffic noise.

Table 12.13 summarises the AADT for the Proposed Development DN and DS scenarios across two links.

Table 12.13 Summary of Change in Noise Level, for Years 2026 and 2041

Link Road	DN AADT 2026	DS AADT 2026	Increase in noise level dB	DN AADT 2041	DS AADT 2041	Increase in noise level dB
N85	15878	16062	0.0	17752	17950	0.0
R474	6756	7083	+0.2	7520	7847	+0.2

The predicted increase in AADT traffic levels along the local road network surrounding the Proposed Development range between 0.0 to 0.2 dB(A) for the opening year 2026. During the future design year 2041, the calculated increase in traffic noise levels range between 0.0 to 0.2 dB(A). Reference to Table 12.6 confirms that the traffic noise level increases for both assessment years along the two closest road links are neutral to negative, imperceptible to not significant and long-term.

12.8.3.2 Building Services Plant

Once operational, there will be building services plant items required to serve the residential and crèche building aspects of the proposed development. The specific requirements for mechanical and electrical plant items for each element of the residential buildings and crèche building have not yet been progressed at this stage of the design. Most of this plant will be capable of generating noise to some degree and may operate 24 hours a day. It would, therefore, be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties as well as louder plant areas on roofs would potentially have the greatest impact.

Plant items will be selected, designed and located so that there is no adverse impact on sensitive receivers within the development itself. The cumulative operational noise level from building services plant at the nearest noise sensitive location within the Proposed Development will be designed/attenuated to not exceed the internal noise levels discussed in Table 12.7.

Taking into account that sensitive receptors within the proposed development are much closer than off-site sensitive receptors, once the relevant noise criteria are achieved within the proposed development, it is expected that there will be no significant negative impact to sensitive receptors off site.

12.8.3.3 Creche Playground

Measurement of noise levels generated by children playing outdoors at several crèches and kindergartens indicate typical noise levels in the order of 56 dB $L_{Aeq,1hr}$ at distance of 5 metres. The nearest existing off-site noise sensitive locations to the east are approximately 20m from the Crèche play area (NSL3). Considering the distance, activities from the crèche are calculated to be 44 dB $L_{Aeq,1hr}$ and hence, is more than 10 dB below the range of baseline noise levels recorded to the east of the site at Location AN2, representing of properties set back from road traffic. The resultant noise impact is therefore neutral, not significant and long-term.

12.8.4 Cumulative Effects

For the purpose of the cumulative assessment, two scenarios have been considered.

The first scenario is a review of the cumulative construction impacts from the Proposed Development LRD Phase 1, 2 and Phase 3. For the construction assessment it has been assumed that Phase 1, 2 and Phase 3 construction occurs simultaneously. The closest NSLs to the cumulative site redline boundary have been considered.

The second scenario is a review of approved and proposed developments in the local area which are external to the cumulative site, as summarised in Chapter 1, Section 1.9 of this EIAR.

12.8.4.1 Cumulative Construction Noise Assessment – Scenario One

The closest residential NSLs to the Proposed Development are indicated in Figure 12-4 e.g. NSL 1 to NSL 4, as previously presented in Section 12.8.2.1. During Phase 1 and Phase 2 if construction works were to occur simultaneously at the site

boundary the resultant construction noise level at NSL3 would range between 73 to 84 dB $L_{Aeq,T}$ during construction works. Therefore resulting in a negative, significant to very significant and temporary effect at the NSL3 immediately east of Phases 1 and 2, however it is noted that this is a highly conservative assessment.

The construction phase will be controlled through the use of construction noise threshold values which the contractor will be required to work within as much as is practicable. In this regard, the choice of plant, scheduling of works on site, provision of screening and other best practice control measures will be employed. Further discussion on construction noise and vibration control measures are included in Section 12.9.1.

12.8.4.2 Cumulative Construction Vibration– Scenario One

The closest NSLs in the cumulative assessment are set back at similar or further distances from the proposed construction works than those outlined in Section 12.8.2.2. Therefore the impacts assessed will not be higher under the cumulative assessment. All construction works can operate within the limit values presented in Table 12.3 for buildings.

The predicted cumulative vibration impact on human comfort during the construction phase is negative, slight to moderate and temporary impact at the closest NSLs.

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Table 12.3. Mitigation measures and recommended good practices have been outlined in Section 12.9.1.1.

12.8.4.3 Cumulative Construction Noise Assessment – Scenario Two

There are a number of approved applications in the local area as outlined in Chapter 1. Depending on the proximity of the construction works to the nearest NSLs it is possible that cumulative impacts could occur at the nearest receptors to the cumulative site (Phase 1, 2 and Phase 3) should all sites progress construction simultaneously. The closest NSL with potential cumulative impacts relate to the NSLs located along the redline boundary of the cumulative site and other developments along the R474 and Drumbiggie Road.

The following developments in Table 12.14 are under consideration due to their proximity to the closest NSLs:

Table 12.14 Projects Considered for Cumulative Impacts

Proposal/Application Ref.	Development Description	Distance to Proposed Development Site
24/60086	48 no. residential units	3.7km
24/122 extension of duration to 17/977	51 no. residential units	1.5km
24/60652	74 no. residential units	2.1km

The three developments listed in the table above are all at distances greater than 1 km from the Proposed Development. Therefore the construction noise from these sites is expected to be significantly below the predicted noise levels at the closest NSLs (NSL1-4) for the Proposed Development i.e. logarithmically they will be at least 10 dB below the predicted noise levels in Section 12.8.2.1 and there will be no cumulative effect.

12.8.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 12.15 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction noise from site clearance, bulk excavation, road works and foundations	Negative	NSL1, NSL2 and NSL3 – significant to very significant	Closest receptors at NSL1 to NSL3 within 35m of the proposed works	Likely	Short- term	Direct / Worst-Case
		NSL4 – slight				
Construction noise from superstructure and landscaping works		NSL1, NSL2, NSL3 and NSL4 – significant to very significant	Closest receptors at NSL1 to NSL4 within 15m of the proposed works	Likely	Short- term	Direct / Worst-Case
		All other NSLs at distance greater than 25m – not significant to slight				
Construction traffic noise	Negative	Not significant	At all receptors	Likely	Temporary	Direct / Worst-Case
Construction vibration damage to buildings	Negative	Not significant	At all receptors	Likely	Temporary	Direct / Worst-Case
Construction vibration human perception	Negative	Slight to moderate	NSL1 to NSL3 within 50m of site boundary	Likely	Temporary	Direct / Worst-Case
		Not significant	All other receptors	Likely	Short-term	
Cumulative construction noise scenario 1	Negative	NSL3 – significant to very significant	Closest receptors at NSL3	Likely	Temporary	Direct / Worst-Case
Cumulative construction vibration scenario 1	Negative	Not significant for vibration damage to buildings	At all receptors	Likely	Temporary	Direct / Worst-Case
		Slight to moderate for human perception at NSL3 within 50m of Phase 1 and Phase 2 site boundaries	NSL1 to NSL3 within 50m of site boundary	Likely	Temporary	
		Not significant	All other receptors	Likely	Short-term	

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Cumulative construction noise scenario 2	Negative	NSL1, NSL2 and NSL3 – significant to very significant	Closest receptors at NSL1 to NSL3 within 35m of the proposed works	Likely	Short-term	Direct / Worst-Case
		NSL4 – slight				

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 12.16 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Additional vehicular traffic noise	Neutral	N85 – imperceptible	All receptors	Likely	Long-term	Direct / Worst-Case
	Negative	R474 –not significant				
Building services plant noise	Negative	Not significant	Closest receptors at NSL1, NSL2 and NSL3	Likely	Long-term	Direct / Worst-Case
Creche playground noise	Neutral	Not significant	Closest receptors at NSL3	Likely	Long-term	Direct / Worst-Case

12.9 Mitigation Measures

The following mitigation measures are outlined for the Proposed Development but are also applicable in the cumulative site scenario i.e. Phase 1, 2 and 3 constructed simultaneously.

12.9.1 Construction Phase Mitigation

Mitigation measures for the construction phase are set out below in order to reduce potential impacts as far as practicable to within the adopted design goals for noise and vibration.

12.9.1.1 Construction Stage

The assessment detailed in Section 12.8.2.1 has determined that construction activities can typically operate within the adopted construction noise threshold levels at the closest off-site NSLs when carried out at distances greater than 60m from the main phases of the construction works.

Vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 12.3 to avoid any cosmetic damage to buildings.

Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant
- Control of noise sources
- Screening
- Hours of work
- Liaison with the public

Further comment is offered on these items in the following paragraphs.

Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring.

Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether said item can be replaced with a quieter alternative.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control at source. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

The following best practice migration measures will be considered:

- Site compounds will be located away from noise sensitive boundaries within the site constraints.
- The use of lifting bulky items, dropping and loading of materials within these areas will be restricted to normal working hours.
- For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant will be switched off when not in use and not left idling.
- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system.
- For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.

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- For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening

Typically screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the source. BS 5228 -1:2009+A1 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than 10kg/m² will give adequate sound insulation performance.

Post-mitigation construction noise calculations assume a partial line of sight (-5dB) is achieved using a solid 2.4m high standard construction site hoarding.

Annex B of BS 5228-1:2009+A1:2014 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials.

In addition, careful planning of the site layout will also be considered. The placement of temporary site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening during the phasing of works.

Liaison with the Public

A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Vibration

On review of the likely vibration levels associated with construction activities, it may be concluded that the construction of the proposed development is not expected to give rise to vibration that is either significantly intrusive or capable of giving rise to structural or cosmetic damage to adjacent buildings.

In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period: -

- A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars;

- Appropriate vibration isolation shall be applied to plant, where feasible;
- Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values.

Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. The potential for cumulative works occurring both within the site and at any external sites with potential to generate significant noise effects will be reviewed in terms of limiting the duration and scale of these effects.

12.9.2 Operational Phase Mitigation

Mitigation measures for the operational phase are set out below.

12.9.2.1 Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the impact of traffic from the development are not deemed necessary.

12.9.2.2 Mechanical Services Plant

Proprietary noise and vibration control measures will be employed as part of the detailed design in order to ensure that noise emissions from building services plant do not exceed the relevant internal noise criteria within Table 12.7 for residential dwellings within the proposed development. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. Considering that sensitive receptors within the development are much closer than off-site sensitive receptors, once the relevant noise criteria is achieved within the development, there are no mitigation requirements to control building services and plant at off-site NSLs.

12.9.2.3 Inward Noise

In terms of the inward noise impact of road traffic on the development buildings and amenity areas, Appendix 12.1 sets out the approach for controlling noise levels across the site.

The majority of the Proposed LRD Phases 1-3 Development site has been categorised as a **Negligible to Low Risk** in accordance with ProPG. The LRD Phases 1-3 Western Section (Unit Type G in Phase 1, Type F in Phase 2 and 3 only) have been categorised as a **Low to Medium Risk** (see further details in Appendix 12.1). Review of the location of residential buildings on site and the external noise levels, the assessment has determined that specific noise mitigation measures are not required to the site boundary or site buildings to control noise intrusion to internal spaces or to control noise in the external amenity spaces.

12.9.3 Cumulative Mitigation

The same design guidance applies to all elements of the development and to the Ennis LRD development as a whole. In this instance, there are no additional noise mitigation measures over and above those set out in Sections 12.9.1 and 12.9.2 for the construction and operational phases.

12.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

12.10.1 Construction Phase

12.10.1.1 Noise

During the construction phase of the project there is the potential for temporary to short-term noise effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable. For the duration of the construction period, construction noise impacts will be short-term and negative, depending on the proximity of the works to the site boundary.

During site clearance the residual effect is **negative, significant to very significant and temporary** noise impact at distances up to 10m for NSL 1 in Phase 1 and NSL3 in Phase 2 if all plant items were assumed to work simultaneously while adjacent to the closest boundary to the site. In line with DMRB Noise and Vibration (UKHE 2020) document, a significant effect relating to construction noise is deemed to occur where a moderate or major impact is likely to occur for a period of greater than 10 days/nights over 15 consecutive day/nights, or greater than 40 days over 6 consecutive months. In the case of this activity, it is unlikely the durations will be exceeded and hence the overall residual effect is categorised as **negative, moderate and temporary**. At all other NSLs at distances of 20m and greater the CNT would not be exceeded and the residual significance of effect and is **negative, slight to moderate and temporary**.

During super structure, compounds and landscaping the residual effect is **negative, not significant to moderate and temporary** at all NSLs (greater than 10m from works) during all phases of the construction.

12.10.1.2 Vibration

Likely noise and vibration effects during the construction phase will be **negative, slight to moderate and temporary**.

12.10.2 Operational Phase

12.10.2.1 Additional Vehicular Traffic on Surrounding Roads

In the context of the existing noise environment, the overall contribution of traffic is not considered to pose any significant impact to nearby residential locations. The resulting residual effect is **neutral to negative, imperceptible to not significant, and long-term**.

12.10.2.2 Building Services Plant

There are no sources of mechanical or electrical plant associated with the building types across the development with potential to emit audible noise levels beyond the site boundary at off-site NSLs. Any required plant items will be selected, designed and located so that there is no negative impact on sensitive receivers within the development itself.

In this instance, best practice is to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the proposed development. The cumulative operational noise level from building services plant at the nearest noise sensitive location within the proposed development will be designed/attenuated to not exceed the internal noise levels discussed in Table 12.7. Once the relevant noise criteria are not exceeded within the proposed development, the related noise impact to existing NSLs offsite will be **negative, not significant and long-term**.

12.10.2.3 Inward Noise

The results of the baseline survey have determined the noise climate along the western site boundary bordering the N85, have the highest day and night-time noise levels measured during the baseline study (UN1). The measured noise levels (see Appendix 12.1 for full details) indicate that with standard double glazing and mechanical ventilation good and reasonable internal noise levels can be achieved with windows open for all dwellings. The exception to this are the western facing bedrooms to the immediate western boundary of the site overlooking the N85 (Unit Type G in Phase 1, Type F in Phase 2 and 3 only), which can achieve good internal levels with windows closed. No perimeter acoustic noise barriers are required to achieve good internal levels. The resultant residual inward noise effect will be of **neutral, not significant and long term**.

12.10.3 Summary of Post-mitigation Effects

The following Table summarises the residual effects during the construction phase of the Proposed Development following the application of mitigation measures for effects identified as significant pre-mitigation.

Table 12.20 Summary of Construction Phase Effects Post-Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction noise from site clearance, bulk excavation, road works and foundations	Negative	NSL1 and NSL3 – moderate All other NSLs – slight to moderate	Closest receptors at NSL1 and NSL3 within 20m of the proposed works	Likely	Short- term	Direct / Worst-Case
Construction noise from superstructure and landscaping works		All NSLs at distance greater than 10m – not significant to moderate	All NSLs	Likely	Short- term	Direct / Worst-Case
Construction vibration human perception	Negative	Slight to moderate Not significant	NSL1 to NSL3 within 50m of site boundary All other receptors	Likely Likely	Temporary Short-term	Direct / Worst-Case

The following Table summarises the residual effects during the operational phase of the proposed development following the application of mitigation measures for effects identified as significant pre-mitigation.

Table 12.17 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Building services plant noise	Negative	Not significant	Closest receptors at NSL1 to NSL3.	Likely	Long-term	Direct / Worst-Case
Inward impact noise	Neutral	Not significant	All units within proposed development	Likely	Long-term	Direct / Worst-Case

12.10.4 Cumulative Residual Effects

12.10.4.1 Construction Stage

The similar magnitude of residual noise and vibration impacts discussed in Section 12.10.1 for the Proposed Development are relevant to the full Ennis development (Phases 1-3), given the same construction noise and vibration criteria will apply to all phases. Table below summarises the cumulative residual effects post mitigation.

Table 12.18 Summary of Cumulative Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Cumulative construction noise scenario 1	Negative	NSL3 – moderate	Closest receptors at NSL3	Likely	Temporary	Direct / Worst-Case
Cumulative construction vibration scenario 1	Negative	Not significant for vibration damage to buildings	At all receptors	Likely	Temporary	Direct / Worst-Case
		Slight to moderate for human perception at NSL3 within 50m of Phase 1 and Phase 2 site boundaries	NSL1 to NSL3 within 50m of site boundary	Likely	Temporary	
		Not significant	All other receptors	Likely	Short-term	
Cumulative construction noise scenario 2	Negative	All NSLs - not significant to moderate	All NSLs at distance greater than 10m	Likely	Short- term	Direct / Worst-Case

12.10.4.2 Operational Stage

There were no significant effects identified for the cumulative operational phase pre-mitigation. The similar magnitude of residual noise and vibration impacts discussed in Section 12.10.2 for the proposed development are relevant to the cumulative site given the same operational noise criteria will apply to all phases.

12.11 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to noise and vibration associated with the proposed development and the cumulative development.

12.12 Worst Case Scenario

In terms of construction phase impacts, worst-case assumptions regarding volumes of excavation materials and number of vehicle movements have been used in order to determine the highest level of mitigation required in relation to potential noise impacts (see Section 12.8.2). The proposed development is the worst-case scenario in terms of noise emissions, emissions from each individual phase will be lower than the cumulative proposed development.

Worst-case traffic data was used in the assessment of construction and operational phase impacts. In addition, conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the construction and operational stage assessment are worst-case and the significance of effects is most likely overestimated.

12.13 Significant Interactions

The potential interaction between noise and vibration and other specialist chapters in the EIAR is primarily limited to Chapter 4 (Population & Human Health), Chapter 11 (Biodiversity) and Chapter 6 (Material Assets - Traffic & Transportation). This chapter has been prepared in consideration of and in conjunction with the relevant elements of these chapters. For example noise and vibration impacts associated with the Proposed Development have been fully considered within this Chapter of the EIA Report. However, commentary on the impact assessment and related noise levels are also summarised specifically with respect to potential human health impacts in Chapter 4. The traffic flow projections associated with the development provided by the traffic consultants in Chapter 6 (Material Assets - Traffic & Transportation) has been utilised in the construction and operational noise calculations in this Chapter of the EIAR report.

12.14 Monitoring

The following monitoring measures are required to be implemented at the site for the project to ensure that construction activities do not cause excessive nuisance to receptors in the vicinity of the site.

12.14.1 Noise Monitoring

During the construction phase, the appointed contractor will monitor noise at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise will be monitored in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).

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The selection of monitoring locations will be based on the closest NSLs to the proposed works which have the potential to exceed the CNT, i.e., at NSL1 and NSL3 to the southern and eastern site boundaries.

Any Noise Monitoring Terminal (NMT) (number and locations to be agreed post-consent with Local Authority), to be installed will have the following specifications (or similar approved):

- Logging of two concurrent periods, e.g., 15-minute & hourly.
- Daily automated Charge Injection Calibration (CIC).
- E-mail alert on threshold exceedance.
- E-mail alert on low battery and low memory.
- Remote access to measured data.
- Live display of noise levels.

In addition, it is recommended that spot-check noise measurements are conducted on a monthly basis. These spot checks can be organised to coincide with works that have the potential to generate high levels of noise on site in order to confirm the potential extent of effects.

A monthly noise-monitoring report should be prepared by the contractor. Reports should identify any exceedances above nominal limit values and attempts to clarify the causes. Where remedial measures are required and identifiable, these should also be clearly stated.

12.14.2 Vibration Monitoring

Where the excavation works take place within 50m of vibration-sensitive locations (VSLs) e.g. NSL1 to NSL3 vibration monitoring shall be installed, with the number and locations to be agreed with Local Authority.

Vibration monitoring stations should continually log vibration levels using the Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions, in accordance with ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.

- The mounting of the transducer to the vibrating structure will need to comply with BS ISO 5348: 2021: Mechanical vibration and shock – Mechanical mounting of accelerometers.
- In summary, the following ideal mounting conditions apply:
- The transducer and its mountings should be as rigid as possible;
- The mounting surfaces should be as clean and flat as possible;
- Simple symmetric mountings are best;
- The mass of the mounting should be small in comparison to that of the structure under test;
- The monitoring equipment should be set to monitor vibration in 5-minute periods;
- E-mail alert on threshold exceedance;
- E-mail alert on low battery and low memory;
- Remote access to measured data;
- Live display of vibration levels.

In addition, it is recommended that spot-check vibration measurements are conducted on a monthly basis. These spot checks can be organised to coincide with works that have potential to generate high levels of vibration on site in order to confirm the potential extent of effects.

A monthly vibration monitoring report should be prepared by the contractor. Reports should identify any exceedances above nominal limit values and attempts to clarify the causes. Where remedial measures are required and identifiable, these should also be clearly stated.

No monitoring is required for the operational phase.

12.15 Summary of Mitigation and Monitoring

There are no significant residual effects during the construction or operational phases of the development. The following Table summarises the construction phase mitigation and monitoring measures.

Table 12.19 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Site clearance, bulk excavation, road works, foundations.	Selection of quiet plant; control of noise sources; screening, controlling; hours of work; liaison with the public.	NSL1 and NSL3
Vibration	Liaison with the public; appropriate vibration isolation shall be applied to plant; monitoring will be undertaken at southern site boundary in close proximity to NSL1 and eastern site boundary in close proximity to NSL2 and NSL3.	NSL1, NSL2 and NSL3

The following Table summarises the operational phase mitigation and monitoring measures.

Table 12.20 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Building services plant noise	Selection of quiet plant at detailed design stage to ensure adherence to criteria outlined in Table 12.7.	Not applicable
Inward impact noise	None - to be confirmed at detailed design stage to ensure adherence to criteria outlined in Table 12.7.	Not applicable

12.16 Conclusion

AWN Consulting have undertaken an assessment of the potential noise and vibration impacts as a result of the proposed development. A range of mitigation measures have been specified for the construction stages, with no specific mitigation required for the operational stage. Noise and vibration monitoring has been identified during the construction phase to ensure the construction and vibration thresholds are not exceed at the closest receptors. Overall, no significant noise and vibration impacts are predicted during the construction or operational phases of the proposed development or cumulative development.

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The ProPG inward impact assessment has identified that the proposed units located at the immediate western edge of the development boundary will achieve suitable internal noise levels with standard double glazing. The resultant residual inward noise effect will be of neutral, not significant and long term.

12.17 References and Sources

- Clare County Council Noise Action Plan 2024-2028.
- ANC, IOA & CIEH (2017). ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development.
- British Standard BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.
- British Standard BS 5228: 2009 +A1:2014: Code of Practice for Control of Noise and Vibration on Construction and Open Sites Part 1: Noise & Part 2: Vibration.
- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- Department of Transport Welsh Office, HMSO (1988). Calculation of Road Traffic Noise.
- EPA (2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports.
- ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.
- ISO 9613-2: 2024: Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.
- United Kingdom Highways England (now National Highways) (UKHE) Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2 (UKHE, 2020).

CHAPTER THIRTEEN

AIR QUALITY

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CHAPTER THIRTEEN

Table of Contents

Air Quality

13.1 Introduction..... 13-1

13.2 Expertise & Qualifications 13-1

13.3 Proposed Development 13-1

13.4 Methodology 13-1

13.5 Difficulties Encountered 13-4

13.6 Baseline Environment..... 13-4

13.7 The ‘Do Nothing’ Scenario 13-7

13.8 Potential Significant Effects 13-7

13.9 Mitigation Measures 13-9

13.10 Residual Impact Assessment 13-10

13.11 Risk of Major Accidents or Disasters 13-11

13.12 Worst Case Scenario..... 13-11

13.13 Interactions 13-11

13.14 Monitoring 13-11

13.15 Summary of Mitigation and Monitoring 13-12

13.16 Conclusion 13-12

13.17 References and Sources 13-12

Table of Tables

Table 13.1 Ambient Air Quality Limit Values..... 13-2

Table 13.2 WHO Air Quality Guidelines 2021..... 13-2

Table 13.3 IAQM Criteria to Determine Dust Emissions Magnitude 13-3

Table 13.4 IAQM Criteria to Determine Risk of Dust Impacts 13-4

Table 13.6 Trends In Zone C Air Quality - Nitrogen Dioxide (NO₂) 13-5

Table 13.7 Trends In Zone C Air Quality - PM₁₀ 13-5

Table 13.8 Trends In Zone C Air Quality - PM_{2.5} 13-6

Table 13.9 Criteria for Determining the Sensitivity of the Area 13-6

Table 13.10 Risk of Dust Impacts used to Define
Site-Specific Mitigation..... 13-8

Table 13.11 Summary of Construction Phase Likely Significant
Effects in the absence of mitigation 13-8

Table 13.12 Summary of Operational Phase Likely Significant
Effects in the absence of mitigation 13-9

Table 13.13 Summary of Construction Phase Effects
Post Mitigation 13-10

Table 13.14 Summary of Operational Phase Effects
Post Mitigation 13-10

Table 13.15 Summary of Construction Phase Mitigation
and Monitoring 13-12

Table 13.16 Summary of Operational Phase Mitigation
and Monitoring 13-12

Table of Figures

Figure 13.1 Wind Roses for Shannon Airport
Meteorological Station 13-5

Figure 13.2 Sensitive Receptors within 20m, 50m and 100m of Site.... 13-7

RECEIVED: 30/06/2025

CHAPTER 13 | Air Quality

13.1 Introduction

This chapter identifies, describes and assesses the likely air quality impacts of the proposed large-scale residential development (LRD) at located at Ennis Ballymacaula, Drumbiggle, Keelty, Circular Road, Ennis, Co. Clare.

A full description of the development is available in Chapter 2. This Chapter should be read in conjunction with Chapter 6 Material Assets Traffic and Transport and the Traffic and Transportation Assessment submitted with the planning application.

13.2 Expertise & Qualifications

This chapter was completed by Tanmay Gojamgunde. Tanmay is an environmental consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He holds a MSc in Air Pollution Management and Control from the University of Birmingham and has also completed BTech in Environmental Engineering. As part of the MSc, he worked on ‘The Impact of bus-fleet electrification on air quality in Birmingham’ utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi’s first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and extends to broader aspects of environmental engineering.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

13.3 Proposed Development

The proposed development will provide a Large Scale Residential Development (LRD) with a creche and all associated site development works. Refer to Chapter 2 of this EIAR and the statutory notices for a full description.

13.3.1 Aspects Relevant to this Assessment

During the construction phase construction dust emissions have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of nitrogen dioxide (NO₂) and particulate matter (as PM₁₀ and PM_{2.5}). Operational phase impacts will be long-term in duration.

13.4 Methodology

13.4.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- Guidance on the Assessment of Dust from Demolition and Construction v2.2 (Institute of Air Quality Management [IAQM] (hereafter referred to as the IAQM Guidelines) (IAQM, 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020); and
- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland [TII], 2022).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

13.4.2 Criteria for Rating of Impacts

13.4.2.1 Ambient Air Quality Standards

To reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or ‘Air Quality Standards’ are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast). This Directive sets out new air quality standards for pollutants to be reached by 2030 which are more closely aligned with the World Health Organisation (WHO) air quality guidelines.

Prior to 2030 the air quality standards set out in EU Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe are still applicable.

The Air Quality Standards Regulations 2022 (S.I. 739 of 2022) transposed EU Directive 2008/50/EC. With the adoption of Directive (EU) 2024/2881, Ireland must transpose this Directive into national law (i.e. update the Air Quality Standards Regulations) before December 2026.

The ambient air quality standards applicable for nitrogen dioxide (NO₂) and particulate matter (as PM₁₀ and PM_{2.5}) are outlined in Table 13.1. These pollutants are of relevance to the proposed development. The limit values set out in Directive (EU) 2024/2881 will need to be achieved by 2030, with the limit values set out in the Air Quality Standards Regulations 2022 (and future updated regulations) applicable until 2030.

Table 13.1 Ambient Air Quality Limit Values

Pollutant	Directive 2008/50/EC		Directive (EU) 2024/2881	
	Limit Type	Limit Value (applicable until 2030)	Limit Type	Limit Value (to be attained by 2030)
Nitrogen Dioxide (NO ₂)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m ³
	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM ₁₀)	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM _{2.5})	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m ³
	Annual limit for protection of human health	25 µg/m ³	Annual limit for protection of human health	10 µg/m ³

13.4.2.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (Table 13.2), the IT4 targets by 2030 and the final targets by 2040 (Table 13.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final PM_{2.5} target of 5 µg/m³. The strategy also acknowledges that “meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both PM_{2.5} and NO₂”.

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that “Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II.”

These assessment thresholds relate to monitoring of ambient air quality by Member States, where “exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years.”

Table 13.2 WHO Air Quality Guidelines 2021

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO ₂	24-hour limit for protection of human health	-	-	25 µg/m ³
	Annual limit for protection of human health	20 µg/m ³	-	10 µg/m ³
PM (as PM ₁₀)	24-hour limit for protection of human health	75 µg/m ³	50 µg/m ³	45 µg/m ³
	Annual limit for protection of human health	30 µg/m ³	20 µg/m ³	15 µg/m ³
PM (as PM _{2.5})	24-hour limit for protection of human health	37.5 µg/m ³	25 µg/m ³	15 µg/m ³
	Annual limit for protection of human health	15 µg/m ³	10 µg/m ³	5 µg/m ³

The applicable air quality limit values for the purposes of this assessment are those set out in Table 13.1. The limit values stipulated under Directive 2008/50/EC and the Air Quality Standards Regulations 2022 are applicable for the construction phase and Opening Year 2026 for the proposed development. The limit values stipulated by Directive (EU) 2024/2881 are applicable for the Design Year 2041 for the proposed development.

13.4.2.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}). The EU ambient air quality standards outlined in Table 13.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m²/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

13.4.3 Construction Phase

13.4.3.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The criteria for determining the category for the works involved are outlined in Table 13.3, these are based on the IAQM guidance (IAQM, 2024). The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Table 13.3 IAQM Criteria to Determine Dust Emissions Magnitude

Dust Emission Magnitude		
Small	Medium	Large
Demolition		
• Total building volume <12,000 m³ • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <6 m above ground • Demolition during wetter months	• Total building volume 12,000 - 75,000 m³ • Potentially dusty construction material • Demolition activities 6 – 12 m above ground level	• Total building volume >75,000 m³ • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >12 m above ground level
Earthworks		
• Total site area <18,000 m² • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <3 m in height • Earthworks during wetter months	• Total site area 18,000 m² - 110,000 m² • Moderately dusty soil type (e.g. silt) • 5 – 10 heavy earth moving vehicles active at any one time • Formation of bunds 3 – 6 m in height	• Total site area >110,000 m² • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6 m in height
Construction		
• Total building volume <12,000 m³ • Construction material with low potential for dust release (e.g. metal cladding or timber)	• Total building volume 12,000 - 75,000 m³ • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >75,000 m³ • On-site concrete batching • Sandblasting
Trackout (Truck Movements)		
• <20 HDV (>3.5 t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50 m	• 20 – 50 HDV (>3.5 t) outward movements in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 – 100 m	• >50 HDV (>3.5 t) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m

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Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 13.4.

Table 13.4 IAQM Criteria to Determine Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

13.4.3.2 Construction Phase Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

TOBIN Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 6 Material Assets – Traffic and Transport of this EIAR. As per Chapter 6, it has been determined by TOBIN that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality with respect with human or ecological receptors.

13.4.4 Operational Phase

13.5 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

13.6 Baseline Environment

13.6.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Shannon Airport meteorological station, which is located approximately 17.8 km southeast of the site. Shannon Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 13.1). For data collated during five representative years (2019 - 2023), the predominant wind direction is westerly to south-westerly; the mean wind speed over the long term 30-year averaging period 1991 - 2020 is 4.6 m/s (Met Éireann, 2025).

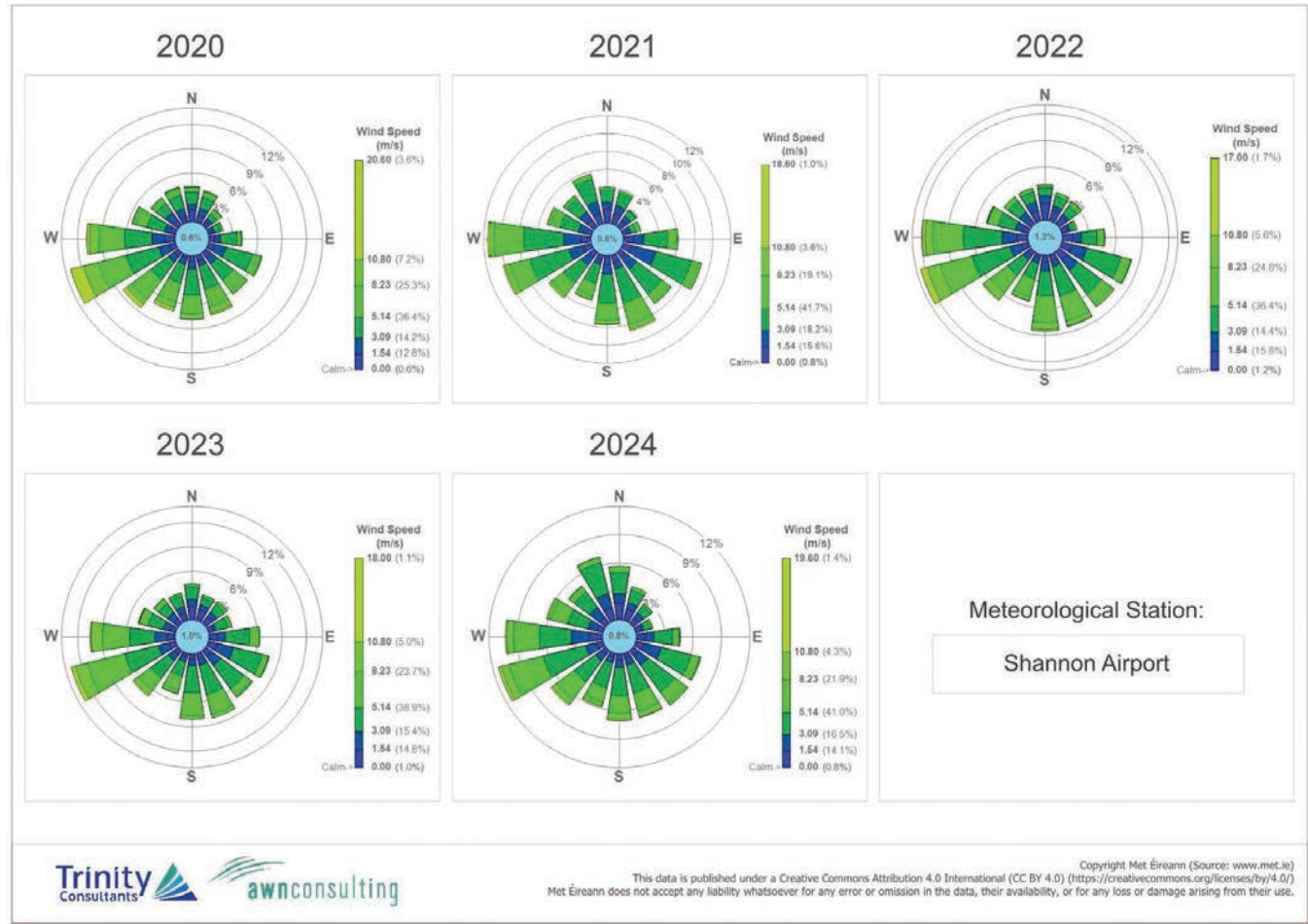


Figure 13.1 Wind Roses for Shannon Airport Meteorological Station

13.6.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is 'Air Quality In Ireland 2023' (EPA, 2024). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) ,as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2024). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone C (EPA, 2024). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

13.6.2.1 NO₂

Long-term NO₂ monitoring was carried out at the representative Zone C suburban background location of Dundalk, Kilkenny and Portlaoise for the period 2019 – 2023 (Table 13.6) (EPA, 2024). Long-term average concentrations are significantly below the annual average limit of 40 µg/m³. Average results range from 4 – 12 µg/m³. The overall annual average concentration for this 5-year period is 8 µg/m³. Additionally, there were no exceedances of the hourly limit value of 200 µg/m³. Based on the above information a conservative estimate of the current background NO₂ concentration for the region of the proposed development is 8 µg/m³.

Table 13.6 Trends In Zone C Air Quality - Nitrogen Dioxide (NO₂)

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Dundalk	Annual Mean NO ₂ (µg/m ³)	12	10	11	10	9
	1-hr Mean > 200 µg/m ³ (days)	-	1	0	1	1
Kilkenny Seville Lodge	Annual Mean NO ₂ (µg/m ³)	5	4	4	5	4
	1-hr Mean > 200 µg/m ³ (days)	-	0	0	0	0
Portlaoise	Annual Mean NO ₂ (µg/m ³)	11	8	8	9	8
	1-hr Mean > 200 µg/m ³ (days)	-	0	0	0	0

13.6.2.2 PM₁₀

Continuous PM₁₀ monitoring was carried out at two representative Zone C locations from 2019 – 2023; Athlone, Dundalk, Ennis, Galway Ragoon, Kilkenny Seville Lodge, Portlaoise and Tralee. Annual average PM₁₀ concentrations across the sites ranged from 10 – 28 µg/m³ over the 2019 – 2023 period (Table 13.7). The overall annual average concentration for this 5-year period is 15 µg/m³. There were at most 21 exceedances of the daily limit of 50 µg/m³ in 2020 (at Ennis). However, 35 exceedances are permitted per year (EPA, 2024). Based on the EPA data, a conservative estimate of the current background PM₁₀ concentration in the region of the proposed development is 15 µg/m³.

Table 13.7 Trends In Zone C Air Quality - PM₁₀

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Athlone	Annual Mean PM ₁₀ (µg/m ³)	17	16	12	12	12
	24-hr Mean > 50 µg/m ³ (days)	-	3	2	3	-
Carlow Town	Annual Mean PM ₁₀ (µg/m ³)	11	11	10	11	10
	24-hr Mean > 50 µg/m ³ (days)	-	1	0	0	-
Dundalk	Annual Mean PM ₁₀ (µg/m ³)	14	13	12	12	13
	24-hr Mean > 50 µg/m ³ (days)	2	2	0	2	-
Ennis	Annual Mean PM ₁₀ (µg/m ³)	18	20	19	20	16
	24-hr Mean > 50 µg/m ³ (days)	12	19	17	21	-

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Galway Ragoon	Annual Mean PM ₁₀ (µg/m ³)	13	13	11	13	13
	24-hr Mean > 50 µg/m ³ (days)	0	1	1	0	-
Kilkenny Seville Lodge	Annual Mean PM ₁₀ (µg/m ³)	18	18	17	18	14
	24-hr Mean > 50 µg/m ³ (days)	7	1	2	2	-
Portlaoise	Annual Mean PM ₁₀ (µg/m ³)	15	12	11	12	11
	24-hr Mean > 50 µg/m ³ (days)	0	0	1	0	-
Tralee	Annual Mean PM ₁₀ (µg/m ³)	28	16	17	18	15
	24-hr Mean > 50 µg/m ³ (days)	2	7	11	14	-

13.6.2.3 PM_{2.5}

Average PM_{2.5} levels in Athlone, Carlow Town, Ennis, Greystones, Naas, Portlaoise and Bray over the period 2019 - 2023 ranged from 5 – 23 µg/m³ (EPA, 2024). The overall annual average concentration for this 5-year period is 9 µg/m³ (Table 13.8). Based on this information, an estimate of the background PM_{2.5} concentration in the region of the proposed development is 9 µg/m³.

Table 13.8 Trends in Zone C Air Quality - PM_{2.5}

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Athlone	Annual Mean PM _{2.5} (µg/m ³)	14	12	9	9	8
Carlow Town	Annual Mean PM _{2.5} (µg/m ³)	8	7	7	7	6
Ennis	Annual Mean PM _{2.5} (µg/m ³)	14	14	15	16	12
Greystones	Annual Mean PM _{2.5} (µg/m ³)	-	-	6	7	6
Naas	Annual Mean PM _{2.5} (µg/m ³)	-	-	7	8	7
Portlaoise	Annual Mean PM _{2.5} (µg/m ³)	-	8	8	8	7
Tralee	Annual Mean PM _{2.5} (µg/m ³)	23	12	13	13	10
Bray	Annual Mean PM _{2.5} (µg/m ³)	7	5	6	6	6

13.6.2.4 Summary

Based on the above information the air quality in the suburban Ennis area is generally good, with concentrations of the key pollutants generally well below the relevant limit values set out in Directive 2008/50/EC. The current pollutant concentrations at the majority of monitoring sites are also in compliance with the 2030 limit values set out in Directive (EU) 2024/2881 and the clean air strategy, however, concentrations are exceeding or approaching the limit values at some sites. Further measures will be needed at a national scale to reduce air pollution in future years. The EPA have indicated that road transport emissions

are contributing to increased levels of NO₂ with the potential for breaches in the annual NO₂ limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM₁₀ and PM_{2.5}). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2024).

13.6.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2024) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. Table 13.9 outlines the criteria for determining the sensitivity of the area to dust soiling and dust-related human health effects as per the IAQM guidance (IAQM, 2024).

Table 13.9 Criteria for Determining the Sensitivity of the Area

Sensitivity of the Area to Dust Soiling Effects on People and Property						
Receptor Sensitivity	Number of Receptors	Distance from Source (m)				
		<20	<50	<100	<250	
High	>100	High	High	Medium	Low	
	10 - 100	High	Medium	Low	Low	
	1 - 10	Medium	Low	Low	Low	
Medium	>1	Medium	Low	Low	Low	
Low	>1	Low	Low	Low	Low	
Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<250
High	< 24 µg/m ³	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low

In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 13.2). There are 10-100 high sensitivity residential properties within 20m of the site boundary, there are a further 10-100 within 50m and >100 properties within 100m of the site boundary. Based on these receptor numbers and using the IAQM criteria in Table 13.9, the sensitivity of the area to dust soiling impacts from the proposed development is high.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the proposed development is 15 µg/m³. There are 10-100 high sensitivity receptors within 20 m of the proposed development boundary (Figure 13.2). Based on the IAQM criteria outlined in Table 13.9 the worst-case sensitivity of the area to dust-related human health effects is low.

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant, as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site, and 50 m from site access roads, up to 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. There are no sensitive ecological receptors that meet these criteria within the study area and there is no potential for impacts to sensitive ecology from construction dust emissions and no further assessment is required.

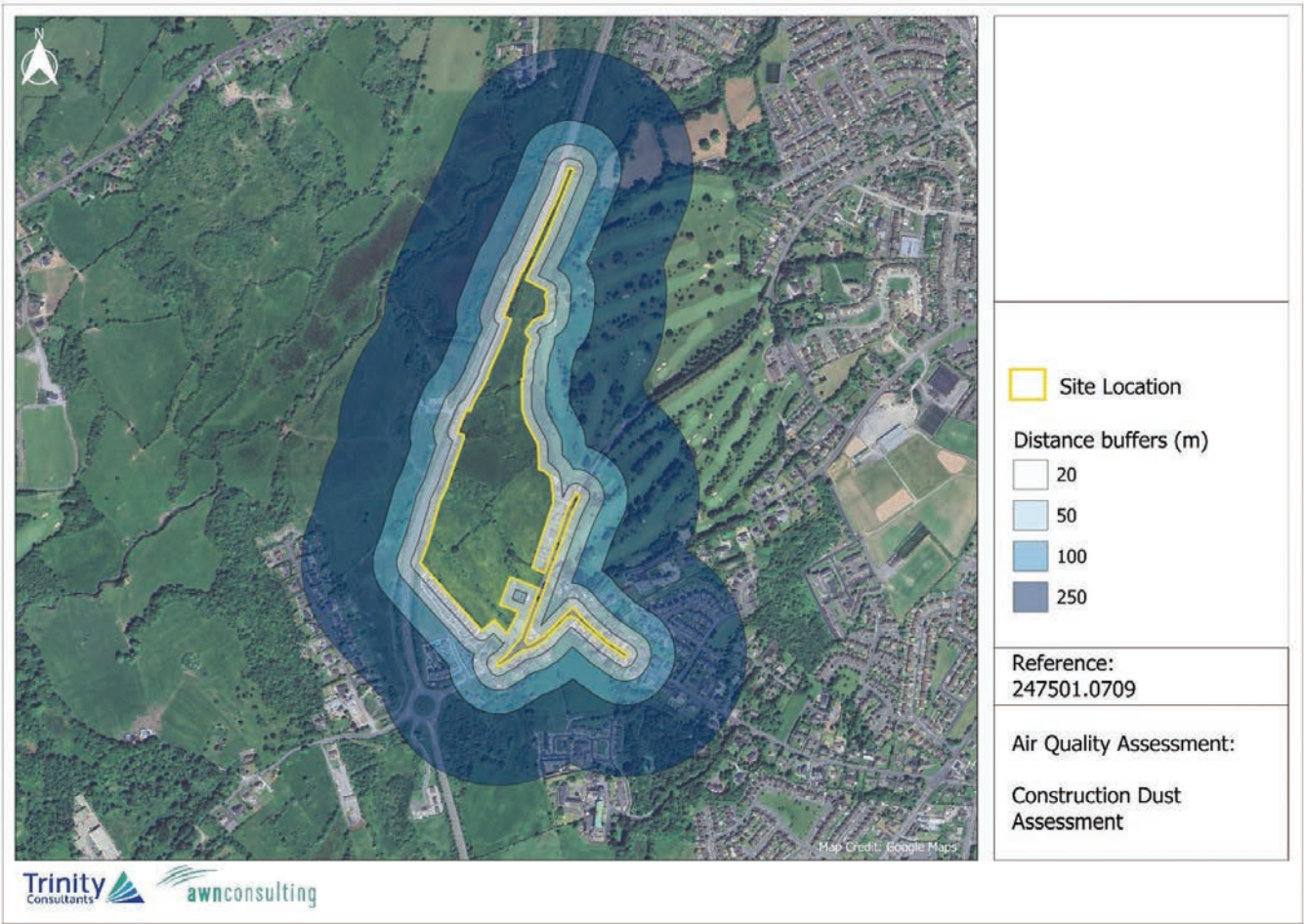


Figure 13.2 Sensitive Receptors within 20m, 50m and 100m of Site

13.7 The ‘Do Nothing’ Scenario

In the Do Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

The Do Nothing scenario associated with the operational phase of the development is assessed within Section 13.4.4 and it was found to be **direct, long-term, negative** and **slight** which is overall **not significant**.

13.8 Potential Significant Effects

13.8.1 Construction Phase

13.8.1.1 Construction Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2024). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Shannon Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 13.6.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Shannon Airport meteorological station indicates that on average 223 days per year have rainfall over 0.2 mm (Met Éireann, 2025). Therefore, it can be determined that 61% of the time dust generation will be reduced due to natural meteorological conditions.

To determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (Section 13.6.3). The major dust generating activities are divided into four types within the IAQM (IAQM, 2024) guidance to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (movement of heavy vehicles).

13.8.1.2 Determining the Potential Dust Emission Magnitude

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity has been determined below for the proposed development using the criteria in Table 13.3.

- **Demolition:** The dust emission magnitude for the demolition activities is not applicable as there is no demolition required as part of the proposed development.
- **Earthworks:** The dust emission magnitude for the proposed earthwork activities can be classified as large as the total site area is greater than 110,000 m².
- **Construction:** The dust emission magnitude for the proposed construction activities can be classified as large as a worst-case as the total volume of buildings to be constructed will be greater than 75,000 m³.
- **Trackout:** The dust emission magnitude for the proposed trackout can be classified as large, as at worst-case peak periods there will be – greater than 50 outward HGV movements per day during the construction phase of the proposed development.

13.8.1.3 Determining the Risk of Dust Impacts

Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling and dust-related human health effects (Section 13.6.3). The level of risk associated with each activity is determined using the criteria in Table 13.4. The overall risk of dust impacts from the construction works is shown in Table 13.10 for each category.

- **Demolition:** There is no demolition required as part of the proposed development.
- **Earthworks:** As the overall sensitivity of the area to dust soiling is high, when combined with a large dust emission magnitude, this produces an overall high risk of dust soiling impacts (as per the criteria in Table 13.4). As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects (as per the criteria in Table 13.4).
- **Construction:** Combining the large dust emissions magnitude for the construction activities with the high sensitivity to dust soiling results in a low risk of dust soiling impacts using the criteria in Table 13.4. There is an overall low risk of dust-related human health impacts as a result of the proposed construction activities.
- **Trackout:** Combining the largest dust emission magnitude for the trackout activities with the high sensitivity to dust soiling results in a high risk of dust soiling impacts using the criteria in Table 13.4. There is an overall low risk of dust-related human health impacts as a result of the proposed trackout activities.

There is at most a high risk of dust soiling impacts and a high risk of dust-related human health impacts associated with the proposed works. As a result, best practice dust mitigation measures associated with high-risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be direct, short-term, negative and slight.

Table 13.10 Risk of Dust Impacts used to Define Site-Specific Mitigation

Receptor	Receptor Sensitivity	Dust Emission Magnitude	Risk of Dust-Related Impacts
Earthworks			
Dust Soiling	High	Large	High Risk
Human Health	Low		Low Risk
Construction			
Dust Soiling	High	Large	High Risk
Human Health	Low		Low Risk
Trackout			
Dust Soiling	High	Large	High Risk
Human Health	Low		Low Risk

13.8.1.4 Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality with respect to human health in the short-term over the construction phase, particularly, due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII assessment criteria in Section 13.4.3.2.

Therefore, it can be determined that the construction stage traffic will have an imperceptible, neutral, short-term and not significant impact on air quality.

13.8.2 Operational Phase

There is the potential for vehicles accessing the site to result in emissions of NO₂, PM₁₀ and PM_{2.5}. However, the proposed development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the proposed development satisfy the screening criteria (Section 13.4.3.2). A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. Operational stage effects on air quality are predicted to be **imperceptible, neutral and long-term**, which is overall **not significant** in EIA terms.

13.8.3 Cumulative Effects

13.8.3.1 Construction Phase

Cumulative construction dust impacts may occur if other large-scale developments within 500 m of the site are under construction simultaneously. A review of the planned and permitted projects in the vicinity of the site was undertaken to identify developments with the potential for cumulative construction phase impacts. There were no permitted projects within 500 m of the proposed development site and therefore, there is no potential for cumulative construction dust impacts to nearby sensitive receptors.

The dust mitigation measures outlined in Section 13.9.1 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development is **short-term, direct, negative and not significant**. No significant cumulative impacts to air quality predicted for the construction phase.

13.8.3.2 Operational Phase

The cumulative effect is included within the operational stage traffic assessment for the proposed development. The effect is predicted to be **long-term, direct, neutral and imperceptible**, which is overall **not significant** with regards to air quality.

13.8.4 Summary

The following table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 13.11 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Dust Impact	Negative	Not significant - slight	Localised	Likely	Short-term	Direct
Construction Traffic Impacts	Neutral	Not significant - imperceptible	Localised	Likely	Short-term	Direct

The following table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 13.12 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Traffic Impacts	Neutral	Not significant - imperceptible	Localised	Likely	Long-term	Direct

13.9 Mitigation Measures

13.9.1 Construction Phase Mitigation

The proposed development has been assessed as having a high risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 13.8.1.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a high risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

13.9.2 Operational Phase Mitigation

No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.

13.10 Residual Impact Assessment

13.10.1 Construction Phase

To minimise dust emissions during construction, a series of mitigation measures have been prepared as outlined in Section 13.9. Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are **short-term, direct, negative, localised** and **not significant**.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values (set out in Directive 2008/50/EC), which are based on the protection of human health (Table 13.1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is **short-term, direct, negative, localised** and **not significant**.

13.10.2 Operational Phase

The operational stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII scoping criteria in Section 13.4.3. Therefore, the operational phase effect on air quality and human health as a result of increased traffic is direct, long-term, neutral and imperceptible, which is overall not significant in EIA terms.

13.10.3 Summary of Post-mitigation Effects

The following table summarises the identified likely residual significant effects during the construction phase of the proposed development following the application of mitigation measures.

Table 13.13 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of construction dust from earthworks, construction and trackout in terms of dust soiling, and human health	Negative	Not significant	Study area as per Section 13.6.3.	Likely	Short-term	Direct
Impact of construction phase traffic on air quality	Neutral	Imperceptible	Detailed assessment and study area scoped out as per Section 13.4.3.	Likely	Short-term	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 13.14 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of operational phase traffic on air quality	Neutral	Imperceptible	Detailed assessment and study area scoped out as per Section 13.4.4.	Likely	Long-term	Direct

13.10.4 Cumulative Residual Effects

The primary potential cumulative residual effect relates to construction dust emissions. According to the IAQM guidance (IAQM, 2024), if the construction phase of the proposed development coincides with the construction phase of any other large scale permitted projects within 500m of the site, there is a possibility of cumulative residual dust effects occurring at any nearby sensitive receptors. Should simultaneous construction phases occur, it would lead to cumulative residual dust soiling and dust-related effects on human health, specifically localised to the works area associated with the proposed works.

However, should the construction phases of the development and any localised permitted developments coincide, it is predicted that once the mitigation measures outlined in Section 13.9.1 are put in place impacts will not be significant. Impacts will be **short-term, direct, localised, negative** and **not significant**. No significant cumulative adverse impacts to air quality are predicted for the construction or operational phases.

13.11 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to air quality associated with the proposed development due to the nature and scale of the development. The proposed development is residential in nature and will not require large scale quantities of hazardous materials or fuels.

13.12 Worst Case Scenario

Reasonable worst case estimates have been used as part of this assessment. As a result, Section 13.10 details the worst-case residual effect of the proposed development.

13.13 Interactions

13.13.1 Air Quality and Population & Human Health

13.13.1.1 Construction Phase

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between Population and Human Health and Air Quality. An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the proposed development. Best practice mitigation measures will implemented during the construction phase to ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is **direct, short-term, negative, localised** and **not significant** with respect to Population and Human Health during the construction phase.

13.13.1.2 Operational Phase

Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the proposed development will not cause a significant change in air pollutant emissions in the locality. It has been assessed that emissions will be in compliance with the ambient air quality standards which are set for the protection of human health. Impacts will be **long-term, localised, direct, neutral** and **not significant**.

13.13.2 Air Quality and Climate

Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

13.13.3 Air Quality and Land & Soils

13.13.3.1 Construction Phase

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase.

13.13.3.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Land & Soils during the operational phase.

13.13.4 Air Quality and Biodiversity

13.13.4.1 Construction Phase

Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. There are no designated ecological sites within 250 m of the proposed development site area. Significant dust impacts are not predicted beyond this distance. Dust mitigation measures will be implemented on site as set out in Section 13.9.1. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be **direct, short-term, negative, localised** and **not significant** with respect to biodiversity.

13.13.4.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Biodiversity during the operational phase.

13.13.5 Air Quality and Material Assets – Traffic & Transport

13.13.5.1 Construction Phase

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between Traffic and Air Quality are linked but there is no potential for significant impacts from traffic on air quality. The effects are considered to be **direct, short-term, neutral, localised** and **not significant** during the construction phase.

13.13.5.2 Operational Phase

The impact of the interactions between Traffic and Air Quality are considered to be **long-term, direct, neutral** and **not significant** during the operational phase.

13.14 Monitoring

13.14.1 Construction Phase

The following monitoring measures are proposed to ensure the dust mitigation measures are working satisfactorily:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

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- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development will be carried out to ensure mitigation measures are working satisfactorily. This will be done using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff method consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. Dust deposition monitoring will be carried out on a monthly basis (30 days (+/- 2 days)) for the duration of the enabling works and construction period.
- An independent contractor will be appointed to carry out this monitoring. The compliance criteria is the TA Luft limit value of 350 mg/m²/day during the monitoring period. In the event of an exceedance the procedures, site activities and appropriate application of dust mitigation measures will be reviewed and improved to achieve a level below 350 mg/m²/day in future monitoring.

13.14.2 Operational Phase

There is no monitoring recommended for the operational phase of the proposed development as impacts to air quality are predicted to be imperceptible.

13.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 13.15 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Impact of construction dust from earthworks, construction and trackout in terms of dust soiling and human health	Dust control measures as per IAQM Guidance (IAQM, 2024) and Section 13.9.1.	Monitoring of construction dust deposition as per Section 13.14.1.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 13.16 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
No mitigation or monitoring required for the operational phase of the development as impacts to air quality are predicted to be imperceptible.		

13.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to air quality. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is *not significant*.

13.17 References and Sources

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit’s Good Practice Guide for Construction and Demolition

Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2024) Air Quality in Ireland 2023 (& previous annual reports)

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2023) Clean Air Strategy for Ireland

Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)

Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)

Met Éireann (2025) Met Éireann website: <https://www.met.ie/>

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)

CHAPTER FOURTEEN

CLIMATE

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CHAPTER FOURTEEN

Table of Contents

Climate

14.1 Introduction..... 14-1

14.2 Expertise & Qualifications 14-1

14.3 Proposed Development 14-1

14.4 Methodology 14-1

14.5 Difficulties Encountered 14-7

14.6 Baseline Environment..... 14-7

14.7 The ‘Do Nothing’ Scenario 14-10

14.8 Potential Significant Effects 14-10

14.9 Mitigation Measures 14-14

14.10 Residual Impact Assessment 14-15

14.11 Risk of Major Accidents or Disasters 14-15

14.12 Worst Case Scenario..... 14-15

14.13 Interactions 14-15

14.14 Monitoring 14-16

14.15 Summary of Mitigation and Monitoring 14-16

14.16 Conclusion 14-16

14.17 References and Sources 14-16

Table of Tables

Table 14.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025 14-2

Table 14.2 Sectoral Emission Ceilings 2030..... 14-2

Table 14.3 Significance Criteria for GHGA..... 14-5

Table 14.4 Vulnerability Matrix..... 14-6

Table 14.5 Trends in Total National GHG Emissions 2021 – 2023..... 14-7

Table 14.6 GHG Assessment Results 14-10

Table 14.7 Estimated GHG Emissions Relative to Targets and GHG Baseline..... 14-11

Table 14.8 Comparison Against Industry Embodied Carbon Benchmarks..... 14-11

Table 14.11 Climate Change Vulnerability Assessment 14-12

Table 14.12 Summary of Likely Significant Effects in the absence of mitigation..... 14-13

Table 14.13 Summary of Effects Post Mitigation 14-15

Table 14.14 Summary of Construction Phase Mitigation and Monitoring 14-16

Table 14.15 Summary of Operational Phase Mitigation and Monitoring 14-16

Table of Figures

Figure 14.1 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990) 14-8

Figure 14.2 Representative Concentration Pathways associated emission levels (Source: TRANSLATE Project Storymap, Met Éireann 2023)..... 14-9

Figure 14.3 Change of climate variables for Ireland for different Global warming thresholds (Source: TRANSLATE Project Storymap, Met Éireann, 2023b) 14-9

CHAPTER 14 | Climate

14.1 Introduction

This chapter assesses the likely climate impacts associated with the proposed development in Ennis, Co. Clare. The subject site is located in Ennis, to the west of the Ennis Golf Club and to the east of the N85. A full description of the development is available in Chapter 2.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a project's vulnerability to climate change and identifies adaptation measures to increase project resilience.

14.2 Expertise & Qualifications

This chapter was completed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

14.3 Proposed Development

The proposed development will provide a Large Scale Residential Development (LRD) with a creche and all associated site development works. Refer to Chapter 2 of this EIAR and the statutory notices for a full description.

14.3.1 Aspects Relevant to this Assessment

During the construction phase, engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO₂ and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. However, the proposed development has been designed with sustainability in mind. The proposed housing units will be of timber frame construction which is less carbon intensive than traditional concrete blocks. Additionally, materials will be sourced locally to reduce transport related emissions and thus reduce the embodied carbon impact of the development. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site, have the potential to impact climate, during the operational phase of the development through the release of CO₂. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase. The proposed development has been designed to minimise the impact on climate where possible in line with the most recent development guidelines (Part L of the Building Regulations 2022) and in reference to measures within the Climate Action Plan 2025 (DECC, 2025).

14.4 Methodology

14.4.1 Relevant Guidance, Legislation & Policy

14.4.1.1 Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on climate are summarised below. In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The assessment has made reference to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (TII, 2022b);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2024);
- Institute of Environmental Management & Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the IEMA 2022 GHG Guidance) (IEMA, 2022);
- IEMA Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the IEMA 2020 EIA Guide) (IEMA, 2020a);
- IEMA GHG Management Hierarchy (hereafter referred to as the IEMA 2020 GHG Management Hierarchy) (IEMA, 2020b);
- IEMA Principles Series: Climate Change Mitigation & EIA (IEMA, 2010);
- Carbon Management in Infrastructure and Built Environment - PAS 2080 (BSI, 2023); and
- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).

14.4.1.2 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the 2015 Act was to enable Ireland "to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050" (3.(1) of No. 46 of 2015). This

is referred to in the 2015 Act as the ‘National Transition Objective’. The 2015 Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the 2015 Act provided for the establishment of the Climate Change Advisory Council. This council functions to advise and make recommendations on the preparation of national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second CAP in November 2021 (Government of Ireland, 2021a) with further updated CAPs in December 2022 (Government of Ireland, 2022) and December 2023 (DECC, 2023a). The fifth and most recent CAP, was published in April 2025 (Government of Ireland, 2025).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The 2021 Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives set out in the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021) is to provide for the approval of plans “for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050”. The 2021 Climate Act also provides for “carbon budgets and a decarbonisation target range for certain sectors of the economy”. The 2021 Climate Act defines the carbon budget as “the total amount of greenhouse gas emissions that are permitted during the budget period”.

In relation to carbon budgets, the 2015 Act (as amended) states “A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a ‘Budget Period’). The carbon budget is to be produced for 3 sequential budget periods (Table 14.1). The carbon budget can be revised when new obligations are imposed under the law of the European Union or international agreements or when there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectoral emission ceilings for 2030 were published in the Climate Action Plan 2024 (CAP24) (DECC, 2023a) (Table 14.2).

Table 14.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO ₂ e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO ₂ e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 14.2 Sectoral Emission Ceilings 2030

Sector	Baseline (MtCO ₂ e)	Carbon Budgets (MtCO ₂ e)		2030 Emissions (MtCO ₂ e)	Indicative Emissions % Reduction in Final Year of 2025 – 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment – Residential	7	29	23	4	40
Built Environment – Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

14.4.1.3 Policy

14.4.1.3.1 Greenhouse Gas Assessment Policy

In 2024, the Government published its Long-Term Strategy on Greenhouse Gas Emissions Reductions (DECC, 2024). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the CAP.

In December 2023, CAP24 was published, establishing key actions to deliver a 51% reduction in GHG emissions by 2030 (compared to 2018 levels) and achieve climate neutrality by 2050 (DECC, 2023a). The updated and current CAP25, published in April 2025, builds on the progress of the previous four iterations of the CAP, with CAP23 first publishing carbon budgets and sectoral emission ceilings, and reaffirms Ireland’s climate ambition, with a focus on delivery, implementation and measurable

outcomes, particularly ahead of the second carbon budget period (2026–2030). 2025 is the last year in the first 5-year carbon budget period. During the initial 5-year budget period the average annual reduction required was 4.8%, this increases to 8.3% in the second budget period (2026-2030). CAP25 retains the high-impact sectors where the biggest savings can be achieved, while emphasising public sector leadership and green procurement. These sectors include renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and land-use change.

CAP25 also includes targeted actions to decarbonise industrial heat and support the transition to carbon-neutral manufacturing processes. Public sector leadership is strengthened through a new Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027), the development of mandatory Climate Action Roadmaps, and enhanced emissions monitoring and reporting across government operations. To support innovation and ensure future economic resilience, IDA Ireland continues to attract and support businesses investing in climate technologies and low-carbon solutions.

CAP25 highlights a significant 17% reduction in electricity emissions in early 2024, with wind power supplying nearly 40% of Ireland’s total electricity demand and over 100,000 rooftop microgenerators connected to the grid. Investments are ongoing in grid reinforcement, offshore wind development, and interconnectors with France and the UK to enhance renewable generation capacity. EirGrid, Enterprise Ireland and IDA Ireland have recently signed an MoU to collectively support offshore wind development in Ireland.

CAP25 also reinforces targets first outlined in CAP24 to reduce the embodied carbon of construction materials, with a 10% reduction by 2025 and 30% reduction by 2030 for materials produced and used in Ireland. Cement and high embodied carbon construction materials can be reduced through product substitution, reduced clinker content in cement and uptake of low-carbon construction methods, including those outlined in the Construction Industry Federation 2021 report Modern Methods of Construction (Construction Industry Federation, 2021). There also remains scope for the construction industry to use more timber in construction. In 2022, 24% of new construction in Ireland was built using timber frames to satisfy the demand for housing. Public bodies are now required under the Public Sector Mandate to use best practice project design to reduce embodied carbon; procure concretes with clinker replacements (lower carbon); and require that large construction projects produce a whole life cycle GHG emissions assessment.

Furthermore, CAP25 advances sector-specific measures in green procurement, electrification of transport and heat, and just transition (with the introduction of a Just Transition Commission) to support vulnerable communities. Transport emissions increased by 0.3%. Electric vehicles and the use of biofuels are stated as the best means of transport emission reductions in the medium term.

Clare County Council (CCC) aims to reduce its direct carbon emissions by 51% by 2030, and supports the generation of renewable energy as part of this. The *Clare County Council Climate Action Plan 2024 – 2029* (Clare County Council, 2024) outlines Clare County Council’s goals to mitigate GHG emissions and plans to prepare for and adapt to climate change. The target is for Clare to be a net zero county by 2050 in line with the National objective of Ireland being net zero by 2050. The plan outlines the five thematic areas for climate action. These include governance & leadership; built environment; transportation; communities & partnerships; and natural environment. The plan outlines a number of actions and targets across these thematic areas to ensure Clare County Council are on track to meet the net zero by 2050 goal.

14.4.1.3.2 Climate Change Vulnerability Policy

The second *National Adaptation Framework* (NAF) (DECC, 2024) was published in June 2024 in line the five-year requirement of the 2015 Climate and Low Carbon Development Act. The plan provides a whole of government and society approach to climate adaptation in Ireland to reduce Irelands vulnerability to climate change risks including extreme weather events, flooding, drought, loss of biodiversity, sea level rise and increased temperatures. Similar to the *‘Just Transition’* when

considering carbon emissions, the NAF aims for *‘Just Resilience’* stating that *“a climate resilient Ireland will have a reduced reliance on fossil fuel, it will have widely accessible electrified public transport and will have transitioned towards sustainable agricultural practices such as agroforestry and organic farming”*.

In relation to the built environment the NAF states in Chapter 3 that *“deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment”*. Within the NAF it is mentioned that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards, e.g. to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms, according to the NAF (DECC, 2024).

The *National Climate Change Risk Assessment* (NCCRA) was published in May 2024 (EPA, 2024a). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to *“further develop Ireland’s national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland”*. The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

- **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.
- **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.
- **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity.
- **Risk** - the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory.
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and the greatest requirement for adaptation.

These scenarios align with a conservative approach to assess risks to Ireland and assumes global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030);
- Medium term (~2050);
- Long term (~2100).

The Clare County Council Climate Action Plan 2024-2029 highlights the risks that climate change poses to the county, these include increases in the risk of river, pluvial, and coastal flooding and coastal erosion. The risk of these hazards is likely to increase in the future because of changes in both hazard frequency as a result of climate change and impact due to changes in exposure and vulnerability. Heatwaves and droughts are expected to occur more frequently due to climate change and with a greater impact on County Clare in the future.

14.4.2 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (Section 14.5.1).

14.4.2.1 Construction Phase

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period, i.e. the assumed building life expectancy, for the purposes of the assessment is 50 years. Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland's CAP goal of Net Carbon Zero by 2050.

A detailed lifecycle assessment (LCA) was undertaken by the project developer (Glenveagh Properties) on their most commonly used house types. The project developer uses consistent house designs across their various developments. This level of repeatability allowed for a detailed LCA to be undertaken across the most commonly used house types, the results of which have been used to generate a typical embodied carbon figure suitable for use across all Glenveagh house types.

A specific kgCO₂e/m² figure has been calculated which can be factored based on the specific gross internal area (m²) of the unit to be assessed. Summing the embodied carbon for all of the units within the proposed development then provides an estimate of the embodied carbon associated with the specific project.

The lifecycle assessment followed the lifecycle stage terminology consistent with widely used industry standards (based on BS EN 15978:2011, BS EN 15804:2012):

- **Stage A1 – A3: Product Carbon** The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products.
- **Stage A4 – A5: Construction Carbon** These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building.
- **Stage B1 – B5: In Use Carbon** – use of the building (B1), maintenance (B2), repair (B3), replacement (B4) and refurbishment (B5).
- **Stage B6, B7, B8: In Use Phase** operational use energy (B6), water (B7) and user activities carbon (B8). *These categories have been excluded from the assessment due to the significant variability in user emissions.*
- **Stage C1 – C4: End of Life Carbon** The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No 'credit' is taken for any future carbon benefit associated with the reuse or recycling of a material into new products.
- **Biogenic Carbon:** Carbon sequestered during the growth cycle of a tree that is temporarily stored in the timber product until the end of its useful life. This element must be reported separately to the A – C carbon.

The house types assessed were of timber framed construction with a rendered blockwork façade and concrete tile roof. These house types were considered 'typical' house types for Glenveagh projects. The LCA study examined the carbon across the lifecycle of the typical home and this information can then be used to mitigate impacts from Glenveagh projects and target key areas for improvement.

The LCA was assessed in line with EN15978 and European Level(s) methodologies. The assessment has also followed *RICS Whole Life Carbon Assessment for the Built Environment Guidance V1*, which is comparable with the European Level(s) methodology but it has been adapted to accommodate a 50 year service life for the building to coordinate with European Level(s) methodologies.

OneClick LCA, in addition to Glenveagh specific calculations, was used to calculate embodied carbon emissions in line with detailed RICS guidance. The Inventory of Carbon and Energy (ICE) database as well as Environmental Product Declaration (EPDs) were used to find the relevant carbon factors for the specified materials.

The building element groups included in the embodied carbon assessment were substructure; frame; floors; external walls; internal walls and partitions; windows and doors; roofs; services; MEP (mechanical, electrical and plumbing); some permanent furnishings; and some external works.

An uncertainty factor was included in the LCA calculations. Due to the early design stage, precise material quantities and types are not yet known. To ensure emissions are not under-reported a conservative uncertainty factor of 22% was added to all the embodied carbon emissions based on the RICS V2 guidance, which is more conservative than the RICS V1 guidance.

The Glenveagh LCA concluded that a figure of 500 kgCO₂e/m² for total carbon (A – C stages, total lifecycle) can be used in EIAR assessments for typical house types.

The Glenveagh house types utilise a timber framed construction. Timber usage has a positive climate impact through carbon sequestration. Carbon sequestration is the process of capturing and storing atmospheric carbon. Trees and plants absorb CO₂ from the atmosphere during photosynthesis in exchange for oxygen that they give out in return.

Biogenic carbon is the term used for carbon absorbed, stored and emitted by organic matter like soil, trees, plants and grasses. Biogenic carbon is reported in life-cycle carbon assessments as a separate line item.

The LCA found that a reduction of 21% of total embodied carbon emissions (A – C stages) can be utilised for the biogenic carbon associated with the Glenveagh house types. This will be a carbon saving or negative carbon figure, e.g. -105 kgCO₂e/m², within the climate impact assessment.

This biogenic carbon must be reported separately to the embodied carbon results and is not included within the figures for the embodied carbon associated with the house and apartment or duplex units referenced above.

In addition to the embodied carbon associated with the buildings in the proposed development, other elements of the proposed development such as site activities, land clearance works, construction worker travel to site, etc. also result in a carbon impact. PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2024).

The TII Online Carbon Tool (TII, 2024) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2024) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESMM) Carbon and Price Book database (CESMM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080. The TII Carbon Tool was utilised to calculate the embodied carbon associated with the non-building elements of the development including construction wastes; site clearance works; worker travel to site; and construction materials.

The results of the Glenveagh LCA and the TII Carbon Tool were summed to provide a total carbon impact of the proposed development.

14.4.2.2 Operational Phase

14.4.2.2.1 Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022b), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment, and also the climate assessment.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5 m or greater.

While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic. The proposed development will not result in operational phase traffic increasing by more than 1000 AADT or 200 HDV AADT. Additionally, there is no proposed change to the road alignment or traffic speeds. As such, a detailed assessment of operational phase traffic emissions was scoped out as there is no potential for significant impacts to climate.

14.4.2.2.2 Operational Phase Energy Use

The EU guidance (European Commission, 2013) also states indirect GHG emissions as a result of a development must be considered, which includes emissions associated with energy usage. An *Energy Efficiency and Climate Change Adaption Plan* was prepared by Byrne Environmental Consulting Ltd. in relation to the proposed development and is submitted separately with this planning application. The report outlines a number of measures which have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible during operation.

14.4.2.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA’s *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. Therefore, the significance of a project’s emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project’s residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project’s remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors, i.e. Ireland’s National GHG targets. In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project’s GHG impact. TII reference the IEMA guidance (IEMA, 2022) which states that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”.

Significance is determined using the criteria outlined in Table 14.3 (derived from Table 6.7 of PE-ENV-01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 14.3 Significance Criteria for GHGA

Effects	Significance Level	Description
Significant Adverse	Major Adverse	• The project’s GHG impacts are not mitigated. • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland’s trajectory towards net zero.
	Moderate Adverse	• The project’s GHG impacts are partially mitigated. • The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland’s trajectory towards net zero.
Not Significant	Minor Adverse	• The project’s GHG impacts are mitigated through ‘good practice’ measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland’s trajectory towards net zero.
	Negligible	• The project’s GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero.
Beneficial	Beneficial	• The project’s net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (DECC, 2023a). With the publication of the Climate Action Act in 2021 and the Climate Action Plan 2024, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan. The aim of the carbon budgets is to ensure we are on a trajectory to meet the National Climate Objective of Net Zero by 2050.

14.4.3 Climate Change Risk Assessment

The assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the Climate Change Risk Assessment (CCRA) is guided by the principles set out in the overarching best practice guidance documents:

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 14.5, future climate change modelling and input from other experts working on the proposed development, i.e. hydrologists should be used to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets, i.e. receptors, and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development by development basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding

could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

14.4.3.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 14.4 details the vulnerability matrix. Vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the proposed development can be considered to be not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Table 14.4 Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 - High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 - Low	1 - Low

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 14.8.

14.4.4 Site Surveys/Investigations

No surveys were required as part of the climate assessment.

14.4.5 Consultation

No specific consultation with relevant bodies was undertaken as part of the climate assessment.

14.5 Difficulties Encountered

There were no difficulties encountered in compiling this assessment.

14.6 Baseline Environment

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline. Climate impacts are assessed at a national level and in relation to national targets and sectoral emission ceilings. The study area for climate is the Republic of Ireland and the baseline is determined in relation to this study area.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland’s current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018), results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

14.6.1 Current GHG Baseline

Data published in April 2025 (EPA, 2025a), indicates that Ireland exceeded, without the use of flexibilities, its 2023 annual limit set under EU’s Effort Sharing Decision (ESD) (EU 2018/842) by 2.22 Mt CO₂e. However, the 2023 emissions were the first time that Ireland’s emission were below (-3.3%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-17.0%) and ESR (Effort Sharing Regulation) emissions decreased (-3.5%). Ireland’s target is an emission reduction of 626 kt of CO₂e by 2030 on an average baseline of 2016 to 2018. The EPA estimate that 2023 total national GHG emissions, excluding LULUCF, have decreased by 6.8% on 2022 levels to 54.93 Mt CO₂e, with a 2.2 Mt CO₂e (-21.4%) reduction in electricity industries alone. This was driven by a 40.7% share of energy from renewables in 2023 and by increasing our imported electricity. Manufacturing combustion and industrial processes decreased by 5.2% to 6.3 Mt CO₂e in 2023 due to declines in fossil fuel usage. The sector with the highest emissions in 2023 was agriculture at 37.7% of the total, followed by transport at 21.5%. For 2023, total national emissions (including LULUCF) were 58.82 Mt CO₂e (EPA, 2025) (Table 14.5).

The current estimates of National greenhouse gas emissions (including LULUCF) in 2023 are 10.3% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2023 Ireland has used 63% (186 Mt CO₂e) of the 295 Mt CO₂e Carbon Budget for the five-year period 2021-2025. This leaves 37% of the budget available for the next two years, requiring a substantial 5% annual emissions reduction for 2024 and 2025 to stay within budget.

Table 14.5 Trends in Total National GHG Emissions 2021 – 2023

Sector ^{Note 1}	2021	2022	2023	Total Budget (Mt CO ₂ e) (2021-2025)	% Budget 2021-2025 Used	Annual Change 2022 to 2023
Electricity	9.89	9.69	7.57	40	67.89%	-21.91%
Transport	11.09	11.76	11.80	54	64.16%	0.35%
Buildings (Residential)	6.87	5.75	5.35	29	61.57%	-7.01%
Buildings (Commercial and Public)	1.44	1.45	1.39	7	61.16%	-3.94%
Industry	7.09	6.62	6.31	30	66.75%	-4.71%
Agriculture	21.94	21.78	20.72	106	60.79%	-4.88%
Other ^{Note 2}	1.86	1.93	1.81	9	62.28%	-6.27%
LULUCF	4.63	3.98	3.89	–	-	-2.33%
Total including LULUCF	64.82	62.99	58.83	295	63.27%	-3.80%

Note 1 Reproduced from latest emissions data on the EPA website July 2024 (EPA, 2024).
Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

14.6.2 Future GHG Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, “whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”.

The future baseline will be determined by Ireland meeting its targets set out in the CAP25, and future CAPs, alongside binding 2030 EU targets. The European Union (EU) enacted ‘Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013’ (hereafter referred to as the Regulation) (European Union, 2018) to meet the commitments under the Paris Agreement. The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its ETS and non-ETS greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and includes GHG emissions from transport, residential and commercial buildings and agriculture.

In May 2025, the EPA released the report *Ireland’s Greenhouse Gas Emissions Projections 2024-2055* (EPA, 2025b), which includes total projected emissions and a breakdown of projected emissions per sector under the ‘With Existing Measures’ and ‘With Additional Measures’ scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

14.6.3 Current CCRA Baseline

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Cork Airport is the nearest, representative, weather and climate monitoring station to the proposed development with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for Cork Airport meteorological station is representative of the current climate in the region of the proposed development. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Cork Airport Meteorological Station were January, October and December, and the driest month on average was May (Met Éireann, 2025a). July was the warmest month with a mean temperature of 15.2 Celsius. January was the coldest month with a mean temperature of 5.7 Celsius.

Met Éireann's 2023 Climate Statement (Met Éireann, 2024a) states 2023's average shaded air temperature in Ireland is provisionally 11.20°C, which is 1.65°C above the 1961-1990 long-term average. Previous to this 2022 was the warmest year on record; however, 2023 was 0.38°C warmer (Figure 14.1).

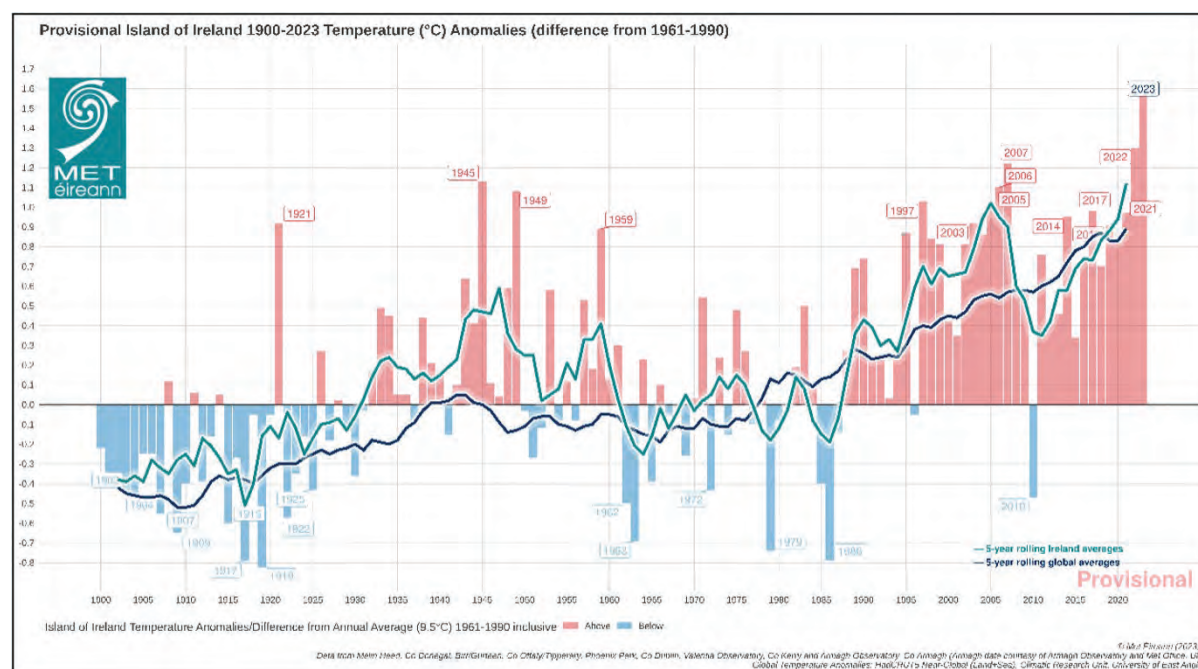


Figure 14.1 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990)

2023 also had above average rainfall. This included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Met Éireann's 2024 Climate Statement (Met Éireann 2025b) states 2024's average shaded air temperature in Ireland is provisionally 10.72°C, which is 1.17°C above the 1961-1990 long-term average or 0.55°C above the most recent 1991-2020 long-term average. This is the 4th warmest year on record with 2023 breaking previous records. Seven of the top ten warmest years have occurred since 2005. Record high sea surface temperatures (SST) were recorded in 2022, and in 2024 continued

at or near record high levels. 2024 was overall drier than average; however, there were many instances of heavy or intense rainfall which led to flooding events. This trend is predicted to continue with climate change with an increase in both dry periods and heavy rainfall events. Considering the extraordinary data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures means the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

14.6.4 Future CCRA Baseline

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

TII's Guidance document PE-ENV-01104 (TII 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RCP4.5 is considered moderate, while RCP8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change (Figure 14.2).

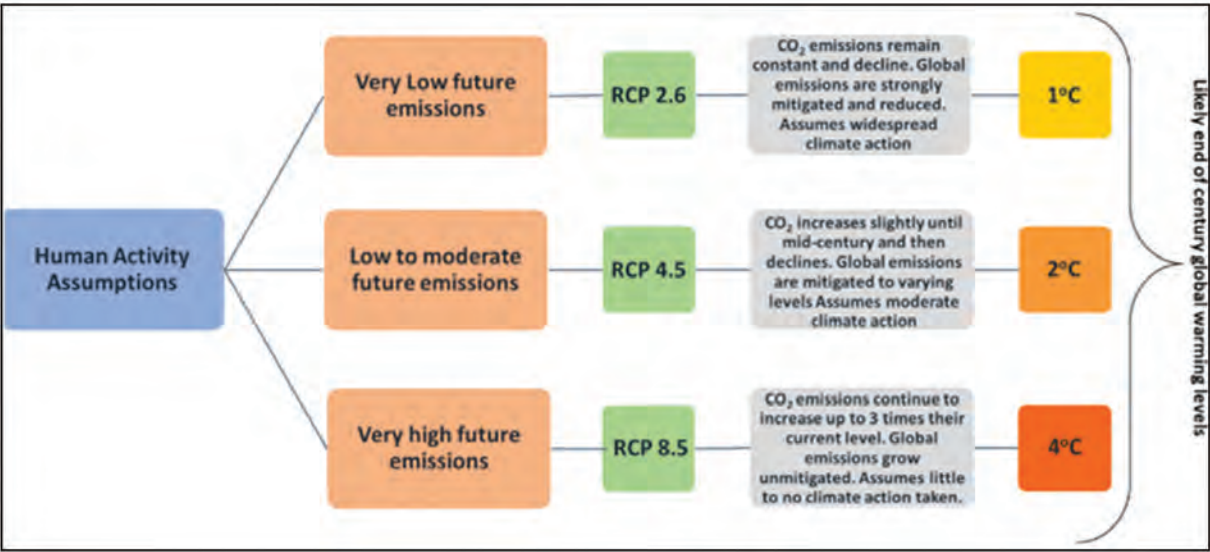


Figure 14.2 Representative Concentration Pathways associated emission levels (Source: TRANSLATE Project Storymap, Met Éireann 2023)

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (e.g. transport, energy, water), by providing information on how Ireland’s climate could change as global temperatures increase to 1.5°C, 2°C, 2.5°C, 3°C or 4°C. Projections broadly agree with previous projections for Ireland. Ireland’s climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents, including the Gulf Stream, characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SSTs) (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland’s temperature and rainfall will undergo more and more significant changes, e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (Figure 14.3). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

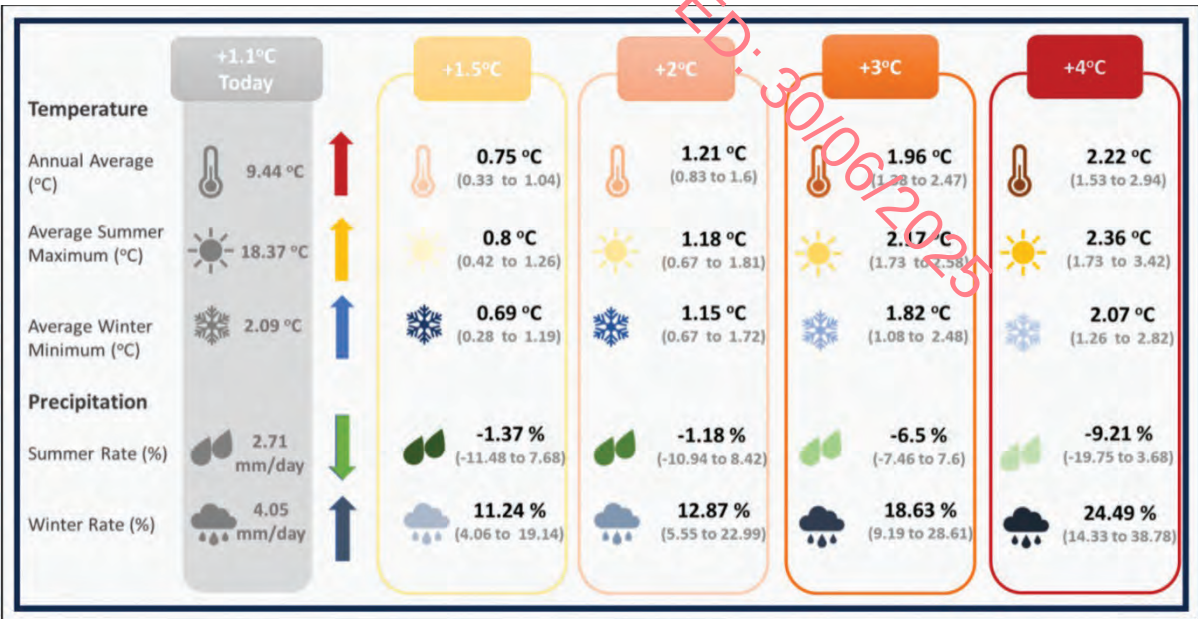


Figure 14.3 Change of climate variables for Ireland for different Global warming thresholds (Source: TRANSLATE Project Storymap, Met Éireann, 2023b)

The TRANSLATE research report (Met Éireann, 2024d) finds that night-time temperatures will warm more than day-time temperatures, with temperatures increases across all seasons but the highest in the summer (with an increase of 0.5°C to 3.5°C). Autumn is projected to have the highest increase in average minimum temperatures (with an increase of 1.1°C to 4.4°C). The variance is dependent on the scenario that is being reviewed. While these temperatures are projected across all of Ireland, they increase most in the east of the country compared to the west. With respect to rainfall, increases of 4% to 38% are projected. However, this will not be spread across the year as during summer months there are projected decreases in rainfall beyond the 2°C warming scenario.

In January 2024 the EPA published *Ireland’s Climate Change Assessment Synthesis Report* (EPA, 2024e) which contained four volumes:

- Volume 1: Climate Science: Ireland in a Changing World;
- Volume 2: Achieving Climate Neutrality by 2050;
- Volume 3: Being Prepared for Ireland’s Future Climate; and
- Volume 4: Realising the Benefits of Transition and Transformation.

This report reinforces the existing and future risks arising from climate change. Volume 1 (EPA, 2024e) states that under Early action, the temperature increase averaged across the island of Ireland relative to the recent past (1976 to 2005) would reach 0.91°C (0.44 to 1.10°C) by mid-century before falling back to 0.80°C (0.34 to 1.07°C) at the end of the century. Whereas under Late action, by the end of the century it is projected that the temperature increases could be 2.77°C (2.02 to 3.49°C). Heat extremes will become more frequent and more severe and cold extremes will become less frequent and less severe with further warming.

Precipitation was 7% higher over the period 1991 to 2020 than over the 1961 to 1990 period. The average future predicted increase in precipitation is <10% in annual mean accumulated. By 2100 projected additional rises in sea level range from 0.32 to 0.6m under early action to 0.63 to 1.01m under late action scenarios, with greater storm surges potentially effecting critical infrastructure along the coastline. Projections of changes in storminess are highly uncertain and translate into large uncertainties in future frequency and intensity of extreme waves.

Volume 3 (EPA, 2024e) discusses how water supplies will face growing pressures resulting in increased water demand and how options need to be developed, including potential new sources. The report states the key role of critical infrastructure for delivering public services, economic development and a sustainable environment. These are exposed to a range of climate extremes. Failures in critical infrastructure can cascade across other sectors and present a multi-sector risk due to climate change.

The report references the EPA's *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021a) as the most substantial research project in Ireland to date on climate change and critical infrastructure which assesses the future performance of Ireland's critical infrastructure when climate is considered. The Critical Infrastructure Vulnerability to Climate Change report states with respect to water availability and quality, that flood risk and heatwaves have a medium vulnerability index and the underground supply network has a high vulnerability to snowstorms and cold spells. However, while the vulnerability is high, the exposure is likely to reduce due to future climate change resulting in less cold weather events. The risk assessment highlights the co-dependence of the water sector to the energy sector, and how vulnerability in the energy sector may have cascading impacts.

Volume 4 (EPA, 2024e) calls for system change, including a transformation of urban settings. Stating that meaningful urban transformation can create a better living environment while simultaneously reducing emissions.

The projections were echoed by the *Updated High-resolution Climate Projections for Ireland Research Report: 471* (EPA, 2024f) which was in broad agreement with previous research. The future autumn and winter months are projected to be up to 10% wetter, while summer is projected to be up to 8% drier.

14.7 The 'Do Nothing' Scenario

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area, including influences from potential new developments in the surrounding area, changes in road traffic, etc.

As the site is zoned for development, it is likely that in the absence of the proposed development a development of a similar nature would occur in the future. Therefore, the predicted climate impacts within this report are likely to occur even in the absence of the proposed development however, the significance of the impact is unknown.

14.8 Potential Significant Effects

14.8.1 Greenhouse Gas Assessment

14.8.1.1 Construction Phase

The most significant proportion of GHG emissions tend to occur during the construction phase as a result of embodied carbon in construction materials and emissions from construction activities. Therefore, the assessment has been included in the

construction phase assessment for the purposes of the EIAR. The assessment is broken down into the following stages as per Section 14.4.2.1.

- Stage A1 – A3: Product Carbon;
- Stage A4 – A5: Construction Carbon;
- Stage B1 – B5: In Use Carbon;
- Stage C1 – C4: End of Life Carbon; and
- Biogenic Carbon.

Using 500 kgCO₂e/m² for the housing units in conjunction with the schedule of areas supplied by the project architects, allowed a site specific carbon figure for the building elements of the project to be calculated (Table 14.6).

Additionally, the TII Carbon Tool was utilised to calculate GHG emissions associated with the non-building elements including materials for infrastructure works, site preparation works, landscaping and waste materials.

It is estimated that the proposed development will result in total embodied carbon emissions of 18,395 tCO₂e (Table 14.6).

Table 14.6 GHG Assessment Results

GHG Assessment Category	Elements Considered	Predicted Development GHG Emissions (tCO ₂ e)	% of Total	Relevant Sector
Buildings	Housing units	15,515	84%	Industry
Materials	Aggregates and other fill material, plastic pipework and cabling, concrete, road pavement materials (e.g. asphalt), steel, geotextiles, timber	2,518	14%	Industry
Clearance and demolition	Rock, topsoil and other excavation	4	0.02%	Industry
Land Use Change and Vegetation Loss	Removal of tress, hedgerows	277	2%	LULUCF
Excavation	Rock, topsoil and other excavation	45	0.2%	Industry
Construction Waste Disposal	Mixed construction and demolition waste	44.2	0.2%	Waste
Construction Waste Transport	Transport of waste offsite. Waste will be taken from the site by HGV. Conservatively estimated that destination waste management facility will be 50 km from the site (100 km to and from the site).	8	0.05%	Transport
Landscaping and Vegetation	Replanting and landscaping resulting in carbon sink opportunity	-16	-0.1%	LULUCF
Total	-	18,395	-	-
Total Project Biogenic Carbon	Based on timber frame house	-3,258	-	-

The GHG emissions associated with the buildings make up the majority (84%) of the total GHG emissions for the project (Table 14.6). As per the LCA completed on the typical house types the majority (75%) of the carbon emissions are linked to the sub and superstructures. The product stage (A1 – A3) contribute the most to the overall carbon result followed by in use emissions (B1 – B5), primarily B4 replacement.

Seven key materials were identified in the assessment of the house units that together make up 87% of Stage A – C emissions: concrete; MEP (mechanical, electrical and plumbing); plastic; windows; boards; timber; and insulation.

Efforts to reduce the quantity of these materials used or swap them for lower carbon alternatives will impact on the carbon footprint of the units. It is important to highlight that although the timber framework forms a significant part of the structural skeleton of the house units; it is not as carbon intensive as other materials. Both the Climate Change Advisory Council (CCAC) and National Climate Action Plan advise for the use of timber framed buildings as a construction method. Timber frames have the additional benefit of having absorbed carbon from the atmosphere during their growth and providing a long-term carbon sink during their lifetime in the building.

The LCA found that a reduction of 21% of total embodied carbon emissions (A – C stages) can be utilised for the biogenic carbon associated with the proposed development house types. This represents carbon savings of 3,258 tCO₂e for the proposed housing units.

The predicted emissions for the proposed development are annualised over the assumed 50 year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets. In Table 14.7, GHG emissions have been compared against Ireland’s total GHG emissions in 2023 (the existing baseline) and against Ireland’s EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO₂e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total GHG emissions, when annualised over the 50-year proposed development lifespan, are equivalent to 0.001% of Ireland’s total GHG emissions in 2023 and 0.001% of Ireland’s non-ETS 2030 emissions target.

Table 14.7 Estimated GHG Emissions Relative to Targets and GHG Baseline

Predicted Development GHG Emissions (tCO ₂ e)		Annualised Development GHG Emissions (tCO ₂ e)	Target/Sectoral Budget (tCO ₂ e)		Annualised Emissions as % of Relevant Target
18,395	Total Project Stage A - C GHG Emissions	368	Ireland's 2023 Total GHG Emissions (existing baseline)	60,620,000	0.001%
			Non-ETS 2030 Target	27,722,000	0.001%
-3,258	Total Project Biogenic Carbon	-65	-	-	-

The results of the lifecycle assessment for the housing units can be compared with a number of industry benchmarks to demonstrate the carbon impact of the development (Table 14.8).

The Royal Institute of the Architects of Ireland (RIAI) 2030 Climate Challenge embodied carbon benchmarks for small scale residential developments were used for comparison with the predicted lifecycle carbon for the proposed development units. The proposed development house types will achieve the RIAI 2025 target of <800 kgCO₂e/m² and the 2030 target of <625 kgCO₂e/m² based on the predicted figure of 500 kgCO₂e/m² for the house types.

RIAI have a 2030 higher target of <450 kgCO₂e/m². Based on the current assessment the predicted figure of 500 kgCO₂e/m² for the housing units is not currently meeting this higher target. However, it is close to this target and given the ongoing commitment to sustainable development that the project developer (Glenveagh Properties) have it is likely that in the future this higher target can be achieved.

The London Energy Transformation Initiative (LETI) Climate Emergency Design banding system for residential properties was also used for comparison with the house units.

The LCA carbon intensity of 500 kgCO₂e/m² (stage A – C) and upfront carbon (A1 – A5) of 356 kgCO₂e/m² indicates that the house units are within the LETI B band. According to the LETI carbon alignment document, banding B is considered a robust target performance.

Table 14.8 Comparison Against Industry Embodied Carbon Benchmarks

Metric	Glenveagh Embodied Carbon (kgCO ₂ e/m ²)	Target	Target Achieved
RIAI 2025 Target (Embodied Carbon (A – C) kgCO ₂ e/m ²)	500	<800	Y
RIAI 2030 Target (Embodied Carbon (A – C) kgCO ₂ e/m ²)	500	<625	Y
RIAI 2030 Higher Target (Embodied Carbon (A – C) kgCO ₂ e/m ²)	500	<450	N
LETI Embodied Carbon Band B – Upfront Carbon	356	400	Y
LETI Embodied Carbon Band B – Lifecycle Embodied Carbon	500	625	Y

14.8.1.2 Operational Phase

14.8.1.2.1 Operational Energy Usage

The proposed development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section 14.9.1 and are based on information provided within the *Energy Efficiency and Climate Change Adaption Plan* prepared by Byrne Environmental Consulting Ltd. in relation to the proposed development.

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14.8.1.2.2 Operational Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. The traffic associated with the proposed development will not increase substantially and is below the TII assessment criteria (see Section 14.4.2.2.1). A detailed assessment of traffic related CO2 emissions was scoped out as a result and there is no potential for significant impacts to climate from traffic emissions relating to the proposed development.

14.8.1.3 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 14.9 has been taken into account when determining the significance of the proposed development’s GHG emissions. Based on the carbon emissions intensity and policy measures the project developer has in place, it can be concluded that the proposed development is aligned with Ireland’s GHG trajectory to net zero by 2050. Therefore, according to the TII significance criteria described in Section 14.4.2.3 and Table 14.4, the significance of the GHG emissions during the construction and operational phase is minor adverse. The proposed development has mitigated some GHG impacts where possible.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase which is **direct, long-term, negative** and **slight**, which is overall **not significant**.

14.8.2 Climate Change Risk Assessment

14.8.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 14.4.3 and Section 14.8.2.2. There are no residual medium or high risk vulnerabilities to climate change hazards. Therefore, a detailed CCRA is not required (TII, 2022a). However, consideration has been given to the proposed development’s vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 14.8:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major Storm Damage including wind damage.

14.8.2.2 Operational Phase

The sensitivity and exposure of the development to various climate hazards must first be determined to then determine the vulnerability of the proposed development to climate change. Flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog have been considered as climate hazards in the context of the proposed development.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. Table 14.11 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined. This is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 14.5. The results of the vulnerability assessment are detailed in Table 14.11.

Table 14.11 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	2 (Medium)	1 (Low)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that the proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

14.8.2.2.1 Flooding

A *Flood Risk Assessment* (FRA) was undertaken by TOBIN Consulting Engineers and is submitted as part of this planning application. This document was reviewed to inform the climate change vulnerability assessment and assess the potential for flooding at the proposed development site.

The FRA assessed the risk of flooding at the site in the context of potential fluvial, coastal, pluvial and groundwater flooding.

The developable area of the proposed development is located in Flood Zone C, where there is less than an 0.1% AEP of fluvial flooding. Given that all vulnerable infrastructure and access routes are located within the developable area, with FFLs providing more than 7.5m freeboard above predicted flood levels, it is predicted that fluvial flood risk to the development is minimal.

In the context of pluvial flooding, as per the FRA “surface water arising at the site will be managed by a dedicated stormwater drainage system and on-site attenuation designed in accordance with SuDS limiting discharge from the site to greenfield runoff

rates. The landscaping and topography of the site will provide safe exceedance flow paths and prevent surface water ponding to minimise residual risks associated with extreme flooding or blockage of the stormwater drainage system, minimizing the potential for pluvial flooding”.

Groundwater flooding and coastal flooding were not considered a risk to the proposed development site.

The FRA has assessed against the ‘Mid-Range Future Scenario’ which is in line with the “Medium Risk” RCP4.5 scenario. Therefore, the sensitivity to flooding has been categorised as 2 (Medium) as the design only mitigates the medium risk future scenario; allowing an additional 30% for future climate change related rainfall in the drainage calculations would align with the “High Risk” RCP8.5 scenario. However, the risk of flooding at the proposed development is still considered Low overall.

14.8.2.2.2 Extreme Wind, Fog, Lightning & Hail

In relation to extreme winds, the buildings shall be designed to the appropriate standards to account for the relevant wind loadings events for RCP4.5 and RCP8.5. If required as part of the building design, lightning protection shall be provided for. Hail and fog are not predicted to significantly affect the building due to its design.

14.8.2.2.3 Wildfires

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) (2025), indicates that the wildfire hazard is classified as ‘medium’ for the Clare area. This means that there is between a 10% to 50% chance of experiencing weather that could support a hazardous wildfire that may poses some risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions. These include increases in temperature and prolonged dry periods. However, as the proposed development is in a predominantly suburban area the risk of wildfire is significantly lessened and it can be concluded that the proposed development is of low vulnerability to wildfires.

14.8.2.2.4 Landslides

The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to inform the risk from landslides at the proposed development. There have not been any historical landslide events in the vicinity of the proposed development and the area is of low susceptibility to future landslides. Therefore, the vulnerability of the proposed development to landslides is classed as low.

14.8.2.2.5 Extreme Temperatures (Heat & Cold) & Drought

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure. However, high quality, durable building materials will be selected for the proposed development at the detailed design stage. Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including; the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission, 2021a), LETI emergency design guide (LETI, 2020), and the latest available IPCC report. In addition, should updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be taken into account. The proposed development has been designed to reduce the impact to climate where possible. This will primarily be achieved through a high-performance building envelope, including airtight construction, enhanced insulation, and energy-efficient glazing, which will reduce reliance on HVAC and renewable energy systems. These measures not only minimize energy demand but also enhance resilience to extreme temperature events, ensuring year-round thermal comfort and long-term sustainability.

14.8.2.2.6 Summary

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

14.8.2.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

14.8.3 Cumulative Effects

With respect to the requirement for a cumulative assessment the IEMA (IEMA, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that “the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland’s trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland’s ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative”.

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

14.8.4 Summary

The following table summarises the identified likely significant effects on climate due to the proposed development before mitigation measures are applied.

Table 14.12 Summary of Likely Significant Effects in the absence of mitigation

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Not significant - slight (minor adverse as per Table 14.3)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant - slight	Local	Likely	Long-term	Direct

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14.9 Mitigation Measures

14.9.1 Incorporated Design Mitigation

A number of measures have been incorporated into the design of the development to reduce the impact on climate wherever possible, these are outlined in further detail in the *Energy Efficiency and Climate Change Adaption Plan* prepared by Byrne Environmental Consulting Ltd. and submitted as part of the planning application for the proposed development. The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards and will achieve a Building Energy Rating (BER) in line with the NZEB requirements.

Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- The residential units will aim to achieve a Building Energy Ratio (BER) of A2 (25-50 kwh/m²/yr).
- The proposed residential dwellings will be served by an air to water heat pump system to provide heating and hot water requirements. Heating shall be controlled by thermostats within each dwelling.
- The proposed residential dwellings be constructed using building elements with the required U-Values to comply the Part L 2022 air permeability limits and shall be tested for air tightness once fully constructed to demonstrate compliance with the 5m³/m²/hour limit.
- Air tightness will be designed to achieve the Part L 2022 requirements.
- Bicycle parking and electric vehicle (EV) car charging has been incorporated into the development to provide an alternative, more sustainable modes of transport.

These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Action Plan. The Energy Efficiency and Climate Adaption Plan outlines how the proposed development will comply with the climate action targets as follows:

- **Reduced Greenhouse Gas Emissions:** By integrating renewable energy technologies, low-carbon heating solutions, and high-performance insulation, the project will achieve significant reductions in operational carbon emissions.
- **Renewable Energy Use:** The installation of solar photovoltaic (PV) panels and low carbon heating system (Air to Water Heat Pump) ensures that at least 20% of the building's energy demand is met by renewable sources.
- **Enhanced Energy Efficiency:** Through airtight construction, triple-glazed windows, and highly insulated building fabric, energy demand is minimized, ensuring a lower environmental impact and resistance to climate change extreme hot and cold weather events.
- **Sustainable Transport Infrastructure:** The inclusion of EV charging hubs, bicycle parking and the site's proximity to public transport links encourage low-carbon commuting options for residents.
- **Contribution to National Net-Zero Goals:** This development supports Ireland's long-term goal of achieving net-zero emissions by 2050 through its integration of energy-efficient systems and sustainable design details in all houses.

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (Section 14.8.2.2).

14.9.2 Construction Phase Mitigation

Project Specific Mitigation

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO₂ emissions.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed, e.g. the EU Commission Technical Guidance on Adapting Buildings to Climate Change (European Commission, 2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.

Developer-Led Mitigation

The project developer, Glenveagh Properties, has committed to achieving Net Zero by 2050 across its whole business. Therefore, the proposed development will be built with carbon reduction and sustainability in mind and will include reductions of embodied emissions during the construction phase. Glenveagh Properties have published a Net Zero Transition Plan and Annual Reports which detail a commitment to achieving Net Zero by 2050.

The above listed measures are supported by Glenveagh Properties PLC's *Net Zero Transition Plan 2023*, published in March 2023, which identifies the sources of Glenveagh Properties PLC's emissions and proposed measures to reduce these. A commitment to achieve a 55% reduction in Scope 3 (construction methods) emissions intensity (tCO₂e per 100 m² of complete floor area) by 2031 (using 2021 as the baseline year) will involve supplier engagement to make informed procurement decisions, engaging with subcontractors to support their transition to less carbon intensive fuels (diesel and gas oil is currently the norm) and investing in innovation of designing and building homes to reduce their associated embodied carbon. A reduction target of 46.2% by 2031 is also set in the plan for Scope 1 and 2 emissions (company operations). All targets have been validated by the Science Based Targets initiative (SBTi).

The Science Based Targets initiative (SBTi) is a corporate climate action organisation, incorporated as a charity, which develops standards, tools and guidance enabling companies to set GHG emissions reductions targets in line with net-zero by 2050 at the latest. Science-based targets show companies and financial institutions how much and how quickly they need to reduce their GHG emissions to prevent the worst effects of climate change (SBTi, 2024a). Glenveagh Properties PLC is one of the over

4,000 companies and financial institutions who have had their emission reduction targets validated by the SBTi (Glenveagh’s targets can be searched in the SBTi’s target dashboard (SBTi, 2024b)).

Glenveagh Properties PLC’s *Full Year 2024 Results*, published in March 2025, identified that Scope 3 emissions are 7% below the 2021 baseline, measured on an intensity basis (tCO₂e per 100m²). This is primarily due to the focus on the energy efficiency of the residential units. Scope 1 and 2 emissions decreased by 47% compared to 2021 baseline, which can be attributed to the first full year HVO (hydrotreated vegetable oil) was used across all sites as a replacement to diesel.

14.9.3 Operational Phase Mitigation

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.9.1 above as incorporated design mitigation. No further operational phase mitigation is proposed.

14.10 Residual Impact Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII reference the IEMA guidance which states that the crux of assessing significance is “*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*”. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in Table 14.3 the residual impact of the proposed development in relation to GHG emissions is considered minor adverse, this equates to a **direct, long-term, negative** and **slight**, impact which is overall **not significant** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

14.10.1 Summary of Post-mitigation Effects

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 14.13 Summary of Effects Post Mitigation

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Not significant (minor adverse as per Table 14.3)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant	Local	Likely	Long-term	Direct

14.10.2 Cumulative Residual Effects

With respect to the requirement for a cumulative assessment the IEMA (IEMA, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that “*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland’s trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland’s ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*”.

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

14.11 Risk of Major Accidents or Disasters

As detailed in Section 14.8.2.2, climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. However, the potential for flooding on site has been reviewed and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. The proposed development has been assessed as having only low vulnerabilities to various climate change related hazards and there is no significant risk to the site as a result of climate change. Therefore, the impact will be neutral and imperceptible.

14.12 Worst Case Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 14.8 details the worst-case impact for the proposed development.

14.13 Interactions

Climate has the potential to interact with a number of other environmental attributes.

14.13.1 Land & Soils

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change. The effect of the interactions between climate and land, soils, geology and hydrology are **direct, short-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

14.13.2 Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

14.13.3 Traffic and Transportation

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO₂, a greenhouse gas. The effects of the proposed development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effects of the interactions between traffic and climate are considered to be *direct, short-term, negative* and *not significant* during the construction phase and *direct, long-term, negative* and *not significant* during the operational phase, which is overall *not significant* in EIA terms.

14.13.4 Waste

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered to be *direct, short-term, negative* and *not significant* during the construction phase and *direct, long-term, negative* and *not significant* during the operational phase, which is overall *not significant* in EIA terms.

14.14 Monitoring

There is no monitoring required for the construction or operational phases.

14.15 Summary of Mitigation and Monitoring

The following table summarises the Construction Phase mitigation measures. No monitoring is required.

Table 14.14 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Impact of proposed development greenhouse gas emissions on climate.	- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled. - Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. - Ensure all plant and machinery are well maintained and inspected regularly. - Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. - Sourcing materials locally where possible to reduce transport related CO₂ emissions.	None proposed.
Vulnerability of proposed development to future climate change.	- Contractor will be required to mitigate against the effects of extreme rainfall/flooding, extreme winds/storms, temperature extremes, fog, lightning and hail through site risk assessments and method statements. - All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures.	None proposed.

The following table summarises the Operational Phase mitigation measures. No monitoring is required.

Table 14.15 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Incorporated design mitigation relating to operational energy usage. See Section 14.9.1 for further details.	None proposed.
Vulnerability of proposed development to future climate change.	Incorporated design mitigation regarding drainage design, landscaping requirements, building design. See Section 14.8.2.2 for further details.	None proposed.

14.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to climate. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is not significant in relation to GHG emissions and climate change risk.

14.17 References and Sources

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CHAPTER FIFTEEN

CULTURAL HERITAGE

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CHAPTER FIFTEEN

Table of Contents

Cultural Heritage

15.1 Introduction..... 15-1

15.2 Expertise & Qualifications 15-1

15.3 Proposed Development..... 15-1

15.4 Methodology 15-1

15.5 Baseline Environment..... 15-7

15.6 Potential Significant Effects 15-13

15.7 Mitigation Measures 15-14

15.8 Residual Impact Assessment 15-15

15.9 Risk of Major Accidents or Disasters 15-15

15.10 Worst Case Scenario..... 15-15

15.11 Interactions 15-15

15.12 Monitoring 15-15

15.13 Conclusion 15-15

15.14 References and Sources 15-15

Table of Tables

Table 15.1 Magnitudes of Effect on Cultural Heritage Assets 15-5

Table 15.2 Guidance Criteria For Assessing Value of Cultural Heritage Assets..... 15-5

Table 15.3 Description of Significance of Effects (per EPA EIAR Guidelines 2022) 15-6

Table 15.4 Significance of Effects Matrix (based on EPA EIAR Guidelines 2022) 15-6

Table 15.5 Recorded archaeological sites within 1km Study Area 15-7

Table 15.6 Protected Structures within the study area 15-10

Table of Figures

Figure 15.1 Recorded Archaeological Sites and Protected Structures (RPS) in 1km Study Area 15-8

Figure 15.2 1st edition 6-inch OS map (published 1841) depicting the proposed development (blue line)..... 15-11

Figure 15.3 Extract from the 25-inch OS map (published 1897) of the proposed development (blue line) 15-11

Figure 15.4 LiDAR Image of the Proposed Development Site (source: Geology Survey Ireland) 15-12

Figure 15.5 Field numbers within the proposed development site are cross-referenced with Photographic Record (see Appendix 15.1)... 15-13

CHAPTER 15 | Cultural Heritage

15.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development, as described in Chapter 2 of the EIAR, on the cultural heritage resource. The cultural heritage resource encompasses several aspects of tangible constraints, such as archaeological sites and monuments and architectural heritage structures, as well as intangible assets such as historical associations, folklore, oral traditions, the arts and language.

This chapter should be read in conjunction with Chapter 2 of the EIAR which describes the proposed development.

15.2 Expertise & Qualifications

This chapter was prepared by Tony Cummins and Peter Looney of John Cronin and Associates. Mr Cummins holds B.A. and M.A. degrees in archaeology (University College Cork (UCC) 1992 and 1994). Mr. Looney holds primary and postgraduate qualifications in archaeology (B.A. 2007 and MPhil. 2011, UCC). Both of these individuals have extensive experience in the compilation of archaeological, architectural, and cultural heritage impact assessments.

15.3 Proposed Development

The proposed development will provide a Large Scale Residential Development (LRD) with a creche and all associated site development works. Please refer to Chapter 2 of this EIAR and the statutory notices for a full description.

15.4 Methodology

The assessment was based on phased programmes of desktop research and field surveys of the proposed development site which were carried out in order to identify any features of cultural heritage significance likely to be impacted by the proposed development. The recorded and potential cultural heritage resource within a study area encompassing the area within the proposed development site and the surrounding lands extending for 1km in all directions from its boundary. This study area was reviewed in order to compile a comprehensive cultural heritage baseline for the location of the proposed development and surrounding lands which informed the assessment of potential impacts on any elements of the resource.

The following sections present an overview of the methodology applied to determine the baseline cultural heritage environment within the study area and the assessment of potential effects on the cultural heritage resource.

15.4.1 Relevant Legislation & Guidance

The guidelines relevant to the assessment include the *Architectural Heritage Protection: Guidelines for Planning Authorities* (Department of Arts, Heritage and Gaeltacht 2011) and the *Framework and Principles for the Protection of Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands 1999). The assessment was also informed by the Environmental Protection Agency (EPA 2022) *Guidelines for Information to be Contained in EIAR* and the International Council on Monuments and Sites (ICOMOS 2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty¹ (1995) (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the European Convention on the Protection of Architectural Heritage (Granada Convention², 1985), ratified by Ireland in 1997; and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003, ratified by Ireland in 2015.

The EIA Directives (from 1985 to 2014) set out the requirement for an EIA in European law. This assessment has been prepared in accordance EIA requirements of codified Council Directive 2011/92/EU as amended by EIA Council Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

Ireland has transposed EU Directive 2014/52/EU by way of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which came into operation on 1 September 2018. The Regulations provide for the transposition of the 2014 EIA Directive and give further effect to the 2011 EIA Directive by way of extensive amendments to existing planning law.

The national legal statutes relevant to this assessment comprise:

- The Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023
- National Monuments Act 1930 (as amended);
- Heritage Act 1995 (as amended);
- National Cultural Institutions Act (1997); and
- Planning and Development Act 2000 (as amended).

The administration of national policy in relation to archaeological and architectural heritage resources is the responsibility of the National Monuments Service (NMS) and the National Built Heritage Service (NBHS) which are both currently based in the Department of Heritage Local Government and Heritage (DHLGH).

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law in October 2023. The DHLGH published an online guidance document in relation to this Act in November 2023³ which provides an overview of its current status, and this is summarised hereafter. While the Act is now law most of its provisions will not enter into force until the Minister has made one or more “Commencement Orders”. This means that section 7 of the Act (which provides for the repeal of the National Monuments Acts 1930 (as amended) and related legislation) has not entered into force. Accordingly, the National Monuments Acts 1930 (as amended) remain fully in force and will continue to do so for the time being. The Act contains transitional provisions which will, if necessary, enable certain aspects of the existing National Monuments Acts (as amended) to continue in operation notwithstanding their repeal post-commencement of the Act while successor provisions are being brought fully into operation. This includes provisions enabling the Record of Monuments and Places to continue to have effect pending the establishment of a new Register of Monuments. A commencement order made on 31st May 2024, insofar as it relates to the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 (other than section 5), has come into operation. On 12th December 2024, further provisions of the Act came into operation, and these relate to historic wrecks and underwater archaeological objects, and also for Irish citizens (and a range of specified other persons), and vessels operating in international waters if they intend to engage in activities directed at underwater cultural heritage.

The National Monuments Act of 1930 (as amended), therefore, remains the primary means of ensuring the protection of the archaeological resource and includes a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments as well listing sites in the

1 <https://www.coe.int/en/web/culture-and-heritage/valletta-convention>
2 <https://www.coe.int/en/web/culture-and-heritage/granada-convention>
3 <https://www.archaeology.ie/news/enactment-of-historic-and-archaeological-heritage-and-miscellaneous-provisions-act-2023-and>

Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record as well as the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as ‘a monument or the remains of a monument, the preservation of which is a matter of national importance’. The State may acquire or assume guardianship of National Monuments through agreement with landowners or under compulsory orders. The prior written consent of the Minister is required for any works at, or in proximity to, a National Monument in the ownership or guardianship of the State, the Minister or a local authority, or those which are subject to a Preservation Order. There are no National Monuments or sites subject to Preservation Orders located within the study area.

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the Record of Monuments and Places (RMP) which comprises the known archaeological sites within the State. The RMP, which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR), provides county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1994 and the DHLGH must be given two months’ notice in advance of any work proposed at their locations.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO in 2023 were also reviewed and none are located within County Clare.

The protection of the architectural heritage resource is provided for through a range of legal instruments that include the Heritage Act 1995 (as amended), the Architectural Heritage (National Inventory) and National Monuments (Misc. Provisions) Act 1999, and the Planning and Development Act 2000 (as amended). The Planning and Development Act 2000 requires all Planning Authorities to keep a ‘Record of Protected Structures’ (RPS) of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. As of the 1st January 2000, all structures listed for protection in current Development Plans, have become ‘protected structures’. Since the introduction of this legislation, planning permission is required for any works to a protected structure that would affect its character. In addition, Local Authorities must provide for the preservation of places, groups of structures and townscapes of architectural heritage significance through designation of Architectural Conservation Areas (ACAs).

The National Inventory of Architectural Heritage (NIAH) was established to record architectural heritage structures within the State. While inclusion in the NIAH does not provide statutory protection to a structure it is intended to advise Local Authorities on compilation of their Record of Protected Structures. The NIAH also includes a Designed Landscapes and Historic Gardens Survey which comprises a non-statutory, desk-based survey of such features.

The relevant development plan for this project is the *Clare County Development Plan 2023-2029*. This development plan includes the following objectives in relation to the protection of the archaeological and architectural heritage resources:

Development Plan Objective: Architectural Heritage

CDP16.1 It is an objective of Clare County Council:

- a) To ensure the protection of the architectural heritage of County Clare through the identification of Protected Structures, the designation of Architectural Conservation Areas, the safeguarding of historic gardens, and the recognition of structures and elements that contribute positively to the vernacular and industrial heritage of the county; and*
- b) To ensure that the archaeological and architectural heritage of the county is not damaged either through direct destruction or by unsympathetic developments.*
- c) To support and promote architectural vernacular skills training and facilities in the county*

Development Plan Objective: Protected Structures

CDP16.2 It is an objective of Clare County Council:

- a) To protect, as set out in the Record of Protected Structures, all structures, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest; and*
- b) To review the Record of Protected Structures periodically and add structures of special interest as appropriate, including significant elements of industrial, maritime or vernacular heritage and any twentieth century structures of merit.*

Development Plan Objective: Industrial Heritage

CDP16.3 It is an objective of Clare County Council: To protect and preserve buildings and features of industrial heritage such as mills, bridges, lighthouses and harbours, amongst others. Proposals for refurbishment works to, or redevelopment/ conversion of, these sites will be subject to a full architectural and archaeological assessment together with an ecological assessment with respect to the presence of protected species.

Development Plan Objective: Revitalisation of Vernacular Heritage

CDP16.4 It is an objective of Clare County Council:

- a) To seek the retention, appreciation and appropriate revitalisation of the vernacular heritage of County Clare, in towns, villages and rural areas, by discouraging the replacement of good quality vernacular buildings with modern structures and by protecting vernacular buildings where they contribute to the character of an area or settlement and/or where they are rare examples of a structure type;*
- b) To support proposals to refurbish vernacular structures that are in a sub-standard or derelict condition, provided that:*
 - I. Appropriate traditional building materials and methods are used to carry out repairs to the historic fabric; II. Proposals for extensions to vernacular structures are reflective and proportionate to the existing building and do not erode the setting and design qualities of the original structure which make it attractive III. Direction for the design is taken from the historic building stock of the area, though it can be expressed in contemporary architectural language; and*
 - (c) To ensure that visitor pressures from tourism associated with built and cultural heritage do not impact negatively on the capacity of local services (including water, waste water) or facilities such as car parking.*

Development Plan Objective: Architectural Conservation Areas (ACAs)

CDP16.5 It is an objective of Clare County Council:

- a) To ensure that new developments within or adjacent to an ACA respect the established character context of the area and contribute positively to the ACA in terms of design, scale, setting and material finishes;*
- b) To protect from demolition or removal and nonsympathetic alterations, existing buildings, structures, groups of structures, sites, landscapes and features such as street furniture and paving, which are considered to be intrinsic elements of the special character of the ACA;*
- c) To ensure that all new signage, lighting, advertising and utilities to buildings within an ACA are designed, constructed and located in a manner that does not detract from and is complementary to the character of the ACA; and*
- d) To ensure that external colour schemes in ACAs enhance the character and amenities of the area and reflect traditional colour schemes.*

Development Plan Objective: Proposed Works to Buildings - Protected Species and Environmental Considerations

CDP16.6 It is an objective of Clare County Council: To protect habitats and species when considering proposed works to buildings which are likely to impact on protected ecological sites and protected species and to ensure that decision-making on heritage related projects and developments is informed by an appropriate level of environmental assessment.

Development Plan Objective: Maintenance and Improvement of Architectural Heritage

CDP16.7 It is an objective of Clare County Council:

- a) To advocate for greater financial assistance, including the Built Heritage Investment Scheme and the Historic Structures Fund, for the maintenance and improvement of architectural heritage in County Clare;*

- b) To support community initiatives and projects regarding preservation, presentation and access to archaeological heritage and underwater cultural heritage, provided such are compatible with appropriate conservation policies and standards, having regard to the guidance and advice of The Department of Housing, Local Government and Heritage
- c) To provide advice and guidance to community groups, owners and occupiers with regards to the maintenance and repair of buildings and structures of architectural heritage importance and to promote initiatives by the Council, the Heritage Council, local communities, heritage property owners and other stakeholders pursuing the maintenance and improvement of the architectural heritage; and
- d) To undertake a risk assessment of the Archaeological and Architectural Heritage and Cultural Assets in the county to assess the vulnerability and the risk to the historical environment from the impacts of climate change and to help build resilience to these important assets.

Development Plan Objective: Sites, Features and Objects of Archaeological Interest CDP16.8 It is an objective of Clare County Council:

- a) To safeguard sites, features and objects of archaeological interest generally;
- b) To secure the preservation (i.e. preservation in situ or in exceptional cases preservation by record) of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological and historical interest generally;
- c) In securing such preservation, to have regard to the advice and recommendations of the Department of the Culture, Heritage and the Gaeltacht;
- d) To have regard to the government publication Framework and Principles for the Protection of the Archaeological Heritage 1999 in relation to protecting sites, features and objects of archaeological interest; and
- e) To advocate for greater financial assistance for the maintenance and improvement of features of archaeological interests in County Clare.

Development Plan Objective: Newly Discovered Archaeological Sites

CDP16.9 It is an objective of Clare County Council: To protect and preserve archaeological sites discovered since the publication of the Record of Monuments and Places.

Development Plan Objective: Zones of Archaeological Potential

CDP16.10 It is an objective of Clare County Council: To protect the Zones of Archaeological Potential located within both urban and rural areas as identified in the Record of Monuments and Places.

Development Plan Objective: Archaeology and Infrastructure Schemes

CDP16.11 It is an objective of Clare County Council: To ensure that decisions relating to development (including infrastructure associated with broadband, telecommunications, renewable energy, major road/ rail infrastructure, flood relief schemes and other services) which may have implications for Recorded Archaeological Monuments/Sites, Zones of Archaeological Potential or undiscovered archaeology, are informed by an appropriate level of archaeological investigation undertaken by qualified persons and the case of flood relief schemes have regard to archaeological Guidelines for Flood Relief Schemes (DHLGH and OPW2022).

Development Plan Objective: Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage

CDP16.12 It is an objective of Clare County Council: To support the Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage 2019, as published by the Department of Culture, Heritage and the Gaeltacht and any subsequent guidance or plans for dealing with climate change and archaeological heritage. The Council shall seek to:

- a) Promote awareness and the appropriate adaptation of Ireland's built and archaeological heritage to deal with the effects of climate change;
- b) Identify the built and archaeological heritage in Local Authority ownership and areas at risk from climate change including, but not necessarily restricted to, the Record of Monuments and Places, Protected Structures and architectural conservation areas designated in the Development Plan;

- c) Undertake climate change vulnerability assessments for the historic structures and sites in its area, subject to resources and funding;
- d) Develop disaster risk reduction policies addressing direct and indirect risks to the built and archaeological heritage in its area;
- e) Develop resilience and adaptation strategies for the built and archaeological heritage in its area;
- f) Develop the skills capacity within the Local Authority to address adaptation/mitigation/emergency management issues affecting historic structures and sites in order to avoid inadvertent loss or damage in the course of climate change adaptation or mitigation works.

Development Plan Objective: Raising Archaeological Awareness

CDP16.12 It is an objective of Clare County Council:

- a) To raise awareness of and improve practice in relation to archaeology in County Clare; and
- b) To promote the care and conservation of historic graveyards throughout the county. Within the lifetime of the Plan it is an objective to prepare conservation plans for a number of historical church and graveyard sites, with the objective of identifying necessary works required to address the decay of the fabric of the sites.

Development Plan Objective: Underwater Archaeology

CDP16.13 It is an objective of Clare County Council

- a) To protect, preserve and promote the archaeological value of underwater archaeological sites in rivers, lakes, coastal, marine, intertidal and sub tidal environments; and
- b) To support the further exploration of the underwater archaeology of County Clare, including the San Marcos project, and any subsequent projects that may arise during the lifetime of this Plan.

15.4.2 Desktop research

Documentary research on the recorded and potential cultural heritage resource within the study area was carried out in order to identify any recorded archaeological, architectural and other cultural heritage sites and features. This information has provided an insight into the development of the study area over time and also assisted in an evaluation of the potential presence of hitherto unrecorded cultural heritage sites or features within the proposed development site.

The principal sources reviewed for the assessment of the recorded archaeological resource were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) maintained by the National Monuments Service, Department of Housing, Local Government and Heritage. The current County Clare Record of Protected Structures (RPS) and structures listed in the National Inventory of Architectural Heritage (NIAH) were reviewed in order to assess the designated architectural heritage resource within the study area.

Other sources consulted as part of the assessment included the following:

- Clare County Development Plan 2023-2029 – This publication outlines the Council's policies for the protection of the archaeological and architectural heritage resource within the county and includes the Record of Protected Structures (RPS) and Architectural Conservation Areas (ACAs).
- Archaeological Survey of Ireland (ASI): While there is currently no published archaeological inventory for County Clare, the National Monuments Service's online Historical Environment Viewer (www.archaeology.ie) presents inventory descriptions compiled by the ASI for a range of known archaeological sites within the county. All available inventory entries for sites located within the study area are included within **Section 15.5** of this chapter.
- UNESCO designated World Heritage Sites and Tentative List: A review was undertaken of the locations of the two world heritage sites in Ireland and other significant sites included in a Tentative List (2023) nominated by Ireland for inclusion.

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- The Database of Irish Excavation Reports: This database contains summary accounts of licensed archaeological excavations carried out in Ireland (North and South) from 1970 to present. Current data was accessed via www.excavations.ie in May 2025.
- Heritage Council's Heritage Map Viewer: This online mapping source (www.heritagemaps.ie) collates various cultural heritage datasets sourced from, among others, the National Monuments Service, National Museum of Ireland, Local Authorities, and the Office of Public Works. This includes a number of datasets based on Clare County Council heritage surveys, including historic bridges, water towers and canals. None of these datasets record any features within the study area.
- Literary Sources: Published literary sources consulted to assess the archaeological, historical, architectural heritage and folklore record of the study area are listed in **Section 15.14** of this chapter.
- Cartographic sources: Available cartographic depictions of the study area dating from the 17th century onward were reviewed and relevant extracts are presented in **Section 15.5** of this chapter.
- Aerial/Satellite/LiDAR imagery: A review of publicly accessible imagery from Tailte Éireann, Google Earth, and Bing Maps was carried out to appraise whether they revealed evidence for any unrecorded archaeological sites within the proposed development site or its environs. LiDAR datasets published on the Geological Survey Ireland's Open Topographic Viewer website were also consulted and relevant image extracts are presented in **Section 15.5** of this chapter.
- Placenames Database of Ireland: This online database (www.logainm.ie) provides a comprehensive management system for data, archival records and place names research conducted by the State.
- *National Museum of Ireland Topographical Files*: These files comprise a written and digital database which records known information in relation to the discovery locations of Irish archaeological artefacts, including those held in the museum's collection. The files are archived in the museum's premises in Kildare Street, Dublin and were inspected as part of the desktop study. The archive contains no files recording the discovery of artefacts within the townlands extending into the proposed development site.

15.4.3 Site Surveys

All areas within the proposed development site were subject systematic field-walking surveys in June 2021 and February 2025 and no access constraints were encountered. The lands were assessed in terms of existing land use, vegetation cover and the potential for the presence of surface traces of previously unrecorded archaeological and architectural heritage sites or features. The results of the field inspection are described in **Section 15.5.6** and extracts from the photographic record compiled during the field survey are presented in **Appendix 15.1**. The proposed development site was also inspected in March 2025 by Ger Dowling, a specialist archaeological geophysical surveyor, in order to appraise whether existing onsite conditions were suitable for geophysical surveying and details on this are provided in **Section 15.4.5** and **Appendix 15.3**.

15.4.4 Impact Assessment

The methodology used for the assessment of potential impacts has been informed by the Environmental Protection Agency (EPA) *Guidelines for Information to be Contained in EIAR* (2022), in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended). The following summation of the criteria used to assess impacts is provided to concisely outline the methodology specifically applied to the cultural heritage resource. Assessment is achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

Duration of Effect is assessed based on the following criteria:

- Momentary (seconds to minutes)
- Brief < 1 day
- Temporary <1 year
- Short-term 1-7 years
- Medium Term 7-15 years
- Long Term 15-60 years
- Permanent > 60 years
- Reversible: Effects that can be undone, for example through remediation or restoration

Quality of Effect on the cultural heritage resource can be positive, neutral or negative.

- Positive: a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation and re-use of an otherwise vulnerable derelict structure).
- Neutral: no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment.
- Negative: a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of an asset, physical intrusion on features/setting of a site)

Types of Effect on the cultural heritage resource can be direct, indirect or no predicted impact.

- Direct impact: where a cultural heritage site is physically located within the footprint of the proposed development, which will result in its complete or partial removal.
- Indirect impact: where a cultural heritage site or its setting is located in close proximity to the footprint of the proposed development.
- No predicted impact: where the proposed development will not adversely or positively affect a cultural heritage site.

Other Types of Effect include:

- Cumulative: Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
- 'Do-nothing Effects' - The cultural heritage environment as it would be in the future should the Project not be carried out.
- 'Worst-case' Effects - The effects arising from a Project in the case where mitigation measures substantially fail.
- Indeterminable Effects - When the full consequences of a change in the environment cannot be described.
- Irreversible Effects - When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
- Residual Effects - The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

The *Magnitude of Effect* is based on the degree of change, incorporating any mitigation measures, and is based on a consideration of the character, duration, probability and consequences (**Table 15-1**). The magnitude can be negative or positive and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The descriptions of magnitudes presented in Table 15-1 are based on guidance published in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 16-7).

Table 15.1 Magnitudes of Effect on Cultural Heritage Assets

Magnitude	Description
High	Most or all key archaeological or architectural materials affected such that the resource is totally altered Comprehensive changes to setting Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character Major changes to area that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation
Medium	Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified. Considerable changes to setting that affect the character of the archaeological asset. Changes to the setting of a historic building, such that it is significantly modified. Change to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, considerable changes to use or access, resulting in moderate changes to historic landscape character. Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Low	Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different. Slight changes to setting of an archaeological monument. Change to setting of a historic building, such that it is noticeably changed. Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Negligible	Very minor changes to key archaeological materials or setting. Slight changes to historic building elements or setting that hardly affect it. Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access; Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.

The *Value/Sensitivity* assigned to cultural heritage assets for the purposes of this assessment are intended as indicators which contribute to a wider judgment based on the individual circumstances of each asset. Other than the level of legal designations, e.g., National Monuments and recognition as World Heritage sites, there is no formal grading or rating system for Irish archaeological monuments or architectural heritage structures. The non-statutory NIAH does apply a ranking system (Regional, National and International) to structures included in that inventory and, while these rankings do not confer a graduated level of statutory protection they have been utilised as a value indicator for NIAH-listed structures for the purpose of this assessment.

The criteria for assessing the value/sensitivity of archaeological and other cultural heritage assets as part of this assessment has been informed by the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 14-16). The Value of known or potential cultural heritage assets are ranked according to the following scale: Very High, High;

Medium; Low and Negligible (**Table 15-2**). Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value is deemed to be. Criteria considered in addition to legal designations include condition / preservation; documentary / historical significance; group value; rarity; visibility in the landscape; fragility / vulnerability and amenity value. Archaeological sites which possess little, or no surface expressions may retain low-medium sensitivity to effects on their wider setting while levelled archaeological sites that retain no visible surface traces, including those that have been subject to full archaeological excavation, are typically not sensitive to setting effects. It is noted that archaeological sites, whether extant or levelled, have the potential to possess sub-surface attributes, including artefacts and other archaeological remains, which may possess values that cannot be discerned without recourse to archaeological excavation but are unlikely to be affected in the absence of direct effects.

The values assigned to the identified cultural assets within the study area were determined following the completion of the desktop study combined with site inspections and are identified in **Section 15.5** of this chapter.

Table 15.2 Guidance Criteria For Assessing Value of Cultural Heritage Assets

Indicative Value/Sensitivity	Examples of Asset Types
Very High (International Significance)	World Heritage Sites (including Tentative List properties) Sites, buildings or landscapes of acknowledged international importance Intangible associations with individuals or innovations of global significance
High (National Significance)	Nationally designated sites, buildings and landscapes of significant quality, rarity, preservation and importance Undesignated assets of the quality and importance to be designated Assets that can contribute significantly to acknowledged national research objectives Archaeological Landscapes with significant group value Intangible associations with individuals or innovations of national significance
Medium (Regional Significance)	Designated or undesignated assets that can contribute significantly to regional research objectives, including buildings that can be shown to have exceptional qualities in their fabric or historical associations Conservation Areas and historic townscapes containing buildings that contribute significantly to its historic character Intangible associations with individuals or innovations of regional significance
Low (Local Significance)	Assets compromised by poor preservation and/or poor survival of contextual associations Assets of limited value, but with potential to contribute to local research objectives Historic Townscape or built-up areas of limited historic integrity in their buildings and settings Intangible associations with individuals or innovations of local significance
Negligible	Assets with very little or no surviving archaeological interest Landscapes little or no significant historical interest Buildings or urban areas of no architectural or historical note; buildings of an intrusive character
Unknown Potential	Assets whose importance has not been ascertained Buildings with some hidden (i.e., inaccessible) potential for historic significance

The *Significance of Effects* is assessed based on a consideration of the Magnitude of the Impact (graded from High to Negligible, based on a consideration of character, duration, probability and consequences) combined with the Value (graded from High to Negligible, based on a consideration of significance/sensitivity) of the cultural heritage asset. The significance can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (**Table 15-3** and **Table 15-4**).

Table 15.3 Description of Significance of Effects (per EPA EIAR Guidelines 2022)

Significance	Description
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 but without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 15.4 Significance of Effects Matrix (based on EPA EIAR Guidelines 2022)

Magnitude of Impact	High	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	Low	Medium	High
		Value/Sensitivity of Asset			

15.4.5 Consultation

As part of the pre-planning process for this proposed development, a cover letter and proposed site layout were provided to the NMS, DHLGH who provided the following response on 28th January 2025:

The Department has reviewed the cover letter and associated layout for this proposed large-scale residential development. The Department wishes to advise that, as part of EIA requirements, your client should retain the services of a suitably qualified Archaeologist to carry out an Archaeological Impact Assessment (AIA) as part of the overall Cultural Heritage Impact Assessment of the proposed development, which should be integrated into the finalised Environmental Impact Assessment Report (EIAR). In this regard, the Department awaits the results of the Cultural Heritage Impact Assessment (CHIA) and full EIAR for the scheme before commenting further.

Further to the above and by way of general archaeological advice, please note that, whilst the proposed development site may or may not contain within it known or subsurface Recorded Monuments and/or Archaeological sites that may require assessment as part of the overall CHA, the proposed development site is located within a wider area of known archaeological settlement and activity (the National Monuments Service of the Department initial review of the Record of Monuments and Places, www.archaeology.ie and cartographic sources). All of these Recorded Monuments are subject to statutory protection in the Record of Monuments and Places, established under section 12 of the National Monuments Act 1930-2014. Therefore, the CHIA should include an assessment of the possible effects of the proposal on the wider archaeological landscape. It is of importance that the study area for the CHIA should be of sufficient size and extent to support this.

The Department advises that the CHIA should incorporate a robust desk-study supported by a comprehensive field inspection as well as a visual impact assessment (to assist in identifying any possible impacts to the setting of sites or monuments). The desk-study and field inspection regime should inform:

- Targeted non-intrusive advance geophysical survey or prospection (such as Ground Penetrating Radar Survey)
- Targeted advance archaeological test excavation.
- Any and all intrusive advance investigations (such as, but not limited to, ground investigations for soils/geology/hydrogeology) carried out as part of the EIA and/or design process should be subject to a programme of archaeological monitoring by a suitably qualified archaeologist licensed under the National Monuments Act.

The results of these investigations should inform the EIA process and be incorporated within the EIA Report. The Department is happy to provide further advice and clarification, as and if required, in relation to the preparation of suitably comprehensive assessments as outlined above, with particular regard to the scope and locations for any advance non-intrusive prospection or advance test excavation that would be appropriate to inform the assessment of this proposed scheme. Notwithstanding the above, the Department awaits the submission of the Cultural Heritage Impact assessment before commenting further.

The above observations/recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority/authorities, in his/her role as statutory consultee under the Planning and Development Act, 2000, as amended.

This chapter presents the results of a Cultural Heritage Impact Assessment of the proposed development and incorporates a robust desk-study supported by a comprehensive field inspection as well as a visual impact assessment on the wider archaeological landscape. The proposed development site was inspected in March 2025 by Dr. Ger Dowling, a specialist archaeological geophysicist, who concluded that a geophysical survey could not be carried out “due to the widespread presence of dense, bunched clumps of grass and areas of dense scrub vegetation and trees... access between some of the fields is restricted to narrow, heavily overgrown paths that will likely obstruct movement of the survey cart.” (see letter in **Appendix 15.3**). The site clearance works required to facilitate a geophysical survey would require extensive cutting of vegetation, which cannot take place until 1st September (Section 40 of the Wildlife Act 1976 prohibits the cutting, grubbing, burning or other

destruction of vegetation growing on “any land not then cultivated” between 1st March and 31st August annually). As detailed in **Section 15.7**, a geophysical survey of the proposed development site and archaeological test trenching will be carried out following required vegetation clearance works and in advance of the construction phase of the proposed development.

15.4.6 Difficulties Encountered

As detailed in **Section 15.4.5**, it was not possible to carry out a geophysical survey of the proposed development site due to the presence of vegetation overgrowth at the time of the compilation of this assessment.

No other difficulties were encountered during the compilation of the assessment.

15.5 Baseline Environment

15.5.1 Archaeological Context

15.5.1.1 Overview

There are no recorded archaeological sites within the proposed development site while there are 15 examples located within the surrounding 1km study area (**Table 15-5** and **Figure 15-1**). Of these sites, eight were identified and excavated during archaeological investigations carried out as part of the construction of the N86 Ennis Bypass and no longer remain in situ. Only one of these excavated sites, lime kiln (CL033-170---), was located within the section of the road scheme adjacent to the proposed development.

The remainder of the archaeological sites within the study area are located within private third-party lands and their existing conditions were appraised by reviews of any published Archaeological Inventory of Ireland (ASI) inventory descriptions as well as reviews of online satellite imagery of their locations. Four of the recorded archaeological sites within the study area retain surviving above ground extant remains and these comprise two post-medieval houses and two early medieval cashel sites. None of these extant archaeological sites are located within 300m of the proposed development site.

Table 15.5 Recorded archaeological sites within 1km Study Area

Monument No.	Monument Class	Townland	Condition	Distance from site
CL033-074----	House - 18th/19th century	Kilnacally	Extant	c.935m to west
CL033-075----	Ringfort - cashel	Kilnacally	Extant	c.745m to west
CL033-078----	Enclosure	Shanvogh	Levelled	c.595m to west
CL033-081----	House - 18th/19th century	Cloghleagh	Extant	c.310m to east
CL033-114001-	Ringfort - cashel	Ballymacaula	Extant	c.500m to west
CL033-114002-	House - indeterminate date	Ballymacaula	Probable sub-surface remains	c.500m to west
CL033-162003-	Burnt mound	Cahircalla More	Excavated	c.965m to SSE
CL033-162004-	Burnt mound	Cahircalla More	Excavated	c.945m to SSE
CL033-162005-	Burnt mound	Cahircalla More	Excavated	c.890m to SSE
CL033-163001-	Enclosure	Cahircalla More	Excavated	c.980m to south
CL033-163002-	Hut site	Cahircalla More	Excavated	c.980m to south
CL033-163003-	Field system	Cahircalla More	Excavated	c.930m to south
CL033-169----	Ring-ditch	Claureen	Excavated	c.570m to NNE
CL033-170----	Kiln - lime	Keelty	Excavated	c.35m to west
CL033-171----	Ringfort - rath	Cahircalla More	Levelled	c.150m to south

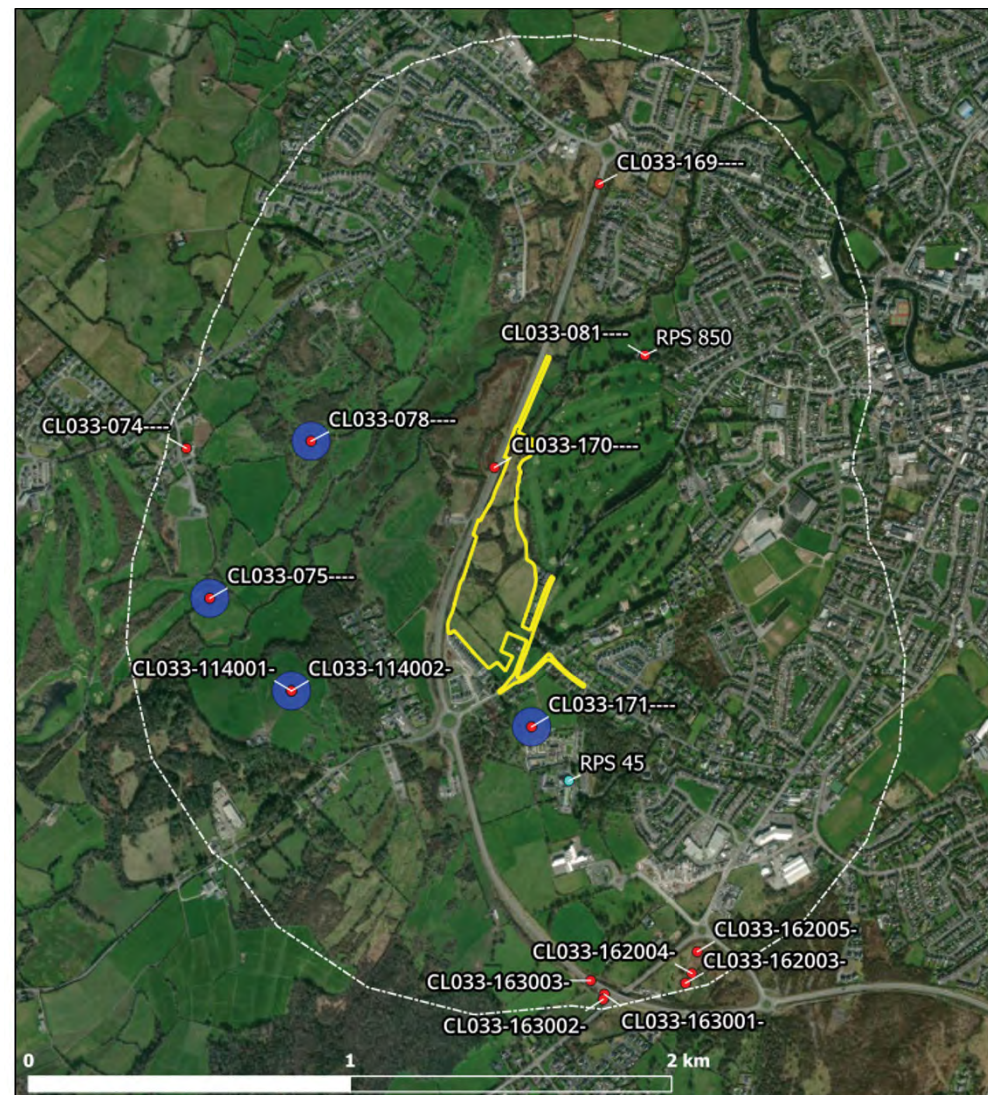


Figure 15.1 Recorded Archaeological Sites and Protected Structures (RPS) in 1km Study Area

15.5.1.2 Early Prehistoric Periods

Until the recent identification of Palaeolithic human butchery marks on animal bones recovered from cave sites which have been dated to the Palaeolithic period, including an example from the Alice and Gwendoline Cave located c.3.5km southwest of Ennis, the earliest recorded evidence for human activity in Ireland dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers lived on the heavily wooded island. The archaeological record indicates that these mobile groups favoured coastal, lake and river shores which provided a transport and food resource. They did not construct any settlements or monuments that have left any above ground traces although their presence in an area can often be identified by scatters of worked flints in ploughed fields or during earthmoving undertaken as part of development works. The Neolithic period (4000–2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlement patterns in farmlands within areas of cleared forestry. As a consequence of the more settled

nature of agrarian life, new site-types, such as more substantial rectangular timber houses and various types of megalithic tombs, and artefacts such as pottery begin to appear in the archaeological record during this period. There are no recorded Mesolithic or Neolithic sites located within the 1km study area.

15.5.1.3 Late Prehistoric Periods

The advent of the Bronze Age period (c. 2400–500 BC) in Ireland saw the introduction of a new artefactual assemblage, including metal and ceramic objects, to the island. This period was also associated with the construction of new monument types such as wedge tombs, standing stones, stone rows/circles and burnt mounds known as fulachta fia. The development of new burial practices during this period also saw the construction of funerary monuments such as cairns, barrows, boulder burials and cists. The arrival of iron-working technology in Ireland saw the advent of the Iron Age (600 BC – 400 AD). Relatively little has been known about Iron Age settlement and ritual practices until recent decades when the corpus of evidence has been greatly increased by the discovery of sites dating to this period during bog-cutting works and road construction projects. It is noted that while the vast majority of prehistoric settlement sites leave no above ground remains their foundations and occupation deposits, which may contain artefactual and environmental remains, can often survive below modern ground surfaces.

A ring-ditch site (CL033-169---) in the north end of the study area was identified and excavated during archaeological investigations in advance of the construction of the N85 Ennis bypass. While the ASI have not published an inventory entry for this ring-ditch, a review of the Database of Irish Excavation Reports revealed that it comprised a 6m diameter enclosure containing cremated bone and glass beads indicating the site had a potential funerary function and perhaps dated to the Late Iron Age (**Appendix 15.2**; Licence 04E0026). Three other late prehistoric sites were identified and excavated in the southern end of the study area as part of the road scheme and these comprised three burnt mounds (CL033-162003-, CL033-162004- and CL033-162005-). None of these late prehistoric sites were located within 740m of the proposed development.

15.5.1.4 The Early Medieval Period

This period began with the introduction of Christianity in Ireland and continued up to the arrival of the Anglo-Normans during the 12th century (c. AD 400–1169). The establishment of the Irish church was to have profound implications for political, social and economic life and is attested to in the archaeological record by the presence of ecclesiastical sites and associated features such as graveyards and holy wells. The early medieval church sites were morphologically similar to settlement sites of the period but are often differentiated by the presence of features such as church buildings, graves, stone crosses and shrines. While this period saw the emergence of the first phases of urbanisation around the large monasteries and Hiberno-Norse ports, the dominant settlement pattern continued to be rural-based and centred around enclosed earthwork farmsteads known as ringforts. These are the most common early medieval sites within the Irish landscape and comprise circular enclosures delimited by earthen banks formed by soils thrown up from a concentric external ditch. Their stone-built equivalents, which are concentrated in western counties, are known as cashels and comprise enclosures constructed with drystone walling. The ubiquity of these enclosures within the Irish landscape is attested to by the fact that their original Gaelic names (rath, lios, dun, caiseal) still form the roots of some of the most common place-name elements in the country. Archaeological excavations have demonstrated that the majority comprised enclosed farmsteads containing the foundations of domestic and agricultural buildings. The enclosures may form the visible element of wider farmlands (known as airliise) that may contain unrecorded, sub-surface archaeological features such as associated field systems, stockades, barns, mills and drying kilns. The ASI also designates certain archaeological sites with no diagnostic features which would allow accurate classification as “enclosures.” While sites assigned this classification can theoretically date from any period from late prehistory onward, the potential exists that many may form the remains of ringforts.

There are two extant cashels (CL033-075---- & CL033-114001-), one levelled ringfort (CL033-171---), one levelled enclosure (CL033-078----) and an excavated field system (CL033-163003-) of potential early medieval date located within the 1km study area. The ASI have published inventory entries for two of these archaeological sites and these are as follows:

CL033-075----
Class: Cashel
Townland: KILNACALLY
Description: Situated at the outer edge of a shelf on a SE-facing slope with the SW-NE Claureen River c. 120m to the SE. A circular overgrown area (diam. c. 30m) defined by a stone spread (at N: Wth 3m; H 0.4-0.8m; at E: Wth 2m; H 0.4m). There are no visible facing stones and an original entrance was not identified.

CL033-078----
Class: Enclosure
Townland: SHANVOGH
Description: Situated on a gentle SE-facing slope down to the Claureen River c. 250m to the SE. Hachured as a circular enclosure (diam. c. 35m) on the 1842 ed. of the OS 6-inch map and as a circular feature (diam. c. 25m) on the 1921 ed. Described as a cashel with a portion of wall (H c. 2m) at W (Ua Cróinín survey 1988, SMR file). On inspection in 2000 it was not visible at ground level.

The field system (CL033-163003-) located within the south end of the 1km study area was identified and excavated during archaeological investigations in advance of the construction of the Ennis Bypass. This site was associated with an early medieval enclosure (CL033-163001-) also uncovered during the road scheme excavations and this is located outside the southern end of the study area, while a hut site (CL033-163002) of unknown date was also identified nearby.

A review of the location of the other cashel (CL033-114001-) within the study area on aerial and satellite images indicates that it remains extant and the potential that an internal hut (CL033-114001-) also survives intact within the enclosed area. A review of aerial images of the location of the ringfort (CL033-171----) within the study area revealed no obvious surface traces. While there is no published inventory information for this ringfort site, based on a description of a 2009 programme of archaeological investigations in advance of a proposed extension to Cahercalla Hospital, which is close to its location, it likely comprises a levelled bivallate (two enclosing banks and ditches) ringfort (**Appendix 15.2**; Licence 09E0170).

15.5.1.5 Late and Post-Medieval Periods

The arrival of the Anglo-Normans in the late 12th century broadly marks the advent of the Irish high medieval period which continued to c.1400 and was followed by the late medieval period which extended to c.1550. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and towns began to develop throughout the country, often within the environs of Anglo-Norman manorial centres which were defended by masonry castles. By the 15th century the native Irish chieftains and lords began to construct tower-house castles within their own landholdings as centres of territorial control. There are no known archaeological sites dating to the late or high medieval periods located within the study area and there is also little historical information on the settlement and land-use patterns within the study area during these periods.

The centuries following 1550 comprise the post-medieval period which continued into the middle of the 19th century and the period thereafter is often described as early modern. The first century of the post-medieval period was a turbulent time in Ireland history and saw a prolonged period of wars between the 1560s and 1603 with further conflicts arising during the Cromwellian Wars (1649–53). This period saw the extensive dispossession of forfeited Gaelic lands and the final disintegration of the Gaelic order in the early 17th century followed the Battle of Kinsale (1601), the conclusion of the Nine Years War (1603) and the Flight of the Earls (1607).

The post-medieval period saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses became more common as the 19th century progressed. An agricultural boom in the late 18th and early 19th centuries saw a rise in prices for both tillage and dairy produce and resulted in Irish landlords investing in extensive land improvement works within their holdings. This included widespread land drainage works, introduction of soil nutrients, grass planting and the enclosure of open lands into field systems that survive to the present-day. The popularity and success of potato farming contributed to a population boom during the 18th and early 19th centuries and its failure in the middle of the latter century was to have devastating consequences. The settlement pattern throughout much of the rural landscape was greatly affected by the Famine period and its aftermath which saw the depopulation of many areas. The following decades were marked by an increasing move away from small-scale subsistence farming towards more market-led pasture, assisted by the development of the Co-Op system, which also increased the extent of land reclamation of previously marginal lands.

The anglicised name of Ennis is derived from the Irish word *Inis* meaning “island” or “river meadow” and relates to an island in the River Fergus on which the O’Briens, former kings of Munster, established a settlement in the early 13th century following their surrender of Limerick to the Anglo-Normans. The town, which did not have a defensive wall, was burnt by Aodh Ó Domhnaill in 1600 during the Nine Years War in reprisal for the O’Brien’s support for the English crown during the conflict. Ennis received a grant to hold fairs and markets in 1610 and some years later a charter for a corporation with a provost, free burgesses, commonalty and a town clerk was granted. Following the 1641 rebellion, which saw English settlers flee the town, the inhabitants of Ennis were attacked again in 1651 by Cromwellian forces which significantly reduced the population in the town and the surrounding countryside. Ennis recovered to expand in the following centuries, mainly as a market town but also as a manufacturing and distributing centre. The proposed development site is located c.1.2km outside the western end of the Zone of Notification around the medieval core of Ennis town, as designated by the National Monuments Service, and it likely formed part of the settlement’s agricultural hinterland during this period. There are no recorded late medieval archaeological sites located within the study area.

The 17th century Down Survey records that the townlands of Keelty and Ballymacaula, which both extend into the proposed development, formed part of the extensive landholdings of Barnabas O’Brien, Earl of Thomond in 1641 and 1670. The study area is within the civil parish of Drumcliff which is described in *The Topographical Inventory of Ireland* (Lewis 1837) as containing lands that varied greatly in quality with about 240 acres of craggy pasture that might be easily converted into good arable land. The parish description makes no references to notable houses or monuments within the townland of Keelty and Ballymacaula.

There are three recorded post-medieval archaeological sites located within the study area and these comprise two house and a kiln site which have been described as follows by the ASI:

CL033-074----

Class: House - 18th/19th century

Townland: KILNACALLY

Description: Situated on level ground at the bottom of a slight E-facing slope. Listed in the RMP (1996) as 'House – 17th century, possible'. On inspection in 2000 this was found to be a five-bay, one-storey farmhouse with loft and modern front porch, probably 19th century in date. No evidence of an earlier date was noted. Archaeological testing (Licence no. 06E0192) just c. 45m to the NE on a large site (c. 130m NW-SE; c. 130m NE-SW) produced no archaeological material (Delaney 2009, 581). Weir (1986, 163).

CL033-081----

Class: House - 18th/19th century

Townland: CLOGHLEAGH

Description: Situated on a slight platform on the floodplain on the E bank of the Inch or Claureen river. Listed in the RMP (1996) as 'House – 17th century, possible'. On inspection in 2000 this was found to be a five-bay, two-storey house dating to the 18th century with a later porch added. The earliest date cited in the Irish Historic Towns Atlas for the house is 1795 (Ó Dálaigh 2012, 24). Weir (1986, 146-7).

CL033-170----

Class: Kiln - lime

Townland: KEELTY

Description: Situated on a NW-facing slope overlooking the floodplain of the Claureen river. A 19th-century limekiln was excavated in 2004 in advance of the construction of the N18 Ennis bypass (Licence no. 04E0025). The kiln was rectangular in plan (5.7m x 6.6m; H 4.7m) and constructed of limestone blocks, roughly dressed and bonded with lime mortar. The kiln had a flat upper surface with a centrally located flue tapering down to a horizontal furnace chamber. (Hull 2007; Bermingham et al. 2012, 96-100).

15.5.1.6 Database of Irish Excavation Reports

The Database does not contain any entries for licensed archaeological investigations carried out within the proposed development site but does include a number of entries for examples within the surrounding 1km study area, which included the archaeological excavations carried out as part of the N85 Ennis Bypass scheme. A pre-construction programme of archaeological test trenching was carried out at the location of the housing estate adjoining the south end of the proposed development site and nothing of archaeological significance was identified (**Appendix 15.2**; Licence 17E0336). Archaeological investigations within two residential development sites to the east of the proposed development also revealed nothing of archaeological significance (**Appendix 15.2**; Licences 06E1223 and 03E1029). Archaeological test trenching in advance of a proposed extension to Cahercalla Hospital in lands to the south of the proposed development revealed sub-surface remains of a levelled ringfort which has been added to the SMR (CL033-171----) (**Figure 15-1** and **Appendix 15.2**; Licence 09E0170).

Summary details on the archaeological sites discovered during the Ennis Bypass investigations within the study area are provided above and the full database entries for all investigations within the study area are presented in **Appendix 15.2**.

15.5.2 Architectural Heritage

There are no Protected Structures, or NIAH-listed structures, located within the boundary of the proposed development site. There are two country houses listed in the Record of Protected Structures located within the surrounding 1km study area and as detailed in **Table 15.6** and mapped in **Figure 15-1**, neither of these are located within 300m of the boundary of the proposed development site. One of the Protected Structures, a house named The Hermitage (RPS ref. 850), is also listed as a recorded archaeological site (CL033-081----). The review of historic cartographical sources presented below (**Section 15.5.3**) indicates that no demesne lands or any curtilage features associated within these two houses extend into the proposed development site or its close environs.

Table 15.6 Protected Structures within the study area

RPS no.	NIAH	Name	ITM E	ITM N	Distance from development
045	20403310	Cahercalla House	532375	676241	355m to south
850	n/a	The Hermitage	532630	677558	310m to east

These two country houses have been described as follows in the Record of Protected Structures published in the County Clare Development Plan:

Cahercalla House (RPS 045)

Detached five-bay two-storey house, c.1760, with single-bay pedimented central breakfront having single-bay single-storey flat-roofed projecting porch with moulded cornice, consoled entablatures over ground floor openings, moulded architraves to first floor openings and consoled eaves; renovated and extended, 1953, comprising fourteen-bay three-storey flat-roofed wing to left and six-bay two-storey wing to right having single-bay single-storey gabled projection to front; now in use as hospital. Detached three-bay single-storey outbuilding with bipartite window openings.

Categories of special interest: Architectural, Materials, Setting

Hermitage (RPS 850)

Two-storey five-bay gable-ended house, c.1680 with a central porch-protected front door. One-and-a half-storey lean-to wing attached to the west end and a small return to the rear. Yard and utility buildings to west and southwest. There is a walled garden and a miniature three-bay gate lodge on the east side of the entrance gate. Marked on 1st edition OS map and is named Hermitage. The house is also an archaeological Monument. RMP site (CL033-081) 17th century house. Repaired c.2005.

15.5.3 Cartographic Review

The cartographic sources examined for the study area comprised the first edition 6-inch Ordnance Survey (OS) map (published 1842) (**Figure 15-2**) and the 25-inch OS map (published 1897) (**Figure 15-3**). The online archive for the 17th century Down Survey mapping was consulted and records that the maps for this area were destroyed in the early 18th century⁴. The proposed development site is shown as an area of vacant farmland containing sub-rectangular fields on both the 6-inch and 25-inch edition OS maps and no potential unrecorded archaeological sites or other features of potential cultural heritage interest, such as vernacular structures or demesne lands, are depicted within its boundary.

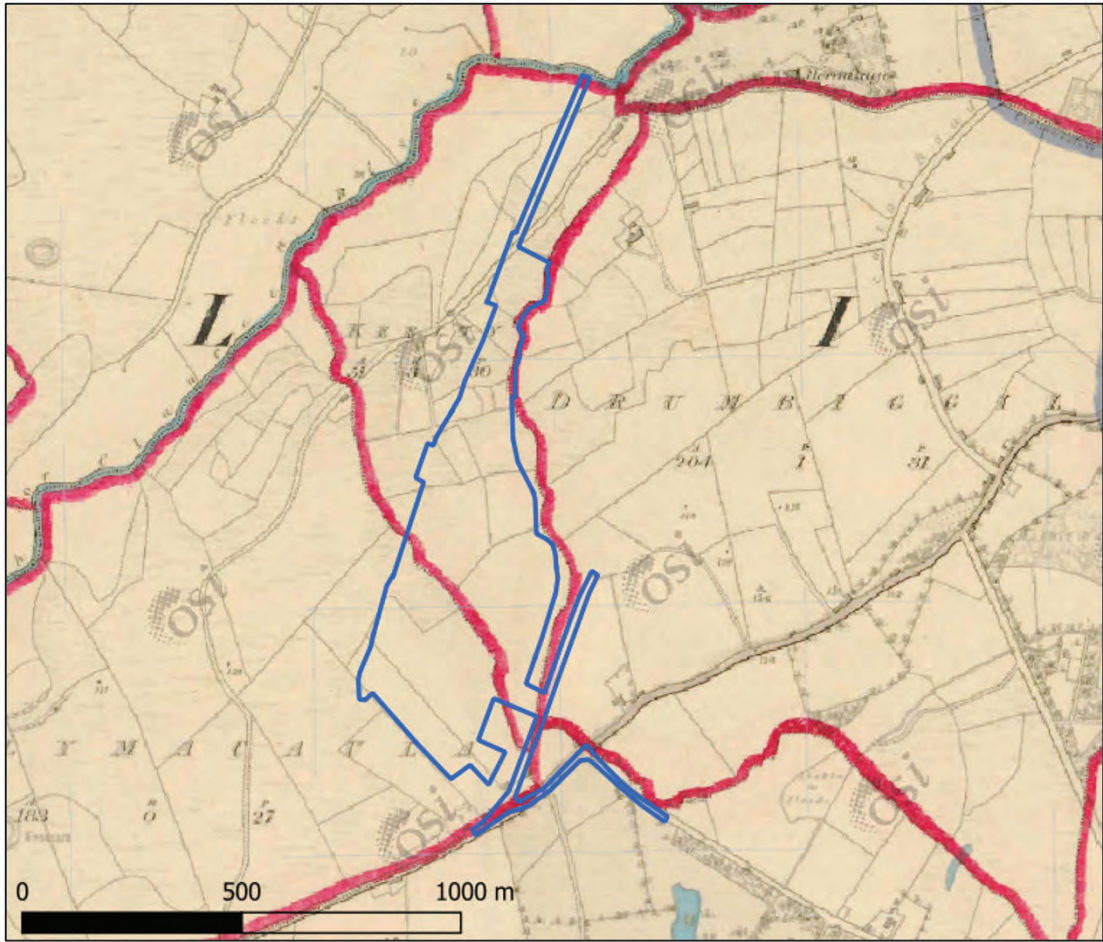


Figure 15.2 1st edition 6-inch OS map (published 1841) depicting the proposed development (blue line)

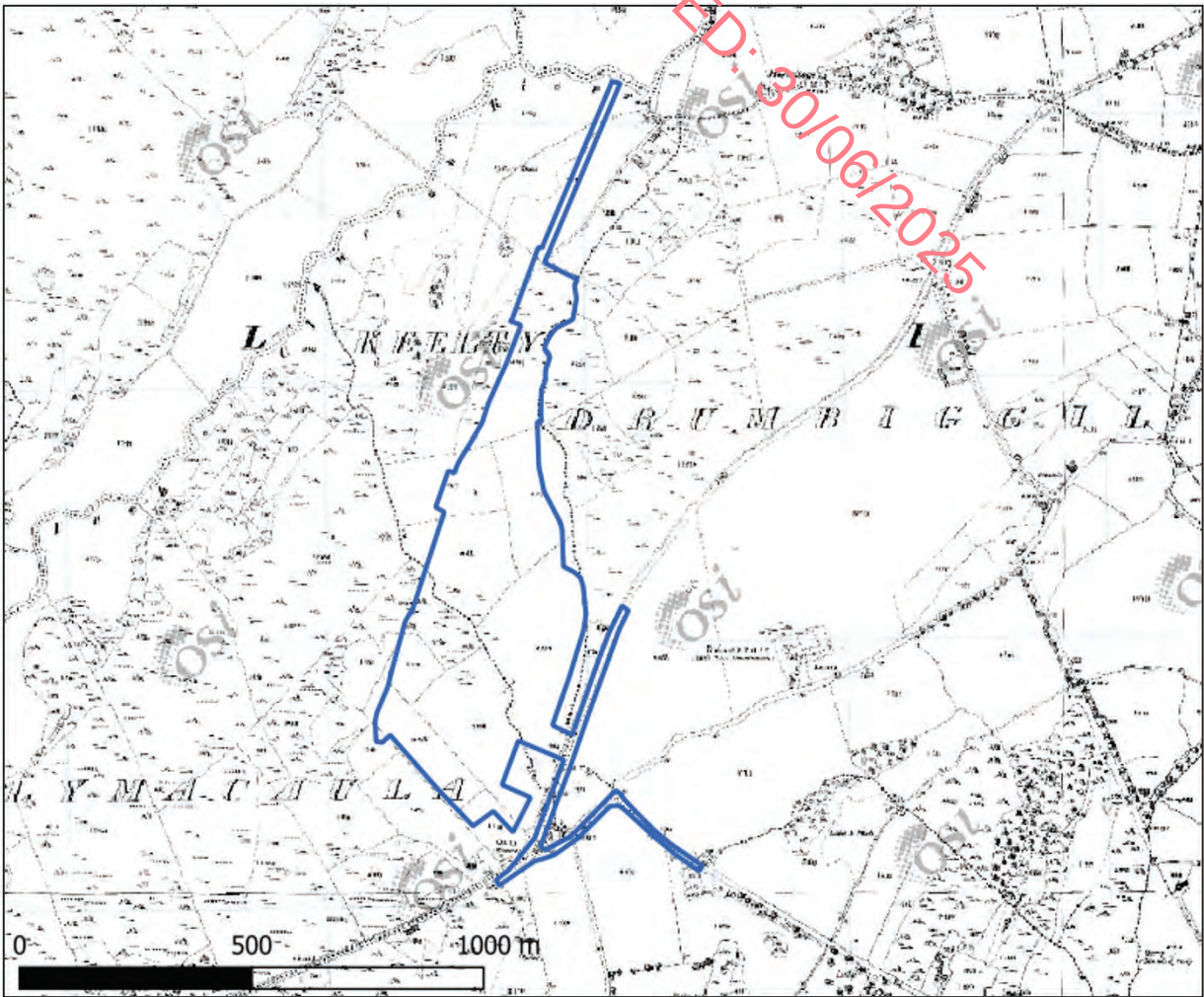


Figure 15.3 Extract from the 25-inch OS map (published 1897) of the proposed development (blue line)

15.5.4 Review of Aerial/Satellite/LiDAR Imagery

A review of publicly accessible aerial, satellite and LiDAR sources published by Tailte Éireann, Google Earth, Bing Maps and the Geological Survey of Ireland (LiDAR) was undertaken in order to assess if any traces of potential unrecorded archaeological sites were visible within the proposed development site. The reviewed aerial/satellite images all show the lands within the proposed development site occupied by vacant, enclosed pasture fields and no evident traces of any potential unrecorded archaeological sites were noted (see **Figure 15-5** below). The detail on the LiDAR imagery shows a series of closely-set, linear marks extending through a number of the southern fields which are likely the result of agricultural activity, likely cultivation or land improvement works (**Figure 15-4**).

The reviewed imagery demonstrates the layout of the fields within the proposed development site has not been significantly altered since the publication of the historic OS maps and the main changes to the surrounding lands are the presence of modern housing developments to the south and east, a golf course to the east and the Ennis Bypass to the west. No traces of any potential unrecorded archaeological sites were identified within the proposed development site during the review.

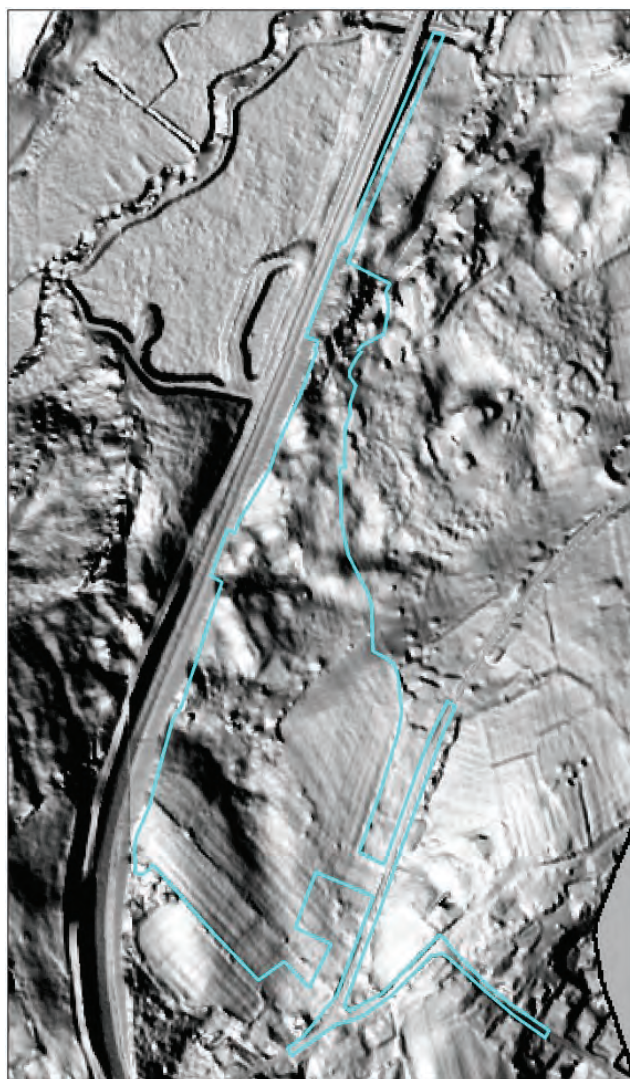


Figure 15.4 LiDAR Image of the Proposed Development Site (source: Geology Survey Ireland)

15.5.5 Undesignated Cultural Heritage Assets

While encompassing the archaeological and designated architectural heritage resource, cultural heritage also includes various undesignated assets such as settlements, demesne landscapes, vernacular structures, townland boundaries, folklore, placenames and historical events. There are no extant vernacular buildings, or structures of any date, located within the proposed development site and it does not form part of a historic demesne landscape.

Townlands are the smallest unit of land division in the Irish landscape and many preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout and nomenclature of Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19th century. The Irish translations of the townlands names often refer to natural topographical features, but name elements may also give an indication of the presence of past human activity within the townland, e.g. dun, lios or rath indicate the presence of a ringfort while temple, saggart, termon or kill record an association with a church site. The Irish origins and translations for the townlands within the study area were sought from www.logainm.ie.

The green field area within the proposed development site extends into two townlands: Ballymacaula and Keelty. The townland name of Ballymacaula derives from the Irish *Bhaile Mhic Amhlaidh*, which derives from McCauley's (*Mhic Amhlaidh*) homestead/townland (*baile*). The townland name of Keelty derives from the Irish for wood: *Coillte*. A series of northwest to southeast orientated field boundaries extending through the proposed development site form part of the boundary between these two townlands. A review of the online records of the National Folklore Collection UCD Digitization Project⁵ revealed that it contains no recorded stories or traditions associated with these two townlands.

15.5.6 Field Survey

An initial field survey of the proposed development site was carried out in June 2021 as part of a previous assessment of the proposed development site, and it was re-inspected in February 2025 as part of the current assessment. The lands within the site were not in agricultural use in the period between these inspections and had become considerably overgrown in the intervening years. The descriptions and photographs from the 2021 inspection provide a record of the lands within the site prior to the development of overgrowth and are included in (**Appendix 15.1: Plates 1-18**) while extracts from the 2025 inspection also included (**Appendix 15.1: Plates 15.19 to 15.21**).

The lands within the proposed development site comprise vacant rough pasture fields within an area of undulating terrain containing limestone bedrock outcrops. The field boundaries comprise overgrown low, random rubble, drystone walls with a modern fence extending along the side of the N85 road which has truncated the west end of a number of adjacent fields. There are no structures of any date located within the site and no surface traces of any potential unrecorded archaeological sites were noted during the inspection. The townland boundary between Keelty and Ballymaculla extends in a northwest to southeast orientation through the southern half of the site and comprises an overgrown field boundary of drystone construction. The back gardens of a row of detached modern houses extends along the southern end of the eastern boundary and the golf course adjoins the northern end of this side of the proposed development. A cut section of the N85 road extends along the west side of the proposed development while a modern housing estate is located to the south.

⁵ <https://www.duchas.ie/en>



Figure 15.5 Field numbers within the proposed development site are cross-referenced with Photographic Record (see Appendix 15.1)

15.5.7 Summary

There are no recorded archaeological sites within the proposed development site and no surviving examples are located within 300m of its boundary (Table 15.5). There are no National Monuments in State Care located within the surrounding 1km study area and the proposed development is located 1.2km outside the Zone of Notification around the historic core of Ennis town. There are 15 recorded archaeological sites located in private lands within the surrounding study area, and none comprise types with potential visually sensitive alignment attributes, such as megaliths or stone circles. Of these sites, eight were identified and excavated during archaeological investigations carried out as part of the construction of the N86 Ennis Bypass and no longer remain in situ. Only one of these excavated sites, lime kiln (CL033-170---), was located within the section of the road scheme adjacent to the proposed development. The other archaeological sites within the study area are types common within the Irish landscape and are in varying states of preservation. They are of likely high value although this cannot be ascertained for levelled examples without recourse to archaeological excavation. While no evidence for potential unrecorded archaeological sites within the proposed development boundary was identified during the desktop study and field surveys undertaken as part of this assessment, the potential for the presence of unrecorded, sub-surface archaeological sites within green field lands cannot be discounted.

There are no Protected Structures, curtilage features or NIAH-listed buildings located within the proposed development site. There are two Protected Structures, which are of likely medium-high value, within the surrounding 1km study area and neither of these are located within 300m of the proposed development site. In addition, the proposed development site is not located within, or in the close environs of, an Architectural Conservation Area.

The only feature of cultural heritage interest identified within the proposed development site is a section of the townland boundary between Keelty and Ballymacaula which comprises a series of field boundaries. This boundary comprises a feature of local (low) cultural heritage value.

15.6 Potential Significant Effects

15.6.1 ‘Do Nothing’ Scenario

A ‘Do Nothing Scenario’ will see the continued use of the lands within the proposed development site as an area of green field lands and this will have no predicted effect on the known cultural heritage resource within the study area.

15.6.2 Demolition Phase

The proposed development will not require any demolition works that will result in any effects on the known cultural heritage resource.

15.6.3 Construction Phase

There are no recorded archaeological sites within the proposed development site. The construction phase of the proposed development will, therefore, have no predicted direct or indirect effects on the known archaeological resource. While there was no evidence for any unrecorded archaeological sites within the proposed development site identified during the desktop study and field inspection, the potential for the survival of unrecorded, sub-surface archaeological features and artefacts within its boundary cannot be discounted. As the existence, nature and extent of any unrecorded archaeological features or artefacts within the proposed development site are unknown; the significance of any potential construction phase impacts cannot be quantified but construction phase ground excavation works will have the potential to result in permanent, direct, negative effects on any such remains and this will require mitigation (see Section 15.7).

There are no designated architectural heritage structures located within the proposed development lands or within 350m of its boundary and it contains no undesignated structures of architectural heritage interest. In addition, the proposed development site is not located within, or in the close environs of, an Architectural Conservation Area. The construction phase of the proposed development will, therefore, result in no predicted direct or indirect effects on the architectural heritage resource.

There are no undesignated vernacular structures, demesne lands, or historic settlements located within the proposed development site and no intangible attributes, such as historical or folklore associations, were noted during the assessment. A section of the townland boundary between Keelty and Ballymacaula extends through the interior of the proposed development site and continues outside its boundary. The construction phase of the proposed development will result in a direct, permanent, slight, negative impact on this element of the undesignated cultural heritage resource, and this will require mitigation (see Section 15.7).

15.6.4 Operational Phase

As noted above, there are no recorded archaeological sites or architectural heritage structures located within the proposed development site. There are also no extant/unexcavated archaeological sites located within 300m of the proposed development and there are no Protected Structures within 300m of its boundary. The review of the locations, settings and functions of the

cultural heritage constraints within the surrounding study area did not reveal any examples that rely on formal sightlines or intervisibility with the locations of other constraints within the wider landscape that formed aspects of their original functions. The proposed development will, therefore, result in no predicted adverse direct or indirect effects on the setting of other cultural heritage constraints within the surrounding study area during the operation phase.

Following the successful implementation of archaeological mitigation measures presented in **Section 15.7**, it is predicted that no effects will arise in relation to the potential archaeological resource within the proposed development site during the operational phase.

15.6.5 Cumulative Effects

A review of the Clare County Council planning enquiry system was carried out in relation to the cultural heritage context of the following developments within the wider environs of the proposed development site.

Application 24/60086: Finn Properties Limited

This approved housing development is located c.3km to the northeast of the proposed development and will entail the construction of 48 no. residential units and associated works. There are no recorded archaeological sites or architectural heritage structures at the location and the DHLGH submission (dated 02/04/25⁶) in relation the development recommended that archaeological monitoring of the construction phase should be included as a planning condition.

Application 24/122: Callanan & Walsh Construction Ltd

This approved application comprises the extension of duration planning permission for a permitted residential development (planning ref. 17/977) entailing 51 no. residential units and associated works which is located within green field lands c.780m to the northwest of the proposed development. There are no recorded archaeological sites or architectural heritage structures within, or adjacent to, the boundary of this development. The grant of planning condition (17/977) for the development does not include any archaeological conditions.

Application 24/60652: Datcha Construction Limited

This proposed development will entail the construction of 74 no. residential units and associated works within green field lands located c.2km to the east of the proposed development. There are no recorded archaeological sites or architectural heritage structures at the location and the DHLGH submission (dated 29/01/25⁷) in relation the development recommended that archaeological monitoring of the construction phase should be included as a planning condition.

Application 25/60265: Pat Mulcair

This proposed development will entail the construction of 54 no. residential units, ancillary surface car parking, vehicular & pedestrian access within green field lands located c.3.3km to the northeast of the proposed development. There are no recorded archaeological sites or architectural heritage structures at the location. This application was lodged on 14/05/2025 and a decision has yet to me made by the planning authority.

As detailed in Sections 15.6.3 and 15.6.4, the proposed development will not result in any predicted direct or indirect adverse effects on recorded archaeological sites or designated architectural heritage structures during the construction and operation phases. Given the absence of any such predicted effects, combined with its distance from the above developments, it is concluded that the proposed development will not result in any significant adverse cumulative effects on the cultural heritage resource in combination with the reviewed developments.

15.6.6 Conclusion

The proposed development will not result in any predicted significant adverse construction, operation or cumulative effects on the known cultural heritage resource.

15.7 Mitigation Measures

15.7.1 Incorporated Design Mitigation

There are no recorded archaeological sites or architectural heritage structures located within the proposed development site that would need to be mitigated by avoidance as part of the design.

15.7.2 Construction Phase Mitigation

A geophysical survey of the proposed development site, under licence by the NMS, will be carried out following the clearance of vegetation overgrowth and in advance of the construction phase. When the results of the geophysical survey are available, they will be subject to archaeological review and a programme of targeted test trenching will be then be carried out under licence by the NMS. This will include targeted test trenching of any anomalies of archaeological potential identified by the geophysical survey. This will also include test trenching of the section of the townland boundary between Keelty and Ballymacaula located within the proposed development site and a written and photographic survey of this land division feature will also be carried out. In the event that any sub-surface archaeological features are identified during these site investigations, their locations will be recorded and securely cordoned off while the NMS are notified of the discovery and consulted to determine further mitigation measures, which subject to findings, may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation.

There are no structures of architectural heritage interest located within the proposed development site or its close environs and no mitigation measures for this element of the cultural heritage resource are required.

15.7.3 Operational Phase Mitigation

Following the successful implementation of the archaeological mitigation measures during the pre-construction phase, as detailed in **Section 15.7.2**, no operational phase mitigation measures will be required for the cultural heritage resource.

6 <https://clarecoco.eplanning.ie/iDocsWebDPSS/ViewFiles.aspx?docid=724078&format=djvu>
7 <https://clarecoco.eplanning.ie/iDocsWebDPSS/ViewFiles.aspx?docid=784873&format=djvu>

15.8 Residual Impact Assessment

15.8.1 Demolition Phase

The proposed development will not require any demolition works that will result in any residual effects on the known cultural heritage resource.

15.8.2 Construction Phase

The proposed development site and its close environs do not contain any extant recorded archaeological sites or designated architectural heritage structures and no residual impacts on these elements of the cultural heritage resource are predicted. The mitigation measures presented in **Section 15.7.2** will provide for either the preservation *in situ* of any currently unknown archaeological features within the proposed development site or the proper and adequate recording of this resource by full archaeological excavation. Preservation *in situ* shall allow for a negligible magnitude of impact resulting in a potential not significant/imperceptible significance of effect in the context of residual impact on the unrecorded archaeological resource. Preservation by record shall allow for a high magnitude of impact, albeit ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate range of significance of effect in the context of residual impacts on the unrecorded archaeological resource.

15.8.3 Operational Phase

Following the successful implementation of archaeological mitigation measures during the pre-construction phase, as detailed in **Section 15.7.2**, no residual effects on the cultural heritage resource are predicted to arise during the operational phase of the proposed development.

15.9 Risk of Major Accidents or Disasters

No predicted risks of major accidents or disasters are predicted to arise from any potential effects on the cultural heritage resource.

15.10 Worst Case Scenario

If the proposed development were to proceed without the implementation of the mitigation measures detailed in **Section 15.7.2**, then construction phase ground works will have the potential to result in direct adverse effects on any unrecorded, sub-surface archaeological remains that may exist within the boundary of the proposed development site.

15.11 Interactions

No adverse effects on the cultural heritage resource are predicted to occur during the construction or operation phases as a result of interactions with other environmental aspects assessed in this EIAR.

15.12 Monitoring

There are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service for licences to carry out archaeological site investigations, and these will allow for monitoring of the successful implementation of the mitigation measures detailed in **Section 15.7.2**. A revised method statement for any required excavation works will be submitted to the NMS and National Museum of Ireland as part of an application for a licence to complete these works. Reports on the archaeological site investigations will then be submitted to the NMS, the National Museum of Ireland and the Planning Authority which will clearly describe the results of all archaeological works in written, mapped and photographic formats.

15.13 Conclusion

There are no recorded archaeological sites within the proposed development site and no examples with surviving surface traces are located within 300m of its boundary. There are also no Protected Structures, curtilage features or NIAH-listed buildings located within the proposed development site. There are two Protected Structures within the surrounding 1km study area and neither of these are located within 300m of the proposed development site. In addition, the proposed development site is not located within, or in the close environs of, an Architectural Conservation Area.

No potential unrecorded archaeological sites or structures of architectural heritage interest were identified within the proposed development site during the desktop research and field surveys carried out as part of this assessment.

The proposed development will not result in any predicted significant direct or indirect adverse effects on the cultural heritage resource during the construction and operation phases. In addition, no significant, adverse cumulative effects on the cultural heritage resource are predicted.

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CHAPTER SIXTEEN

RISK OF MAJOR ACCIDENTS AND DISASTERS

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CHAPTER SIXTEEN

Table of Contents

Risk of Major Accidents and Disasters

16.1 Introduction..... 16-1

16.2 Expertise & Qualifications 16-1

16.3 Methodology 16-1

16.4 Difficulties Encountered 16-3

16.5 Baseline Environment..... 16-3

16.6 Characteristics of the Proposed Development 16-5

16.7 Environmental Receptors 16-5

16.8 Predicted Impacts 16-6

16.9 Mitigation Measures 16-9

16.10 References..... 16-9

Table of Tables

Table 16.1 Risk Classification – Likelihood 16-1

Table 16.2 Risk Classification - Consequence 16-2

Table 16.3 Example Risk Matrix 16-2

Table 16.4 Assessment of Major Accidents and Disasters for
Construction Phase 16-7

Table 16.5 Assessment of Major Accidents and Disasters for
Operational Phase 16-8

Table of Figures

Figure 16.1 Ireland Seismic Activity Map 16-4

Figure 16.2 Landslide Susceptibility Map (GSI Ireland) 16-4

RECEIVED: 30/06/2025

CHAPTER 16 | Risk of Major Accidents and Disasters

16.1 Introduction

This chapter of the EIAR assesses the vulnerability of the proposed development to be affected by major accidents and disasters (MA&D). It includes an assessment of the potential of the proposed development to cause an increased risk of MA&D, and the likely significant adverse effects arising from potential MA&D.

This assessment is a review of major accident hazards and disasters based on the engineering design, drawings and documentation.

16.2 Expertise & Qualifications

This chapter of the Environmental Impact Assessment Report has been prepared by Matthew Michie a Senior Environmental Consultant at AWN Consulting Limited. Matthew holds an MChem and a MSc (Physical Chemistry). Matthew has 5 years’ experience in environmental consulting and process safety, and has been involved in numerous EIARs for a range of projects including commercial, residential, industrial, pharmaceutical and data centre developments.

16.2.1 Scope of Assessment

In brief, Major Accidents are events that threaten serious environmental effects to human health, welfare and / or the environment and require the use of resources beyond those of the operator to manage, and disasters are external hazards, either natural or anthropogenic, with the potential to cause a Major Accident.

This assessment will provide an overview of the regulatory requirements to identify and assess MA&Ds. It will take into consideration the materials, operations and location of the Proposed Development. MA&Ds Risk Events relevant to the Proposed Development will be identified and evaluated.

16.3 Methodology

The analysis of the predicted impacts of the proposed development on human health and the environment during construction and operation are presented in this Chapter. The risk assessment identifies and quantifies risks focusing on potentially significant adverse effects of the development on the environment, deriving from its vulnerability to risks of relevant major accidents and/or disasters. The approach to identifying and quantifying risks associated with the proposed development by means of a sites specific risk assessment is derived from the EPA *Guidelines on the Preparation of an EIAR* (EPA, 2022) and all other documents outlined above.

Assessment methods quantify and predict the magnitude and significance of impacts.

The methods employed for assessment and evaluation of the environmental topics for this Chapter have been:

- 1. Schedule 6 of the Planning and Development Regulations, 2001, as amended:

“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”.

- 2. Geospatial Analysis (cumulative impacts only – used to identify planning permissions/applications and Seveso Establishments within a 5 km radius).
- 3. Flood Risk Assessment following The Planning System and Flood Risk Management Guidelines for Planning Authorities published by the OPW in 2009 (OPW Guidelines).

The risk assessment identifies and quantifies risks focusing on potentially significant adverse effects of the development on the environment, deriving from its vulnerability to risks of relevant major accidents and/or disasters. The approach to identifying and quantifying risks associated with the proposed development by means of a sites specific risk assessment is derived from the EPA Guidelines on information to be contained in EIAR (EPA, 2022).

The criterion for categorising impact is derived from the EPAs Guidance on Assessing and Costing Environmental Liabilities (2014). In this guidance, the risk assessment methodology commences with the establishment of risk classification criteria followed by risk analysis based on these criteria. Risk classification tables are required in order to evaluate and rank the risks compared with each other. They form the basis for rating the likelihood of an event occurring and the consequence of impact if the event occurs. The approach used in this assessment is summarised as follows and has been derived from relevant guidance as described above:

- Identification of hazardous substances which could be present over the lifecycle of the Proposed Development, including flammable substances, materials harmful to the environment and materials harmful to human health.
- Consideration of the quantities and storage arrangements associated with these substances and the prospective operations at the Proposed Development involving these materials.
- Identification of potential MA&D Risk Events associated with these materials and operations. Assessment of the vulnerability of the Proposed Development to disasters as a result of, for example, location, infrastructure, climatic conditions and geological events.
- Where credible MA&Ds Risk Events and Disasters are identified, the reasonable worst-case consequence of a of each Risk Event is assessed in qualitative terms, based on factors including receptors which could be affected, and mitigation measures already in place (see Table 16-1)

The likelihood and consequence ratings are combined to form a risk score for risk evaluation (see Table 16-2)

Table 16.1 Risk Classification – Likelihood

Rating	Category	Description
1	Very low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very high	Very high chance of hazard occurring

Table 16.2 Risk Classification - Consequence

Rating	Category	Description
1	Trivial	Small number of people affected, no fatalities No contamination to environment
2	Minor	Single fatality: limited number of people affected; a few serious injuries Localised contamination effects of short duration
3	Moderate	Significant number of people in affected area impacted with multiple fatalities Contamination effects widespread or of extended duration
4	Major	5 to 50 fatalities, up to 100 serious injuries Heavy contamination, localised effects, or extended duration
5	Massive	Large numbers of people impacted with a significant number of fatalities (>50), injuries in the hundreds Very heavy contamination, widespread effects of extended duration

The risks are then ranked according to their own risk score (1-5) in a colour coded matrix able which allows risks to be easily displayed and prioritised. The colour codes are as follows and indicated in Table 16-3 below:

- Red – high level risks requiring priority action (overall risk scores of 15-25);
- Yellow – medium-level risks requiring action, but not as critical as red-coded risks (overall risk scores of 8-12); and
- Green (light and dark) – low-level risks requiring continuing awareness and monitoring on a regular basis (overall risk scores of 1-6).

Table 16.3 Example Risk Matrix

		Consequence				
		Trivial	Minor	Moderate	Major	Massive
Likelihood	Very High	Low	Medium	High	High	High
	High	Low	Medium	Medium	High	High
	Medium	Low	Low	Medium	Medium	High
	Low	Low	Low	Low	Medium	Medium

16.3.1 Legislative Context and/or Source of Guidance

Alongside the legislation, policy, and guidance outlined in Chapter 1, the following relevant legislation, policy, and guidance has informed the preparation of this chapter:

- EPA 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022),
- EPA 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2018),
- Health and Safety Authority Guidance on Technical Land-Use Planning Advice, for planning authorities and COMAH establishment operators (2023)
- Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015
- HSA Guide to the COMAH Regulations 2015 (S.I. No. 209 of 2015)
- Building Regulations (Part A Amendment) Regulations 2012 (as amended) (SI No. 138 of 2012)
- Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) (hereafter referred to as the Safety, Health and Welfare (Construction) Regulations) (S.I. No. 291 of 2013)
- A Framework for Major Emergency Management. Guidance Document 10 (DECLG 2015)

The EPA Guidelines, 2022, state that:

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

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 facilities. 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."

16.3.2 Major Accidents

For the purpose of this assessment, the definition of a 'Major Accident' is taken from the guidelines on Major Accidents and Disasters within EIA published by Institute of Environmental Management and Assessment (IEMA, 2020).

"A major accident is an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and / or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e., contractors) to manage". Major accidents can be caused by disasters resulting from both man-made and natural hazards. A disaster is a man-made / external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident. In general, major accidents and / or disasters should be considered as part of an assessment where the development has the potential to cause the loss of life, permanent injury and/or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration".

For the purposes of this assessment, the definition of ‘Vulnerability’ is as follows (IEMA, 2020):

“Vulnerability – describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to ‘exposure and resilience’ of the proposed development to the risk of a major accident and / or disaster. Vulnerability is influenced by sensitivity, adaptive capacity, and magnitude of impact; and Significant environmental effect (in relation to a major accident and / or disaster assessment) – includes the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.”

16.3.3 Background to Control of Major Accident Hazards Involving Dangerous Substances (COMAH) Regulations

The Seveso III Directive (2012/18/EU) requires Member States to apply land-use or other relevant policies to ensure that appropriate distances are maintained between residential areas, areas of substantial public use and the environment, including areas of particular natural interest and sensitivity and hazardous establishments. For existing establishments, Member States are required to implement, if necessary, additional technical measures so that the risk to persons or the environment is maintained at an acceptable level.

The purpose of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations (S.I. 209 of 2015) (COMAH Regulations) is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The HSA is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implement the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are considered with respect to land use planning. This is achieved through the provision of technical advice to planning authorities.

The COMAH Regulations do not apply to the Proposed Development as the Proposed Development will not store significant quantities of hazardous materials which are in excess of the defined COMAH thresholds set out in Schedule 1 of the COMAH Regulations.

16.3.4 Natural Disasters

For the purpose of this assessment, the definition of a ‘Disaster’ is as follows (IEMA, 2020):

“a natural hazard (e.g. earthquake) or a man-made external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.”

16.4 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

16.5 Baseline Environment

16.5.1 Seveso Establishments

Seveso establishments have a “consultation distance” which is defined as “a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment” (COMAH Regulations).

There are no Seveso establishments within 10km of the Proposed Development; therefore, there are no constraints to the Proposed Development at this location from nearby Seveso establishments.

16.5.2 Flood Risk

TOBIN Consulting Engineers completed a Flood Risk Assessment (FRA) and drainage impact assessment for the Proposed Development. The FRA concluded the following:

- The proposed development is located in Flood Zone C (<0.1% annual exceedance probability (AEP)) for Fluvial Flooding,
- The proposed development is not at risk of tidal flooding during a 0.1% AEP mid-range future scenario
- The proposed development is not at risk of coastal flooding during a 0.1% AEP mid-range future scenario
- The proposed development could be liable to pluvial flooding; however, the risk of pluvial flooding will be minimised by landscaping, topography and the surface water drainage system.

Based on the results of the Drainage impact Assessment the developable area is located outside the predicted flood extents of the Claureen River and the proposed drainage is considered ‘appropriate’ in line with the PSFRM and SuDS Guidelines. It is concluded that the risk of flooding to the proposed development will be minimal; therefore, the likelihood of a flood impacting the Proposed Development is unlikely and not significant.

16.5.3 Seismic Activity

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies, has been recording seismic events in Ireland since 1978 (www.dias.ie). This network consists of several seismometers that are located throughout Ireland. **Figure 16-1** illustrates historical and recorded seismic events since 1980.

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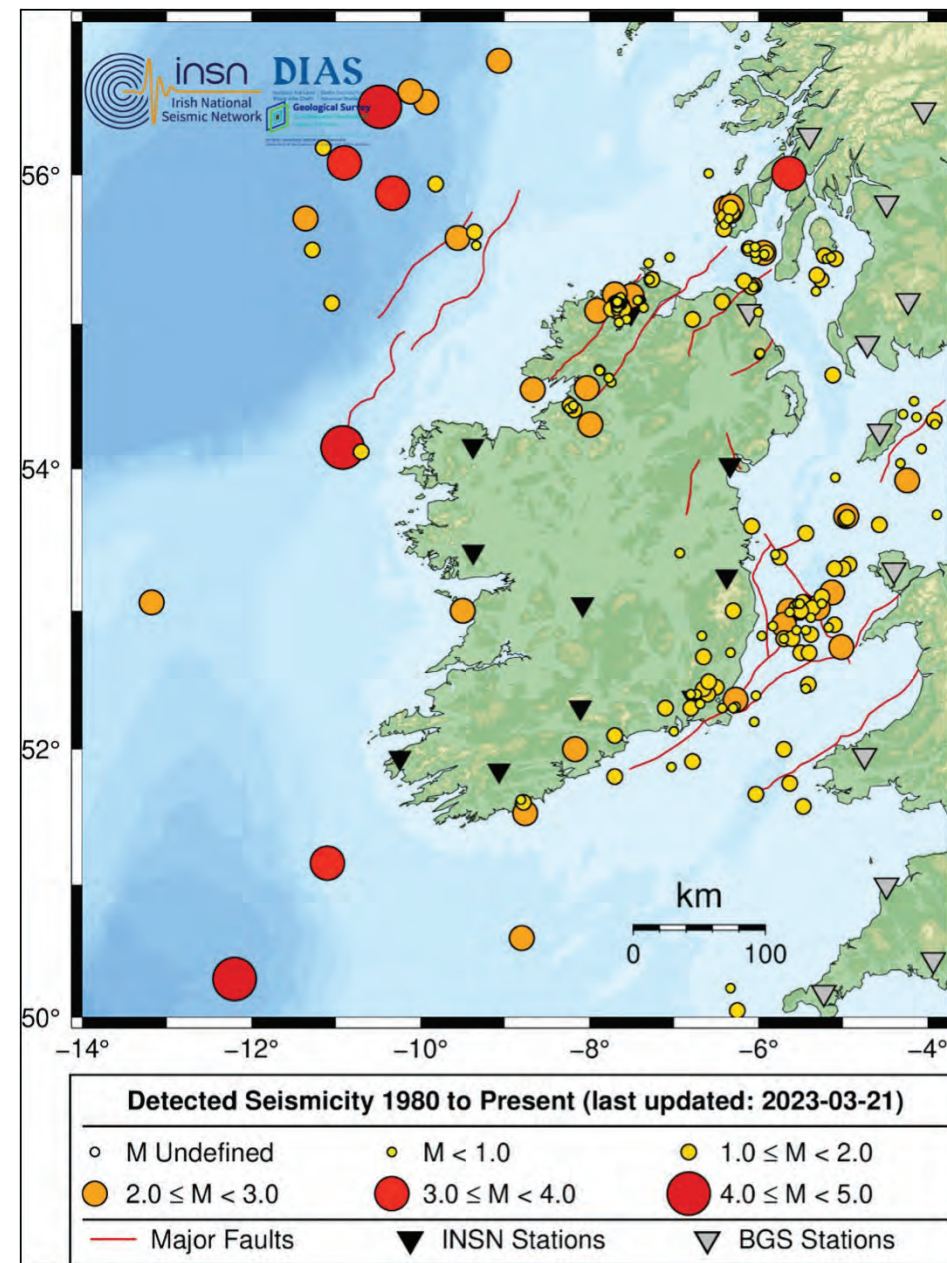


Figure 16.1 Ireland Seismic Activity Map

Seismic activity and earthquake risk in Ireland are generally considered to be low. This is because Ireland is located on the western edge of the Eurasian Plate, which is a tectonic plate that is not known for its seismic activity. However, earthquakes can still occur in Ireland, although they are typically small and have little impact.

It can be seen in **Figure 16-1** that there is no significant seismic activity recorded in the vicinity of the Proposed Development. Therefore, the likelihood of seismic activity impacting the Proposed Development is unlikely and not significant.

16.5.4 Landslides

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a natural hazard that can occur. These can cause damage to property, infrastructure, and the natural environment, and can also pose a risk to human life.

In general, risk of landslides in Ireland is generally considered to be low, as the country is not located in a region with high seismic activity or large mountain ranges. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

The landslide susceptibility map identifies areas which are subject to landslides and is measured from low to high. The landslide susceptibility map considers the location of landslides and what causes them (slope, soil type and the impact of the flow of water). Figure 16-2 illustrates the landslide susceptibility map in the vicinity of the Proposed Development.

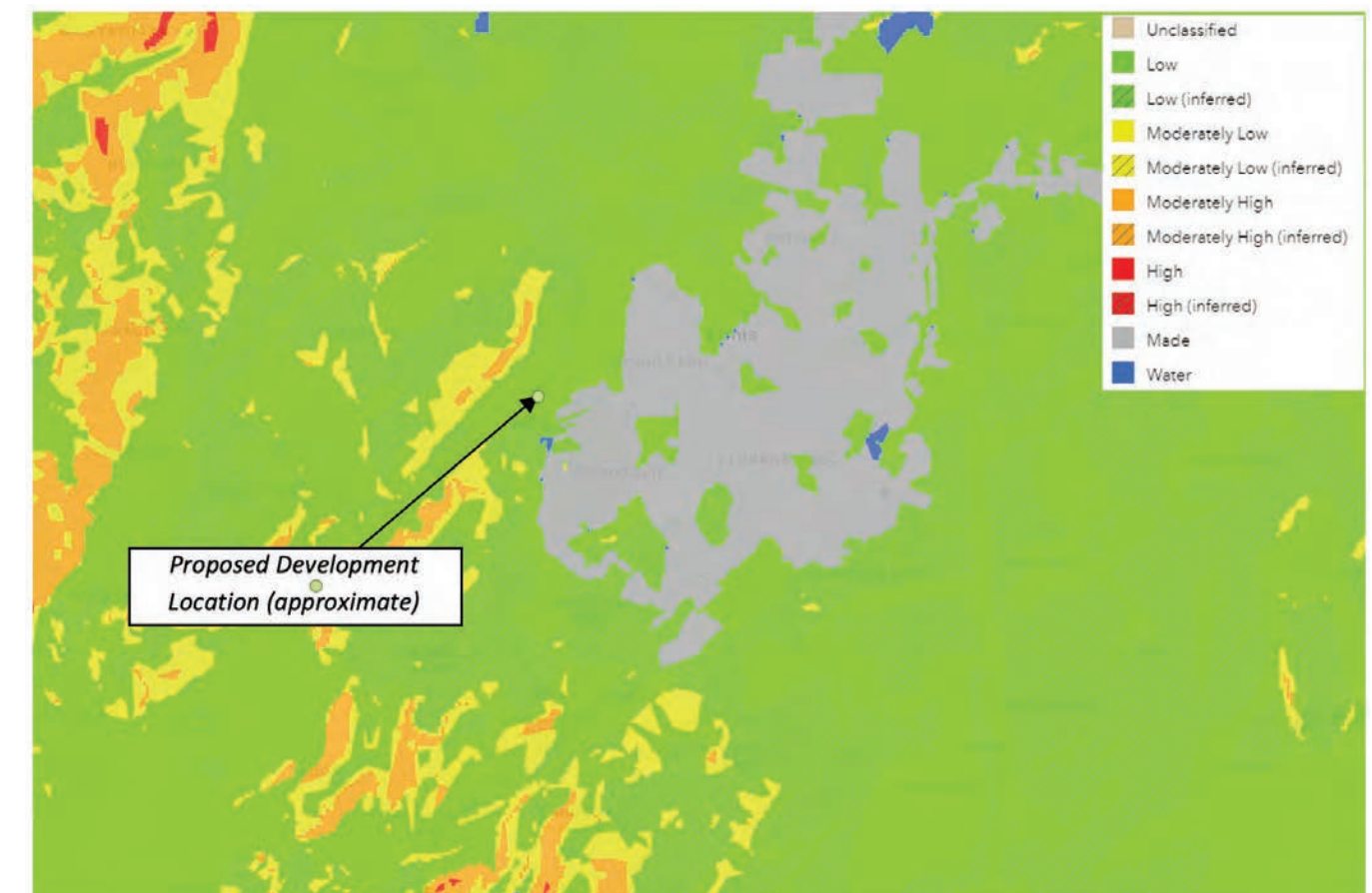


Figure 16.2 Landslide Susceptibility Map (GSI Ireland)

It can be seen in Figure 16-2, that the Proposed Development and the surrounding area have a low susceptibility of landslides. Therefore, the likelihood of a landslide impacting the Proposed Development is unlikely and not significant.

16.6 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package.

The subject site is located at Ballymacaula, Drumbiggie, Keelty, Circular Road, Ennis, Co. Clare. The proposed development will consist of 300 no. residential units, an 80 child crèche and all associated ancillary development works. A full description of the proposed development is outlined in Chapter 2 ‘Project Description’ of this EIAR.

The Proposed Development is a non-COMAH site and the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 (COMAH Regulations 2015) does not apply.

16.6.1 Hazardous Materials

16.6.1.1 Construction Phase

Flammable Gas Cylinders

Construction and maintenance activities may require welding which can be carried out using compressed gases such as acetylene. There is the potential for a release of flammable gas, including an explosive depressurisation event, for example due to accidental damage to a gas cylinder, pressure regulator, or associated pipework. The released gas could be ignited, resulting in a fire or explosion. The potential impacts of which could include harm to persons due to thermal radiation and damage to property.

Concrete

There is the potential for an accidental release of concrete into the soil, or surface water during the construction Proposed Development. Concrete is not classified hazardous in accordance with the Chemical, Label and Packaging (CLP) Regulations (EC No. 1272/2008); however, concrete paste is alkaline (pH 10-14); therefore the potential impacts if concrete enters the environment via a release to water, include:

- Raising the pH causing harm to aquatic ecosystems
- Cause sedimentation on aquatic beds, which could harm flora and fauna.

Containment systems to intercept any material released will be developed within a Construction Phase Environmental Management Plan (CEMP). Therefore, it is not considered credible that a release of concrete could lead to a consequence that meets the criteria of a Major Accident and will not be considered further in this assessment.

Fuel Storage

Small quantities of diesel will be present on-site for use in construction vehicles. Diesel has flammable and environmental hazards.

Diesel is classified as an ignition category 3 substance, following the criteria in the Guidance on Technical Land Use Planning (HSA, 2023); therefore, it has an ignition probability of 0. Therefore, flammable hazards associated with diesel are not credible and will not be considered further in this assessment.

Due to the small quantities of diesel involved, it is not considered credible that a spill of diesel would meet the criteria for a Major Accident and it will not be considered further in this assessment.

Natural Gas

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

16.6.1.2 Operational Phase

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

The Proposed Development is a residential scheme; therefore, there will be no hazardous material stored at the Proposed Development during the operational phase.

16.7 Environmental Receptors

16.7.1 Receiving Surface Waters

There are two streams are located in the surrounding area of the Proposed Development:

- Fergus River, which is located 2km northeast and east of the Project location.
- Claureen River, which is a tributary of the Fergus River 0.4km west of the Project location.

According to the EPA (2021) on-line mapping, the proposed development site lies within the Shannon Estuary North Catchment (Hydrometric Area No. 27) and the River Fergus sub-catchment – Fergus_060.

16.7.2 Designated Protected Areas

The nearest relevant Protected Areas downstream of the site are:

- Drinking Water Protected Area – Drumcliffe Source and Source Protection zone.
- Natura Site: Lower River Shannon SAC, which the Fergus River flows into at a location just downstream of Claureen Bridge in Ennis, 2 km (straight line) to the north of proposed development. Although the Claureen River is not a designated Salmonid Water, the tidal section of the river Fergus downgradient is a Salmonid River.

There are no protected Bathing Waters, Shellfish Waters, Freshwater Pearl Mussel Waters, Nutrient Sensitive Areas or Drinking Water Protected Areas downgradient of the site.

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16.8 Predicted Impacts

The potential impacts of the construction and operational phases of the Proposed Development are outlined below.

16.8.1 Do Nothing Scenario

The EIA Directive requires the following to be described relating to the future receiving environment (the 'Do Nothing' scenario):

"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge".

Under a 'do-nothing' scenario there is no known or anticipated change to the Major Accidents and Disasters risk at the Proposed Development site.

16.8.2 Construction Phase

General construction activities will include ground preparation, excavation, construction of structures. These activities will require the use of vehicles and tools. The hazards associated with activities include the potential for vehicle impact, particularly during reversing and vehicle overturning. The controls around this work will be managed by appropriate risk assessments to control the risks to people, the environment and also to the existing operational areas.

A site-specific Construction Environmental Management Plan (CEMP) and a Health and Safety Plan will be produced by the Construction Contractor, covering the construction and commissioning of the Proposed Development. The CEMP will be prepared to ensure compliance with relevant health and safety legislation including the Safety, Health and Welfare at Work Act.

The following scenarios have been identified that could impact the construction phase of the project:

- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Compressed Gas Cylinder release
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

The impact and likelihood of these scenarios is assessed in Table 16-4. There are no likely impacts to the Proposed Development or to off-site receptors during the construction phase in relation to major accidents and disasters.

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Table 16.4 Assessment of Major Accidents and Disasters for Construction Phase

Risk ID	Natural Disaster	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
C1	Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater or surface waters	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	The Proposed Development will be constructed, and operated in accordance with all relevant planning, building and environmental licencing codes (Building Regulations, 2012). The engineering design of the facilities will take operation at future climatic conditions into account.	1	All construction activities will be suspended during extreme weather events.	2
C2	Storm events (including lightning) resulting in structural damage and/or pollution to groundwater and surface waters	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	The engineering design of the Proposed Development will incorporate lightning mitigation. This will be assessed in accordance with recognised industry standards such as EN/IEC 62305.	1	All construction activities will be suspended during extreme weather events.	2
C3	Flooding	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	A Flood Risk Assessment was prepared in accordance with 'The Planning System and Flood Risk Management -Guidelines for Planning Authorities' issued by the Department of Environment, Heritage and Local Government in November 2009. It was concluded that the Proposed Development is within Flood Zone C.	1	The flood risk assessment concluded that there is no flood risk to the site.	2
C4	Flash fire, Explosion or Jet fire following compressed gas cylinder release (e.g. acetylene for welding)	Human Health	3	There is potential for harm to persons on-site in the vicinity of the hazardous gas release. Detailed method statements, plans and assessments will be produced to carry out compressed gas activities safely. A Site Emergency Response Plan will be developed prior to the commencement of operations and will include detailed procedures in the event of a major accident.	1	European Industrial Gases Association standard procedures will be used for the storage and use of gas cylinders. When not in use, cylinders will be stored in external, well-ventilated areas and when in use, appropriately certified equipment will reduce the potential for ignition if a flammable gas is accidentally released.	3

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16.8.3 Operational Phase

In the scoping phase for this EIAR the potential for impacts to human health and impacts to the environment were assessed.

The following scenarios have been identified that could impact the operational phase of the project:

- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Compressed Gas Cylinder release
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

The impact and likelihood of these scenarios is assessed in Table 16-5. There are no likely impacts on the project or to off-site receptors during the construction phase in relation to major accidents and disasters.

Table 16.5 Assessment of Major Accidents and Disasters for Operational Phase

Risk ID	Major Accident Scenario	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
O1	Flooding	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	A Flood Risk Assessment was prepared in accordance with 'The Planning System and Flood Risk Management -Guidelines for Planning Authorities' issued by the Department of Environment, Heritage and Local Government in November 2009. It was concluded that the Proposed Development is within Flood Zone C.	1	The flood risk assessment concluded that there is no flood risk to the site.	2
O2	Extreme Weather (e.g. heat, cold, wind and storms, resulting in result structural damage)	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	Increases in extreme weather could potentially result in the operational instability of equipment such as and electrical apparatus, which is sensitive to temperature and humidity. Failure of these systems due to extreme temperatures could result in operational interruptions at the Proposed Development but would be unlikely to cause an incident which has the potential to result in a major accident or disaster. Increasing atmospheric wind speeds could cause structures to become unstable. In a worst-case event, these structures could fall and/or collapse resulting in harm to people in the vicinity. The structural engineering design of the facilities will calculate wind loading and other requirements based on industry standard guidance and methods.	1	The Proposed Development will be constructed, and operated in accordance with all relevant planning, building and environmental licencing codes (Building Regulations, 2012). The engineering design of the facilities will take operation at future climatic conditions into account.	2

RECEIVED: 30/06/2025

16.8.4 Demolition

There will be no demolition as part of the proposed development.

16.8.5 Cumulative Effects

Cumulative effects relate to the potential effects of the proposed development in combination of the potential effects of other developments (referred to as 'cumulative developments') within the surrounding area.

During the construction phase, since there are no likely impacts on the project or to off-site receptors, the cumulative impacts, of major accidents and disasters, are considered imperceptible and neutral to the proposed development and to cumulative developments in the surrounding area.

During the operational phase, since there are no likely impacts to off-site receptors, the cumulative impacts, of major accidents and disasters, are considered imperceptible and neutral to the proposed development and to cumulative developments in the surrounding area.

There are no expected impacts from developments in the vicinity of the Proposed Development, from a major accidents and disasters perspective, as such, there are no significant cumulative effects with the Proposed Development from a major accidents and disasters perspective.

16.9 Mitigation Measures

The Proposed Development has been designed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design and in accordance with planning and legislative requirements. As no likely significant effects were identified, no additional mitigation measures are proposed.

16.10 References

Institute for Environmental Management and Assessment (IEMA) Major Accidents and Disasters in EIA – A Primer (IEMA, 2020)

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

S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015.

A Framework for Major Emergency Management. Guidance Document 10 (DECLG, 2015)

Building Regulations (Part A Amendment) Regulations 2012 (as amended) S.I. No. 138/2012

Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) S.I. No. 291 of 2013

Guidance on Assessing and Costing Environmental Liabilities, Environmental Protection Agency (2014)

CHAPTER SEVENTEEN

INTERACTIONS

RECEIVED 30/06/2025



RECEIVED: 30/06/2025

CHAPTER SEVENTEEN

Table of Contents

Interactions

17.1 Introduction..... 17-1

17.2 Population and Human Health 17-1

17.3 Landscape and Visual 17-1

17.4 Material Assets: Traffic and Transport 17-1

17.5 Material Assets: Built Services..... 17-1

17.6 Material Assets: Waste 17-2

17.7 Land and Soils 17-2

17.8 Water & Hydrology..... 17-2

17.9 Biodiversity 17-2

17.10 Noise and Vibration..... 17-2

17.11 Air Quality 17-3

17.12 Climate 17-3

17.13 Cultural Heritage 17-3

17.14 Major Accidents and Disasters 17-3

17.15 Conclusion 17-3

Table of Tables

Table 17.1 Interactions with Potential for Significant Impacts
Before the Implementation of Mitigation Measures 17-4

RECEIVED: 30/06/2025

CHAPTER 17 | Interactions

17.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights in Table 17.1 (located at the end of this chapter) those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

This chapter was prepared by Saoirse Kavanagh of McCutcheon Halley Chartered Planning Consultants with input from the lead author of each assessment.

17.2 Population and Human Health

During the construction phase, the following aspects have potential to interact with population and human health:

- **Air Quality:** Dust generated during the construction phase can impact on air quality and in turn on the health of the local population.
- **Landscape and Visual:** there will be visual changes associated with removal of some vegetation and emerging plant and machinery
- **Traffic:** Construction vehicles travelling to the subject site have the potential to increase traffic on the surrounding streets and increase the associated emissions.
- **Services:** 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.
- **Waste:** The improper removal, handling, and storage of hazardous waste could negatively impact on the health of construction workers.

During the operational phase, the following aspects have potential to interact with population and human health:

- **Landscape and Visual:** there will be permanent visual changes to the landscape with the transition of the site from an agricultural field to a residential development.
- **Traffic:** Once complete the proposed development will result in an imperceptible to slight increase in traffic on the surrounding streets.
- **Air Quality:** The increased traffic has the potential to negatively impact the air quality due to increased emissions, in turn negatively impacting the population and human health.
- **Waste:** The incorrect removal and storage of waste during the operational phase has the potential to negatively impact on the future residents of the development

17.3 Landscape and Visual

Chapter 5 assesses the landscape and visual impact of the proposed development. During the operational phase, the following aspects have potential to interact with landscape and visual:

- **Population and Human Health:** The related change to the landscape character i.e. planned expansion of the urban into a peri-urban landscape, would have significant positive population and human health benefits (providing homes offering a high level of residential amenities).
- **Biodiversity:** The proposed landscape masterplan includes arrange of open spaces, of varying character, which, in addition to providing recreational amenities and contributing to the areas place-identity, would deliver a range of ecosystem services.
- **Water:** The proposed SUDs measures include large swales, rain gardens and permeable paving for all parking spaces in private realm

17.4 Material Assets: Traffic and Transport

Chapter 6 assesses the likely impacts on Traffic and Transportation arising from the proposed development. During the construction phase, the following aspects have potential to interact with traffic and transport:

- **Population and Human Health:** Construction traffic has the potential to negatively impact local residents and businesses through increased delays and potential impacts on health and safety.
- **Noise and Vibration:** Construction traffic may give rise to local noise and vibration which may have an impact on the amenity of local residents.
- **Air Quality and Climate:** Emissions from construction traffic may result in a decrease in local air quality. Increased greenhouse gas emissions from construction traffic may contribute to climate change.
- **Water (Hydrology):** Construction vehicles at this site may give rise to hydrocarbon spills.

During the operational phase, the following aspects have potential to interact with traffic and transport:

- **Population and Human Health:** Increased traffic once each phase of the development is occupied has the potential to negatively impact local residents and businesses through increased delays and potential impacts on health and safety.
- **Noise and Vibration:** Construction traffic may give rise to local noise and vibration which may have an impact on the amenity of local residents.
- **Air Quality and Climate:** Emissions from traffic may result in a decrease in local air quality, increased greenhouse gas emissions and emission from traffic may contribute to climate change.
- **Water (Hydrology):** Increased traffic and parking at the site may give rise to hydrocarbon spills from vehicle.

17.5 Material Assets: Built Services

Chapter 7 assess the likely impacts on Services and Infrastructure arising from the proposed development. During the construction phase, the following aspects have potential to interact with built services:

- **Population and Human Health:** there may be interruptions to existing services, including water, electricity, communications, as connections are provided between the proposed development and existing services.
- **Water (Hydrology):** works to provide connections to utilities and services, such as foul and surface water, sewer may have negative impacts on groundwater if spills or fuels or other contaminants occur. Stockpiling of materials or works may lead to temporary localized flooding if the drains become blocked

- Traffic: Project related traffic will also interact with the land resource in the area which is predominately urban and agricultural.
- Where roads are opened for the installation of cables or pipelines, interaction will occur between material assets (namely the local road network and utility providers), traffic and population.

During the operational phase, the potential interactions are:

- Water (Hydrology): There will also be an increased demand on potable water on the municipal drainage infrastructure.
- Biodiversity: Disturbance to bats arising from artificial light spillage into the environment from the associated lighting scheme

It is unlikely that any of these interactions will result in significant additional impacts that are not already anticipated in this EIAR. It is predicted that the proposed development will contribute to the improvement of the overall urban environment.

17.6 Material Assets: Waste

Chapter 8 assess the impact of the proposed development on the production of waste: During the construction and operational phases, the following aspects have potential to interact with waste:

- Land, Soil and Geology: During the construction phase, c. 15,000m³ of excavated soil and stones will be generated from the excavations required to facilitate site levelling, construction of new foundations and the installations of site services
- Traffic: Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development.
- Population and Human Health: The incorrect management of waste during construction and/or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity.

17.7 Land and Soils

Chapter 9 assess the impact of the proposed development on land, soil, and geology. During the construction phase, the following aspects have potential to interact with land and soils:

- Landscape and Visual: Earthworks and soil stripping activities affect landform and terrain stability, which in turn influence landscape character and visual amenity. Soil conservation measures contribute to maintaining landscape integrity.
- Traffic: The sourcing and transportation of fill material influence traffic flows and emissions; careful planning reduces disruption and environmental impact.
- Waste: Soil and subsoil excavation, reuse, and importation tie directly into waste management strategies. The classification of excavated material as waste or by-product affects resource management and compliance with legislation.
- Water: The hydrogeological characteristics of soils and subsoils directly influence groundwater vulnerability, surface water runoff, and drainage patterns. Soil permeability and infiltration rates inform the design of sustainable drainage systems and attenuation measures.
- Biodiversity: Soil types and quality affect vegetation patterns and habitat suitability for flora and fauna. Changes in soil properties during construction can impact local ecology, soil microbial communities, and habitat connectivity
- Air Quality: Soil disturbance during construction can generate dust emissions, affecting local air quality. The management of exposed soils is crucial to mitigate particulate matter release.

- Cultural Heritage: Subsurface soils may contain archaeological deposits or paleoenvironmental records. Excavation impacts on soils are coordinated with archaeological assessments to prevent loss of heritage assets.

There are considered to be no potential significant interaction of impacts with Land during the operational phase of the development.

17.8 Water & Hydrology

Chapter 10 assesses the proposal's impact on water and hydrology. During the construction phase, the following aspects have potential to interact with water & hydrology:

- Biodiversity: Soils, geology and hydrogeology have an important interrelationship with the water and ecological environment, as a determinant of water chemistry, river flow regimes, water storage capacity and watercourse location. It also has an impact on water quality through the ability of bedrock and surface deposits to filter potential pollutants.

17.9 Biodiversity

Chapter 11 assesses the proposal's impact on biodiversity. During the construction phase, the following aspects have potential to interact with biodiversity:

- Land and Soils: Potential for impacts on local biodiversity via the proposed excavation and re-profiling works.
- Water and Hydrology: Potential for downstream impacts on the proximate watercourses, and designated conservation sites via contaminated surface water runoff.
- Air Quality: Potential for dust and materials to enter the proximate watercourse during site clearance and re-profiling works with the potential for downstream impacts on biodiversity and designated conservation sites.
- Noise and Vibration: Construction phase noise and vibration could potentially impact on birds on site and mammals proximate to the site.
- Traffic and Transport: Heightened traffic within and immediately surrounding the subject site (resulting from the transport of construction materials and the commuting of workers to the site) has the potential to impact on local biodiversity through increased disturbance.

During the operational phase, the following aspects have potential to interact with biodiversity:

- Water and Hydrology: Potential for downstream impacts on the proximate watercourses, and designated conservation sites via contaminated surface water runoff.
- Noise and Vibration: Potential for operational phase noise and vibration to impact birds on site and mammals proximate to the site.

17.10 Noise and Vibration

Chapter 13 assess the impact on noise and vibration arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with noise and vibration:

- Population and Human Health: increased levels of noise and vibration during construction activities may result in negative impacts to the amenity of local residents.
- Biodiversity: increased levels of noise and vibration during construction activities may result in negative impacts to the local biodiversity.

During the operational phase, the potential interactions are:

- Population and Human Health: Once the development is fully occupied increased levels of noise due to increased traffic and activity may result in negative impacts to the amenity of local residents

Chapter 12 has been prepared in consideration of and in conjunction with the relevant elements of these chapters

17.11 Air Quality

Chapter 13 assesses the proposal's impact on air quality. During the construction phase, the following aspects have potential to interact with air quality and climate:

- Population and Human Health: An adverse air quality impact during the construction phase can cause health and dust nuisance issues
- Climate: There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.
- Land and Soils: Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions.
- Biodiversity: Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects
- Traffic and Transport: With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The effects are considered to be **direct, short-term, neutral, localised** and **not significant** during the construction phase.

During the operational phase, the potential interactions are:

- Population and Human Health: Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health.
- Climate: There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.
- Traffic and Transport: With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The effects are considered to be **long-term, direct, neutral** and **not significant** during the operational phase.

17.12 Climate

Chapter 14 assesses the proposals impact on climate. During the construction and operational phases, the following aspects have potential to interact with air quality and climate:

- Land and Soils: The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change.
- Air Quality: There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked
- Traffic: Vehicles accessing the site will result in emissions of CO₂, a greenhouse gas. The effects of the proposed development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site.
- Waste: Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling

17.13 Cultural Heritage

Chapter 15 assesses the likely impacts to Cultural Heritage arising from the proposed development. No adverse effects on the cultural heritage resource are predicted to occur during the construction or operation phases as a result of interactions with other environmental aspects assessed in this EIAR.

17.14 Major Accidents and Disasters

Chapter 16 assesses the Risks of Major Accidents and Disasters arising from the proposed development. No other significant interactions have been identified other than those discussed in this chapter. With mitigation measures in place, no significant residual negative impacts are predicted.

17.15 Conclusion

This EIAR has taken the above interactions into account throughout the assessments of the proposed development and mitigation measures have been outlined where relevant to minimize the impact of any identified potential impacts.

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Table 17.1 Interactions with Potential for Significant Impacts Before the Implementation of Mitigation Measures

Interaction	Population & Human Health		Landscape		Material Assets- Traffic		Material Assets- Built Services		Waste		Land & Soils		Water		Biodiversity		Noise & Vibration		Air Quality		Climate		Cultural Heritage	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Population & Human Health			✓	✓	✓	✓	✓	✓	✓	✓							✓		✓	✓				
Landscape and Visual		✓											✓		✓									
Material Assets- Traffic	✓	✓											✓	✓			✓	✓	✓	✓	✓	✓		
Material Assets- Built Services	✓				✓								✓	✓		✓								
Waste	✓	✓				✓					✓													
Land & Soils			✓		✓				✓				✓		✓				✓				✓	
Water															✓									
Biodiversity					✓						✓		✓	✓			✓	✓	✓					
Noise & Vibration	✓	✓																						
Air Quality	✓	✓			✓	✓					✓				✓						✓	✓		
Climate					✓	✓				✓	✓	✓							✓	✓				
Cultural Heritage																								
C - Construction Phase O - Operational Phase ✓- Potential Significant Interaction																								

CHAPTER EIGHTEEN

SUMMARY OF MITIGATION MEASURES

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CHAPTER EIGHTEEN

Table of Contents

Summary of Mitigation Measures

18.1 Introduction..... 18-1

RECEIVED: 30/06/2025

Table of Tables

Table 18.2 Construction Phase Mitigation 18-1

Table 18.3 Operational Phase Mitigation 18-15

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CHAPTER 18 | Summary of Mitigation Measures

18.1 Introduction

A key objective of the Environmental Impact Assessment process is to identify likely significant environmental impacts at the pre-consent stage and where necessary to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR summarises the proposed mitigation measures set out in Chapters 4 to 15 and also incorporates the mitigation measures set out in the Natura Impact Statement.

All the mitigation measures proposed within the individual specialists’ assessments will be incorporated into the Construction and Environmental Management Plan (CEMP) prior to works commencing on-site.

Table 18.2 Construction Phase Mitigation

Aspect	Construction Phase Mitigation
Population & Human Health	It is anticipated that that the construction phase will have a short term slight positive economic impact on the area due to the influx of construction workers to the town. Health and safety risks will be managed in accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, 2013. Measures are also set out in the CEMP, and include; • Securing of site boundary and erecting of fencing or hoarding as required • Minimising disruption of services through adequate engagement with utility and service providers; • Restriction of construction working hours and traffic access; • Personnel, pedestrian and vehicle segregation; • Preparation of a site-specific Safety Statement; • Preparation of an Emergency and Evacuation Plan. The design of the proposed development will be subject to safety design reviews to ensure that all requirements of the project are safe. A Project Supervisor for the Design Process (PSDP) will be appointed as part of this process. Where issues are identified, corrective actions will be implemented to amend design issues prior to the issuance of final design for construction. A contractor safety management programme will be implemented identifying potential hazards associated with the proposed works. Temporary contractor facilities and areas under construction will be fenced off from the public with adequate warning signs of the risks associated with entry to these facilities. Entry to these areas will be restricted and they will be kept secure when construction is not taking place. Measures to ensure public safety, with respect to construction traffic will be included in the final Construction Traffic Management Plan, to be agreed with the Planning Authority prior to commencement of development.
Landscape & Visual	This mitigation process was developed to address any residual adverse effects of the development. • The protection of existing retained trees and screening vegetation on the boundaries to BS 5837:2012 standards with the Root Protection Area (RPA) protected by secure fencing for the duration of the development. • Soil stripping and correct stockpiling method will ensure that where existing topsoil is to be reused it is stripped and stored in dry conditions and placed in a suitable area of the site where it is not trafficked or contaminated with building spoil. • Site works are carried out in consideration of neighbouring houses and roadways are and site warning signage are properly maintained. • Planting operations are carried out to the best horticultural practices and an irrigation and weed control maintenance operations are put in place during the defect’s liability period.

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Aspect	Construction Phase Mitigation
Material Assets: Traffic & Transport	The Construction Environmental Management Plan (CEMP) includes proposed mitigation measures to minimise the impact of constructed related traffic on the modelled roads network. The construction stage of the proposed development will be complete in three phases as described in CEMP and the project is scheduled to begin construction in 2026 for a three-year period. It is envisaged that working hours will be 07:00am to 19:00pm Monday to Friday (08:00am to 14:00pm for Saturday) for construction personnel through each phase of the development. Generally, construction workers will travel to site before the measured peak hour of 08:00 to 09:00, to be on site for a 08:00 start-time. It is envisaged that a very limited number of construction employees are likely to travel to the site during peak hours. It is anticipated that heavy goods vehicles, HGV's, will be restricted to movements on the local road network during the off-peak periods. It is estimated that truck movements and general deliveries would arrive/leave at a steady rate during the course of the day. It is envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 12 no. HGV's will deliver to the site on a daily basis for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase but these are expected to be at a lower frequency. An estimated total of 920 HGV trips are envisaged throughout the course of the construction phase of the works. A number of mitigation measures are proposed during the construction phase to minimise the impact, the measures are as follows; • A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site. • All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc. • Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods. • No vehicle will be allowed to stop or park on the access road to the proposed development site. • Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development. • Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles. • Routine sweeping/cleaning of the road and footpaths in front of the site; and • No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity. There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising.
Material Assets: Built Services	The following mitigation measures are proposed for the construction phase of the development with respect to Material Assets: • The proposed development should comply with the provisions of the Construction Waste Management Plan with respect to construction waste. • The proposed development will comply with the provisions of the Construction Environmental Management Plan. • Water metering will be provided during the construction phase to record consumption. • All new services will be constructed and provided in strict accordance with the codes of practice of the relevant utility company and new connections to have an agreed permit for the works where required. • To minimise impact of the wastewater/water infrastructure required for the development, best practise construction practices should be adhered to, and Uisce Éireann procedures followed. • Temporary measures such as silt traps will be put in place to limit the rate of surface water runoff from site. • The quality of surface water runoff to be managed and ensure the run-off from the site does not result in excessive siltation of the receiving drainage channels. • Excavations are to be kept to a minimum, with excavated material stockpiled for reuse or removed off-site following removal of waste material regulations. • The contractor also will be obliged to put measures in place to ensure that there are minimal or no interruptions to existing services, and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority. • All watermains will be cleaned and tested in accordance with Uisce Éireann guidelines and standards prior to connection to the public watermain. • All works in the vicinity of the local authority will be in compliance with any requirements or guidelines. • Road opening licences will be applied for and a temporary traffic management plan to be implemented when connecting utilities in the public road. Consideration will be given to the sustainable sourcing of all materials and will be reused where possible. The methodologies chosen at design stage, will result in a decrease in the amount of imported material, which in turn will reduce the impact of traffic on the surrounding roads and will result in less demand on non-renewable sources such as quarries. Other mitigation measures which will be employed in relation to raw materials are as follows: • Design will be optimised to minimise the requirements for raw materials. • Materials will be reused where possible. • Raw materials will be sourced locally where possible; and • Raw materials will be managed in accordance with the CEMP for construction.

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Aspect	Construction Phase Mitigation
Material Assets: Waste	The following mitigation measures will be implemented during the construction phase of the proposed development: - As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the EPA ‘<i>Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects</i>’ (2021) and is included as Appendix 8.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development. • Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 8.1) in agreement with CCC and in compliance with any planning conditions, or submit an addendum to the RWMP to CCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream. • The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases. A quantity of topsoil and sub soil will be excavated to facilitate the proposed development. The project engineers (Tobin) have estimated that c. 1,500 m³ of excavated material will be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. In addition, the following mitigation measures will be implemented: • Building materials will be chosen to ‘design out waste’; • On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated: • Concrete rubble (including ceramics, tiles and bricks); • Plasterboard; • Metals; • Glass; and • Timber. • Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal); • All waste materials will be stored in skips or other suitable receptacles in designated areas of the site; • Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably banded areas, where required); • A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works; • All construction staff will be provided with training regarding the waste management procedures; • All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal; • All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and • All waste leaving the site will be recorded and copies of relevant documentation maintained. Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with <i>Regulation 27 (By-products)</i>, as amended, and the <i>European Union (Waste Directive) Regulations 2011-2020</i>. EPA approval will be obtained prior to moving material as a by-product. These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the <i>Waste Management Act 1996</i>, as amended, associated Regulations and the <i>Litter Pollution Act 1997</i> and the NWMCP. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

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Aspect	Construction Phase Mitigation
Land & Soils	The mitigation measures proposed for implementation during the construction phase are set out in the Construction Environmental Management Plan (CEMP) submitted as part of this application. Soil/Subsoil Management <i>Stripping of Topsoil</i> - Stripping of topsoil will be managed with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. Topsoil stockpiles will also be located so as not to require double handling. - Surface water runoff from areas stripped of topsoil will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate. - On-site settlement ponds will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion. <i>Excavation of Subsoil Layers</i> - Excavation of existing subsoil layers has been minimised. Cut type earthworks operations will not be required to achieve designed site levels. - Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed will be minimised in order to mitigate against weather effects. - Stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. Measures will be implemented to capture and treat sediment laden surface water runoff (e.g., sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches). - No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area. - Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling. Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site. Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site. It is intended that any excavated soil and stones materials will be reused within the site boundary insofar as possible to minimise the quantity of materials to be removed from site. Any material that is intended for retention on site for re-use within the site boundary in landscaping will be relocated to this area as soon as possible. The main contractor will minimise the extent of areas of exposed soil at any one time to reduce potential for generation of dust during dry periods or creation of sediment laden run-off during wet periods. Where possible, works will be carried out during dry weather periods. Accidental Spills and Leaks In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site). No mitigation measures are proposed in relation to the geological environment.

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Aspect	Construction Phase Mitigation
Water & Hydrology	The use of plant and machinery during construction works will require the storage and use of fuels and oils. Any servicing of vehicles on-site will be confined to designated areas. Spill kits will be retained on-site to ensure that all spillages or leakages are dealt with immediately and staff will be trained in their proper use. Storage tanks, used to store fuel for plant and machinery, will be self-contained, bunded, and double-walled. Refuelling plant and equipment will be carried out from these tanks or from delivery vehicles at designated refuelling areas. The design of all bunds will conform to EPA bunding specifications. Details of spill protection measures and emergency spill response procedures are included in the Construction and Environmental Management Plan (CEMP) submitted as part of this application. Programming of works will need to be such that earthworks are not scheduled during severe (wet) weather conditions. Where such weather is forecast, suitable measures will be taken to secure the works. Construction activities will be confined to the footprint of the development site. The following measures are proposed during the construction phase to mitigate against risks to the surrounding hydrological environment. • Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate. • Weather conditions will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion. • In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site). • Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents). • Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds. • The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established. • The construction compound's potable water supply will be protected from contamination by any construction activities or materials. • Water sediment and colour will be monitored extensively during construction. Trigger values will be established to shut works down, namely 25mg/l Total Suspended Solids. The division of work areas in phases (outlined Chapter 9 - Land & Soils) reduces the areas of exposed soil materials at any given time, which reduces the likelihood or risk of sediment mobilization and transport further. Water intercepted from constructed roads and hardstanding areas will be similarly managed to ensure that uncontrolled water discharges do not take place to the receiving environment. Stormwater collected in this manner will be diverted through a sediment grit trap and oil interceptor, prior to discharge to the settling ponds. Construction vehicles leaving the site will pass through a wheel wash, to ensure that debris and soil from the site do not impact on the roads. All imported soils and stones shall be sourced from a licenced/permitted facility with suitable documentation to confirm the material is inert and fit for purpose. The contractor shall ensure the material is fit for use before importing to the site. Pollution prevention measures will be put in place to avoid release of potential pollutants into the watercourses adjacent to the site. The management of surface water run-off during the construction phase will also be carried out in accordance with the CIRIA C698F publication Site Handbook for the Construction of SUDS 1. Material stockpiles will be kept at least 10m from any watercourses or manholes and silt fences will be erected at the toe of stockpiles to prevent run-off into watercourses. The silt fences will be monitored daily by the main contractor and silt removed where required. Damaged fences will be repaired immediately. Tarpaulins or polythene sheets will be used to cover stockpiles of material during heavy rainfall to avoid sediment release. Washout from concrete delivery vehicles will be required on site and will only occur at designated concrete washout areas. This will be allocated by the site manager at the start of the works and relayed to all concrete delivery drivers upon arrival on site. The washout area will not be permitted within areas close to sewers or ground. No liquids will be permitted to be discharged direct to ground and absorbent socks will be installed around surface water drains to prevent silt entering the drainage network. Surface water monitoring comprising visual inspections and in-situ testing will be carried out on a regular basis throughout the project to monitor for any changes in water quality of these open water streams. The results of surface water monitoring will be retained on site for inspection.

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Aspect	Construction Phase Mitigation
	In addition, the following measures will be implemented. • A project ecologist will be appointed to oversee works from prior to commencement of works on site to the completion of all drainage elements. This would include consultation with the arborist in relation to trees to be retained. • Local silt traps established throughout site and regular inspections carried out. • Mitigation measures on site include dust control, stockpiling away from drains • Stockpiling of loose materials will be kept to a minimum of 20m from drains. • Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system. • Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. • Fuel, oil and chemical storage will be sited within a bunded area. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. • During the construction works, silt traps will be put in place in the vicinity of all runoff channels to prevent sediment entering the drainage network which discharges to the River Fergus network. • Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks. • The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained. • The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area. • Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains. • Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis. • 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. • If cast-in-place concrete is required, all work must be carried out in the dry and effectively isolated from any water courses or drainage ditches. • Instream machine works will be minimised, and any machines working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels. • Instream earthworks must be executed so as to minimise the suspension of solids. • There will be no mixer washings or excess concrete discharged on Site. All excess concrete is to be removed from Site and all washout of concrete chutes to be captured in a tank which shall be removed offsite for disposal at an authorised wastewater treatment facility. • Works within 50m of the Claureen River will only be carried out subject to the approval of the project ecologist. Works to connect drainage to the Claureen River will be under the direct supervision of the project ecologist with mitigation in place to prevent silt and contaminated material from entering the watercourse. Works will be carried out in dry weather with no cement works within 20m of the watercourse. A pre-cast headwall will be used.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
Biodiversity	• A pre-construction survey for bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Given the nature of the dense scrub on site no machinery access to the site for construction will be allowed without consultation and approval of the project ecologist. The ecologist will oversee site clearance and will be on site during the removal of scrub and hedgerows. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place. • A 30m construction exclusion zone will be implemented around the active badger sett located proximate to the eastern site boundary. This is demonstrated in figure 11.14 (in Chapter 11). No works will be carried out within this exclusion zone for the duration of the construction phase. Prior to machinery coming on site this exclusion zone will be put in place under the supervision of the project ecologist. • An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds, mammals including bats, badger and otter will not be significantly impacted. • Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). If removal is required during this season the removal of woody material will be carried out under the supervision of an ecologist. If nesting birds are present NPWS will be contacted, and removal will be subject to conditions outlined by NPWS. • Lighting during construction will be carried out in consultation with the project ecologist and treelines, boundary hedgerows or wooded areas will not be lit. • Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal, it will first be surveyed for roosting potential and bat presence if required. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Any tree felling will be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, will be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight. • Works within 50m of the Claureen River will only be carried out subject to the approval of the project ecologist. Works to connect drainage to the Claureen River will be under the direct supervision of the project ecologist with mitigation in place to prevent silt and contaminated material from entering the watercourse. Works will be carried out in dry weather with no cement works within 20m of the watercourse. A pre-cast headwall will be used. • Trees to be retained. Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted will be avoided and retained intact. Retained trees will be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing. • Lighting restrictions. In general, artificial light creates a barrier to bats so lighting will be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill during construction. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. • Noise control measures such as limited working hours and minimising noise emissions will assist in reducing the disturbance of animals; dusk and dawn is high faunal activity time. • Plant machinery will be turned off when not in use to reduce noise emissions. • Illumination of the site will be kept to the minimum required for health and safety purposes and established on a task specific basis to prevent disturbance to local fauna that may occur in the wider area. • Light spill will be minimised where possible; and • Operating equipment and machinery will be restricted to the site boundary.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
Noise & Vibration	Mitigation measures for the construction phase are set out below in order to reduce potential impacts as far as practicable to within the adopted design goals for noise and vibration. The assessment detailed in Section 12.8.2.1 of Chapter 12 has determined that construction activities can typically operate within the adopted construction noise threshold levels at the closest off-site NSLs when carried out at distances greater than 60m from the main phases of the construction works. Vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 12-3 (in Chapter 12) to avoid any cosmetic damage to buildings. Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to: • Selection of quiet plant • Control of noise sources • Screening • Hours of work • Liaison with the public Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring. <i>Selection of Quiet Plant</i> This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers’ proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether said item can be replaced with a quieter alternative. <i>Noise Control at Source</i> If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control at source. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. The following best practice migration measures will be considered: • Site compounds will be located away from noise sensitive boundaries within the site constraints. • The use of lifting bulky items, dropping and loading of materials within these areas will be restricted to normal working hours. • For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant will be switched off when not in use and not left idling. • For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system. • For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. • For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. • For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. • All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
	Screening Typically screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the source. BS 5228-1:2009+A1 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than 10kg/m² will give adequate sound insulation performance. Post-mitigation construction noise calculations assume a partial line of sight (-5dB) is achieved using a solid 2.4m high standard construction site hoarding. Annex B of BS 5228-1:2009+A1:2014 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials. In addition, careful planning of the site layout will also be considered. The placement of temporary site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening during the phasing of works. Liaison with the Public A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. Vibration On review of the likely vibration levels associated with construction activities, it may be concluded that the construction of the proposed development is not expected to give rise to vibration that is either significantly intrusive or capable of giving rise to structural or cosmetic damage to adjacent buildings. In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period: - • A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars; • Appropriate vibration isolation shall be applied to plant, where feasible; • Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values. Project Programme The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. The potential for cumulative works occurring both within the site and at any external sites with potential to generate significant noise effects will be reviewed in terms of limiting the duration and scale of these effects. Other measures to control noise emissions from the works will include: • Ensuring that HGV drivers turn off engines when parked for prolonged periods on the site and turning off engines during loading of demolition waste materials. • Using minimal impact reversing alerts and avoiding the use of horns, where possible. These alerts, however, are essential safety measures for bust construction sites and cannot be avoided. • Choosing equipment with reduced noise output and silencers/dampeners. • Using radio contact across the site to avoid workers shouting or whistling. • Maintaining plant and equipment in good condition to ensure noise emissions are as per plant specifications and that all noise attenuation features are in good working order; and • Use of mains power supply instead of generators insofar as is possible. Contact details for the site manager will be provided at the entrance to the site and residents/public will be encouraged to report any noise issues. Any noise complaints made during the works will be logged, investigated and followed up with measures to limit noise emissions, where appropriate.

Aspect	Construction Phase Mitigation
Air Quality	The proposed development has been assessed as having a high risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 13.8.1.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a high risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities. Communications • Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses. • The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details. Site Management • During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions. • A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out Preparing and Maintaining the Site • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping. Operating Vehicles / Machinery and Sustainable Travel • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) Operations • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
	Waste Management - Avoid bonfires and burning of waste materials. Measures Specific to Earthworks - Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. - Only remove the cover in small areas during work and not all at once. - During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. - Minimise the extent of exposed earthworks at any one time. - Cover, seed, or fence soil stockpiles to prevent wind-blown dust. - Promptly remove excavated material unless it is required for immediate reuse. <i>Limit imported material stockpiles to the minimum volumes necessary for progress.</i> Measures Specific to Construction - Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. - Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. - For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. Measures Specific to Trackout - A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles. - Avoid dry sweeping of large areas. - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. - Record all inspections of haul routes and any subsequent action in a site logbook. - Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsters and regularly cleaned. - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. - Access gates to be located at least 10 m from receptors where possible. Monitoring - Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
	Access and Haul Routes • Enforce a site speed limit of 10 km/h to minimise dust lift. • Regular damping of haul roads during dry weather using water bowsters or sprinkler systems. Perimeter and Barrier Controls • Erect solid hoarding or dust netting along site boundaries, especially adjacent to the R474 and nearby residences. • Deploy street sweepers to clean public roads near the site, particularly the R474. Dust Suppression During Works • Maintain an adequate non-potable water supply for dust suppression. • Use dust suppression systems (e.g. water sprays, local extraction) during cutting, grinding, or sawing. • During dry and windy conditions, avoid high dust-potential activities or implement enhanced suppression controls. There is the potential for excessive dust to enter the Lower River Shannon SAC via air during strong winds. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on this SAC. The main activities that may give rise to dust emissions during construction include the following: • Excavation of material; • Materials handling and storage; • Movement of vehicles (particularly HGV's) and mobile plant. Mitigation measures to be in place: • Consultation will be carried with an ecologist throughout the construction phase; • Trucks leaving the site with any excavated material will be covered so as to avoid dust emissions along the haulage routes which run close to the Claureen River. • Speed limits on site (15kmh) to reduce dust generation and mobilisation. Site Management • Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged. • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. Monitoring • Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary. Preparing and Maintaining the Site • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Avoid site runoff of water or mud. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping. • Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic. • Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
	Operations • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. Waste • Avoid bonfires and burning of waste materials. Measures Specific to Earthworks • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once. • During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. • The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required. Storage/Use of Materials, Plant & Equipment • Materials, plant and equipment shall be stored in the proposed site compound location; • All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater; • Fuel may be stored in the designated bunded area or in fuel bowzers located in the proposed compound location. Fuel bowzers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages; • Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. • Drip trays will be turned upside down if not in use to prevent the collection of rainwater; • Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips.

RECEIVED: 30/06/2025

Aspect	Construction Phase Mitigation
Climate	Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are: Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled. Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Ensure all plant and machinery are well maintained and inspected regularly. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. Sourcing materials locally where possible to reduce transport related CO₂ emissions. The project developer, Glenveagh Properties, has committed to achieving Net Zero by 2050 across its whole business. Therefore, the proposed development will be built with carbon reduction and sustainability in mind and will include reductions of embodied emissions during the construction phase. Glenveagh Properties have published a Net Zero Transition Plan and Annual Reports which detail a commitment to achieving Net Zero by 2050. The above listed measures are supported by Glenveagh Properties PLC's <i>Net Zero Transition Plan 2023</i>, published in March 2023, which identifies the sources of Glenveagh Properties PLC's emissions and proposed measures to reduce these. A commitment to achieve a 55% reduction in Scope 3 (construction methods) emissions intensity (tCO₂e per 100 m² of complete floor area) by 2031 (using 2021 as the baseline year) will involve supplier engagement to make informed procurement decisions, engaging with subcontractors to support their transition to less carbon intensive fuels (diesel and gas oil is currently the norm) and investing in innovation of designing and building homes to reduce their associated embodied carbon. A reduction target of 46.2% by 2031 is also set in the plan for Scope 1 and 2 emissions (company operations). All targets have been validated by the Science Based Targets initiative (SBTi). The Science Based Targets initiative (SBTi) is a corporate climate action organisation, incorporated as a charity, which develops standards, tools and guidance enabling companies to set GHG emissions reductions targets in line with net-zero by 2050 at the latest. Science-based targets show companies and financial institutions how much and how quickly they need to reduce their GHG emissions to prevent the worst effects of climate change (SBTi, 2024a). Glenveagh Properties PLC is one of the over 4,000 companies and financial institutions who have had their emission reduction targets validated by the SBTi (Glenveagh's targets can be searched in the SBTi's target dashboard (SBTi, 2024b)). Glenveagh Properties PLC's <i>Full Year 2024 Results</i>, published in March 2025, identified that Scope 3 emissions are 7% below the 2021 baseline, measured on an intensity basis (tCO₂e per 100m²). This is primarily due to the focus on the energy efficiency of the residential units. Scope 1 and 2 emissions decreased by 47% compared to 2021 baseline, which can be attributed to the first full year HVO (hydrotreated vegetable oil) was used across all sites as a replacement to diesel. In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements. Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed, e.g. the EU Commission <i>Technical Guidance on Adapting Buildings to Climate Change</i> (European Commission, 2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.
Cultural Heritage	A geophysical survey of the proposed development site, under licence by the NMS, will be carried out following the clearance of vegetation overgrowth and in advance of the construction phase. When the results of the geophysical survey are available, they will be subject to archaeological review and a programme of targeted test trenching will be then be carried out under licence by the NMS. This will include targeted test trenching of any anomalies of archaeological potential identified by the geophysical survey. This will also include test trenching of the section of the townland boundary between Keelty and Ballymacaula located within the proposed development site and a written and photographic survey of this land division feature will also be carried out. In the event that any sub-surface archaeological features are identified during these site investigations, their locations will be recorded and securely cordoned off while the NMS are notified of the discovery and consulted to determine further mitigation measures, which subject to findings, may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation. There are no structures of architectural heritage interest located within the proposed development site or its close environs and no mitigation measures for this element of the cultural heritage resource are required.

RECEIVED: 30/06/2025

Table 18.3 Operational Phase Mitigation

Aspect	Operational Phase Mitigation
Population & Human Health	Measures to avoid potential negative impacts on population and human health have been fully considered in the design of the project and are integrated into the final layout and design. Compliance with the layout and design will be a condition of the permitted development. As such no mitigation measures are required.
Landscape & Visual	Grass cutting, tree, shrub and hedge maintenance and leaf and litter clearing are the main operations carried out in such a development. Periodic tree surveys are also important where there are existing mature trees retained on site to ensure the safety of residents and public where trees adjoining housing and roadways.
Material Assets: Traffic & Transport	Mitigation measures proposed during the operational stage are as follows; • Provision of “STOP” road markings at the access junctions in accordance with Figure 7.35 of the Traffic Signs Manual (TII, 2019). • Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways. • It is proposed to provide advanced warning signs on the R474 Circular Road as it approaches the site entrance. The signage will be in accordance with Chapter 6 of the Traffic Signs Manual (TSM) for road users travelling in the northern and southern direction towards the entrance to the development. • The connection of the proposed development footpaths to the existing footpath network on the R474 Circular Road. This will allow connectivity to the existing Bus Stops in Ennis Town. • The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling. • Charging points for electric vehicles are being provided • A Mobility Management Chapter has been included as part of the Traffic and Transport Assessment, submitted as part of this application. This outlines the mobility strategy for the proposed development and includes measures for guiding the delivery and management of coordinated mobility management initiatives by the scheme promotor • Provision of upgrade works on Circular Road (pedestrian facilities) as part of the proposed development
Material Assets: Built Services	The following section discusses the mitigation approaches that will be followed during the operational phase of the development: • All new foul and surface water drainage pipes to be pressure tested and CCTV to identify any possible defects. • Water conservation measures to implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments. • Ensure that all hydro brakes are designed to limit the flow of water from the development to the greenfield run off. • All water main pipes to be pressure tested in accordance with Uisce Éireann details. • All water mains will be cleaned and tested in accordance with Uisce Éireann guidelines and standards prior to connection to the public water main. Uisce Éireann have confirmed that a wastewater connection for the development is feasible and have issued a confirmation of feasibility letter (COF), Refer to Appendix 7.3. They have also stated that upgrade works are to be carried out downstream of the development as part of Uisce Éireann’s Capital Investment Plan (CIP), however they have noted that the latest capacity register can accept the proposed development. Connection agreements will be made with Uisce Éireann regarding wastewater discharge off site. As Uisce Éireann have confirmed that the system has capacity to accommodate the proposed development significant impacts to the system therefore not considered likely. No additional mitigation measures will be required. The surface water drainage has been designed to accommodate the greenfield run-off from the proposed development. As the flow will be generated by seven catchment areas and it will be limited to the existing greenfield runoff rate of each catchment and will be attenuated to reflect the greenfield run off rate. Due to measures already incorporated in the design as outlined in Section 7.7.3, no additional mitigation measures will be necessary on surface water during the operational phase. Uisce Éireann have confirmed that there is enough capacity in the Uisce Éireann network to supply the development Refer to Appendix 7.3. All plumbing fixtures and fittings to be installed within the development should be to the current best practice for water consumption to minimize future water usage. As Uisce Éireann have confirmed that the existing Uisce Éireann watermain has capacity to accommodate the proposed development, significant impacts to the system therefore not considered likely. No additional mitigation measures will be required.

Aspect	Operational Phase Mitigation
Material Assets: Waste	The following mitigation measures will be implemented during the operational phase of the proposed development: - All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site. As previously stated, a project specific OWMP has been prepared and is included as Appendix 8.2. The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the NWMPCE, <i>Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland</i> and the CCC Waste Bye-Laws. The crèche operator and the residents will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development. In addition, the following mitigation measures will be implemented: - On-site segregation of all waste materials into appropriate categories including (but not limited to): - - Organic waste; - Dry Mixed Recyclables; - Mixed Non-Recyclable Waste; - Glass; - Waste electrical and electronic equipment (WEEE); - Batteries (non-hazardous and hazardous); - Cooking oil; - Light bulbs; - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); - Furniture (and from time-to-time other bulky waste); and - Abandoned bicycles. - All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. - Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. - The residents and tenants will ensure that all waste collected from the site will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and - The residents and the crèche operator will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities. These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, The NWMPCE and the CCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.
Land & Soils	On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment. SuDS measures will be maintained as part of the operational phase.

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Aspect	Operational Phase Mitigation
Water & Hydrology	The design of proposed site levels (roads, FFL etc.) has been carried out to ensure the proposed development is elevated and set in such a way as to avoid concentrating additional surface water flow in a particular location. Following the Site Specific Flood Risk Assessment, it has been determined that the site / zoned developable area is located in Flood Zone C as defined by the Guidelines. No proposed dwellings are located in Flood Zone A or B Surface water runoff from the site will be attenuated to the greenfield runoff rate. Surface water discharge rates will be controlled by a hydro brake type vortex control device in conjunction with below ground attenuation storage. There are four critical objectives that SuDS seek to meet: • Quantity: managing flows and volumes to match the rainfall characteristics before development. • Amenity: integrated design that provides useful and attractive multifunctional spaces. • Quality: preventing and treating pollution to ensure that clean water is available as soon as possible to provide amenity and biodiversity benefits and protecting watercourses and groundwater. • Biodiversity: maximising the potential for wildlife through design and management of SuDS. The following methodologies are being implemented as part of a SuDS surface water treatment train approach: • Permeable paving in driveway areas • Surface water runoff from roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways • Attenuation of the 30- and 100-year return period storms • Installation of a hydro brake • Surface water discharge will also pass via a fuel / oil separator (sized in accordance with permitted discharge from the site) A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, hydro brake and full retention fuel / oil separator noted above. • Bioswale following discharge from the final settlement pond All new foul drainage lines will be pressure tested and be subject to a CCTV survey in order to identify any possible defects prior to being made operational. No specific mitigation measures are proposed in relation to water supply. Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design. It is proposed to use a Sustainable Urban Drainage Systems, (SuDS) approach to surface water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of stormwater runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed SuDS features in the development are permeable paving on driveways, cellular underground soakaways, petrol interceptors and a hydro brake flow control. The proposed surface water drainage network has been designed into 7number catchment areas for the development. The surface water will flow to soakaways for 6 of the catchment areas and to a detention pond for the northernmost catchment area. The soakaways and the detention pond have been designed to a cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc. The soakaways have been designed using infiltration rates from a Site Investigation carried out by Grounds Investigation Ireland (see appendix 7.1 of this EIAR). The infiltration rates were obtained by Soakaway Testing to BRE Digest 365. A conventional infiltration rate for each soakaway was used in the design and a factor of safety of 2. The surface water in each soakaway will infiltrate to the ground, as it would naturally in a green field site. Prior to entering each soakaway, the surface water will flow through petrol interceptors to remove any hydrocarbons the water may contain. The pond has been designed to cater for the catchment area and the overflows from each of the soakaways if needed. The pond is relatively shallow at 1.5m, designed with 4number step formations at a 1/4 slope. Refer to engineers drawing for details. The detention pond provides several forms of treatment to the collected water within it. As a result of the size of the pond, much of the bacteria and pollutants that enter the pond settle over time prior to reaching the outfall pipe. Furthermore, retention ponds can support vegetation and plant life, which provide further pollutant treatment and removal. The plants absorb dissolved pollutants and convert them into less harmful materials. Microorganisms present in the pond can further treat and breakdown pollutants that include bacteria, nitrogen, phosphorus, total suspended solids, oil and particulate matter from vehicles. Surface water from the retention pond shall discharge into the Claureen River via a hydro brake manhole, which will limit the amount of water discharging to the river. The amount of water discharging will be under the allowable greenfield Runoff rate, which has been calculated at 17.8 l/s due to the developable area of the site. The surface water will flow through a bar screen at either end of the outfall pipe which will mitigate against debris/litter entering the Claureen River. The outfall from the retention pond will run along the corridor adjacent to the N85 route via a bioswale further improving water quality.

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Aspect	Operational Phase Mitigation
Biodiversity	The biodiversity value of the site would be expected to improve as the landscaping matures. The proposed development has a sustainable drainage strategy and detailed landscape strategy and mitigation during operation will be carried out as outlined elsewhere in the EIAR. The following operation mitigation measures will be carried out: • Post construction an inspection of drainage connections to the watercourse network including petrochemical interception will be carried out by the project ecologist. • 30 bird boxes to be placed on site in consultation with project ecologist. Bats In addition, the following measures in relation to bats, that have been extracted from the Bat Assessment Report (Bat Eco Services, 2022) from the approved scheme will be implemented into the design of the proposed development: Lighting “Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018). Consultation was undertaken with the lighting specialists to reduce the potential impact on local bat populations. • All luminaires used will lack UV/IR elements to reduce impact. • LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability. • A warm white spectrum (<2700 Kelvins (i.e. 2200 Kelvins) will be used to reduce the blue light component of the LED spectrum). • Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. • Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. • Only luminaires with an upward light ratio of 0% and with good optical control will be used. • Luminaires will be mounted on the horizontal, i.e. no upward tilt. • Any external security lighting will be set on motion-sensors and short (1min) timers. • As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed. Any external lighting for the Proposed Development should strictly follow the above guidelines and these should be strictly implemented during Construction and Operation phase of the Proposed Development. Additional measures were also recommended: • Removal of specific luminaires to prevent light spillage on the boundary with the golf course.” Bat Box Scheme “The total number of bat boxes required to mitigate for general conservation of local bat populations: 4 summer bat boxes (Schwegler Woodcrete 1FF bat box or equivalent – source www.nhbs.com or www.veldshop.nl) to be erected on mature trees within the Proposed Development site. Bat boxes will be erected prior to construction works. The bat specialist will erect the bat boxes with assistance from the contractor. Some general points that will be follow include: • Straight limb trees (or telegraph pole) with no crowding branches or other obstructions for at least 1 metre above and below position of bat box. • Diameter of tree should be wide and strong enough to hold the required number of boxes. • Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations should be sheltered from prevailing winds. • Bat boxes should be erected at a height of 4-5 metres to reduce the potential of vandalism and predation of roosting bats. Locations for bat boxes should be selected to ensure that the lighting plan for the proposed site does not impact on the bat boxes. Therefore, the bat boxes are to be erected mature trees to the rear of the proposed development site and away from public street lighting.”

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Aspect	Operational Phase Mitigation
	Lesser Horseshoe Bat Conservation Measures “Due to the presence of Lesser Horseshoe Bats within the survey area and the fact that the Proposed Development is within 2.5km radius of two SACs, it is important that additional measures are undertaken to conservation local Lesser Horseshoe Bat populations. These measures will entail the following: • Compensatory planting for the removal of linear habitats. • Compensatory planting for the removal of scrub habitats. • Specific measures to reduce lighting impacts. • Lesser Horseshoe Bat conservation zone – zone of land along a linear strip to the north of the Proposed Development site and connected to the boundary of the Inch River. This area has been selected because it is outside the Lighting Plan zone and it is adjacent to the Inch River which is deemed as the likely commuting route for Lesser Horseshoe Bats to the Proposed Development area. This river also allows direction commuting to lands with the Ennis Golf Course where Lesser Horseshoe Bat activity was also recorded. • This area is approximately 20m wide and 170m long and it is proposed that the following measures are undertaken: Erection of Day Roost.” A Day Roost consists of a “small structure building of concrete block (externally plastered) with a natural slate roof and bitumous felt. It is designed according to VWT Day Roost recommendations and full details of the plans are provided in the appendices” of the Bat Assessment Report accompanying this application. “The provision of such features within the 2.5km radius of Lesser Horseshoe Bat SACs is considered by The Vincent Wildlife Trust (VWT) as an important component to the support network for maternity and hibernation roosts. • Dark free zone connected to Inch River no lighting permitted withing this area. • Landscaping in vicinity of Day Roost and Inch River. • Approximately 200m of hedge planting (Hawthorn). • Approximately 10 small trees (e.g. Rowan, Birch and Crab Apple). Landscape Design “It is recommended that native tree, shrub, and plant species are included in the landscaping plan. It is recommended that night-scented planting is also undertaken to encourage foraging areas for local bat populations. As such, night scented-floral species, including Honeysuckle <i>Lonicera periclymenum</i> and Star Jasmine <i>Trachelospermum jasminoides</i>, will be included within the proposed hedgerows and areas of ornamental planting on Site, as outlined within the Landscape Design Plan, to provide foraging habitat for local bats. It is essential that the northern and eastern boundary with the Ennis Golf Course is protected. Any gaps or opportunity to undertaken planting to increase the height and width of this boundary should be undertaken and planting should be with native tree and shrub species. “The retention of the hedgerows along this boundary, along with the proposed compensatory woodland planting and native infilling to these hedgerows, as outlined in the Landscape Design Plan, will protect this ecological corridor. It should be noted that the proposed development has increased the level of hedgerow planting to include more linear woodland planting across the boundary of the site which includes oak. This will result in taller treelines in the longterm than the granted development which would provide superior foraging corridors and greater light spill containment. In addition to the measures outlined above for bats, the following operational mitigation measures will be in place: • Post construction an inspection of drainage connections to the watercourse network including petrochemical interception will be carried out by the project ecologist. • Inspection of landscaping elements to ensure suitable replacement habitat for natural habitat lost during site clearance.

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Aspect	Operational Phase Mitigation
Noise & Vibration	Additional Traffic on Adjacent Roads During the operational phase of the development, noise mitigation measures with respect to the impact of traffic from the development are not deemed necessary. Mechanical Services Plant Proprietary noise and vibration control measures will be employed as part of the detailed design in order to ensure that noise emissions from building services plant do not exceed the relevant internal noise criteria within Table 12-7 for residential dwellings within the proposed development. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. Considering that sensitive receptors within the development are much closer than off-site sensitive receptors, once the relevant noise criteria is achieved within the development, there are no mitigation requirements to control building services and plant at off-site NSLs. Inward Noise In terms of the inward noise impact of road traffic on the development buildings and amenity areas, Appendix 12.1 sets out the approach for controlling noise levels across the site. The majority of the Proposed LRD Phases 1-3 Development site has been categorised as a Negligible to Low Risk in accordance with ProPG. The LRD Phases 1-3 Western Section (Unit Type G in Phase 1, Type F in Phase 2 and 3 only) have been categorised as a Low to Medium Risk (see further details in Appendix 12.1). Review of the location of residential buildings on site and the external noise levels, the assessment has determined that specific noise mitigation measures are not required to the site boundary or site buildings to control noise intrusion to internal spaces or to control noise in the external amenity spaces.
Air Quality	No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.
Climate	The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.9.1 above as incorporated design mitigation. No further operational phase mitigation is proposed.
Cultural Heritage	Following the successful implementation of the archaeological mitigation measures during the pre-construction phase, as detailed in Section 15.7.2 of Chapter 15, no operational phase mitigation measures will be required for the cultural heritage resource.

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