**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# Environmental Impact Assessment Report

## Volume II

April 2022

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Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 1

## Introduction

Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 1 Introduction to EIAR

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# 1 Introduction to EIAR

## 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 environmental assessment. The environmental impact assessment process has been completed in line with Directive 2014/52/EU, based on the draft guidance presented in Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Draft (EPA 2017).

Chapter 1 introduces the project and describes 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.

### 1.1.1 Project Description

Cumnor Construction Ltd, wish to submit an application to An Bord Pleanála under the Planning and Development (Housing) and Residential Tenancies Act 2016 for a strategic housing development at Coolcarron, Fermoy, Co. Cork comprising the following;

- The construction of 336 no. residential units comprising of 250 no. 5, 4, 3 and 2 bed detached, semi-detached and townhouse/terraced units and 86 no. 1 and 2 bed apartments/duplex units;
- A 587m2 creche/childcare facility;
- The provision of landscaping and amenity areas to include 4 no. flexible open space areas with natural play features, a linear green route with a 3m wide shared surface path running along the western boundary and a number of informal grassed areas;
- Public realm upgrades along the R639, including a shared footpath and cycleway, a 4m toucan crossing with tactile paving;
- The proposed alteration to the Barrymore-Coolcarron 38kv line. The proposed alteration will involve the undergrounding of a section of the above mentioned overhead 38kV line to facilitate the housing development and the realignment of approximately 13.6 metres of 38kv overhead line. The proposed alterations will comprise of one (1) 12 metre Type “F” lattice steel end terminate mast structure and one (1) 38kV cable sealing ends. The proposed retirement of 282 metres of overhead conductors and one (1) type “F” Lattice steel mast structure , one (1) Type “C” light angle strain structure and one (1) Type “B” portal suspension structure; and
- All associated ancillary development including vehicular access on to the R639 road, 2 no. access gates to the existing weighbridge and associated ancillary development, lighting, drainage, boundary treatments, bicycle & car parking and bin storage at Coolcarron (townland), Fermoy, Co. Cork.

A detailed description of the project is provided in Chapter 2 Project Description. The location and context of the site is shown on Figure 1.

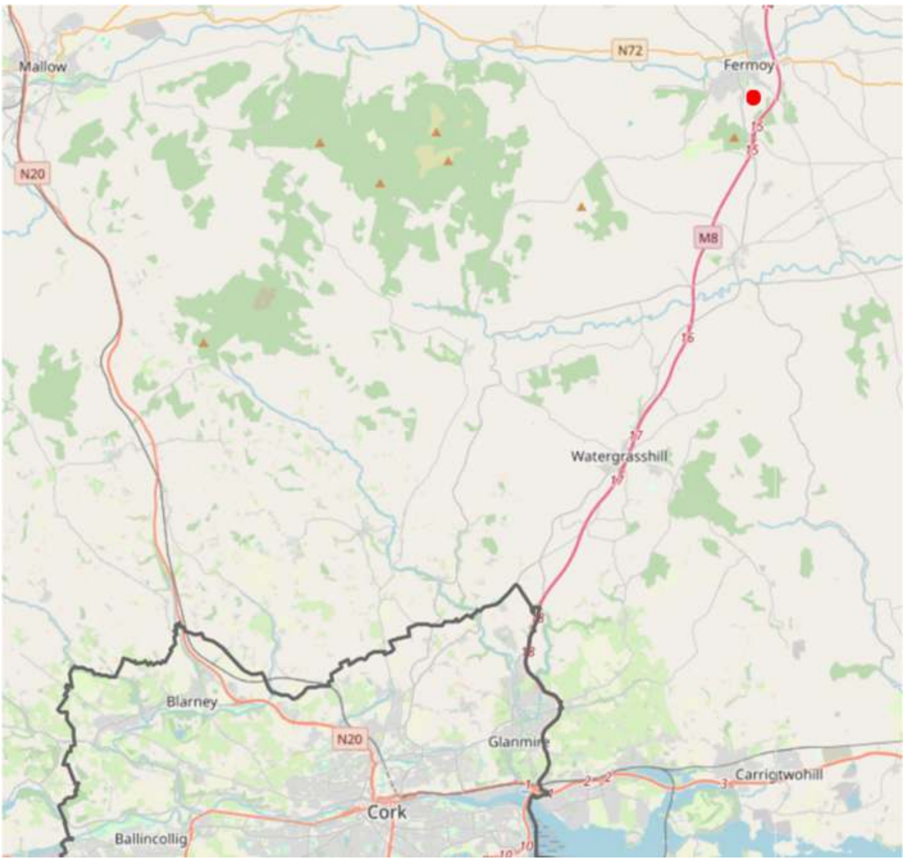

Figure 1.1 Location of subject site at Coolcarron, Fermoy, Cork (in red).

Figure 1.2 Aerial Image of site location and context.

### 1.1.2 The Applicant

Cumnor Construction Ltd, is a leading Irish home builder founded in 1983 who have built a reputation for quality and embrace innovation in construction materials, methods and design. Their consistent growth in commercial, industrial and residential development is achieve through provisional management of construction activities and management procedures.

### 1.1.3 Background and Purpose of the EIAR

This proposed development falls within the class of development types requiring an EIA under Schedule 5 to the Planning and Development Regulations 2001 (as amended). 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. Schedule 5 (Part 2) of the Planning and Development Regulations 2001 (as amended) sets mandatory thresholds for each project class.

Sub-section 10 addresses 'Infrastructure Projects' and requires that a number of classes of project be subject to EIA. The following classes are applicable to the proposed development;

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 city or town in which the predominant land use is retail or commercial use.)*

The proposed Strategic Housing Development is for 336 units including a crèche on a site area of c.11.56 hectares. While this does not exceed the threshold of 500 dwelling units set out in 10 (b) (i), a mandatory EIA is required under the provisions of Part 2, Article 10 (b) iv as the proposed development site comprises c. 11.56 hectares and is located in within the Cork County boundary, forming part of the town of Fermoy.

## 1.2 Methodology

The EIAR has been prepared in accordance with the requirements set out in the Planning and Development Act 2001 (as amended) and in Council Directive 2011/92/EU as amended by Directive 2014/52/EU (the EIA Directive). The Planning and Development Acts and Regulations 2000 to 2018 have been amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018) to take account of the requirements of the EIA Directive (Directive 2014/52/EU).

Annex IX of the EIA Directive and Schedule 6 of the European Union (Planning and Development) (Environmental Impact Assessment) (Regulations) 2018 specify the information to be contained in EIAR. These requirements identify a range of prescribed environmental factors, the significant effects of which have been addressed in this EIAR. These include population and human health, biodiversity, land and soil, water, air and climate, noise, landscape, cultural heritage and material assets as well as the inter-relationship between the above topics.

The preparation of this EIAR was also undertaken in accordance with the following guidance;

- Department of Housing, Planning, Community and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018);
- Department of Housing, Planning, Community and Local Government (2017) Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems;
- Department of Housing, Planning, Community and Local Government (2017) Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition;
- Environmental Protection Agency (2017) Revised Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft August 2017);
- Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements (Draft September 2015).

### 1.2.1 Report Structure

This EIAR has been prepared according to the 'Grouped Format Structure'. This means that each topic is considered as a separate section and is drafted by relevant specialists.

The EIAR is divided into three Volumes as follows:

| | |
|---|---|
| **Volume I**: | Non-Technical Summary |
| **Volume II**: | Main Environmental Impact Assessment Report |
| **Volume III**: | Appendices to the Main Environmental Impact Assessment Report |

Volume II is presented in the following Chapters of this report.

McCutcheon Halley Planning Consultants (MH Planning) are the planning consultants and project co-ordinators of the EIAR. The EIAR structure and consultant responsible for each of the chapters is set out in Table 1.1.

## 1.3 Design Team and Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, Cumnor Construction Ltd., engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters, the consultant firms and lead authors are listed in the Table 1.1 below. Information on the competency of the relevant consultant is provided at the start of each chapter.

Table.1.1 List of Consultants and Responsibility

| Consultant | Chapters prepared |
|---|---|
| McCutcheon Halley Planning, 6 Joyce House, Barrack Square, Ballincollig, Cork.<br>Tel: (021) 4208710 | Chapter 1 Introduction<br>Chapter 13 Population and Human Health<br>Chapter 14 Significant Interactions<br>Chapter 15 Summary of Mitigation and Monitoring |
| Geraldine Coughlan Architects, Ard Na Greine, Bridges Street, Teadies Lower, Enniskean, Cork<br>Tel: (023) 8822688<br>e-mail: info@gca.ie | Chapter 2 Project Description<br>Chapter 3 Alternatives Considered |
| Cathal O' Meara Landscape Architects, 2 McSweeney Street, Fermoy, Co. Cork.<br>Tel: (087) 9202549<br>e-mail: info@cathalomeara.com | Chapter 4 Landscape and Visual Impact |
| MHL Consulting Engineers, 10 High St, Ballinlough, Cork.<br>Tel: 353 21 4840214<br>Email: info@mhl.ie | Chapter 5 Material Assets: Traffic and Transportation |
| Walsh Design Group, The Mall, Maryborough Woods, Douglas, Cork<br>Tel: (021) 4774940<br>E-mail: reception@wdg.ie | Chapter 2 Project Description<br>Chapter 6 Material Assets – Services, Utilities and Infrastructure |
| Viridus Consulting Limited.<br>Gaia House, Cloghphilip, Blarney Co. Cork<br>Mobile: 087 6503582<br>e-mail: darragh.musgrave@viridus.ie | Chapter 7 Soils and Geology<br>Chapter 8 Hydrology and Hydrogeology |
| Kelleher Ecology Services Ltd,<br>e-mail: info@kelleherecologyservices.ie | Chapter 9 Biodiversity |
| AWN Consulting, The Tecpro Building, Clonshaugh Business & Technology Park, Dublin 17, Ireland.<br>Tel: 353(0)1 8474220<br>e-mail: info@awnconsulting.com | Chapter 10 Noise and Vibration<br>Chapter 11 Air Quality and Climate<br>Chapter 16 Major Accidents Screening |
| Louise Harrington, Whitethorn, Douglas Road, Cork<br>Tel: (085) 7481769<br>e-mail: louise@louiseharrington.com | Chapter 12 Cultural Heritage and Archaeology |
| Innovision, Sligo Airport Business Park, Strandhill, Sligo<br>Tel: 353 (0)21 230 7043<br>e-mail: info@innovision.ie | Photomontages |

### 1.3.1 Difficulties Encountered in Compiling Information

No difficulties were encountered in compiling information for this chapter of the EIAR.

## 1.4 Scoping and Public Consultation

The EIAR was scoped following an appraisal of the EPA guidelines of information to be contained within the EIAR, through design team meetings with the specialist consultants and the formal S247 Meeting on 20th November 2019 held at the offices of Cork County Council.

The EIAR was also informed by the Inspector's Report and Opinion received from An Bord Pleanála during the Pre-Application Consultation process (Ref: ABP-310351-21).

Prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government's EIA Portal (Portal I.D 2022055). The purpose of this tool is to inform the public, in a timely manner, of applications that are accompanied by an EIAR. A dedicated EIA portal number has been assigned to the project which has been submitted as part of the SHD application.

A dedicated website has been created for this project and is available here;

https://fermoyshd.ie/

Projects considered for their potential cumulative impacts with the proposed development are identified in Table 1.2. Within the EIAR other disciplines may have identified further projects which are considered to be relevant to their assessments.

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

**Prescribed Bodies / Agencies**

1) Department of Culture, Heritage, & the Gaeltacht (Development Applications Unit)
    I. National Monuments Services;
    II. National Parks & Wildlife Service (NPWS);
2) Department of Education;
3) Geological Survey Ireland;
4) The Heritage Council;
5) Office of Public Works (OPW);
6) Transport Infrastructure Ireland (TII);
7) The National Transport Authority (NTA)
8) The Health and Safety Authority;
9) The Health Service Executive (HSE);
10) Inland Fisheries Ireland;
11) Bat Conservation Ireland;
12) Irish Water;
13) An Taisce;
14) Environmental Protection Agency

At the time of Submission of the EIAR four responses had been received from the following prescribed bodies and are summarised below. The responses are presented in full in Appendix 1.1;

- Health Service Executive (HSE) on 09th September 2021;
- Transport Infrastructure Ireland (TII) on 23rd July 2021;
- Geological Survey of Ireland (GSI) on 27 August 2021; and
- Inland Fisheries Ireland (IFI) on 17th August 2021.
- Irish Water on 12th August 2021

**TII**: The TII recommended that the developer should have regard, inter alia, to the following;

- Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to the locations of existing and future national road schemes in the vicinity.

- TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads), in the proximity of the proposed development.
- It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads.

TII's Traffic and 'Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA.

Transport analysis should also consider:

- All road users, not just private cars.
- Modal share targets should be outlined and how any PT/Walking/Cycling modal share is to be accommodated.
- Measures proposed to reduce car dependency should be outlined.
- Consider and address cumulative impacts of other development and impacts on national road capacity.
- A mobility management plan for the development to accompany the transport assessment.

- The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.

- The developer should have regard to any Environmental Impact Statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts.

- The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works).

- The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes '(National Roads Authority (NRA), 2006).

- The EIAR should consider the 'Environmental Noise Regulations 2006' (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority (see 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (1st Rev., NRA, 2004)).

**HSE**: The HSE submission recommended that the developer should have regard, inter alia, to the following:

- The design characteristics of the project and the reasons for proposing same should be outlined. It is recommended a diverse variety of household types is provided to offer people a range of lifestyle, affordability and life stage choices. The proposed residential development should incorporate the 'Universal Design' Principal to ensure the housing can meet the needs of the occupants regardless of their age, size, ability or disability. It is also recommended that the development proposals are assessed to ensure compliance with the objectives of the Draft Cork County Development Plan 2021.

- The EIAR should fully describe and consider any alternatives to this project. The applicant should outline a rational for the site selection and the proposed housing scheme design.
- The EIAR should describe measures the applicant took to inform the public about the project. Details of feedback from the public regarding the proposal should be included within the EIAR. Public consultation should be a two way process between the applicant and the public. The EIAR should clearly demonstrate how the legitimate concerns of the public have been assessed and evaluated and how the outcome of consultation with the public influenced decision making within the environmental impact assessment.
- The construction phase of the development creates the potential for temporary emissions which may have a negative impact on the environment and on the health of local residents. The applicant should assess the impacts of construction works having particular regard to:
    - Waste Management,
    - Pest Control Management,
    - Dust Impacts,
    - Excessive Noise
    - Emissions to Surface/Groundwater
- All sensitive receptors in the vicinity of construction works should be identified and measures implement to ensure they are protected. It is also recommended a Site Specific Construction Management Plan is prepared and included in the EIAR.
- Any natural flood plains or wetlands on or in the vicinity of the site should be identified and measures implemented to ensure they are protected from the development. The impact of the proposed SHD on watercourses/wetlands further downstream should be assessed.
- An integrated approach to surface water management should be implemented on the site. It is recommended that green space and nature based solutions are provided for the storage and conveyance of rainwater on site and to improve flood mitigation in line with the principals outlined in the Greater Dublin Strategic Drainage Study (SUDS).
- It is recommended the applicant ensures climate considerations are fully integrated into the planning of the strategic housing development and outlines how the proposed buildings contribute to climate action through their design. Specific measures which conserve energy consumption and reduce carbon emissions should be outlined in the EIAR.
- The applicant should assess the vulnerability of the proposed development against the predicted impacts of a warming climate and they should predict and should outline proactive adaption measures to ensure the long term resilience of the site infrastructure to the impacts climate change.
- It is recommended that measures to promote walking and cycling throughout the development are implemented along with proposals to ensure the connectivity of the site with the wider urban area. It is noted that play facilities are proposed to be provided. Recreational facilities should also be provided to cater specifically for the needs of adolescents and the elderly.
- It is recommended that the applicant assesses the impact of traffic from the proposed development by carrying out a traffic and transport assessment. An assessment of existing sustainable transport facilities and capacity in the vicinity of the proposed development should also be carried out. It is recommended that the applicant outlines a travel plan for the proposed development which will facilitate and promote the use of public or active transport options for residents.
- Green recreational space is proven to have positive impacts on health, both physical and mental. The recent global pandemic has highlighted the importance of access to open green space for recreational purposes for the public. The provision of quality, usable, urban green space is of paramount importance as housing design becomes more compact.

- The applicant should assess the impact the proposed strategic housing development will have on existing biodiversity in the area. The applicant should also assess the impact of any possible loss of recreational and amenity green area as a result of the proposed development.
- It is recommended that green planting is integrated at all opportunities throughout the development to improve the quality of the built environment and the applicant should outline a diverse range of green spaces for the development in the EIAR. The applicant shall also outline proposals to protect and promote biodiversity on the site.
- It is stated that the M8, Cork - Dublin motorway runs to the east of the site. It is recommended the applicant assesses the impact of noise from passing traffic on potential residents in the strategic housing development and carries out an evaluation of the significance of this impact in line with the health based guidelines as outlined by the WHO.
- The applicant should assess what significance the impact the increased population as a result of the proposed SHD will have on key infrastructure and community facilities and amenities in the town of Fermoy.
- The cumulative impacts of any other proposed housing developments in the vicinity should also be assessed.

**GSI:** The GSI submission contained the following recommendations;

- We identify there are no County Geological Sites (CGSs) in the vicinity of the proposed development;
- The groundwater data view indicated a 'Locally Important Aquifer – Bedrock which is moderately productive only in Local Zones' underlies the proposed development. The Groundwater Vulnerability map indicates the area is classified as 'Moderate' Vulnerability.
- We recommend that geotechnical database resources are used as part of any baseline geological assessment of the proposed development;
- We recommend that geohazards be taken into consideration, especially when developing areas where these risks are prevalent.
- Should any significant bedrock cutting be created, we would ask that thy will be designed to remain visible as rock exposure rather than covered with soil and vegetated in accordance with safety guidelines and engineering constraints.

**IFI**: The IFI submission recommended that the developer should have regard, inter alia, to the following:

- It appears it is proposed to dispose of septic effluent from the development to the public sewer. IFI would ask that Irish Water signifies there is sufficient capacity in existence so that it does not overload either hydraulically or organically existing treatment facilities or result in polluting matter entering waters. Should this not be the case then please forward proposals for alternative treatment and disposal options.
- IFI would ask that there be no interference with, bridging, draining, or culverting of any watercourse its banks or bankside vegetation to facilitate this development without the prior approval of IFI.

**IW**: IW submission recommended that the the following aspects of Water Services to be considered in the scope of an EIAR (where relevant):

- Where the development proposal has the potential to impact an IW Drinking Water Source the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to IWs Drinking Water Source during construction and operational phases of the development. It is a requirement of the Water Framework Directive that waters used for the abstraction of drinking water are protected so as to avoid deterioration in quality.

- Mitigation proposed for any potential negative impacts on any water source(s), in proximity including the environmental management plan and incident response.
- Any and all potential impacts on the nearby reservoir as public water supply water source is assessed, including any impact on hydrogeology and any groundwater/ surface water interactions.
- Impacts of the development on the capacity of water services - submit a Pre Connection Enquiry (PCE)
- In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an IW collection network
- The potential impact of surface water discharges to combined sewer networks & potential measures to minimise/stop surface waters from combined sewers
- Any physical impact on IW assets
- Any potential impacts on the assimilative capacity of receiving waters in relation to IW discharge outfalls including changes in dispersion /circulation characterises
- Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development or the potential of the development to influence/ present a risk to the quality of the water abstracted by IW for public supply.
- Where a development proposes to connect to an IW network consideration as to whether the integrity of the site/conservation objectives of the site would be compromised.
- Mitigation measures in relation to any of the above ensuring zero risk to any IW drinking water sources

## 1.5 Cumulative Impacts

The following projects have been considered for potential cumulative impacts in combination with the proposed SHD; Within the EIAR other disciplines may have identified further projects which are considered to be relevant to their assessments.

Table 1.2 Projects considered for Cumulative Impacts

| Proposal/Application | Planning Reference | Comment |
|---|---|---|
| Part 8 Housing Scheme 11 no. residential housing units at Uplands, Fermoy | Cork County Council Part 8 Application | Information at:<br>https://www.corkcoco.ie/en/Planning/Part-8-Development-Consultation/active-part-8-development-consultation |
| Retention for Internal woks for new technology room, sanitary rooms, 3 no. new classrooms, 1 no. new computer room at St. Colman's College, Monumental Hill, Fermoy | Planning Ref: 21/4049 | Permitted on 15th July 2021 |
| A) the change of use (through intensification of use) of part of an existing light industrial building currently used for the assembly and commissioning of stainless-steel vessels to provide for an electropolishing area within the building footprint; b) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor; and c) ancillary external site works to connect to the existing on-site sewer network. | Planning Ref: 20/6246 | Permitted by 07/12/2020 |
| The demolition of 2 No. dwelling houses and associated sheds/outhouses and the construction of 28 No. residential units and all ancillary site development works, including access, car/bike parking, bin storage and amenity areas | Planning Reference: 21/7241 | Under review by Cork County Council |
| To demolish existing pump canopy, shop and stores, for construction of valeting buildings, car wash, boundary fencing and 2 no. signs together with associated works. | Planning Reference: 19/6221 | Permitted by 11/6/2020 |

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# CHAPTER 2

## Project Description

# Volume II

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# Chapter 2 Project Description

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## Figures

# 2 Project Description

## 2.1 Introduction

This chapter was prepared by Anna Healy of Geraldine Coughlan Architects Ltd and Ian Reilly of Walsh Design Group, in conjunction with McCutcheon Halley Planning Consultants.

Anna Healy graduated from the University of Limerick with a B.Arch in Architecture in 2011 and completed her professional diploma in Architecture in University College Dublin in 2015. She has over 10 years' national and international experience in designing public, residential, healthcare and commercial projects.

Ian Reilly is a Civil & Structural Engineer who graduated from the Cork Institute of Technology in 2014. Ian has been involved in a variety of residential and commercial projects at their planning, design and construction stages. Ian is a member of Engineers Ireland and completed a post graduate Master’s degree in Structural Engineering in 2015

### 2.1.1 Reference to Guideline Relevant to Discipline

This chapter will set out a detailed description of the project together with details of the existing environment in accordance with Article 5(1)(a) of the 2011 Directive, as amended by Directive 2014/52/EU, the description of the proposal should comprise "...information on the site, design, size and other relevant features of the site".

### 2.1.2 Methodology

The methodology employed was a site visit and photographic survey, as well as desktop survey of Ordnance Survey Maps, Survey Drawings such as topographical surveys with the existing contours and landscaping features, aerial photographs and other relevant information, including the Cork County Development Plan 2014 and the Fermoy Municipal District Local Area Plan.

### 2.1.3 Difficulties Encountered in Compiling Information

There were no particular difficulties in compiling this information.

Figure 2.1 Connections

## 2.2 Description of Existing Environment

### 2.2.1 Site Location

The subject site is located south of Fermoy town, within the development boundary of the town, in the townland of Coolcarron. The development is within 1km of Fermoy Town Centre, providing local services such as shops, primary and secondary schools, a pre-school, creche, pharmacies, GPs and a post office. The development is within 700m of a bus stop where the 245-bus provides an hourly service between Cork City and Clonmel. Approximately 1.4km from the site the 768 Busaras route provides a 4 times daily service to Dublin. There is also easy vehicular access to the national road network, being within 1km of the Cork to Dublin Road (M8).

### 2.2.2 Site Context

The site is currently a green field site, with parts of the site being overgrown. It is bounded on the west by the main road to Fermoy town (R639), as well as private dwellings, commercial properties and an ESB facility. There is also an existing lay-by and weigh station on the western boundary, adjacent to the proposed entrance. There is a planted woodland and drainage ditch to the east of the site. The south of the site is bounded by agricultural land. St. Colman's College Sports Campus is to the north.

The site itself is made up of two existing field boundaries within the site, one a stone wall, and one of mature alder trees. There is an existing field boundary of native hedgerows surrounding the site. These native hedgerows define the existing field boundaries and these landscaping features are dealt with in the Landscape and Visual Impact Chapter (Chapter 4) and Biodiversity Chapter (Chapter 9)

There is an ESB line that currently cross the development site from just south of the southern boundary to the ESB substation.

The site is free from structures on the Record of Protected Structures and is not located within an Architectural Conservation Area (ACA). There are no sites on the Record of Monuments and Places (RMP) within the development area. The site is also not within a Special Area of Conservation (SAC) or a Special Protection Area (SPA).

## 2.3 Description of Proposed Development

The proposed development will contribute positively to Fermoy town and deliver much needed housing for the Cork area. The development will consist of:

336 no. residential units, comprising 242 no. dwelling houses and 94 no. duplex and simplex apartments as follows:

- 39 no. 1 bed apartments
- 55 no. 2 bed apartments
- 10 no. 2 bed dwelling houses
- 182 no. 3 bed dwelling houses
- 46 no. 4 bed dwelling houses
- 4 no. 5 bed dwelling houses
- 602 no. car parking spaces for residential units, bicycle storage for each duplex & simplex building

The development will also consist of 1) Communal bin storage for each apartment building 2) Open space of c. 1.7 hectares including play areas 3) landscaping works with public lighting and provision for potential pedestrian connections to lands to the west and north 4) Pedestrian access from main entrance 5) Biodiversity corridor along the east of the site, 6) the proposed alteration to the Barrymore-Coolcarron 38kv line. The proposed alteration will involve the undergrounding of a section of the above mentioned overhead 38kV line to facilitate the housing development and the realignment of approximately 13.6 metres of 38kv overhead line 7) a creche (gross floor area 587m2), providing 86 child places, along with associated play area and car parking. Please refer to Appendix 2.1 for Schedule of Accommodation.

The total site area is 11.56 hectares with a net developable area of 11.22 hectares. The site layout is shown in Figure 2.2.

**Figure 2.2 Site Layout Plan**

### 2.3.1 Connectivity and Access

The main entrance to the development is from the R639 which is located on the western boundary of the site. This entrance provides vehicular, pedestrian and cycle access. The development is within 1km of Fermoy Town Centre and within 700m of a bus stop with access to Cork City (as shown in Figure 2.1), as well as vehicular access to the national road network, being within 1km of the Cork to Dublin Road (M8). A pedestrian and cycle route runs from the main entrance on the west to the ecological corridor on the east, and then north through the ecological corridor before turning west again, allowing for potential connection to the future development to the west. Ease of access for pedestrians to play areas and public open space has been priorities throughout the scheme.

Within the site, the internal connections will provide easy access from the dwellings to the proposed amenities which also provide passive surveillance and promote active neighbourhoods.

#### 2.3.1.1 Parking

The proposed development provides for an entrance at the western boundary and the development will provide a well-connected street network within the proposed scheme. Car parking space are provided as follows: 2 no. spaces per house, 1 no. space per duplex/simplex and 1 no. visitor space per 4 duplexes/simplexes. This provides a total of 602 car parking spaces for residential units. Electric charging facilities will be provided for within the proposed scheme.

In addition to this, bicycle parking has been provided as follows: 1 no. bike space per duplex/simplex bedroom and 1 no. visitor space per 2 duplexes/simplexes. Visitor bike parking is located in open and overlooked areas, while resident bike spaces are provided in gated storage.

There are a total of 47 visitor bicycle spaces and 149 resident bicycle spaces proposed as part the development. Creche parking has been provided as 1 space per 3 no. staff and 1 space per 10 no. children, giving a total of 15 spaces, with electric charging facilities provided for.

### 2.3.2 Development Principles

The overall form of the scheme was developed around existing features of the site. The planted woodland and drainage ditch to the east informed the decision to maintain a green edge along this boundary, which has been further developed as a wildflower meadow and pedestrian route.

The urban edge to the north of the site, close to Fermoy town, led to the siting of higher density apartment buildings in this area. These duplex apartments are 2 and a half and 3 storeys in height.

Three storey duplex buildings are clustered around the central core, creating an urban heart to the scheme, with these buildings overlooking a large green area.

The proposed development includes the provision of a childcare facility. The creche is located beside the main entrance, providing easy access both by car and on foot.

Lower density housing is provided outside of duplex clusters. Simplex apartments, terrace houses, semi-detached and detached houses are 2 storeys. A variety of housing types have been provided, forming neighbourhood clusters, and creating distinctive areas within the scheme. The scheme is split into 2 architectural finishes. To the south there is a strong brick elevational treatment, while to the north there is an emphasis on painted render finish.

Public open space is dispersed throughout the scheme, influenced by the existing site features. Existing mature alder trees created a linear green area just below the main entrance. Several play areas have been dispersed throughout the scheme, with easy access from neighbouring dwellings.

Pedestrian permeability is prioritised in the layout, with pedestrian routes following desire lines through public open space.

## 2.4 Services

### 2.4.1 Surface Water Network

The overall drainage system has been designed in 6 separate networks due to the topography of the site and the proposed street layout. The proposed SuDS elements in the proposed design are; proprietary permeable paving, tree pits and filter drains, water butts, subsurface EcoCell attenuation tanks, hydrocarbon interceptors and hydrobrakes on each outfall. It is also proposed to retain the wetland area in the east of the site as described in Chapter 9 by Kelleher Ecology Services. It is proposed to discharge the attenuated surface water runoff from the completed networks into the existing open drainage channels in the site which in turn discharge to the River Blackwater.

### 2.4.2 Wastewater Network

The network is a conventional piped, gravity sewer flowing to a wastewater pumping station in the East of the site from which it is proposed to pump the wastewater, via rising main, to the public wastewater sewer in the R639.

### 2.4.3 Watermain Network

It is proposed that a connection to the existing Irish Water infrastructure will be made in the R639 road. Private properties will each have a separate service connection, fitted with an Irish Water approved boundary box immediately outside the boundary. Fire hydrants are placed so that no domestic property within the development is more than 46m from a hydrant.

### 2.4.4 Road Network

The sole vehicular access to the development is via the entrance from the R639. A link street at the main entrance provides access to the north and south of the site before becoming local streets for main routes. Shared surfaces have been used wherever possible to create home zones.

### 2.4.5 Electricity Supply

It is proposed to underground the 38kV cables that are currently overhead from the southern boundary to the ESB distribution facility to the west of the site. The works proposed include the construction of a new steel mast near the southern boundary at which the overhead cables coming from the South would be diverted underground. Should permission be granted a separate diversion agreement shall be entered into with ESB networks to have the 10kV/20kV overhead lines existing on site rerouted to suit the proposed layout.

### 2.4.6 Communications

Telecoms ducting and cables will be laid within the development site during the construction stage. Prior to the operational phase of the development this internal network will be connected to the local infrastructure of one or more of the telecoms providers in the area.

### 2.4.7 Construction Activities and Phasing

It is proposed to construct the development in 5 phases generally progressing from the south to the north of the site. Refer to Figure 2.3 for Phasing Plan. In terms of the Delivery of the Phases of Development the following will be the key stages in each phase:

- Stage 1a – Site Set Up

This task will take up to c. 3-5 weeks to complete, depending on the size of the phase, with approximately up to 5 staff employed and will involve installation of construction phase surface water swales and settlement ponds, site clearance, set up site offices and contractor's compound and secure the construction site and erection of signage for site security purposes.

- Stage 1b – Setting out of sites and provision of services

Given the significant work involved in the provision of drainage services this stage will involve significant work and is estimated to take between 6-10 weeks per phase and will run in tandem with phase 1c below and will involve up to 20 construction staff. This will involve the laying of new sewers, water mains, electrical, telecoms and lighting ducts within the site and the setting out of footpaths, lighting and roadways as well as the buildings and their boundaries. As part of any works (i.e. provision of services) along the public areas/roads in the vicinity of the site, it will be ensured that the surface of the roads/areas will be re-instated to the satisfaction of Cork County Council.

The wastewater treatment plant will necessarily be constructed in Phase 1 and be operational before any dwellings on the site are occupied.

The surface water sewer including gullies, attenuation tanks, aquabrakes and outfalls shall be completed for each phase prior to any dwellings being occupied and runoff from all hardstanding areas shall be accommodated in the surface water network. The new works proposed, to lay a new 750mm dia. pipe to link the drainage channel north of the site westward to the existing public sewer in Devlin Street, shall also be completed in Phase 1 of the development.

- Stage 1c – Construction of Residential Units

The construction of the residential units will, to a certain degree, respond to the demand/sale of the units involved, however there is a strong demand for housing in Cork and it is anticipated that the construction progress will reflect this strong demand and that the units in each phase will be constructed/completed over a 1-2 year period (depending on phase size) and will involve up to 60 construction staff (depending on the number of units being constructed at any one time).

It is envisaged that the housing units will generally be developed on a sequential basis starting with the southern portion of the site and moving towards the north with each phase. This phasing will allow the construction compound and access to be provided in the northern part of the site without impacting on the constructed/completed units.

#### 2.4.7.1 Earthworks

The development of the subject site will require the stripping of top soil and the excavation or fill of ground to formation level. The earthwork cut and fill volumes are described in more detail in Chapter 6 – Material Assets – Services, Infrastructure and Utilities of the EIAR and in the preliminary Construction Demolition Waste Management Plan (CEMP), 19074-ER-04, accompanying this Strategic Housing Development application. The CEMP also includes measures to minimise the dust and noise raised by construction activities and the hours during which construction activities will be permitted on the site.

#### 2.4.7.2 Construction Traffic Management

Construction activities and vehicle movements shall be in accordance with the Construction Environmental Management Plan (CEMP), Construction and Demolition Waste Management Plan (CDWMP) and the Construction Traffic Management Plan (CTMP), all formulated by the appointed Main Contractor and overseen by their Construction Manager and Waste Manager in order to minimise any impact on the existing environment and the surrounding area.

An estimation of the maximum daily vehicle movements is as follows:

Construction Workers / Site Staff - Maximum number of 60 per day, generating 140 traffic movements,

Net Importation of fill material - As required, less than 20 loads per day, generating 40 truck movements, General Construction materials delivery (truck/ Van) - On average 15 deliveries per day, generating 30 traffic movements,

Construction Waste Removal - When required, less than 40 loads per day, generating 80 truck movements.

#### 2.4.7.3 Construction Surface Water Management

The Surface water runoff during the construction stage of the development will be managed by limiting the topsoil strip to a phase by phase sequence and limiting its extent as much as possible. Measures such as; settlement ponds, silt fencing and sediment traps will be used to reduce the suspended sediment in runoff and good housekeeping measures such as bunding of hydrocarbon stores will prevent the contamination of runoff. The management of surface water runoff is addressed in more detail in the Civil Engineering Report, 19074-ER-01, accompanying this application.

#### 2.4.7.4 Flood Risk

A desktop study of the flood history at the site was carried out. There are no records of any flooding in this area of Fermoy in the OPW's floodinfo.ie database of maps and the development lies outside all flood zones shown in the Local Area Plan for the Fermoy Municipal District.

Fermoy Town is known to be susceptible to flooding but the projected flood extents shown in the CFRAM River Flood Extents maps are localised in the lower lying areas of the town near the river and do not extend southwards to the proposed site which is significantly elevated above the river level.

**Figure 2.3 Phasing Plan**

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 3

## Alternatives Considered

# Volume II

Environmental Impact Assessment Report

Building & Civil Engineering Contractors

April 2022

CHARTERED PLANNING CONSULTANTS

# Chapter 3 Alternatives Considered

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## Figures

# 3 Alternatives Considered

## 3.1 Introduction

### 3.1.1 Author Information and Competency

This chapter of the EIAR was prepared by Anna Healy of Geraldine Coughlan Architects Ltd. Anna graduated from the University of Limerick with a B.Arch in Architecture in 2011 and completed her professional diploma in Architecture in University College Dublin in 2015. She has over 10 years' national and international experience in designing public, residential, healthcare and commercial projects.

### 3.1.2 Reference to Guidelines Relevant to Discipline

Annex IV of the EIA Directive 2014/52/EU requires the consideration of alternatives within EIAR to contain the following:

> *"a description of the reasonable alternatives studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

A number of alternatives were developed and discussed with the developer and design team before arriving at the chosen solution. This section provides an outline of the main alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account the environmental effects. For the purposes of the Regulations, alternatives may be described under the follow headings:

i. Do-nothing Alternative
ii. Alternative Locations
iii. Alternative Designs
iv. Alternative Processes

The following text provides information on the consideration of alternatives and mitigation measures are considered where appropriate in the EIAR technical chapters.

### 3.1.3 Methodology

Methodology is detailed within Chapter 2 Project Description of the EIAR.

### 3.1.4 Difficulties Encountered

The scheme has gone through many different iterations, and challenges have been resolved with the design team. The location of the site between a rural and urban area has presented challenges in providing an appropriate density for the zoning, while also respecting the rural edge to the south of the site. The undergrounding of an overhead ESB line has impacted the layout, with units being relocated to allow for the clearance distances required.

## 3.2 Description of Existing Environment

A detailed description of the existing environment is provided in Chapter 2 Project Description.

## 3.3 'Do-nothing' Scenario

The site is zoned FY-R-08 (medium A density residential development) under the Fermoy Municipal District Local Area Plan 2017, and as such, consideration of alternative sites is not necessary. The consideration of an alternative location would equate to a ‘do-nothing’ alternative for the subject site and the site would become overgrown and unkept. This would mean that these residential zoned lands would not be developed in accordance with the objectives of the Local Area Plan and would be contrary to the Councils objectives to promote residential land use at this site. This in turn would have the knock-on impact, creating pressure to develop unzoned, unserviced or remote sites. This is not in line with National, Regional or Local plan policies which require the efficient use of zoned land. Furthermore, these lands are considered suitable for development due to their proximity to existing public transport facilities, services, and community facilities.

A 'do nothing' approach would likely result in a neutral impact on the environment in respect of material assets, land, water, air, climate, cultural heritage, biodiversity and landscape.

## 3.4 Alternative Location

The site is zoned for Medium A density residential development under the Fermoy Municipal District Local Area Plan 2017 and the development of the site is consistent with the core strategy of the Development Plan.

At this location, the proposed scheme will deliver significant additional public and private housing in a range of house types in a consolidated and accessible urban neighbourhood which will be supported by ancillary community facilities and public open spaces. The site is well connected to Fermoy town which will also ensure that the future residents will benefit from the existing shops and facilities which are available in the area.

As such, it is considered that the site is entirely suitable for the nature of the development as proposed in the application and it was not considered necessary to consider alternative sites.

## 3.5 Alternative Layouts and Designs

The key character areas and features of the site were established at an early stage and informed all design options considered. The planted woodland and drainage ditch to the east informed the decision to maintain a green edge along this boundary. The urban edge to the north of the site led to the siting of higher density duplex buildings in this area. A number of proposals were considered for the integration of the existing stone field boundary in the centre of the site into the overall design. As the design evolved the central core developed as a strong character area, with the duplex buildings surrounding a central green square. Below is a selection of the alternative layouts considered.

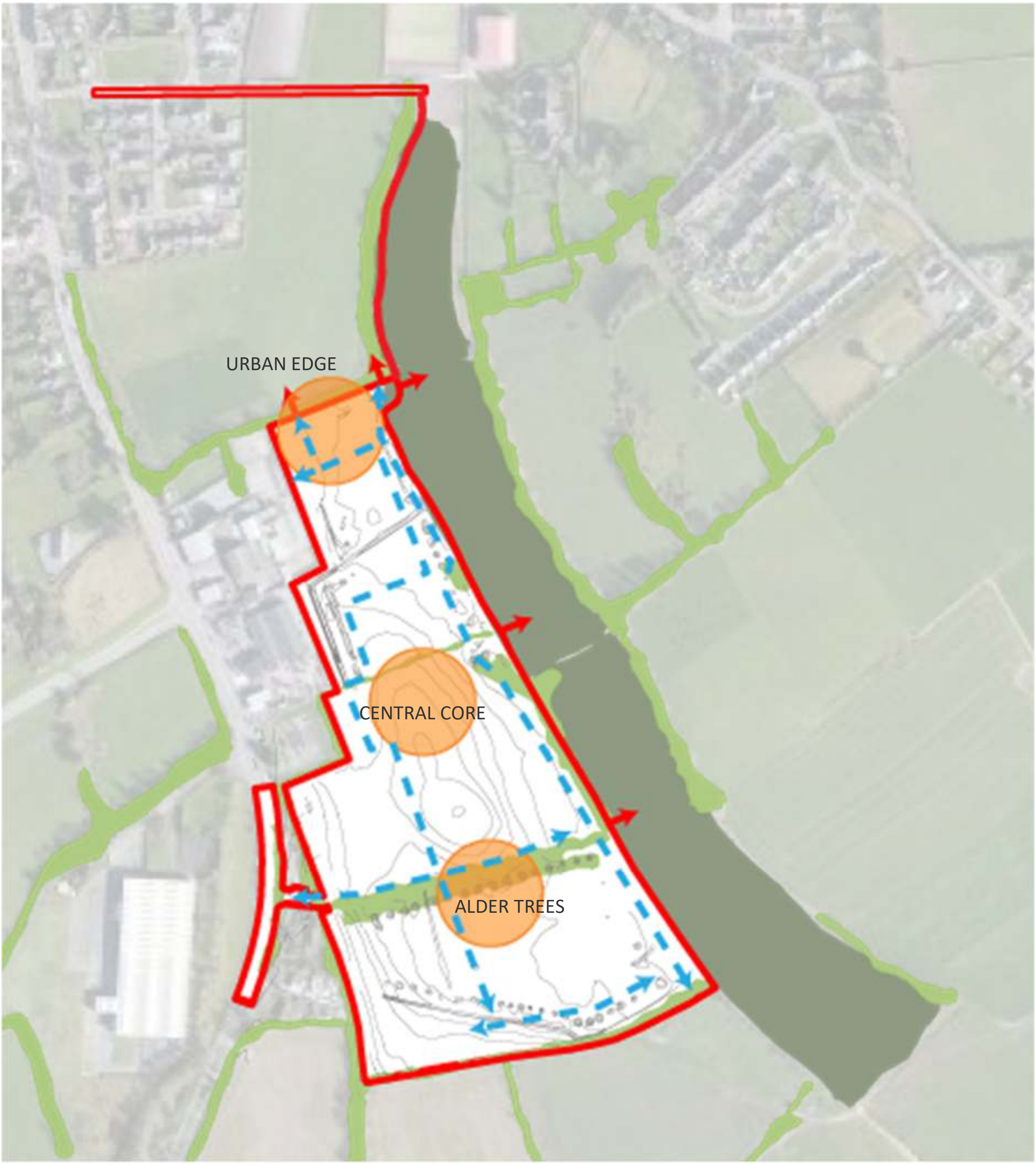

**Figure 3.1** **Character Areas & Pedestrian Links**

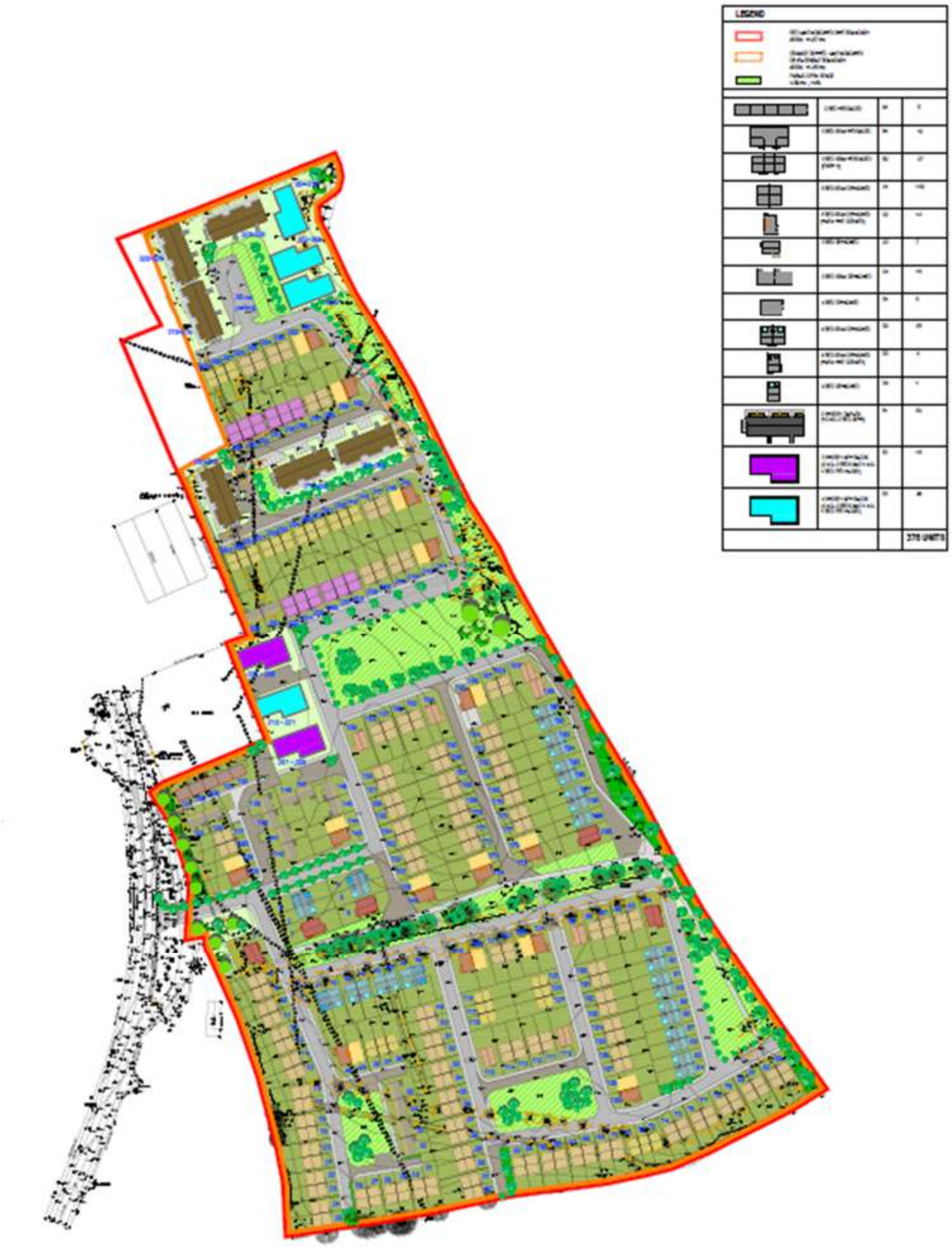

Figure 3.2 Option A

### 3.5.1 Option A

This option comprised 375 units, 126 of which were apartments or duplex apartments. Apartments were located to the north of the site, and adjoining a large green area, incorporating the existing stone wall. Duplex buildings were 2 storeys in height, while apartment buildings were 3 and 4 storeys.

#### 3.5.1.1 Environmental Effects

The scheme does not provide sufficient routes through the development for pedestrians. Therefore, it can be expected that residents would depend on cars even for short trips. This car dependency would increase greenhouse gas emissions, air pollution and traffic congestion. It would also contribute to sedentary lifestyles with a negative impact on public health.

Figure 3.3: Option B

### 3.5.2 Option B

Option B comprised 373 units, 136 of which were apartments or duplex apartments. Duplex buildings were increased to 3 storeys in height. A Creche was added to the south of the site entrance and a pedestrian link was added to St. Colman's College.

### 3.5.2.1 Environmental Effects

This option increased the provision of open-space, and connections to neighbouring services. The provision of a creche close to the entrance provides easy access for residents and eliminates the need to travel by car to alternative childcare facilities. The increase in the height of duplex building results in more efficient land use.

| REF | SUB | QUANTITY | TOTAL |
|---|---|---|---|
| 5 BED DETACHED | A1 & A1.1 | 3 | |
| | | | 3 |
| | | | |
| 4 BED SEMI | B1 & B1.1 | 22 | |
| 4 BED SEMI | B2 & B2.1 | 6 | |
| 4 BED DETACHED | B3 & B3.1 | 4 | |
| 4 BED 3 STOREY SEMI | B4 & B4.1 | 6 | |
| 4 BED 3 STOREY SEMI | B5 & B5.1 | 2 | |
| 4 BED 3 STOREY DETACHED | B6 & B6.1 | 2 | |
| 4 BED DETACHED | B7 | 1 | |
| 4 BED SEMI (PART V) | B8 | 2 | |
| | | | 48 |
| | | | |
| 3 BED SEMI | C1 & C1.1 | 68 | |
| 3 BED SEMI CORNER | C2 & C2.1 | 7 | |
| 3 BED MID TERRACE | C3 | 6 | |
| 3 BED TERRACED (PART V) | C4 & C4.1 | 6 | |
| 3 BED END OF TERRACE | C5 & C5.1 | 4 | |
| 3 BED TERRACED | C6 | 3 | |
| 3 BED (PART V) SEMI | C7 | 4 | |
| 3 BED SEMI | C8 | 10 | |
| 3 BED SEMI | C9 | 19 | |
| 3 BED TERRACED | C10 | 3 | |
| 3 BED TERRACES | C11 | 6 | |
| 3 BED SEMI CORNER | C12 & C12.1 | 5 | |
| 3 BED DETACHED | C13 | 1 | |
| 3 BED MID TERRACE | C14 | 1 | |
| | | | 162 |
| | | | |
| 2 BED MID TERRACE | D1 | 2 | |
| 2 BED SEMI | D2 | 2 | |
| 2 BED TERRACED (PART V) | D3 | 6 | |
| 2 BED SIMPLEX APARTMENTS | D4 | 4 | |
| 2 BED SIMPLEX APARTMENTS | D5 | 6 | |
| 2 BED SIMPLEX APARTMENTS | D6 | 8 | |
| 2 BED SIMPLEX APARTMENTS | D7 | 8 | |
| | | | 38 |
| | | | |
| 2 BED / 3 BED DUPLEX | E1 | 5 NO. 2 BED, 5 NO. 3 BED | |
| 2 BED / 3 BED DUPLEX | E2 | 6 NO. 2 BED, 6 NO. 3 BED | |
| 2 BED / 3 BED DUPLEX | E3 | 6 NO. 2 BED, 6 NO. 3 BED | |
| 2 BED / 3 BED DUPLEX | E4 | 5 NO. 2 BED, 5 NO. 3 BED | |
| | | | 44 |
| | | | |
| 1 BED / 2 BED APARTMENTS | G1 | 21 NO. 1 BED | |
| | | 16 NO. 2 BED | |
| | | | 37 |
| | | | |
| 1 BED / 2 BED APARTMENTS | H1 | 14 NO. 1 BED | |
| | | 8 NO. 2 BED | |
| | | | 22 |
| | | | |
| 1 BED / 2 BED APARTMENTS | F1 | 7 NO. 1 BED | |
| | | 14 NO. 2 BED | |
| | | | 21 |
| TOTAL | | | 374 |
| | | | |
| | AREA | % | |
| SITE BOUNDARY | 11.23 HA | | |
| PUBLIC OPEN SPACE | 1.43 HA | 12.73% | |

**Figure 3.4:** Option C

### 3.5.3 Option C

Option C is the option submitted to An Bord Pleanála for formal consultation at Pre-Planning Consultation stage. It comprises 374 units, 150 of which are apartments or duplex apartments. This gives a density of 33 units per hectare. Apartment buildings are clustered to the north of the site, as well as around a central green area. The existing stone wall is incorporated into an apartment building. Green areas have been further expanded and enhance.

#### 3.5.3.1 Environmental Effects

This option was considered to provide appropriate density, while also providing ample green space, and preserving key characteristics of the site. Keeping higher buildings away from the western boundary of the site reduces the visual impact from the main road.

An Bord Pleanála believed the application required further consideration & amendment and recommended the following regarding the layout:

- Investigation of a pedestrian and cycle connection to the north and north-west.
- Further clarification of the impact of the vehicular access from the R639 on the garda weight bridge and lay-by.
- further consideration of residential amenity, having regard to the proportion of single aspect and north facing apartments, and internal unlit corridors in apartments buildings
- further consideration regarding Daylight and Shadow Impact Assessment
- scale of creche to be reviewed
- back-to-back relationship of particular units to be considered in relation to residential amenity
- relationship of Apartment block H1 to pedestrian path to north-east to be considered
- visual impact of apartment buildings to north to be reviewed when viewed from St. Coleman’s College
- Consideration to be given to the overall form and massing of block G1.

As well as the issues listed above, Cork County Council noted that green space was allocated disproportionately towards the north of the site.

LEGEND

| REF | SUB | QUANTITY | TOTAL |
|---|---|---|---|
| 5 BED DETACHED | A1, A1.1 & A2 | 4 | |
| | | | 4 |
| | | | |
| 4 BED SEMI | B1 & B1.1, B10, B10.1 | 31 | |
| 4 BED SEMI | B2 & B2.1, B9, B9.1 | 11 | |
| 4 BED DETACHED | B3 & B3.1 | 2 | |
| 4 BED SEMI (PART V) | B8 | 2 | |
| | | | 46 |
| | | | |
| 3 BED SEMI | C1, C1.1, C15, C15.1 | 78 | |
| 3 BED SEMI CORNER | C2, C2.1 | 2 | |
| 3 BED MID TERRACE | C3, C18 | 8 | |
| 3 BED TERRACED | C2.2,C2.3,C3.1,C3.2 | 8 | |
| 3 BED END OF TERRACE | C5 & C5.1 | 2 | |
| 3 BED TERRACED | C6 | 11 | |
| 3 BED (PART V) SEMI | C7/C16/ C21 | 6 | |
| 3 BED SEMI | C8 | 6 | |
| 3 BED SEMI | C9 | 18 | |
| 3 BED TERRACED | C10 | 6 | |
| 3 BED TERRACED | C11 | 12 | |
| 3 BED SEMI CORNER | C12 & C12.1 | 4 | |
| 3 BED DETACHED | C13 & C13.1 | 2 | |
| 3 BED END OF TERRACE | C17 | 1 | |
| 3 BED TERRACED | C19/C19.1/C18.2/ C19.3/ C15.2 | 11 | |
| 3 BED TERRACED CORNER | C20/C20.1 | 4 | |
| 3 BED TERRACED (PART V) | C22,C22.1 & C23 | 3 | |
| | | | 182 |
| | | | |
| 2 BED TERRACE | D3 | 6 | |
| 2 BED SEMI | D2 | 2 | |
| 2 BED MID TERRACE | D1 | 2 | |
| 2 BED SIMPLEX APARTMENTS | D4 | 8 | |
| | | | 18 |
| | | | |
| 1 BED / 2 BED DUPLEX | E1 | 4 NO. 1BED,<br>4 NO. 2 BED | 8 |
| 1 BED/ 2 BED DUPLEX | E1.1 | 5 NO. 1 BED,<br>5 NO. 2 BED | 10 |
| 1 BED / 2 BED DUPLEX | E2 | 8 NO. 1 BED,<br>8 NO. 2 BED | 16 |
| 1 BED / 2 BED DUPLEX | E2.1 | 4 NO. 1 BED,<br>4 NO. 2 BED | 8 |
| 1 BED / 2 BED DUPLEX | E2.2 | 6 NO. 1 BED,<br>6 NO. 2 BED | 12 |
| 1 BED/ 2 BED DUPLEX | E3.1 | 6 NO. 1 BEDS, 6 NO. 2 BEDS | 12 |
| 1 BED/ 2 BED DUPLEX | E3.2 | 6 NO. 1 BEDS, 6 NO. 2 BEDS | 12 |
| 2 BED DUPLEX | E4 | 8 NO. 2 BEDS | 8 |
| | | | 86 |
| TOTAL | | | 336 |

| | AREA | % | |
|---|---|---|---|
| SITE BOUNDARY | 11.56 HA | | |
| DEVELOPABLE AREA | 11.22 HA | | |
| PUBLIC OPEN SPACE | 1.7 HA | 15.2% | |
| PART V HOUSING | | | |

Figure 3.5: Option D

## 3.5.4 Option D

Option D is the final iteration of the scheme and is the proposed option which does not give rise to any significant adverse environmental impacts. It comprises 336 units, 94 of which are simplex or duplex apartments. Taller duplex buildings are clustered around a central green area and provides a high-quality residential development which responds appropriately to the site characteristics, opportunities and constraints. Permeability is a very important element of the scheme and is achieved by providing potential connections between the site and adjoining residential properties to the north west of the site. The overall development provides a good mix of houses which vary in configuration, size and style, which will meet the needs of the future residents of Fermoy.

#### 3.5.4.1 Environmental Effects

This option provides a lesser, but still appropriate density of 30 units per hectare. The ecological corridor along the eastern boundary is further strengthened in this layout. Visual impact is reduced, with a maximum height of three storeys, and buildings being smaller in scale.

This layout addresses the issues raised by An Bord Pleanála. There were concerns about daylight in apartment units, north facing units and the massing of the buildings, as well as the visual impact of the apartments to the north and their orientation in relation to the pedestrian path to the north-east. Apartments with communal circulation have been omitted in favour of own door duplex and simplex units that are all dual aspect. Potential pedestrian and cycle connections to the north and north-west have been allowed for. The relationship between the main entrance and the garda weight bridge and lay-by has been reviewed and altered. The scale of the creche has been increased, with an upper floor being added. Overlooking issues between units have been resolved. The areas of public open space to the south of the site have been increased, with green space more evenly distributed throughout the site.

## 3.6 Alternative Processes

The residential units will be designed to comply with TGD L 2019 Conservation of Fuel and Energy – Dwellings, including requirements for Nearly Zero Energy Building (NZEB). A Building Energy Rating (BER) of A2 is to be achieved. Low maintenance cladding materials are proposed to minimize the impact of façade maintenance. Brick is proposed for duplex/simplex buildings, while a mix of brick and render are proposed for houses.

## 3.7 Cumulative Impact

As noted, the proposed scheme does not give rise to any significant adverse environmental impacts. It is considered that the proposed scheme in general achieves a better result in terms of impact on the environment that the other design options previously considered. The strong biodiversity corridor would have a positive impact on biodiversity and human health. Improved pedestrian and cycle routes would lead to less car dependence and would have a positive impact on human health. Reduced car dependence would reduce traffic impact compared to other layouts.

## 3.8 Mitigation Measures

These are provided throughout the various chapters in the EIAR and no alternative mitigation measures were considered in the preparation of this chapter.

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 4

## Landscape and Visual Impact Assessment

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 4 Landscape and Visual Impact Assessment

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## Tables

# Figures

# 4. Landscape and Visual Impact Assessment

## 4.1 Introduction

Cathal O'Meara Landscape Architects have prepared a Landscape and Visual Impact Assessment of the proposed development which forms part of the overall EIAR, which seeks to construct a Strategic Housing Development at Coolcarron (townland), Fermoy, Co. Cork comprising:

- The construction of 336 no. residential units comprising 242 dwellings houses (comprising a mix of 5, 4, 3 and 2 bed detached, semi-detached and townhouse/terraced units) and 94 no. duplex/simplex units (comprising a mix of 1 and 2 bed units);
- A 587m2 creche/childcare facility;
- The provision of landscaping and amenity areas to include 4 no. flexible open space areas with natural play features, a linear green route with a 3m wide shared surface path running along the western boundary and a number of informal grassed areas;
- Public Realm upgrades along the R639, including a shared footpath and cycleway, a 4m toucan crossing with tactile paving;
- The proposed alteration to the Barrymore-Coolcarron 38kv line. The proposed alteration will involve the undergrounding of a section of the above mentioned overhead 38kV line to facilitate the housing development and the realignment of approximately 13.6 metres of 38kv overhead line. The proposed alterations will comprise of one (1) 12 metre Type "F" lattice steel end terminate mast structure and one (1) 38kV cable sealing ends. The proposed retirement of 282 metres of overhead conductors and one (1) type "F" Lattice steel mast structure , one (1) Type "C" light angle strain structure and one (1) Type "B" portal suspension structure; and
- All associated ancillary development including vehicular access on to the R639 road, 2 no. access gates to the existing weighbridge and associated ancillary development, lighting, drainage, boundary treatments, bicycle & car parking and bin storage.

A Landscape and Visual Impact Assessment (LVIA) describes the existing receiving environment, contiguous landscape and the methodology utilised to assess the impacts. It assesses the visual extent of the proposed development and its visual effects on key views throughout the study area. It describes the landscape character of the application site, together with the visibility of the site from significant viewpoints in the locality. The report summarises the impact of the proposed development on the visual and landscape amenity of the application site and contiguous area.

The site is located on the outskirts of Fermoy Town, Co. Cork. As such this assessment looks at the planning context for the site as well as the landscape context for the wider area.

This report has been prepared in tandem with a series of Landscape drawings of the proposed development and is included as Appendix 4.1 to this report. (in A3 format). A series of Photomontages of the site from the selected viewpoints has been included, please refer to Appendix 4.2. These location are the subject of the assessment in Section 6 of this report.

### 4.1.1 Author Information and Competency

Cathal O'Meara Landscape Architects were commissioned to conduct the Landscape and Visual Impact Assessment of the site and its environs. Cathal O'Meara undertook this Assessment. Cathal has studied, taught and practiced Landscape Architecture at a Masters level for 15 years. Cathal is a Chartered Landscape Architect and Member of the Irish Landscape Institute. Prior to establishing Cathal O'Meara Landscape Architects in 2010 Cathal worked as a consultant in Saudi Arabia, Dubai, Guatemala, Norway and the UK. Cathal also holds a graduate Degree in Industrial Design where he was awarded a first-Class honours from the National College of Art and Design in 2002.

### 4.1.2 Guidance and other information used in the Landscape and Visual Impact Assessment

This Assessment follows best practice advisory guidelines set out in the following guidance documents:

- Guidelines for landscape & Visual Impact Assessment" 3rd Edition, published by the Landscape Institute (UK), - (2013).
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017)
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)

This assessment has regard to related documents, specifically

- Cork County Development Plan 2015-2021
- Draft Cork County Development Plan 2022-2028
- Cork County Draft Landscape Strategy (2007)

### 4.1.3 Methodology

This methodology includes a desktop analysis of the existing landscape area, including specific designations and land use patterns. Several site visits were undertaken to assess the likely visibility and consequent visual impact of the proposed development. Cathal O'Meara Landscape Architects undertook these during 2019, 2020 and 2021 from the site and from the roads in the vicinity on several days as indicated in the attached map. The conditions were clear with good visibility.

The following maps were included as part of the desktop review and were also used as field references.

- Ordnance Survey Map 1:2500 – 3959-C
- Ordnance Survey Map 1:10560 – CK038

#### 4.1.3.1 Assessment of Landscape and Visual Effects.

Landscape and Visual Effects are considered as separate items and assessed as part of this report. Whereas Landscape Effects are considered in terms of the landscape character, Visual Effects refer to changes which occur with respect to specific views.

The methodology for determining the significance of the landscape and visual impacts is based on the Guidelines for Landscape and Visual Impact Assessment (2013). This is distinguished by the following criteria.

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area or feature) can "accommodate changes or new features without unacceptable detrimental effects to its essential characteristics". This is outlined in Table 4.1.

**Table 4.1 Categories of Landscape Sensitivity**

| Sensitivity | Description |
|---|---|
| High | Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level where the principal management objectives are likely to be considered conservation of the existing character |
| Medium | Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use. |
| Low | Areas where the landscape character exhibits a higher capacity for change from development. Typically this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement , repair and restoration |
| Negligible | Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value. |

### 4.1.3.2 Magnitude of Landscape Impacts

The magnitude is a crucial measurement to assess the landscape impact to which change is perceived. The same element can impact visual receptors to different degrees depending on proximity, orientation and landscape context.

Table 4.2 Magnitude of Landscape Impacts

| Magnitude | Description |
|---|---|
| High | Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality. |
| Medium | Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality. |
| Low | Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements. |
| Negligible | Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable. |

The interplay between these criteria enable classification of the Significance of the effects as per the table below.

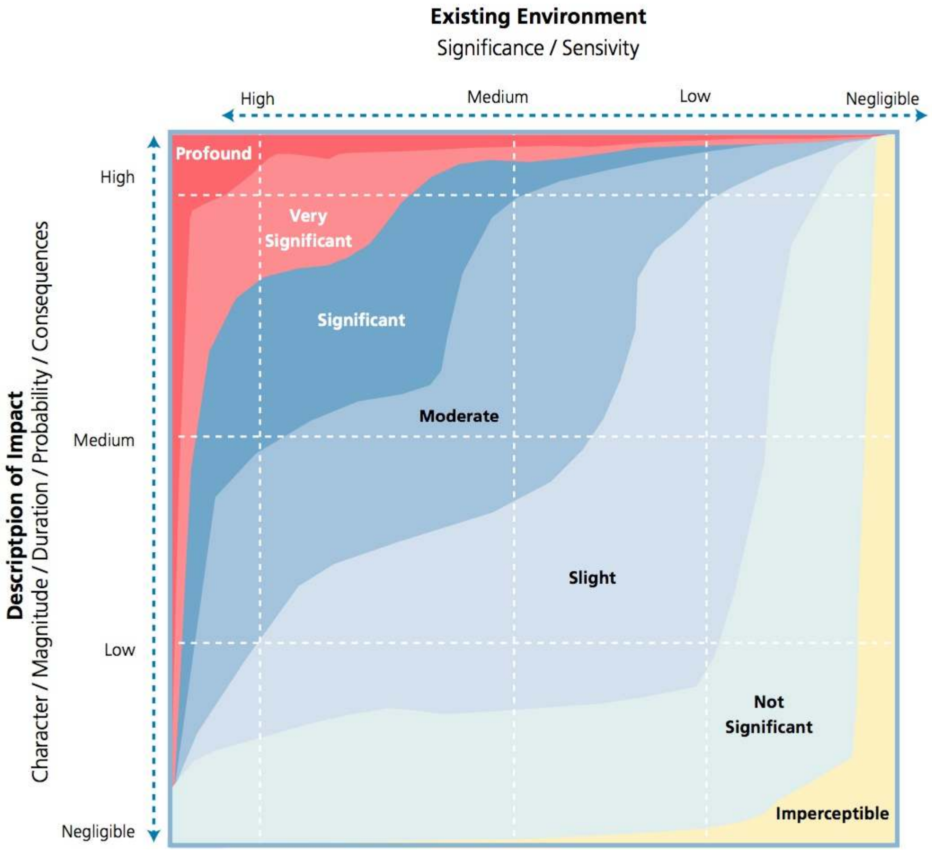

Figure 4.1 Classification of Significance of effects (impacts), EPA, 2017

### 4.1.3.3 Methodology for Visual Appraisal

As with the landscape impact, the visual impact of the proposed development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of visual receptors, weighed against the magnitude of visual effects.

### 4.1.3.4 Visual Sensitivity

Unlike landscape sensitivity, visual sensitivity has an anthropocentric basis. These criteria are extracted from The IEMA Guidelines for Landscape and Visual Assessment (2013) and are set out below:

**Table 4.3 Visual Sensitivity**

| Sensitivity | Description |
|---|---|
| High | Viewers at viewpoints that are recognised in policy or by designation as being of value, or viewpoints that are highly values by people that experience them regularly, ie Tourist attraction and heritage features of regional or county value and views from scenic routes. |
| Medium | Viewers at viewpoint travelled at slow or moderate speed, where views are partly but not entirely focused on the landscape. Generally not designated but may be judged to be of some scenic quality. |
| Low | Viewers at viewpoints not focused on the landscape, e.g. place of work, shopping etc. Limited evidence that the view is valued and may form a backdrop to activities. Similarly viewers travelling at high speeds (eg motorways) may be considered of low susceptibility. |

### 4.1.3.5 Visual Impact Magnitude

This is determined by weighing two basic factors

- Visual presence (visual dominance within a particular view)
- Effect on visual amenity (measure of visual dominance within the available vista i.e., - minimal, sub dominant, co-dominant, highly dominant

The magnitude of visual impact is classified in Table 4.4.

**Table 4.4 Visual Impact Magnitude**

| Criteria | Description |
|---|---|
| High | The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual disorder or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene |
| Medium | The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual disorder or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity |
| Low | The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene |
| Negligible | The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene |

### 4.1.3.6 Visual Impact Significance

As stated above, the significance of impacts is a function of receptor sensitivity and impact magnitude. This relationship is expressed in the significance matrix in Figure 4.1 above.

## 4.2 Description of the Proposed Development

The proposed development is for a Strategic Housing Development at Coolcarron (townland), Fermoy, Co. Cork comprising:

- The construction of 336 no. residential units comprising 242 dwellings houses (comprising a mix of 5, 4, 3 and 2 bed detached, semi-detached and townhouse/terraced units) and 94 no. duplex/simplex units (comprising a mix of 1 and 2 bed units);
- A 587m2 creche/childcare facility;
- The provision of landscaping and amenity areas to include 4 no. flexible open space areas with natural play features, a linear green route with a 3m wide shared surface path running along the western boundary and a number of informal grassed areas;
- Public Realm upgrades along the R639, including a shared footpath and cycleway, a 4m toucan crossing with tactile paving;
- The proposed alteration to the Barrymore-Coolcarron 38kv line. The proposed alteration will involve the undergrounding of a section of the above mentioned overhead 38kV line to facilitate the housing development and the realignment of approximately 13.6 metres of 38kv overhead line. The proposed alterations will comprise of one (1) 12 metre Type “F” lattice steel end terminate mast structure and one (1) 38kV cable sealing ends. The proposed retirement of 282 metres of overhead conductors and one (1) type “F” Lattice steel mast structure , one (1) Type “C” light angle strain structure and one (1) Type “B” portal suspension structure; and
- All associated ancillary development including vehicular access on to the R639 road, 2 no. access gates to the existing weighbridge and associated ancillary development, lighting, drainage, boundary treatments, bicycle & car parking and bin storage.

To assess the likely effects on landscape character and visual amenity a comprehensive understanding of the sites location, nature and scale is achieved through a review of detailed descriptions of the proposed development and drawings submitted with the Strategic Housing Development Application and on site appraisal.

## 4.3 Receiving Environment - Existing Landscape Context

A detailed description of the landscape and surrounding context to the proposed development is included below. This description is sub divided under separate headings to allow a structured overview of the existing landscape context as it relates to the sensitivity of the site and the proposed development.

Within the context of the current Cork County Development Plan 2014 and the Cork County Landscape Character Assessment (Draft) it is noted that the site location occupies a single classification, landscape type 5 – “Fertile Plain with Moorland Ridge”.

Table 4.5 Extract from Draft Cork Landscape Strategy; Landscape Classification

| | |
|---|---|
| **Landscape Character Type** | Fertile Plain with Moorland Ridge |
| **Landscape Value** | Very High |
| **Landscape Sensitivity** | Very High |
| **Landscape Importance** | County |

Specifically this landscape is classified as Kilworth (Moorland Ridge and Broad Undulating Patchwork Lower Valley). The Landscape Character Assessment notes that these Settlements (Mallow, Mitchelstown and Fermoy) “are not only important county towns but they are also economic generators and service providers for a large hinterland”.

Recommendations concerning this landscape type encourage the continuation of deciduous planting to “retain the landscape type’s character, and that new development must be controlled to prevent it from “adversely affect(ing) distinctive linear sections of the Blackwater River Valley, especially its open flood plains, when viewed from relevant scenic routes and settlements”.

### 4.3.1 Landform and Drainage

The site lies on slightly elevated ground less than 800meters from the centre of Fermoy Town. To the immediate south (less than 1.5KM) lies the eastern terminus of the Nagle mountains culminating in the peak of Corrin Hill. Within the site, the landform is gently undulating and this pattern is continued in the fields adjacent to the site.

The Nagle Mountains extend to the west of the site for some distance and include elevated hills as this Mountain range extends towards Cappagh Cross roads approximately three kilometres distant. The landscape to the immediate south of the site rises locally before falling towards the Bride Valley and the villages of Rathcormac and Castlelyons at approximately five kilometres.

### 4.3.2 Vegetation and Landuse

The proposed site overlooks the Blackwater Valley and the town of Fermoy to the North. The immediate context of the proposed development is one of an edge of town character with agricultural fields, coniferous woodland, a Texaco/Spar Service station, a large car sales garage and an ESB substation as well as single dwellings and schools pitches. The site itself is currently laid to four large fields with one internal hedgerow and some peripheral hedgerows.

This pattern is consistent with the surrounding landscape where with large fields and Coniferous plantations dominate the land cover. This is a function of the predominance of practices such as tillage and grazing for animals as well as plantation forestry. According to Cork County Landscape Character Areas (Draft) this is a “working” landscape of fields and Coniferous trees, interspersed with deciduous hedgerows with patches of scrub vegetation. The pattern also occurs throughout the wider landscape, to the east, west, and south of the site, with much of the northern slope of the Nagle Mountains dominated by coniferous forestry.

**Figure 4.2 Eastern boundary (pine) with peripheral deciduous trees (alder)**

### 4.3.3 Centres of Population and Houses

As noted above the nearest centre of population to this site is the town of Fermoy, Co. Cork. This is a large country town with a population approaching seven thousand inhabitants. As the town is located within a valley, principal views are contained within the streets and buildings of the town itself. Long distant views from the town are principally of Corrin Hill and no views from the town centre to the proposed development will be possible, owing to the siting of the town on the valley floor. Other settlements within a 10km radius are the villages of Ballyhooley approximately 9 kilometres to the west of the site, Kilworth approximately 6 kilometres to the north of the site and Rathcormac at approximately 6 kilometres to the south. None of these settlements afford views of the proposed development.

### 4.3.4 Transport Routes , Scenic Routes and Views

The principle transport route in relation to the proposed development is the Local Road the R639 to the immediate west of the site. To the southwestern of the site this road contains the 60km speed signs. The M8 Motorway also runs close to the site at a distance less than 700M from the nearest boundary.

Within 2 kilometres of the site there are four scenic routes, as described in the Cork County Development Plan 2014. However all are at the limit of the study extent, and it is highly unlikely that any views of the proposed development will exist from these scenic routes. Should any partial views of the development be afforded from these scenic routes, they would offer only a minor background element with the foreground composition dominated by the urban context of the town of Fermoy.

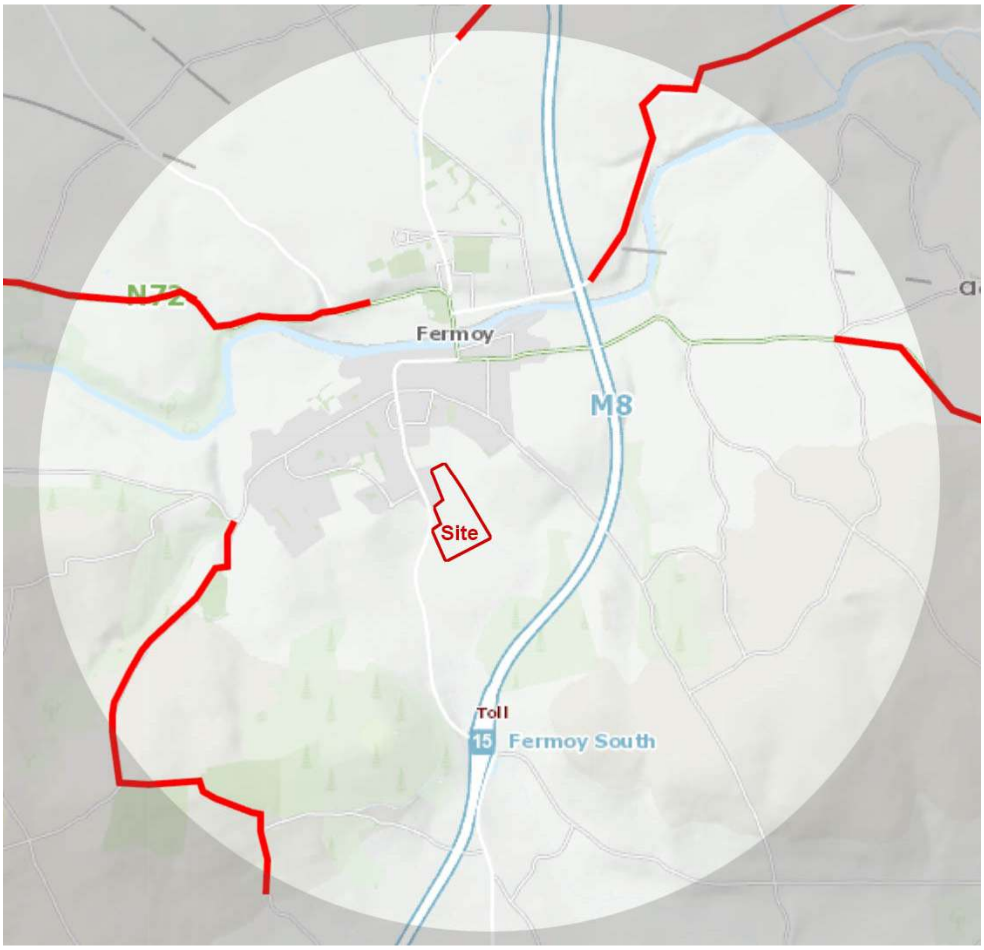

**Figure 4.3 Extract from Draft Cork County Council Development Plan showing the site and Scenic routes highlighted**

### 4.3.5 Heritage and Amenity Features

Corrin Hill is located approximately 1350 Meters from the site and is an important amenity for the town of Fermoy. The hill contains a cairn or mound of stones and also the remains of a ring fort dating to the Iron Age. This site also has a local religious function for the Catholic Church, who use it as a prayer route. The Stations of the Cross are located on the approach to the Cairn from the car park. The view from this location is further described under Receptor View 1, Chapter 6. Views from this receptor are panoramic and extend in all directions.

Fermoy Golf Course is split into two locations divided by the S8 local road indicated in the attached graphic as described above. No views are permitted from this location of the proposed development owing to the presence of the intervening vegetation as well as the undulating nature of the landform.

The Avondhu Blackwater Way which forms part of the European walking route the E8, runs in a Northeast – Southwest direction approximately 1.5 Kilometres to the Northwest of the site, however views towards the proposed development do not afford any visibility of the site owing to the undulating landform and the dominance of intervening screening vegetation.

Other scenic routes are also highlighted on the above map, these are located over 1km from the proposed development and similarly are unlikely to present any views towards the development.

Amenity features exist to the north of the site, where the St Colemans Pitches are located. These pitches (although part of the secondary school lands) have public access with a hardstanding path located at their perimeter. This path appears well used by the public. Adjacent to these pitches to the northeast are the Loretto Convent Sports hall. This contains a number of Astroturf pitches and an indoor pitch in the hall. This facility is also widely used by members of the public. However views of the development form the Loretto facility are very limited owing to the intervening vegetation.

Figure 4.4 Photo of amenity path to Coleman's Pitches to north of site.

## 4.4 Landscape and Visual Appraisal

### 4.4.1 Landscape Effects

The site consists of a single parcel of land, spread over four fields. Although currently agricultural land it is zoned for “Residential” and “Mixed Residential and Other Uses” in the Cork County Development Plan.

Figure 4.5 View of Corrin Hill from North of site showing adjacent Texaco buildings to west.

### 4.4.2 Landscape Sensitivity

As noted in Chapter 4, the wider landscape of the Blackwater Valley is classified as having a Very High Landscape Sensitivity in the Draft Cork Landscape Strategy. However, this is a broad classification for such a wide area. It should further be noted that the proposed site is located within an existing urban settlement boundary and given this and the adjacent edge of town land uses, the site is more appropriately determined to have a Medium level of Landscape sensitivity. This is described in Table 4.1 as: “Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use”.

### 4.4.3 Magnitude of Change

The proposed development will result in significant change which will transform the greenfield site into a residential development. The nature of the development is not uncharacteristic in the locality, being consistent with residential developments to the east of the site and in the locality but less prominent in the hillside setting to the south.

The magnitude of change is considered Medium:

Medium – Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.

### 4.4.4 Level of Landscape Effect

The landscape effect resulting from a Medium landscape sensitivity, and a Medium magnitude of change, is Moderate. Give the adjacent context the Qualitatively assessment is determined to produce a Neutral Landscape Effect.

This change in effect is consistent with the zoning for the site.

A number if site constraints have been identified to assist with the development of the site from a landscape perspective.

- Retention of external boundary vegetation as well as (one) significant internal boundary/treeline
- Design of high quality streetscape with legible hierarchy of routes and street
- Development of a number of play spaces as focal points with the development
- Cut and fill operations to optimise integration of the proposed development in the setting
- All open spaces to maximise passive supervision from adjoining houses.

## 4.5 Zone of Visual Influence and Visual Receptors

The zone of visual influence is the extent of visibility of the site from the landscape and is defined further by topography and built structures. Although the site is located on an elevated parcel of land, several barriers exist that limit visibility. These include the undulating nature of the local landscape, with Fermoy Town largely built within the valley of the Blackwater River and the presence of a forestry plantation screening views from the east. The number and spread of potential visual receptors is limited to lands principally to the south and immediately west of the site. An elevated view of the site also exists from Corrin Hill and is also included.

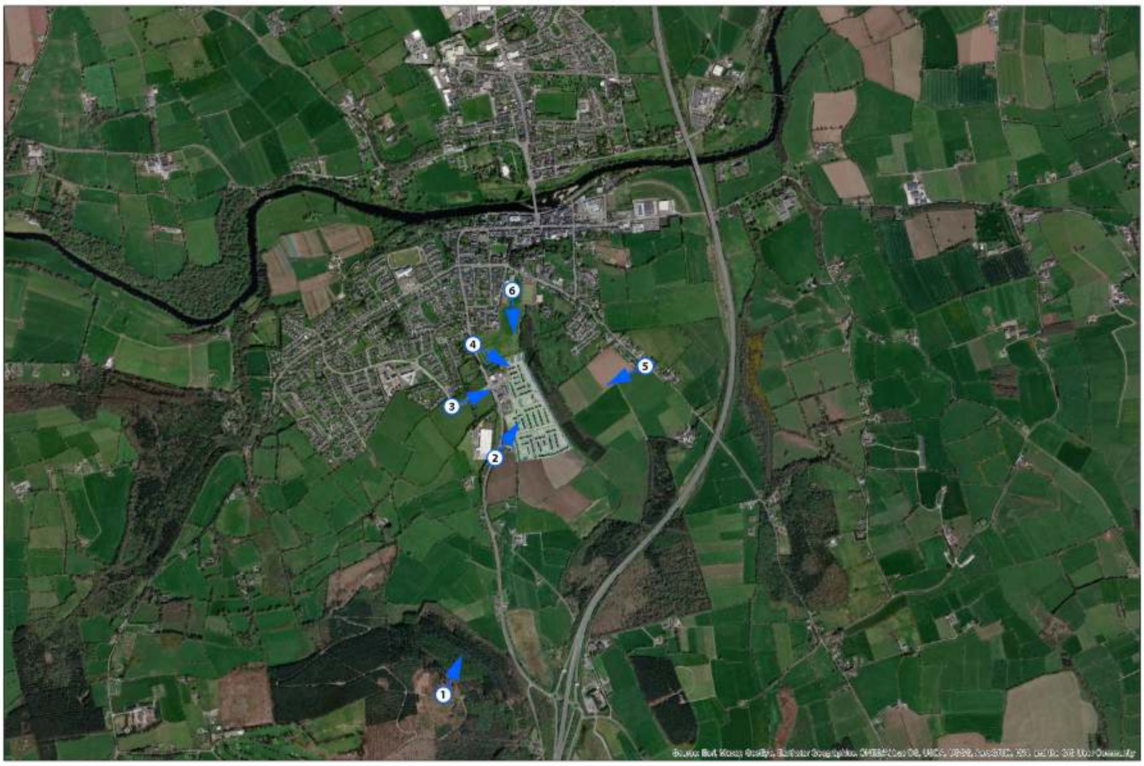

Figure 4.6 Location of Viewpoint Receptors selected

**Viewpoint 1**
View from Corrin Hill looking northeast

Existing View

This view is 1.35km southwest of the site and is taken from the cairn or mound of stones at the top of Corrin Hill. Corrin Hill contains a large modern cross and is access via a forest track. Corrin hill also represents the summit of a series of stations of the cross, a religious ceremonial route. The summit represents a panoramic viewpoint with views in all directions. To the north views are of Fermoy Town and its landscape setting in the Blackwater Valley. Long distance views are of the Galtee Mountains. No views of the proposed development are visible on approach to the summit.

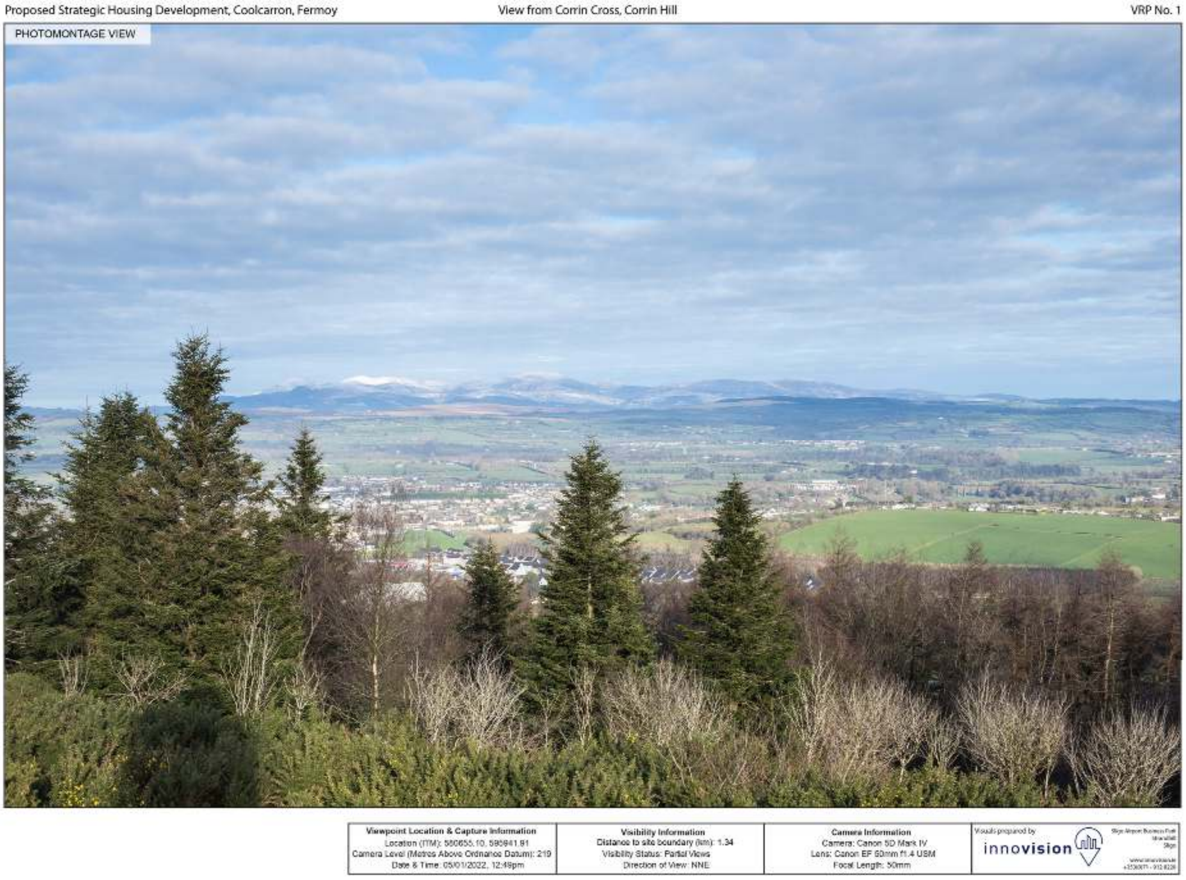

**Figure 4.7 View 1 from Corrin Hill with development in the photomontage**

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be High. This is a scenic panorama over the countryside with associated pagan and catholic significance. Viewers will have made the effort to ascend this locally important walking route.

Magnitude of Change

Views in the direction of the site are screened by the intervening vegetation of the Coillte forestry on the north side of Corrin Hill. The development, although partially visible will be viewed in the context of Fermoy Town and the adjacent collection of peri urban land uses, including Texaco and the adjacent large industrial warehouse and industrial type buildings. The magnitude of change is considered to be Low.

Significance of Effect

The visual impact from this location will be Slight and Neutral.

Viewpoint 2

View from R639/Cork Road – adjacent to the site entrance

Existing View

This view represents the approach to Fermoy Town from the south on the R639. Lands to the east and west are both effectively screened by dense mature avenue type tree planting. The curving nature of this approach to the town leads views towards the approaching collection of industrial and petrol station buildings which signify the limits of the town extents.

**Figure 4.8 View 2 from R639 with development to east**

Visual Receptor Sensitivity

Viewers will be drivers approaching Fermoy Town who are considered to be of Medium sensitivity.

Magnitude of Change

The proposed view shows that while elements of the proposed development will be visible from this location visual impact will be significantly limited by existing vegetation. In addition, the moderate speed of viewers on the R639 will further mitigate visual impact. The magnitude of change is considered to be Low.

Significance of Effect

The significance of effect is considered Slight and Neutral.

Viewpoint 3

View from local relief road to the west, 300 meters from the proposed development

Existing View

This view is composed of peri urban elements such as a local relief road and associated infrastructure in the foreground with midground elements of the Texaco service station and the adjacent car sales yard of Cavanagh’s garage. Distant elements that terminate the view on Strawhall hill are the town water tower and the adjoining Baile Ard housing estate to the southeast of the town.

**Figure 4.9 View 3 from local relief road with development in photomontage**

Visual Receptor Sensitivity

The visual receptor sensitivity is considered to be Medium. It represents a transitory receptor most commonly viewed from vehicles travelling the relief road or pedestrians walking the adjacent footpaths. Although the view is pleasant it is not highly scenic.

Magnitude of Change

The magnitude of change from this view includes the expansion of the housing which terminates the viewpoint, However, this expansion that is proposed will not affect the ridge of Strawhall hill and is partially screened by adjacent vegetation.

The magnitude of change is considered to be Low.

Significance of Effect

Visual impact from this location will be Slight, and Neutral as the proposed planting matures and the site settles into the landscape.

Viewpoint 4

View from R639/Cork Road to west, looking southeast – Approximately 200 meters from the proposed development

Existing View

This view from this location reveals the foreground of the grassed amenity walk at Colemans pitches. A significant stand of tree cover merges into the distance and terminates the view. To the west of this receptor the dark roofs of the garages associated with the Texaco service station are evident. This collection of industrial buildings merges with the R639 which is out of view.

**Figure 4.10 View 4 from R639 looking towards development to southeast**

Visual Receptor Sensitivity

Viewers will be motorists heading south on the R639 or walkers on the adjacent footpath. Some viewers will also be recreational walkers on the adjacent St Colemans sports field. Although representing in part a recreational facility, walkers are within an urban landscape and not on a rural walk. The visual receptor sensitivity is considered to be Medium.

Magnitude of Change

This slightly elevated position shows that while many elements of the proposed development will be visible from this location some mitigation will be afforded the existing boundary vegetation. Visual impact is further limited to the upper stories of the proposed buildings. The dark coloured roofs will help to integrate the development against the backdrop of the woodland along the eastern edge of the site. Magnitude of change is considered medium.

Significance of Effect

Visual impact from this location will be Moderate, Neutral over time tending to Slight Neutral as the proposed planting matures and the site settles into the landscape.

Viewpoint 5

View from College Road at Strawhall approximately 600 meters from the proposed development.

Existing View

This view shows the undulating agricultural landscape which significantly restricts views west. This viewpoint represents a gap in the hedgerow at a field gate and similar views west are further restricted.

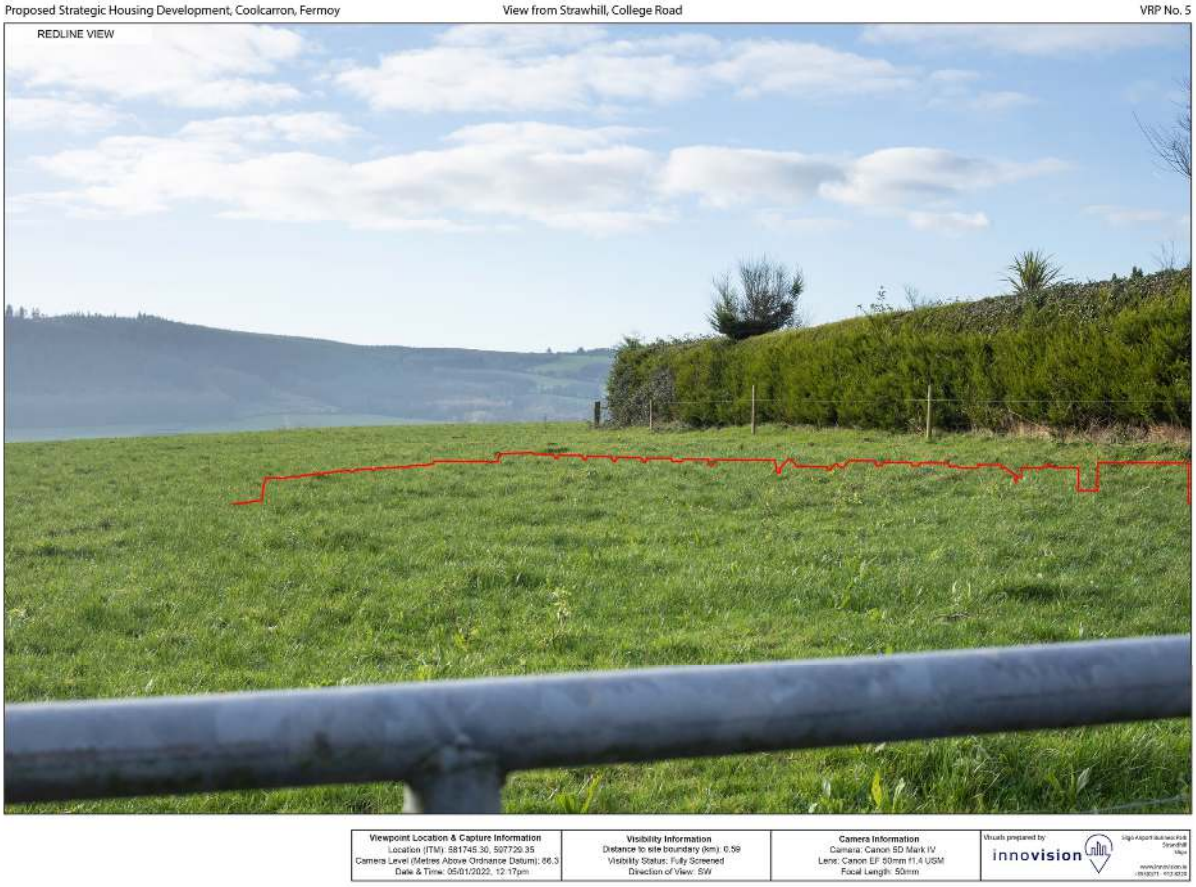

Figure 4.11 View 5 from Strawhall

Visual Receptor Sensitivity

Viewers will be regular users of through the local rural landscape and are considered to be of Medium sensitivity.

Magnitude of Change

The proposed development will be fully screened from view from this location by the topography of the local landscape.

Significance of Effect

There will be no visual impact experienced from this location.

### Viewpoint 6

View from Colemans pitches looking south, approximately 400 meters from the proposed development.

### Existing View

This recreational location provides a panoramic view south towards the peak of Corrin Hill. The expansive pitches of Colemans are visible in the foreground. There is significant tree cover evident in the locality. Views are directed south towards the peak of Corrin Hill.

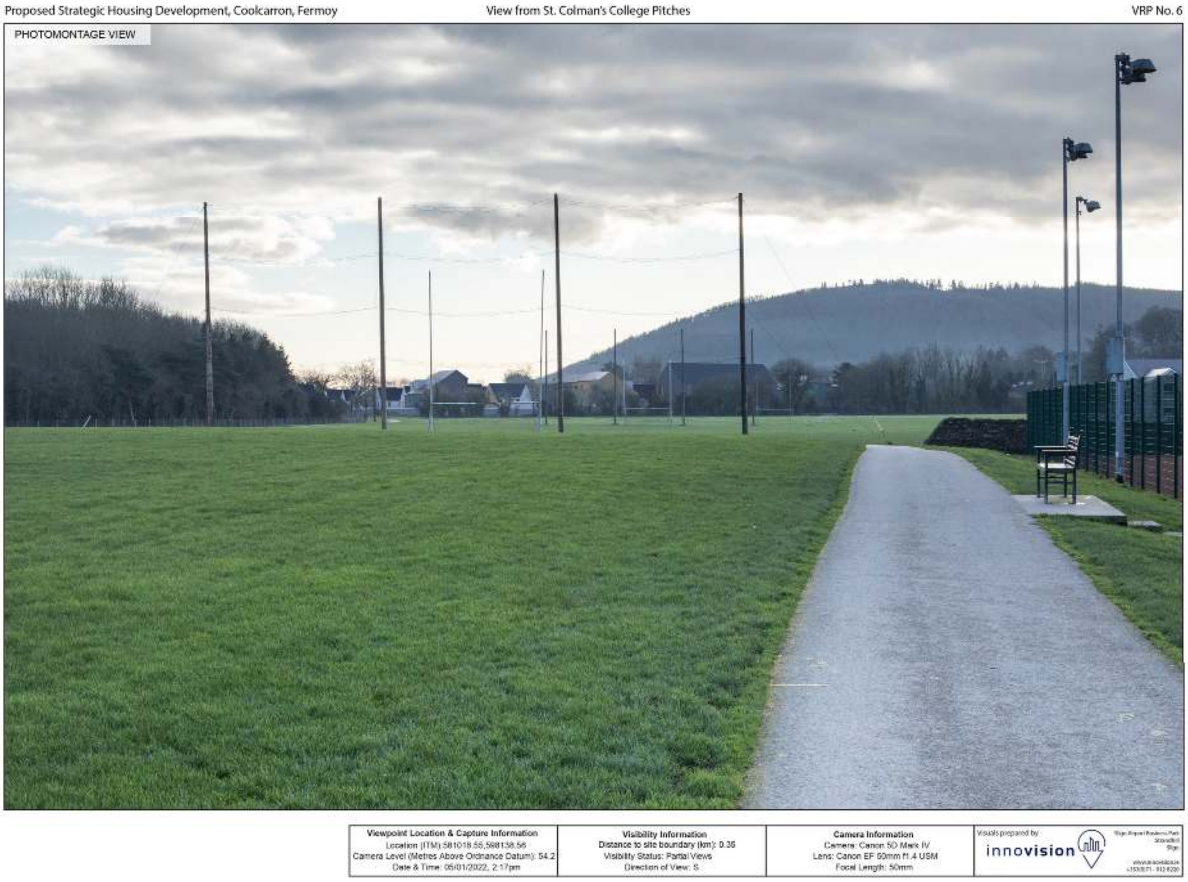

**Figure 4.12 View 6 From Coleman’s pitches looking towards Corrin Hill to south**

### Visual Receptor Sensitivity

Viewers will primarily be schoolchildren playing sports or recreational users of the local walking loop around the pitches. Although representing in part a recreational facility, walkers are within an urban landscape and not on a rural walk. The visual receptor sensitivity is considered to be Medium.

### Magnitude of Change

This receptor location shows that while many elements of the proposed development will be visible from this location some mitigation will be afforded the existing boundary vegetation. Visual impact is further limited to the upper stories of the proposed buildings. The dark coloured roofs will help to integrate the development against the backdrop of the woodland along the eastern edge of the site. Magnitude of change is considered medium.

Significance of Effect

Visual impact from this location will be Moderate, Neutral over time tending to Slight Neutral as the proposed planting matures and the site settles into the landscape.

### 4.5.1 Additional views from private dwellings

These are a number of private dwellings in the immediate vicinity of the site and it is likely that some of these houses are afforded partial views into the site, particularly from the upper floor windows. As these houses are private dwellings further investigation was not feasible. Only two residences directly abut the site and it is understood these are in poor condition and have recently been sold for development. All other dwellings are separated by some distance. Given the dense vegetation within the site it is likely that most views are at least partially screened.

### 4.5.2 Summary of Visual Effects

Of the six viewpoints assessed there will be Moderate Neutral effects associated with two viewpoints and a Slight effect associated with a further three viewpoints and No Change for the remaining viewpoint. It is anticipated however that the two viewpoints with Moderate Neutral effects will tend over time towards Slight and Neutral as the internal site planting at the northern hedgerow matures and the proposed scots pine trees develop to partially screen the development from these locations.

Table 4.6 Summary of Visual Effects

| Receptor | Receptor Sensitivity | Magnitude of Change | Significance of Effect |
|---|---|---|---|
| Corrin Hill looking northeast | High | Low | Slight, Neutral |
| R639/Cork Road | Medium | Low | Slight and Neutral |
| Relief road to the west | Medium | Low | Slight and Neutral |
| R639/Cork Road to west | Medium | Medium | Moderate and Neutral |
| College Road at Strawhall | Medium | Negligible | No Change |
| Colemans pitches looking south | Medium | Medium | Moderate and Neutral |

Given the nature and scale of the proposed development significant visual impacts will arise, primarily during the construction phase, with the moving of materials, construction traffic and earthworks. However, the site is well screened from many surrounding areas owing to existing forestry as well as Industrial type buildings to the west. And to a lesser extent existing boundary vegetation. Local topography also effectively contains views into the site, as lands rise both to the east and west and effectively limit views of the site and its impact on wider landscape level views. Impact on views from Corrin Hill/Cross will be observed within the context of Fermoy Town and will not appear incongruous or out of place.

### 4.5.3 Cumulative Effects

Cumulative impact considerations include:

Cork County Planning Reference: 21/4049

Retention for Internal woks for new technology room, sanitary rooms, 3 no. new classrooms, 1 no. new computer room at St. Colman's College, Monument Hill, Fermoy.

Permitted 15/07/2021

Part 8 Housing Scheme Cork County Council Part 8 Application

11 no. residential housing units at Uplands, Fermoy

Cork County Planning Reference: 20/6246

A) the change of use (through intensification of use) of part of an existing light industrial building currently used for the assembly and commissioning of stainless steel vessels to provide for an electropolishing area within the building footprint; b) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor; and c) ancillary external site works to connect to the existing on-site sewer network.

Permitted by 07/12/2020

Cork County Planning Reference: 21/7241

The demolition of 2 No. dwelling houses and associated sheds/outhouses and the construction of 28 No. residential units and all ancillary site development works, including access, car/bike parking, bin storage and amenity areas

Under review by Cork County Council

Cork County Planning Reference: 19/6221

To demolish existing pump canopy, shop and stores, for construction of valeting buildings, car wash, boundary fencing and 2 no. signs together with associated works.

Permitted by 11/6/2020

The proposed residential development to the northwest of the site will have a minor cumulative impact on the subject site appearing to merge with the subject site from a distance. However despite the apparent increase in the development size, the nature of the development is not uncharacteristic in the locality being consistent with the pattern of developments to the north, northeast and west of the site.

The other developments indicated in the attached map are at a significant distance from the subject site or are modifications to existing developments and will not have a cumulative impact.

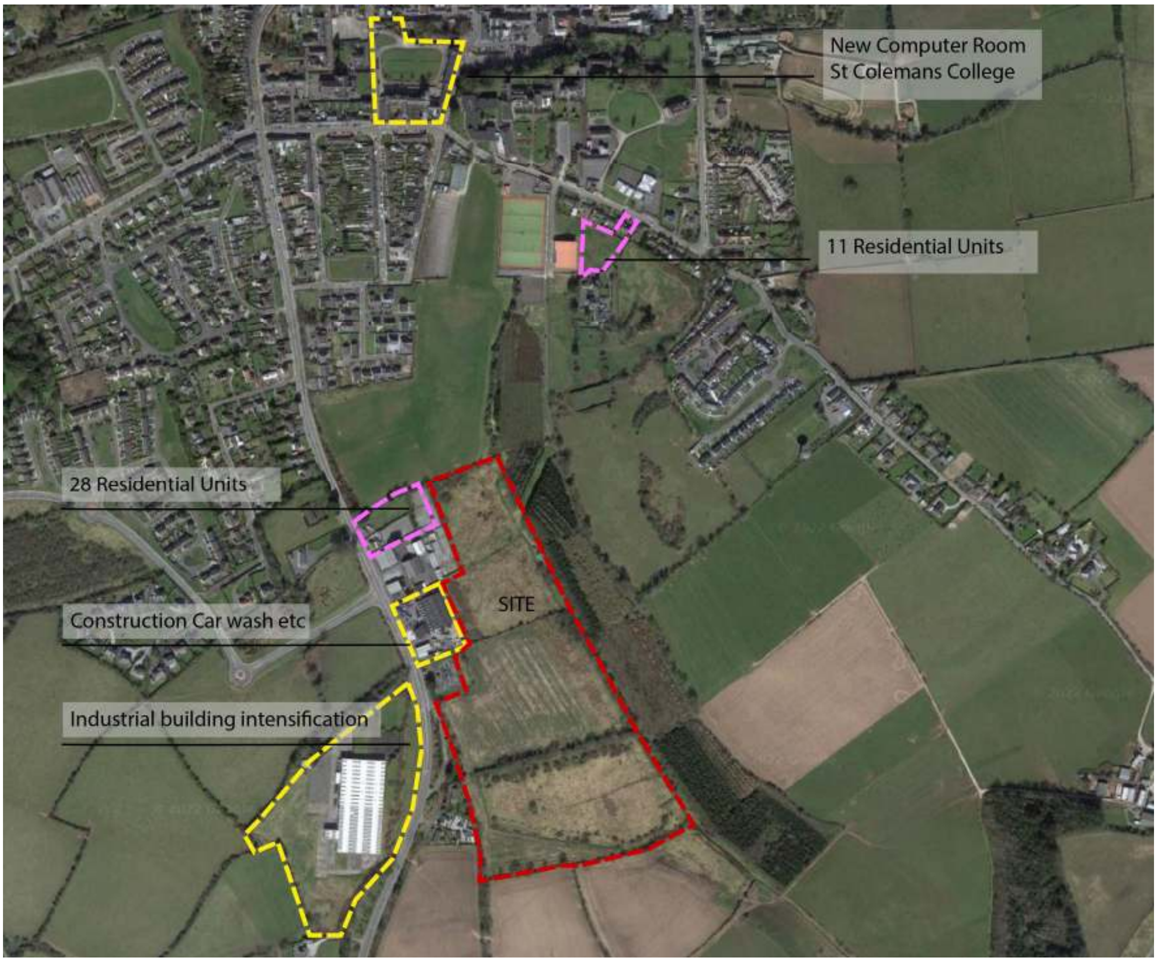

Figure 4.13 Context, Aerial view of Permitted Developments

### 4.5.4 Mitigation Measures and Remediation Measures

The principal mitigation for the proposed development is inherent in the design of its architecture, public realm and proposed open spaces which have evolved through an iteration process or assessment and consideration as outlined in Chapter 3 – Alternatives Considered. Consideration has been given to avoid adverse impacts from the visual receptors described above. Some degree of impact is inevitable and the following measures have been identified to mitigate these impacts.

- Additional Planting adjacent to the existing site boundaries should be principally in a manner consistent with The Landscape Character Assessment recommendations for this area, “ Deciduous trees are a dominant feature within the landscape... Their continuation will be important in retaining this landscape type’s character”.
- The single internal Hedgerow/treeline is to be retained and supplemented with similar species to form a dominant landscape feature and ecological corridor.
- Cut and fill operations are to be optimised to integrate the proposed development into its landscape setting.
- Landscape works to be carried out as per associated Site Landscape Layout.
- Landscape management and maintenance plan to be drawn up and approved up by qualified professional

## 4.6. Conclusion

In terms of landscape and visual impacts the proposed development is considered to have only a minor physical impact as the site is substantially contained within the existing undulating contours of the wider landscape and is further mitigated by the dense screening vegetation to the east.

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 5

## Material Assets:
## Traffic and Transportation

# Volume II

Environmental Impact Assessment Report

Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 5 Traffic and Transportation

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# 5 Traffic and Transportation

## 5.1 Introduction

This material assets (Traffic & Transportation) chapter assesses and evaluates the likely impact the proposed development will have on the existing roads network in the vicinity of the site, as well as identifying proposed mitigation measures to minimise such impacts.

### 5.1.1 Author Information and Competency

This chapter was prepared by Ken Manley BE CEng MIEI HDip Envm Eng FConsEI of MHL Consulting Engineers. Ken has been involved in the preparation of Traffic & Transportation Schemes for over 20 years and is fully competent in the use of traffic modelling software used as part of this assessment, namely Junctions 9: PICADY and TRICS.

### 5.1.2 Reference to Guidelines Relevant to Discipline

The structure of this Chapter is in accordance with the European Commission EIAR Guidance and draft EPA EIAR Guidelines (both 2017) and TII Document, Traffic and Transport Assessment Guidelines, 2014 and is developed using data from independently commissioned traffic counts at key junctions/locations, and local data extracted from the 2016 National Census.

## 5.2 Methodology

A Traffic and Transportation Assessment (TTA) has been prepared in accordance with the NRA's 2014 publication "Traffic and Transport Assessment Guidelines" and the "Guidelines for Traffic Impact Assessments" as published by the Institution of Highways & Transportation U.K. in 1994. The scope of the study has been agreed with Cork County Council's Traffic & Transportation Department. The purpose of a TTA is to assess the potential traffic impact of a development on the existing road network and propose any necessary mitigation measures to best accommodate the expected traffic volumes generated by the proposed development. It is also a requirement to ensure that proposals promote more efficient use of investment in transportation infrastructure, reduce travel demand and promote road-safety.

Key parameters relating to the traffic modelling carried out included: junctions to be assessed, trip generation, modal shift targets, trip distribution, and assessment years.

A total of 2 turning count surveys were undertaken as part of the study on Thursday 16th December 2021, as outlined in the following figure, Figure 5.2.1, Traffic Count Survey Locations. These surveys were carried out simultaneously using video cameras at each of the junctions for a 12-hour period.

To account for the reduced traffic volumes experienced at the time of the traffic surveys due to Covid-19 travel restrictions, a growth factor was applied to the traffic counts to better represent "normal" traffic volumes. This growth factor was determined by comparing TII Traffic Data volumes from 2019 (pre-covid) to volumes in 2021. The site selected for the comparison study is the TII Traffic Data Site located on the R639 between Exit 15 of the M8 and Rathcormac. The week during which the new traffic counts were taken (12th December to 18th December 2021) was compared the week of 15th December to 21st December 2019. It was found that traffic volumes in 2021 were 95.14% of the volumes measured in 2019

Figure 5.2.1 Traffic Count Survey Locations

The aim of the TTA is to identify the characteristics of the site of the proposed development and surrounding area, examine the likely transport implications, ensure sustainable accessibility is maximised and appropriate infrastructure provided to accommodate the proposed development.

The key issues that are addressed in the TTA, with reference to the size and location of the development proposal, are as follows:

- Review of the site location, composition and local roads network.
- Analysis of Road Safety data for the most recent five-year period available.
- Accessibility critique reviewing pedestrian, cycle and public transport access to the site, plus any infrastructure currently available to promote travel by sustainable means.
- A review of the relevant planning and transport policy.
- Description of the development proposal.
- Description and justification for the proposed access arrangement, internal layout, parking provision, public transport provision, fire tender/service/delivery access, including all necessary swept-path assessments and visibility splays.
- Forecast multi-modal trip rates and trip generation as agreed with the Local Authority.
- Modal split assumptions used in the trip generation process.
- The use of appropriate and agreed traffic modelling software for the assessment of individual junctions.
- Provide With/Without Development assessment for each of the critical junctions.
- Assess significance of development generated traffic upon the surrounding transport infrastructure and identify any necessary mitigation.

The opening year is the year of expected completion of the scheme (336 units) including the creche and is taken to be 2027. In accordance with the NRA's "Traffic and Transport Assessment Guidelines", a traffic analysis is required to be undertaken for the Base Year – 2021, Opening Year – 2027, Opening Year +5 – 2032 and Opening Year +15 – 2042.

## 5.3 Existing Use

The following site-specific characteristics are noted:

The application site is located in Fermoy, County Cork with access to the site via a new proposed access road off R639 Cork Road.

Within 10 mins walk time from the site:

- Texaco Spar
- Bus Stop Cork Rd (Service 245)
- Within 15 mins walk time from the site:
- Fermoy Town Playground
- Bishop Murphy Memorial Primary School
- St. Patricks Catholic Church
- St. Colmans College
- Loretto Catholic Secondary School
- Loretto Fermoy Sports Complex
- Bus Stop St. Patricks Ave. (Service 245)

Within 20 mins walk time from the site:

- Fermoy Post Office
- Fermoy Library
- Fermoy Educate Together National School
- Fermoy Rowing Club
- AIB Bank
- Synergy Credit Union
- Bank of Ireland
- McCauley Pharmacy
- Bus Stop Fermoy (Service 245 & 768)

Within 30 mins walk time from the site:

- Fermoy Health Centre
- Fermoy Town Park
- Fermoy Leisure Centre
- Riordan's SuperValu
- Lidl
- Fermoy GAA (Fitzgerald Park)
- Christ Church
- Fermoy Playground

The 245-bus route available at a stop within 10 mins walk of the site provides an hourly service from Cork City to Clonmel. The route includes stops in Glanmire, Sallybrook, Watergrasshill, Rathcormac, Mitchelstown, and Cahir, amongst others.

The 768-bus route to Busaras Dublin stops four times daily within 20 mins walk of the site.

The key junctions in the area surrounding the proposed development are shown in Figure 5.3.1 and are as follows:

- Junction 1: T- junction serving the R639 Cork Rd. & the L-1542 local road.
- Junction 2: Roundabout on the junction of the R639 and the M8 Motorway.
- Junction 3: Proposed entrance junction to the development.

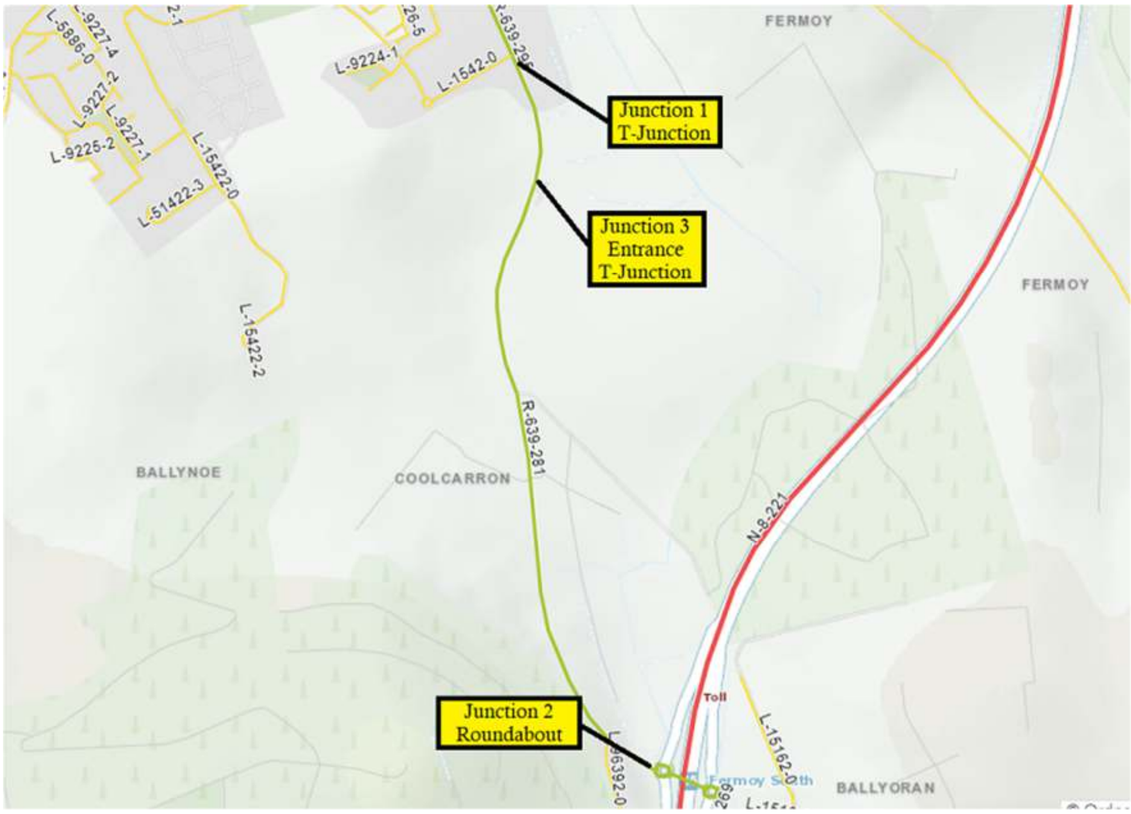


Figure 5.3.1 Junction Locations

Junction 1: T- junction serving R639 Cork Rd. & L-1542 local road

This T- junction serves as an important vehicular access between Fermoy and the M8 Motorway. It also provides a link for the surrounding residential areas to the wider roads network.

The measured two-way AADT (Annual Average Daily Traffic) at the cross-roads junction is 14,910.

Image 5.3.1 Image of R639 Cork Rd./L-1542 local roads

Figure 5.3.2 R639 Cork Rd./L-1542 local road – AM Peak Hour Flows

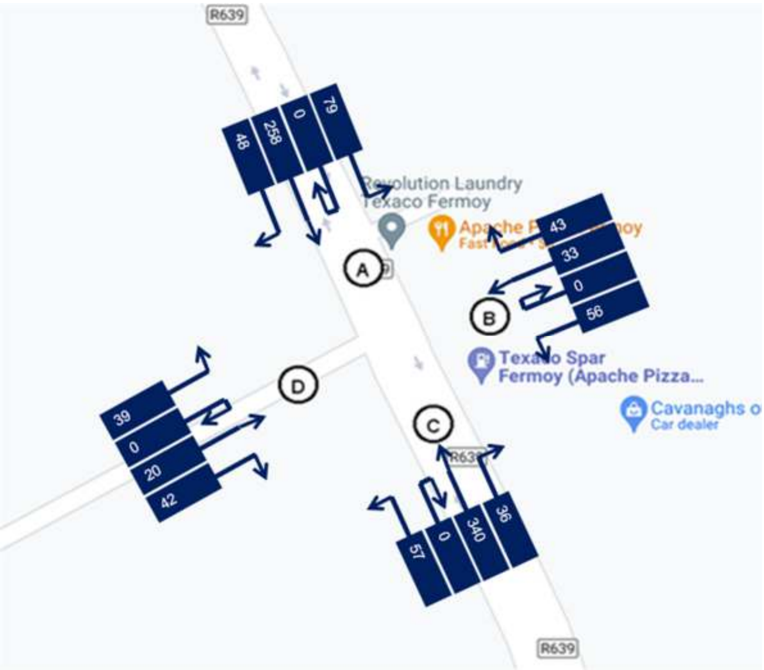


Figure 5.3.3 R639 Cork Rd./L-1542 local road – PM Peak Hour Flows

Junction 2: Roundabout on the junction of R639 Cork Rd. and M8 Motorway

This roundabout forms a part of the access to the M8 Motorway from the R639. The roundabout also facilitates northbound M8 traffic exiting the motorway and traffic heading towards Rathcormac further south on the R639.

The measured AADT (Annual Average Daily Traffic) at the roundabout is 10,570.

Image 5.3.2 Image of Junction 2: R639 Cork Rd./M8 Motorway

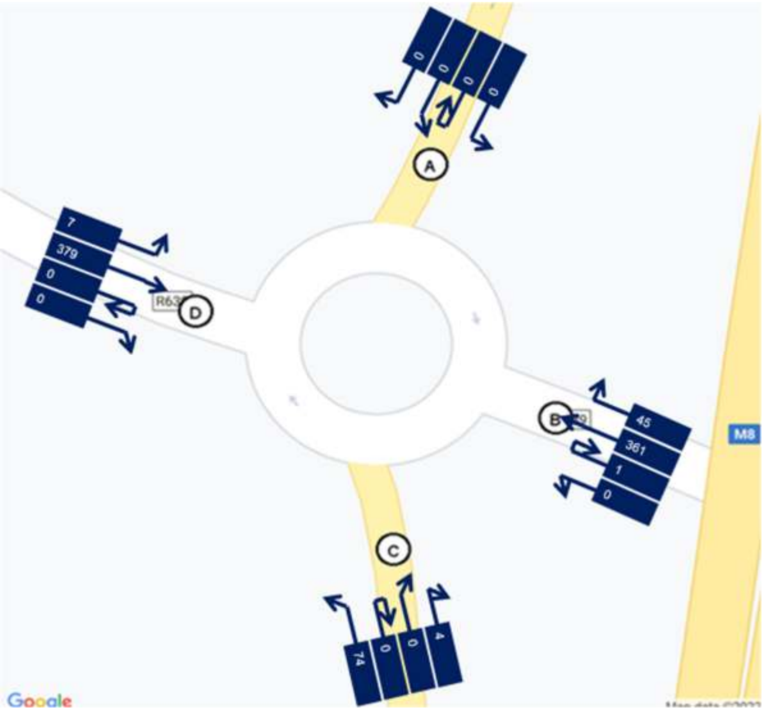


Figure 5.3.4 R639 Cork Rd./M8 Motorway– AM Peak Hour Flows

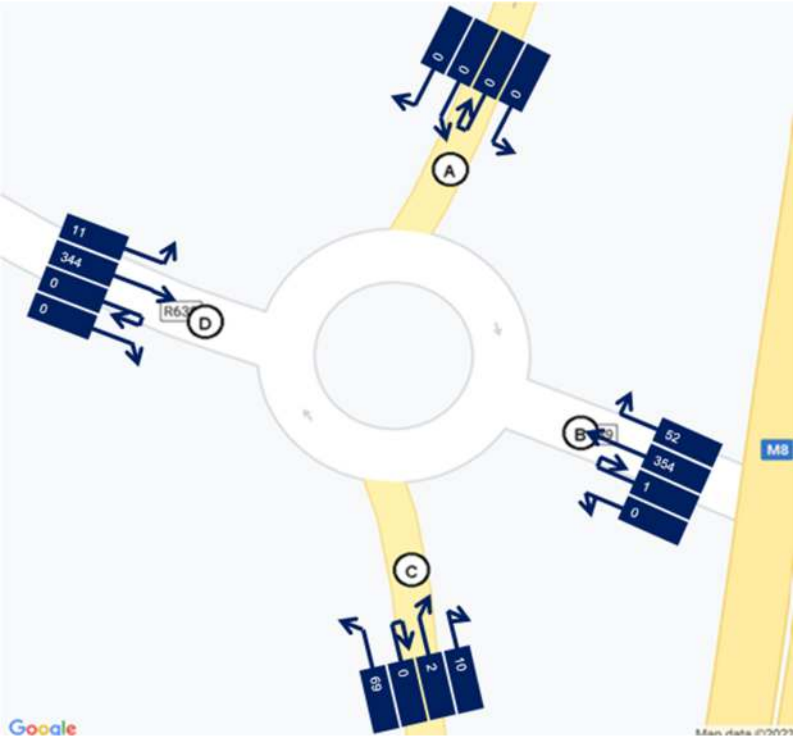


Figure 5.3.5 R639 Cork Rd./M8 Motorway– PM Peak Hour Flows

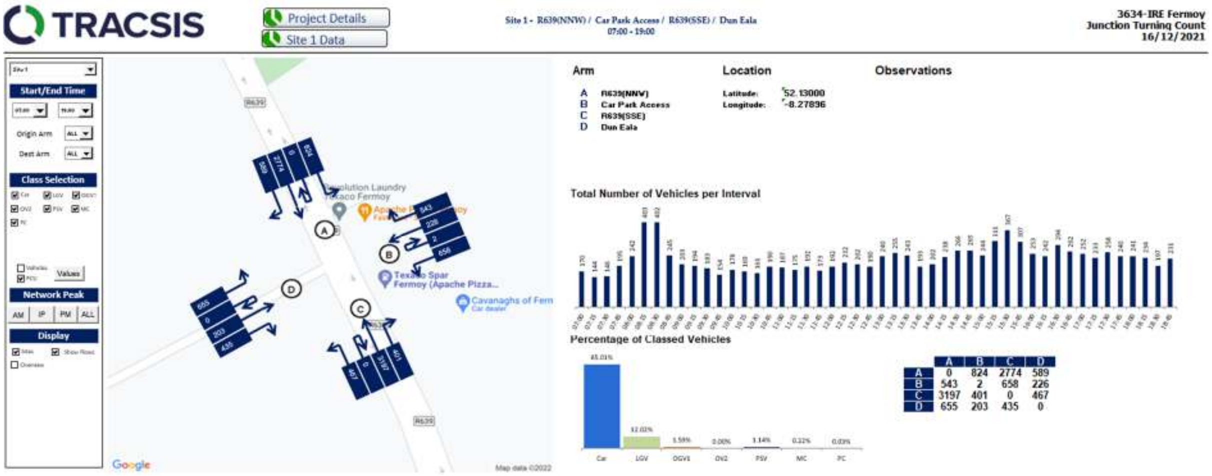
### 5.3.1 Existing Traffic Conditions

A variety of different data sources have been used, including:

- 12-hour classified turning counts (2 sites, refer Figure 5.2.1);
- Background OS Mapping and aerial photography;
- On-site junction measurements including saturation flows, link speeds, queue length measurements, pedestrian movements at signalled crossings and geometric data for each of the modelled junctions;

A total of 2 turning count surveys were undertaken as part of the study on Thursday 16th December 2021, as outlined in the following figures; these surveys were carried out simultaneously using video cameras at each of the junctions for a 12-hour period.

The following figures present the recorded 12-hour traffic profile, percentage of classified vehicles and turning movements for each of the modelled junctions carried out on Thursday 16th of December 2021:



Site 1 - R639(NNW) / Car Park Access / R639(SSE) / Dun Eala
07:00 - 19:00

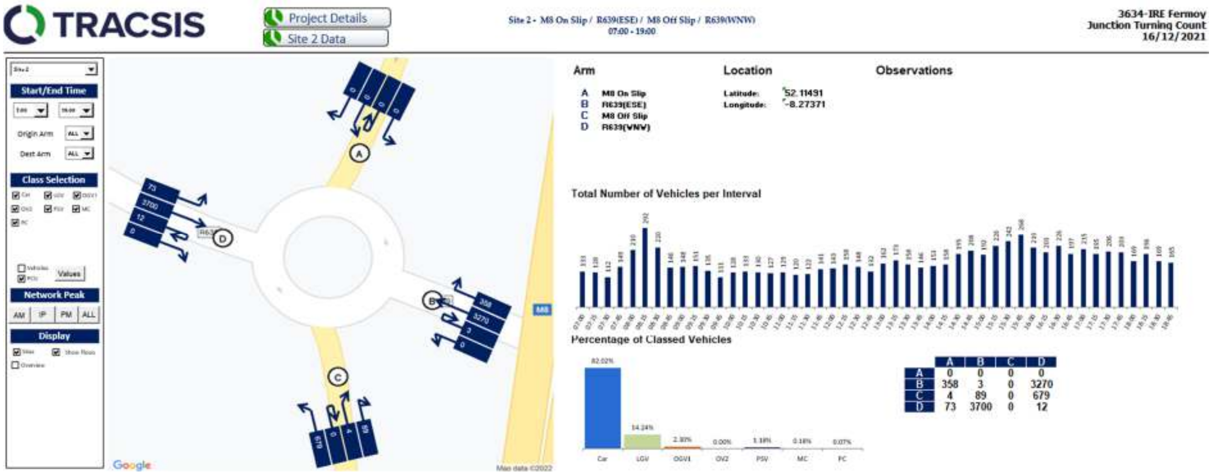
3634-IRE Fermoy
Junction Turning Count
16/12/2021

| Arm | | Location | |
|---|---|---|---|
| A | R639(NNV) | Latitude: | 52.13000 |
| B | Car Park Access | Longitude: | -8.27896 |
| C | R639(SSE) | | |
| D | Dun Eala | | |

Observations

| | A | B | C | D |
|---|---|---|---|---|
| A | 0 | 824 | 2774 | 589 |
| B | 543 | 2 | 658 | 226 |
| C | 3197 | 401 | 0 | 467 |
| D | 655 | 203 | 435 | 0 |

Figure 5.3.6 Junction 1: R639 Cork Rd./L-1542 local road



Site 2 - M8 On Slip / R639(ESE) / M8 Off Slip / R639(WNW)
07:00 - 19:00

3634-IRE Fermoy
Junction Turning Count
16/12/2021

| Arm | |
|---|---|
| A | M8 On Slip |
| B | R639(ESE) |
| C | M8 Off Slip |
| D | R639(WNW) |

Location
Latitude: 52.11491
Longitude: -8.27371

Observations

| | A | B | C | D |
|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 |
| B | 358 | 3 | 0 | 3270 |
| C | 4 | 89 | 0 | 679 |
| D | 73 | 3700 | 0 | 12 |

**Figure 5.3.7 Junction 2: R639 Cork Rd./M8 motorway**

The data presented in the above figures shows the peak hour traffic periods for both morning and evening respectively at each junction as follows:

- Junction 1: 08:00 – 09:00 and 16:00 – 17:00
- Junction 2: 07:45 – 08:45 and 16:00 – 17:00

For the purpose of the modelling analysis, each of the above peak hour traffic periods are included in order to obtain the worst-case traffic build-up results. This ensures a robust analysis of the road network is conducted.

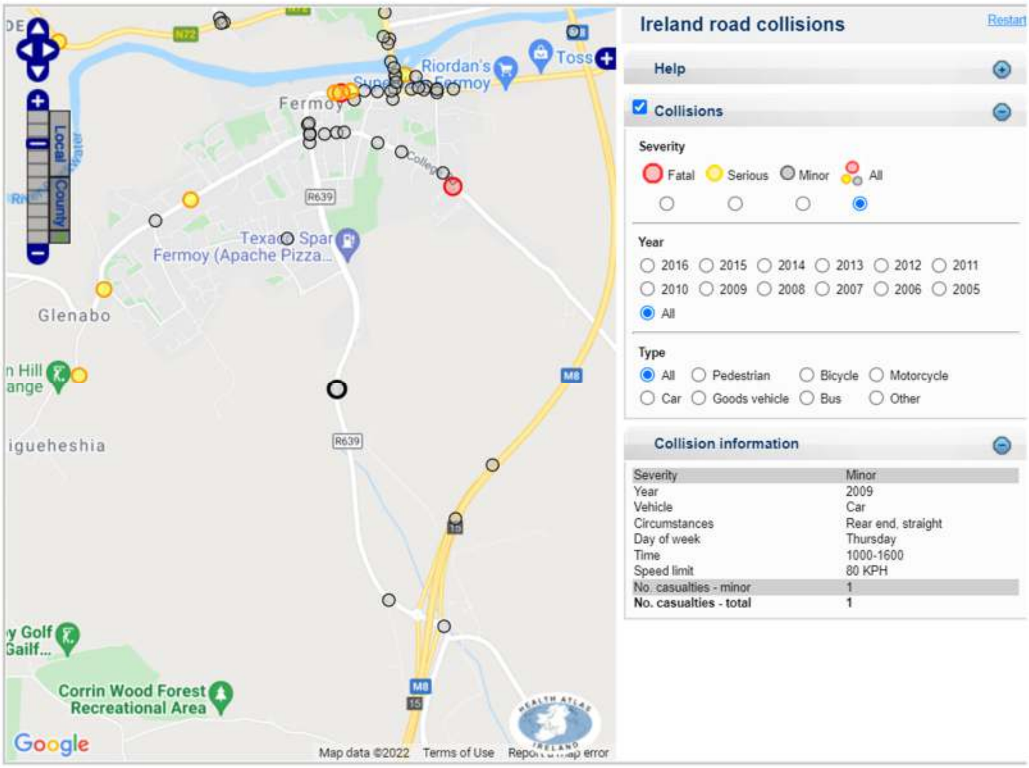
The percentage of classified vehicles was used within the generated traffic models to reflect existing conditions more accurately (HGV% averaged across both junctions calculated at 3%).

To account for the reduced traffic volumes experienced at the time of the traffic surveys due to Covid-19 travel restrictions, a growth factor was applied to the traffic counts to better represent "normal" traffic volumes. This growth factor was determined by comparing TII Traffic Data volumes from 2019 (pre-covid) to volumes in 2021. The site selected for the comparison study is the TII Traffic Data Site located on the R639 between Exit 15 of the M8 and Rathcormac. The week during which the new traffic counts were taken (12th December to 18th December 2021) was compared the week of 15th December to 21st December 2019. It was found that traffic volumes in 2021 were 95.14% of the volumes measured in 2019.

### 5.3.2 RSA Collision Data

A review of the RSA Road Collision Statistics was undertaken for the area in the vicinity of the subject site. One minor collision occurred in 2009 at a location on the R639 approximately 350m south of the proposed development entrance. The circumstances of the collision involved a car being rear ended resulting in one minor casualty.

A number of other collisions occurred in the wider area over the available 11-year period as shown in Figure 5.3.8 below.



Ireland road collisions

☑ Collisions

Severity

○ Fatal ○ Serious ○ Minor ● All

Year

○ 2016 ○ 2015 ○ 2014 ○ 2013 ○ 2012 ○ 2011
○ 2010 ○ 2009 ○ 2008 ○ 2007 ○ 2006 ○ 2005
● All

Type

● All ○ Pedestrian ○ Bicycle ○ Motorcycle
○ Car ○ Goods vehicle ○ Bus ○ Other

Collision information

| | |
|---|---|
| Severity | Minor |
| Year | 2009 |
| Vehicle | Car |
| Circumstances | Rear end, straight |
| Day of week | Thursday |
| Time | 1000-1600 |
| Speed limit | 80 KPH |
| No. casualties - minor | 1 |
| **No. casualties - total** | **1** |

Figure 5.3.8 Collision statistics for Roads in the vicinity of the site

## 5.4 Proposed Development

### 5.4.1 Description of Proposed Development

The proposed development consists of 336 no. residential units comprising 242 no. houses, and 94 no. duplexes and simplex apartments. The proposed houses consist of detached, semi-detached, and terraced units. A creche will be provided as part of an overall developed masterplan for the site.

The proposed primary access to the site is from the R639 Cork Road via a new entrance junction to be constructed as a part of the development works.

The following Figure 5.4.1 presents the scheme layout, the subject of this SHD application.

**Figure 5.4.1 Proposed Site Layout**

### 5.4.2 Phasing of Proposed Scheme

The scheme of three hundred and thirty-six (336) residential units, and a creche, would be completed in a number of phases starting in 2022 and finishing by 2027. To demonstrate the impact of the development on the local road network, the Traffic Impact Assessment includes the base year (2021), the design year 2027 (full scheme complete), the design year +5 (2032), and the design year +15 (2042).

The proposed development will be phased as follows:

- 2023 – Phase 1 (40 residential units)
- 2024 – Phase 2 (adding 70 residential units)
- 2025 – Phase 3 (adding 77 residential units and creche)
- 2026 – Phase 4 (adding 66 residential units)
- 2027 – Full scheme complete

Figure 5.4.2 Proposed Development Phasing

## 5.5 Impact Assessment

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

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

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 Junction 1 have been developed with operational phase traffic presenting a worst-case scenario.

The results of the analysis of the affected junctions will be presented in the following format.

### 5.5.1 Do Nothing Scenario

The local roads network has been assessed for the Do-Nothing Scenario and is presented as the 'Without Development' results for the modelled junctions (Junction 1). The results tables generated by the Junctions 9 Picady & Arcady traffic modelling packages have been constructed to make it easy to make a direct comparison between the with/without scenarios for each of the years and peak periods, refer to Section 5.5.3.5 Network Modelling Results.

### 5.5.2 Potential Construction Stage Traffic Impacts

As part of this application a Construction Environmental Management Plan (CEMP) has been developed which includes directions for a Construction Stage Traffic Management Plan. This traffic management plan will identify the optimum route and times for construction access to the site.

From a junction capacity assessment perspective, the operational phase of the scheme will generate more traffic during the peak traffic periods than the construction stage. Operational phase junction models therefore present a worst-case scenario in terms of impact for the modelled network.

The percentage of classified vehicles was used within the generated traffic models to reflect existing conditions more accurately (HGV% averaged across both junctions calculated at 3%). The development of the site will see this percentage marginally increase to 3.42% during the construction stage of the scheme, estimated at a maximum of 15 no. HGV's/day. This equates to 30 HGV movements per day. In addition, allowance is made for a maximum of 20 workers/staff on-site (4 movements per employee including for lunch break) giving an overall construction phase traffic generation of 110 movements per day. Assuming a worst-case scenario with all development traffic arriving via the R639 junction this would equate to an increase in the AADT of 1.14%

The following table, taken from the separate Construction and Demolition Waste Management Plan included in this application, presents the cut/fill requirements for the site based on the developed scheme and the results from site investigation works carried out to date.

Table 5.5.1 Summary of Estimated Site Cut & Fill Volumes

| Phase | Site Strip (300mm) ($m^3$) | Site Cut ($m^3$) | Site Fill (under Structures) ($m^3$) | Site Fill (Landscaped areas) ($m^3$) |
|---|---|---|---|---|
| 1 | 5535 | 3761 | 9036 | 7653 |
| 2 | 7657 | 1554 | 17280 | 6577 |
| 3 | 9572 | 8535 | 4307 | 5649 |
| 4 | 5908 | 1473 | 3715 | 4093 |
| 5 | 5264 | 20 | 6023 | 5125 |
| Totals | 33936 | 15343 | 40361 | 29097 |

The imported structural fill requirement will be sourced from available quarries within the wider area and imported to site as the requirement arises based on the phasing of the scheme. Over the 5-year construction stage this would equate to approximately 1,700 HGV trips to the site for imported structural fill material. Per phase, this equates to approximately 360 HGV trips in phase 1, 1060 HGV trips in phase 2, and 280 HGV trips in phase 5, being required for the importation of structural fill. Pending site investigation results, there is a surplus of cut material in phase 3 to meet the fill requirements of phases 3 & 4. In addition, the estimated 30 HGV movements per day includes 'normal' construction related materials such as concrete, timber, pipe-work and other finishing materials.

The potential construction phase impacts on traffic will occur as site staff arrive and leave the site, material deliveries and the implementation of the Construction Stage Traffic Management Plan. The access for construction traffic to the site will be via the single junction with the R639. The use of a road-sweeper on the R639 adjacent to the site has the potential to impact on traffic flows. It is envisaged that this will only occur during off-peak hours.

The following mitigation measures are proposed to minimise the impact of the traffic increase during construction.

#### 5.5.2.1 Mitigation Measures

- The re-use of excavated materials generated on-site will reduce the total volume of imported material thereby reducing traffic generation.
- Adequate storage space on site will be provided to accommodate all cut material.
- Defining delivery times to site will avoid background traffic peak periods. Trucks will be equipped with dust covers when carrying dust producing materials to reduce the environmental impact of this activity.
- Construction stage site staff starting at 07:00 and ending at 18:00 will avoid the recorded peak periods.
- Site Staff encouraged to car-pool and to use public transport.
- Road cleaning and wheel-wash systems will be put in place.
- Specific haulage routes will be identified and agreed with the Local Authority prior to commencement of construction.
- Construction Traffic Management Plan will be developed and implemented when appropriate, ie during the delivery of materials.
- Warning Signs and Advanced Warning Signs will be installed at appropriate locations in advance of the construction works.
- All site staff parking will be accommodated on-site within the designated site compound. No parking of site vehicles will be facilitated on the public road.
- All site vehicles are to be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits will be available on site. It will be the responsibility of the main contractor to ensure that all vehicles delivering to the site are suitably licensed to use the public road and equipped for this activity.

### 5.5.3 Operational Stage Traffic Impact

In order to assess the impact of the proposed development on the identified study area, the key junctions have been assessed both with/without development traffic for both AM and PM peak hours. Results are presented for the full operation starting in 2027, 5 years after the full operation start 2032, and 15 years after the full operation start 2042.

As previously mentioned in Section 5.3.1, the peak hour traffic periods for each junction are included in order to obtain the worst-case traffic build-up results. This ensures a robust analysis of the road network is conducted.

#### 5.5.3.1 Traffic Forecasting

The TII Guidelines have been followed when forecasting growth rates for background traffic for the area. Recorded background traffic was factored using TII (Transport Infrastructure Ireland) Project Appraisal Guidelines (PE-PAG-02017) for use in future year scenarios. The following table presents the factors used on recorded PCU's based on Link Based Growth Rates (Central Growth) for the Cork County Area.

Table 5.5.2 Background Traffic Growth Rates Per Annum

| | Cars/LGV | HGV | Combined |
|---|---|---|---|
| Count % | 97% | 3% | **100%** |
| | | | |
| **2021 to 2027** | 1.119 | 1.249 | **1.123** |
| **2021 to 2032** | 1.201 | 1.427 | **1.208** |
| **2021 to 2042** | 1.290 | 1.608 | **1.299** |

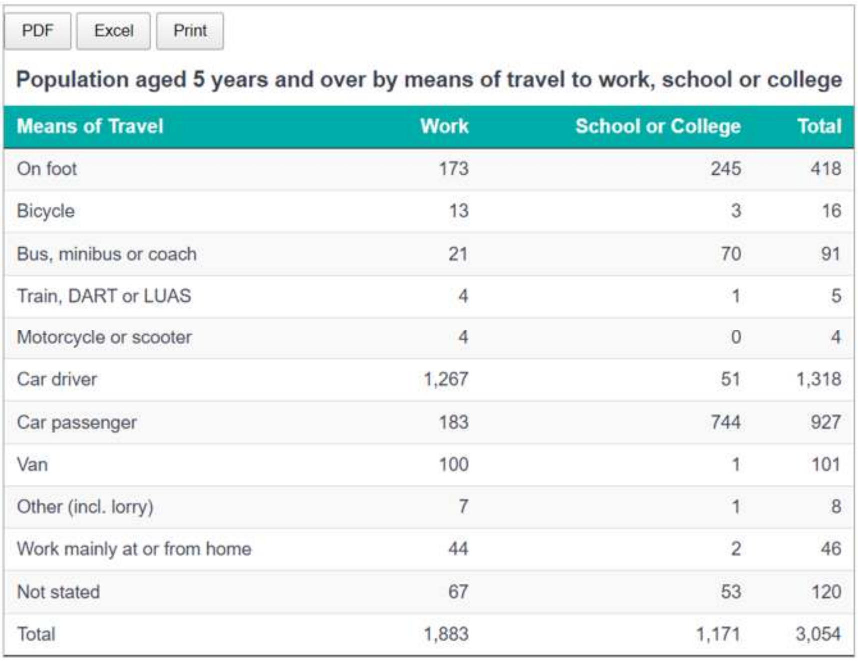
**TII Project Appraisal Guidelines for National Roads Unit 5.3**
*Travel Demand Projections (PE-PAG-0217-02)*

#### 5.5.3.2 Modal Shift

This section describes the current level of modal shift (the use of sustainable modes of travel) based on available data and compares these to national targets.

The 2016 Census online SAP data was used to assess current modal shift patterns in the Fermoy area, specifically the electoral division of Fermoy Rural which encompasses the site. 18% of people in this area said they were commuting on foot, bike or using public transport.

Table 5.5.3 2016 Modal Shift by means of travel to work, school or college. (Electoral Division of Fermoy Rural)



Population aged 5 years and over by means of travel to work, school or college

| Means of Travel | Work | School or College | Total |
|---|---|---|---|
| On foot | 173 | 245 | 418 |
| Bicycle | 13 | 3 | 16 |
| Bus, minibus or coach | 21 | 70 | 91 |
| Train, DART or LUAS | 4 | 1 | 5 |
| Motorcycle or scooter | 4 | 0 | 4 |
| Car driver | 1,267 | 51 | 1,318 |
| Car passenger | 183 | 744 | 927 |
| Van | 100 | 1 | 101 |
| Other (incl. lorry) | 7 | 1 | 8 |
| Work mainly at or from home | 44 | 2 | 46 |
| Not stated | 67 | 53 | 120 |
| Total | 1,883 | 1,171 | 3,054 |

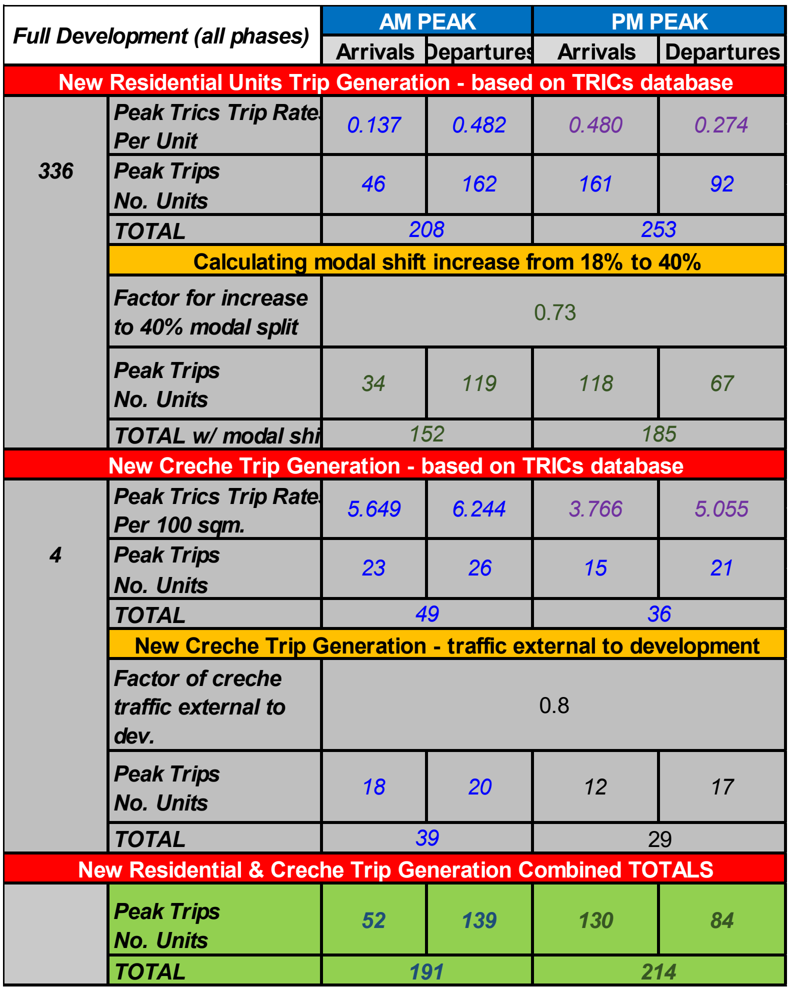
A modal shift of 40% (implying an anticipated increase in public transport or active travel in the immediate area of 22%) for future year models is deemed to be reasonable. This modal shift increase of 22% will be applied to proposed development traffic from the opening year (when the development is fully completed) 2027, up to the design year 2042.

#### 5.5.3.3 Trip Generation

This section describes the traffic generation from the proposed development and is based on the TRICS Database as outlined in the TTA.

The following table presents residential development traffic for future years. This traffic has been added to existing background flows and distributed through the network to model each of the identified junctions. The results are presented in Section 5.5.3.5 of this report.

Table 5.5.4 Proposed Development Traffic in 2027 (full scheme)



| *Full Development (all phases)* | | AM PEAK | | PM PEAK | |
|---|---|---|---|---|---|
| | | Arrivals | Departures | Arrivals | Departures |
| New Residential Units Trip Generation - based on TRICs database | | | | | |
| *336* | *Peak Trics Trip Rate Per Unit* | *0.137* | *0.482* | *0.480* | *0.274* |
| | *Peak Trips No. Units* | *46* | *162* | *161* | *92* |
| | *TOTAL* | *208* | | *253* | |
| | Calculating modal shift increase from 18% to 40% | | | | |
| | *Factor for increase to 40% modal split* | 0.73 | | | |
| | *Peak Trips No. Units* | *34* | *119* | *118* | *67* |
| | *TOTAL w/ modal shi* | *152* | | *185* | |
| New Creche Trip Generation - based on TRICs database | | | | | |
| *4* | *Peak Trics Trip Rate Per 100 sqm.* | *5.649* | *6.244* | *3.766* | *5.055* |
| | *Peak Trips No. Units* | *23* | *26* | *15* | *21* |
| | *TOTAL* | *49* | | *36* | |
| | New Creche Trip Generation - traffic external to development | | | | |
| | *Factor of creche traffic external to dev.* | 0.8 | | | |
| | *Peak Trips No. Units* | *18* | *20* | *12* | *17* |
| | *TOTAL* | *39* | | 29 | |
| New Residential & Creche Trip Generation Combined TOTALS | | | | | |
| | *Peak Trips No. Units* | *52* | *139* | *130* | *84* |
| | *TOTAL* | *191* | | *214* | |

The above table presents the expected AM/PM traffic generation figures from the various uses within the scheme. This traffic is added to the measured background flows to develop future year traffic models of the identified junctions. The distribution of these 'new' trips onto the roads network will be in-line with recorded patterns of flow. The term 'new' trips implies that it is assumed that all residents and end users of the residential element of the scheme are new to the area.

#### 5.5.3.4 Trip Distribution

Traffic flow matrices have been developed for each Junction for the following scenarios:

- 2027 AM/PM With/Without Dev (Full scheme)

- 2032 AM/PM With/Without Dev
- 2042 AM/PM With/Without Dev

## Junction 1: T- junction serving R639 Cork Rd. & L-1542 local road

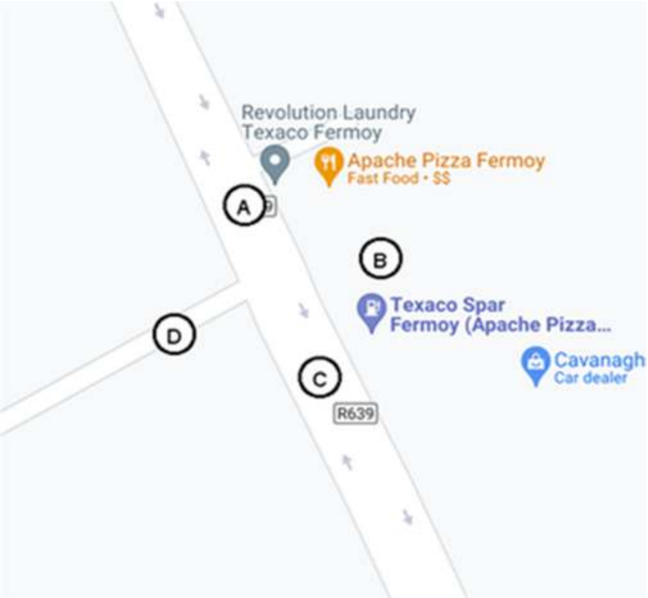


Figure 5.5.1 Junction 1 Arm Designation

Table 5.5.5 Junction 1: Existing 2021 AM/PM Peak Hour Traffic Movements

**2021** *AM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 82 | 256 | 107 | 445 |
| B | 37 | 1 | 82 | 24 | 144 |
| C | 330 | 27 | 0 | 83 | 440 |
| D | 201 | 44 | 83 | 0 | 328 |
| Total | 567 | 154 | 421 | 214 | 1357 |

*PM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 83 | 271 | 50 | 404 |
| B | 45 | 0 | 59 | 35 | 139 |
| C | 357 | 38 | 0 | 60 | 455 |
| D | 41 | 21 | 44 | 0 | 106 |
| Total | 443 | 142 | 374 | 145 | 1104 |

Table 5.5.6 Junction 1: 2027 Without Development AM/PM Peak Hour Traffic Movements

**2027** *AM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 92 | 288 | 120 | 500 |
| B | 41 | 1 | 92 | 27 | 162 |
| C | 370 | 31 | 0 | 93 | 494 |
| D | 225 | 50 | 93 | 0 | 368 |
| Total | 637 | 173 | 473 | 241 | 1523 |

*PM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 93 | 304 | 57 | 454 |
| B | 51 | 0 | 66 | 39 | 156 |
| C | 401 | 42 | 0 | 67 | 510 |
| D | 46 | 24 | 50 | 0 | 119 |
| Total | 498 | 159 | 420 | 163 | 1239 |

Table 5.5.7 Junction 1: 2027 With Development AM/PM Peak Hour Traffic Movements

**2027** *AM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 92 | 303 | 120 | 515 |
| B | 41 | 1 | 97 | 27 | 167 |
| C | 423 | 35 | 0 | 107 | 565 |
| D | 225 | 50 | 98 | 0 | 373 |
| Total | 690 | 177 | 498 | 255 | 1619 |

*PM* **Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 93 | 347 | 57 | 497 |
| B | 51 | 0 | 75 | 39 | 165 |
| C | 437 | 46 | 0 | 73 | 556 |
| D | 46 | 24 | 57 | 0 | 126 |
| Total | 534 | 163 | 479 | 169 | 1344 |

**Table 5.5.8 Junction 1: 2032 Without Development AM/PM Peak Hour Traffic Movements**

**2032** *AM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 99 | 309 | 129 | 538 |
| B | 44 | 1 | 99 | 29 | 174 |
| C | 398 | 33 | 0 | 100 | 531 |
| D | 242 | 53 | 100 | 0 | 396 |
| Total | 685 | 186 | 509 | 259 | 1639 |

*PM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 100 | 327 | 61 | 488 |
| B | 55 | 0 | 71 | 42 | 167 |
| C | 431 | 46 | 0 | 72 | 549 |
| D | 49 | 25 | 53 | 0 | 128 |
| Total | 535 | 171 | 451 | 175 | 1333 |

**Table 5.5.9 Junction 1: 2032 With Development AM/PM Peak Hour Traffic Movements**

**2032** *AM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 99 | 324 | 129 | 553 |
| B | 44 | 1 | 104 | 29 | 179 |
| C | 451 | 37 | 0 | 114 | 602 |
| D | 242 | 53 | 105 | 0 | 401 |
| Total | 738 | 190 | 534 | 273 | 1735 |

*PM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 100 | 370 | 61 | 531 |
| B | 55 | 0 | 80 | 42 | 176 |
| C | 467 | 50 | 0 | 78 | 595 |
| D | 49 | 25 | 60 | 0 | 135 |
| Total | 571 | 175 | 510 | 181 | 1438 |

**Table 5.5.10 Junction 1: 2042 Without Development AM/PM Peak Hour Traffic Movements**

**2042** *AM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 106 | 333 | 139 | 578 |
| B | 48 | 1 | 106 | 31 | 187 |
| C | 428 | 35 | 0 | 108 | 572 |
| D | 261 | 57 | 108 | 0 | 426 |
| Total | 737 | 201 | 547 | 278 | 1763 |

*PM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 108 | 352 | 65 | 525 |
| B | 59 | 0 | 76 | 45 | 180 |
| C | 464 | 49 | 0 | 78 | 591 |
| D | 53 | 27 | 57 | 0 | 138 |
| Total | 576 | 184 | 486 | 188 | 1434 |

**Table 5.5.11 Junction 1: 2042 With Development AM/PM Peak Hour Traffic Movements**

**2042** *AM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 106 | 348 | 139 | 593 |
| B | 48 | 1 | 111 | 31 | 192 |
| C | 481 | 39 | 0 | 122 | 643 |
| D | 261 | 57 | 113 | 0 | 431 |
| Total | 790 | 205 | 572 | 292 | 1859 |

*PM*

**Destination**

**Origin**

| | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 108 | 395 | 65 | 568 |
| B | 59 | 0 | 85 | 45 | 189 |
| C | 500 | 53 | 0 | 84 | 637 |
| D | 53 | 27 | 64 | 0 | 145 |
| Total | 612 | 188 | 545 | 194 | 1539 |

## Junction 2: Roundabout on the junction of R639 Cork Rd. and M8 Motorway

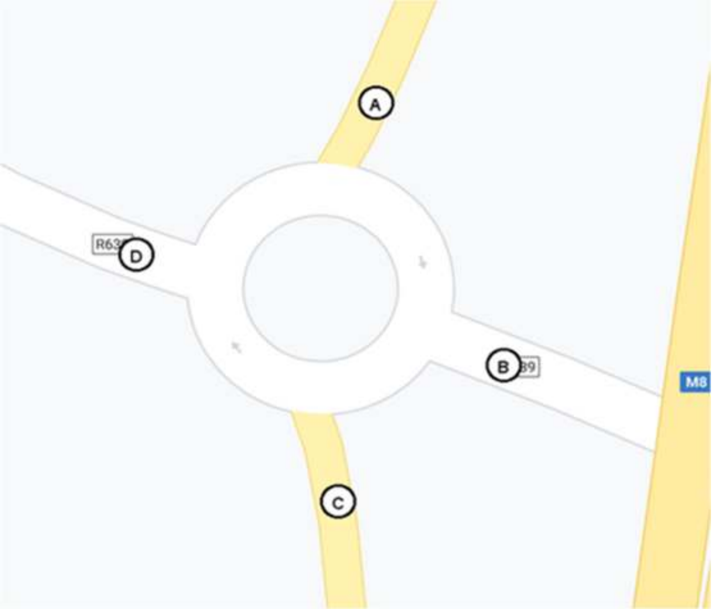


Figure 5.5.2 Junction 2 Arm Designation

### Table 5.5.12 Junction 2: 2021 AM/PM Peak Hour Traffic Movements

**2021** *AM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 47 | 1 | 0 | 379 | 427 |
| | C | 0 | 4 | 0 | 78 | 82 |
| | D | 7 | 398 | 0 | 0 | 405 |
| | Total | 55 | 403 | 0 | 457 | 915 |

*PM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 55 | 1 | 0 | 372 | 427 |
| | C | 2 | 11 | 0 | 72 | 85 |
| | D | 12 | 361 | 0 | 0 | 373 |
| | Total | 68 | 373 | 0 | 444 | 885 |

### Table 5.5.13 Junction 2: 2027 Without Development AM/PM Peak Hour Traffic Movements

**2027** *AM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 53 | 1 | 0 | 426 | 480 |
| | C | 0 | 5 | 0 | 87 | 92 |
| | D | 8 | 447 | 0 | 0 | 455 |
| | Total | 61 | 453 | 0 | 513 | 1027 |

*PM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 61 | 1 | 0 | 417 | 480 |
| | C | 2 | 12 | 0 | 81 | 95 |
| | D | 13 | 406 | 0 | 0 | 419 |
| | Total | 77 | 419 | 0 | 499 | 994 |

### Table 5.5.14 Junction 2: 2027 With Development AM/PM Peak Hour Traffic Movements

**2027** *AM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 53 | 1 | 0 | 448 | 502 |
| | C | 0 | 5 | 0 | 92 | 97 |
| | D | 9 | 514 | 0 | 0 | 523 |
| | Total | 62 | 520 | 0 | 540 | 1122 |

*PM*

**Destination**

| | | A | B | C | D | Tot |
|---|---|---|---|---|---|---|
| **Origin** | A | 0 | 0 | 0 | 0 | 0 |
| | B | 61 | 1 | 0 | 477 | 540 |
| | C | 2 | 12 | 0 | 92 | 106 |
| | D | 14 | 443 | 0 | 0 | 457 |
| | Total | 78 | 456 | 0 | 570 | 1103 |

## Table 5.5.15 Junction 2: 2032 Without Development AM/PM Peak Hour Traffic Movements

**2032** *AM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 57 | 1 | 0 | 458 | 516 |
| C | 0 | 5 | 0 | 94 | 99 |
| D | 9 | 481 | 0 | 0 | 490 |
| Total | 66 | 487 | 0 | 552 | 1105 |

*PM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 66 | 1 | 0 | 449 | 516 |
| C | 3 | 13 | 0 | 88 | 103 |
| D | 14 | 436 | 0 | 0 | 450 |
| Total | 82 | 450 | 0 | 536 | 1069 |

## Table 5.5.16 Junction 2: 2032 With Development AM/PM Peak Hour Traffic Movements

**2032** *AM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 57 | 1 | 0 | 480 | 538 |
| C | 0 | 5 | 0 | 99 | 104 |
| D | 10 | 548 | 0 | 0 | 558 |
| Total | 67 | 554 | 0 | 579 | 1200 |

*PM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 66 | 1 | 0 | 509 | 576 |
| C | 3 | 13 | 0 | 99 | 114 |
| D | 15 | 473 | 0 | 0 | 488 |
| Total | 83 | 487 | 0 | 607 | 1178 |

## Table 5.5.17 Junction 2: 2042 Without Development AM/PM Peak Hour Traffic Movements

**2042** *AM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 61 | 1 | 0 | 492 | 555 |
| C | 0 | 5 | 0 | 101 | 106 |
| D | 10 | 517 | 0 | 0 | 527 |
| Total | 71 | 524 | 0 | 593 | 1188 |

*PM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 71 | 1 | 0 | 483 | 555 |
| C | 3 | 14 | 0 | 94 | 110 |
| D | 15 | 469 | 0 | 0 | 484 |
| Total | 89 | 484 | 0 | 577 | 1150 |

## Table 5.5.18 Junction 2: 2042 With Development AM/PM Peak Hour Traffic Movements

**2042** *AM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 61 | 1 | 0 | 514 | 577 |
| C | 0 | 5 | 0 | 106 | 111 |
| D | 11 | 584 | 0 | 0 | 595 |
| Total | 72 | 591 | 0 | 620 | 1283 |

*PM* **Destination**

| **Origin** | A | B | C | D | Tot |
|---|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 | 0 |
| B | 71 | 1 | 0 | 543 | 615 |
| C | 3 | 14 | 0 | 105 | 121 |
| D | 16 | 506 | 0 | 0 | 522 |
| Total | 90 | 521 | 0 | 648 | 1259 |

Junction 3: Proposed development entrance junction

Figure 5.5.3 Junction 3 Arm Designation

Table 5.5.19 Junction 3: 2021 AM/PM Peak Hour Traffic Movements

**2021** *AM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 0 | 421 | 421 |
| | B | 0 | 0 | 0 | 0 |
| | C | 440 | 0 | 0 | 440 |
| | Total | 440 | 0 | 421 | 861 |

*PM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 0 | 374 | 374 |
| | B | 0 | 0 | 0 | 0 |
| | C | 455 | 0 | 0 | 455 |
| | Total | 455 | 0 | 374 | 828 |

Table 5.5.20 Junction 3: 2027 Without Development AM/PM Peak Hour Traffic Movements

**2027** *AM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 0 | 473 | 473 |
| | B | 0 | 0 | 0 | 0 |
| | C | 494 | 0 | 0 | 494 |
| | Total | 494 | 0 | 473 | 967 |

*PM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 0 | 420 | 420 |
| | B | 0 | 0 | 0 | 0 |
| | C | 510 | 0 | 0 | 510 |
| | Total | 510 | 0 | 420 | 930 |

Table 5.5.21 Junction 3: 2027 With Development AM/PM Peak Hour Traffic Movements

**2027** *AM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 25 | 473 | 498 |
| | B | 71 | 0 | 68 | 139 |
| | C | 494 | 27 | 0 | 521 |
| | Total | 565 | 52 | 541 | 1158 |

*PM*

| | | Destination | | | |
|---|---|---|---|---|---|
| | | A | B | C | Tot |
| **Origin** | A | 0 | 59 | 420 | 479 |
| | B | 46 | 0 | 38 | 84 |
| | C | 510 | 71 | 0 | 581 |
| | Total | 556 | 130 | 458 | 1144 |

Table 5.5.22 Junction 3: 2032 Without Development AM/PM Peak Hour Traffic Movements

**2032** *AM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 509 | 509 |
| B | 0 | 0 | 0 | 0 |
| C | 531 | 0 | 0 | 531 |
| Total | 531 | 0 | 509 | 1040 |

*PM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 451 | 451 |
| B | 0 | 0 | 0 | 0 |
| C | 549 | 0 | 0 | 549 |
| Total | 549 | 0 | 451 | 1001 |

Table 5.5.23 Junction 3: 2032 With Development AM/PM Peak Hour Traffic Movements

**2032** *AM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 25 | 509 | 534 |
| B | 71 | 0 | 68 | 139 |
| C | 531 | 27 | 0 | 558 |
| Total | 602 | 52 | 577 | 1231 |

*PM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 59 | 451 | 510 |
| B | 46 | 0 | 38 | 84 |
| C | 549 | 71 | 0 | 620 |
| Total | 595 | 130 | 489 | 1215 |

Table 5.5.24 Junction 3: 2042 Without Development AM/PM Peak Hour Traffic Movements

**2042** *AM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 547 | 547 |
| B | 0 | 0 | 0 | 0 |
| C | 572 | 0 | 0 | 572 |
| Total | 572 | 0 | 547 | 1119 |

*PM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 486 | 486 |
| B | 0 | 0 | 0 | 0 |
| C | 591 | 0 | 0 | 591 |
| Total | 591 | 0 | 486 | 1076 |

Table 5.5.25 Junction 3: 2042 With Development AM/PM Peak Hour Traffic Movements

**2042** *AM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 25 | 547 | 572 |
| B | 71 | 0 | 68 | 139 |
| C | 572 | 27 | 0 | 599 |
| Total | 643 | 52 | 615 | 1310 |

*PM* **Destination**

**Origin**

| | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 59 | 486 | 545 |
| B | 46 | 0 | 38 | 84 |
| C | 591 | 71 | 0 | 662 |
| Total | 637 | 130 | 524 | 1290 |

The Distribution of traffic from the proposed development is in accordance with existing recorded traffic patterns on the local roads network. This is standard practice when developing future year traffic flows of a new development

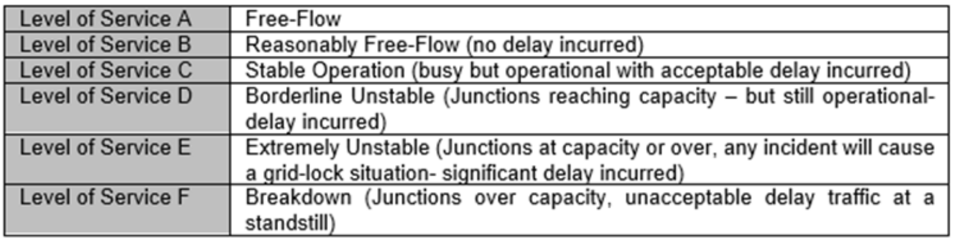
### 5.5.3.5 Network Modelling Results

This section presents the results of the traffic modelling of the three identified junctions presented both with/without development in place for the year 2021 (traffic counts undertaken in December 2021), the Opening Year 2027, the Opening Year + 5 (2032), and the Opening Year +15 (2042). The Junctions 9 Picady software was used to analyse Junctions 1 & 3, whilst the Junction 9 Arcady Software Package was used to analyse the roundabout at Junction 2.

The Junctions 9: PICADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a junction implies that the junction has reached capacity but is still operational with delay incurred. The following Table 5.5.3.25 describes the different LOS and the implications for the junctions being assessed.

The Junctions 9: ARCADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a roundabout junction implies that the junction has reached capacity but is still operational with delay incurred. The following table describes the different LOS and the implications for the junctions being assessed.

Table 5.5.26 Level of Service



| | |
|---|---|
| Level of Service A | Free-Flow |
| Level of Service B | Reasonably Free-Flow (no delay incurred) |
| Level of Service C | Stable Operation (busy but operational with acceptable delay incurred) |
| Level of Service D | Borderline Unstable (Junctions reaching capacity – but still operational-delay incurred) |
| Level of Service E | Extremely Unstable (Junctions at capacity or over, any incident will cause a grid-lock situation- significant delay incurred) |
| Level of Service F | Breakdown (Junctions over capacity, unacceptable delay traffic at a standstill) |

The results for the selected junctions both with/without development are presented in the respective Tables below.

Junction 1: T- junction serving R639 Cork Rd. & L-1542 local road

The Picady results for the junction both with/without development are presented in Table 5.5.3.26 below. The current year (2021) results are representative of how the junction currently operates during peak periods. This is borne out in terms of measured queue and observed delay recorded as part of the data collection process. Figure 5.5.3.1 is referred to for arm designation when interpreting the results. The constructed model is deemed to be fit for purpose.

The results indicate that the junction operates within capacity currently and will continue to do so up to and including the design year 2042 with the development in place. The maximum future year RFC (Ratio of Flow to Capacity) is 75% in 2042 AM peak. The Level of Service for this maximum RFC is D – Borderline Unstable. This Level of Service signals that the junction is reaching capacity but remains operational while incurring delays. The modelling results demonstrate that this Level of Service will be experienced both with and without development traffic in the year 2042.

Future year results, both with and without development traffic, show a steady degradation in capacity at the junction with some queuing occurring.

Table 5.5.27 Junction 1: Picady software modelling results

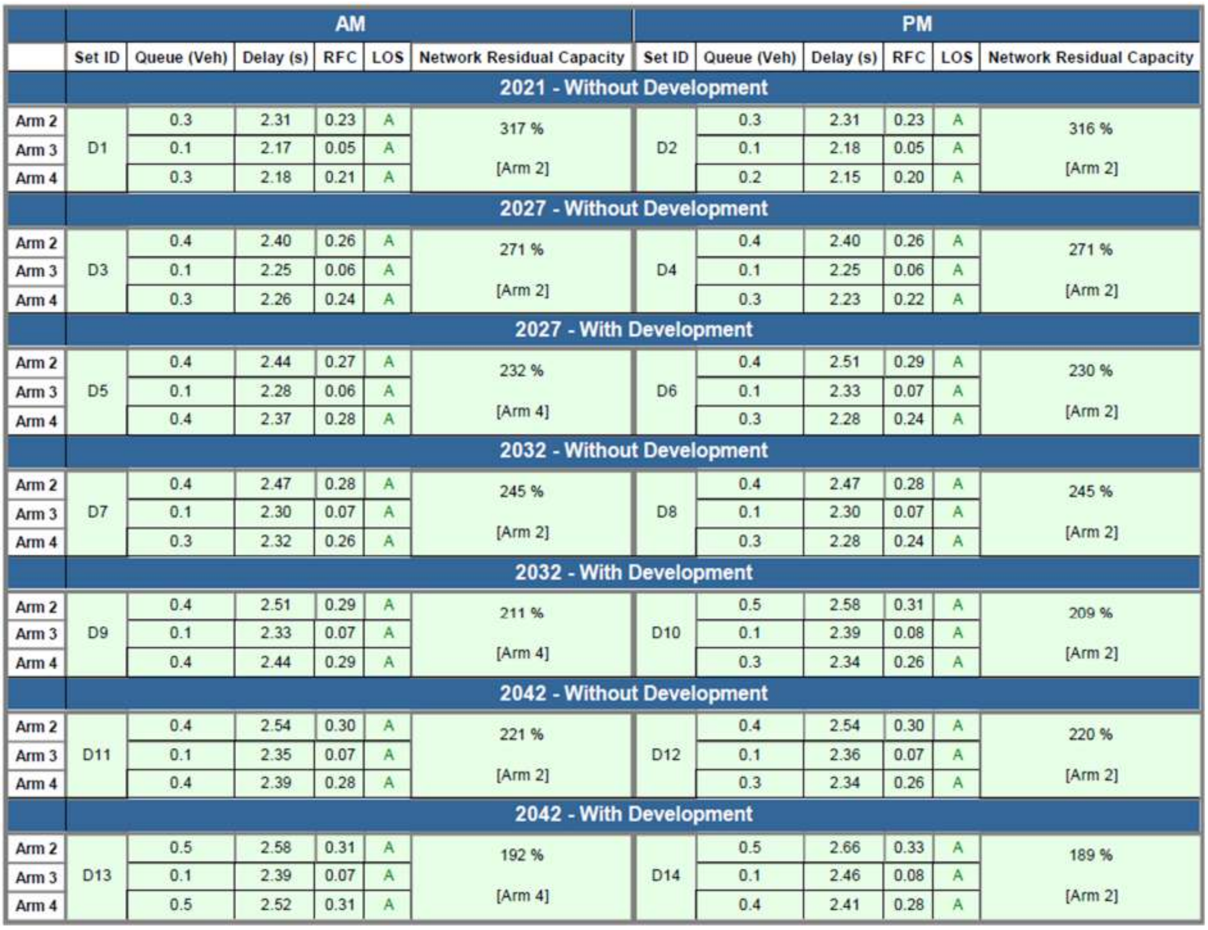
| | AM | | | | | | PM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity |
| | 2021 - Without Development | | | | | | | | | | | |
| Stream B-ACD | D1 | 0.5 | 10.72 | 0.34 | B | 24 %<br>[Stream D-AB] | D2 | 0.4 | 10.01 | 0.30 | B | 70 %<br>[Stream B-ACD] |
| Stream A-D | | 0.2 | 7.63 | 0.20 | A | | | 0.1 | 6.60 | 0.09 | A | |
| Stream D-AB | | 1.2 | 14.92 | 0.54 | B | | | 0.1 | 7.39 | 0.11 | A | |
| Stream D-BC | | 0.6 | 17.05 | 0.36 | C | | | 0.2 | 11.80 | 0.16 | B | |
| Stream C-B | | 0.1 | 5.97 | 0.05 | A | | | 0.1 | 5.84 | 0.06 | A | |
| | 2027 - Without Development | | | | | | | | | | | |
| Stream B-ACD | D3 | 0.6 | 11.66 | 0.36 | B | 23 %<br>[Stream D-AB] | D4 | 0.5 | 11.41 | 0.35 | B | 52 %<br>[Stream B-ACD] |
| Stream A-D | | 0.3 | 7.87 | 0.22 | A | | | 0.1 | 6.91 | 0.11 | A | |
| Stream D-AB | | 1.2 | 15.30 | 0.55 | C | | | 0.1 | 7.95 | 0.13 | A | |
| Stream D-BC | | 0.6 | 18.02 | 0.38 | C | | | 0.2 | 13.30 | 0.20 | B | |
| Stream C-B | | 0.1 | 6.17 | 0.06 | A | | | 0.1 | 6.05 | 0.07 | A | |
| | 2027 - With Development | | | | | | | | | | | |
| Stream B-ACD | D5 | 0.6 | 12.39 | 0.38 | B | 17 %<br>[Stream D-AB] | D6 | 0.6 | 12.41 | 0.39 | B | 42 %<br>[Stream B-ACD] |
| Stream A-D | | 0.3 | 8.27 | 0.23 | A | | | 0.1 | 7.11 | 0.11 | A | |
| Stream D-AB | | 1.3 | 17.22 | 0.58 | C | | | 0.2 | 8.37 | 0.13 | A | |
| Stream D-BC | | 0.7 | 20.73 | 0.42 | C | | | 0.3 | 14.92 | 0.23 | B | |
| Stream C-B | | 0.1 | 6.27 | 0.06 | A | | | 0.1 | 6.24 | 0.08 | A | |
| | 2032 - Without Development | | | | | | | | | | | |
| Stream B-ACD | D7 | 0.7 | 13.13 | 0.41 | B | 14 %<br>[Stream D-AB] | D8 | 0.6 | 12.65 | 0.39 | B | 41 %<br>[Stream B-ACD] |
| Stream A-D | | 0.3 | 8.25 | 0.25 | A | | | 0.1 | 7.14 | 0.12 | A | |
| Stream D-AB | | 1.5 | 18.59 | 0.61 | C | | | 0.2 | 8.33 | 0.14 | A | |
| Stream D-BC | | 0.7 | 20.83 | 0.43 | C | | | 0.3 | 14.48 | 0.22 | B | |
| Stream C-B | | 0.1 | 6.34 | 0.06 | A | | | 0.1 | 6.22 | 0.08 | A | |
| | 2032 - With Development | | | | | | | | | | | |
| Stream B-ACD | D9 | 0.8 | 14.11 | 0.43 | B | 9 %<br>[Stream D-AB] | D10 | 0.7 | 13.92 | 0.43 | B | 32 %<br>[Stream B-ACD] |
| Stream A-D | | 0.3 | 8.69 | 0.26 | A | | | 0.1 | 7.36 | 0.12 | A | |
| Stream D-AB | | 1.8 | 21.66 | 0.65 | C | | | 0.2 | 8.81 | 0.15 | A | |
| Stream D-BC | | 0.9 | 24.50 | 0.47 | C | | | 0.3 | 16.42 | 0.26 | C | |
| Stream C-B | | 0.1 | 6.45 | 0.07 | A | | | 0.1 | 6.42 | 0.09 | A | |
| | 2042 - Without Development | | | | | | | | | | | |
| Stream B-ACD | D11 | 0.9 | 15.43 | 0.47 | C | 6 %<br>[Stream D-AB] | D12 | 0.8 | 14.28 | 0.44 | B | 31 %<br>[Stream B-ACD] |
| Stream A-D | | 0.4 | 8.72 | 0.27 | A | | | 0.1 | 7.40 | 0.13 | A | |
| Stream D-AB | | 2.2 | 24.81 | 0.70 | C | | | 0.2 | 8.86 | 0.16 | A | |
| Stream D-BC | | 0.9 | 25.14 | 0.49 | D | | | 0.3 | 16.06 | 0.25 | C | |
| Stream C-B | | 0.1 | 6.54 | 0.07 | A | | | 0.1 | 6.39 | 0.09 | A | |
| | 2042 - With Development | | | | | | | | | | | |
| Stream B-ACD | D13 | 1.0 | 16.91 | 0.50 | C | 2 %<br>[Stream D-AB] | D14 | 0.9 | 15.97 | 0.48 | C | 24 %<br>[Stream B-ACD] |
| Stream A-D | | 0.4 | 9.21 | 0.28 | A | | | 0.2 | 7.63 | 0.13 | A | |
| Stream D-AB | | 2.7 | 30.90 | 0.75 | D | | | 0.2 | 9.44 | 0.17 | A | |
| Stream D-BC | | 1.2 | 30.57 | 0.54 | D | | | 0.4 | 18.48 | 0.29 | C | |
| Stream C-B | | 0.1 | 6.65 | 0.07 | A | | | 0.1 | 6.61 | 0.10 | A | |

### Junction 2: Roundabout on the junction of R639 Cork Rd. and M8 Motorway

The Arcady results for Junction 2 both with/without development are presented in Table 5.5.3.27 below. The current year (2021) results are representative of how the junction currently operates during peak periods. This is borne out in terms of measured queue and observed delay recorded as part of the data collection process. Figure 5.5.3.2 is referred to for arm designation when interpreting the results. The constructed model is deemed to be fit for purpose

The results indicate that the junction currently operates well within capacity and will continue to do so up to and including the design year 2042 with the development in place. The maximum future year RFC (Ratio of Flow to Capacity) is 33% in 2042 PM peak. The Level of Service for this maximum RFC is A – Free Flow.

**Table 5.5.28 Junction 2: Arcady software modelling results**



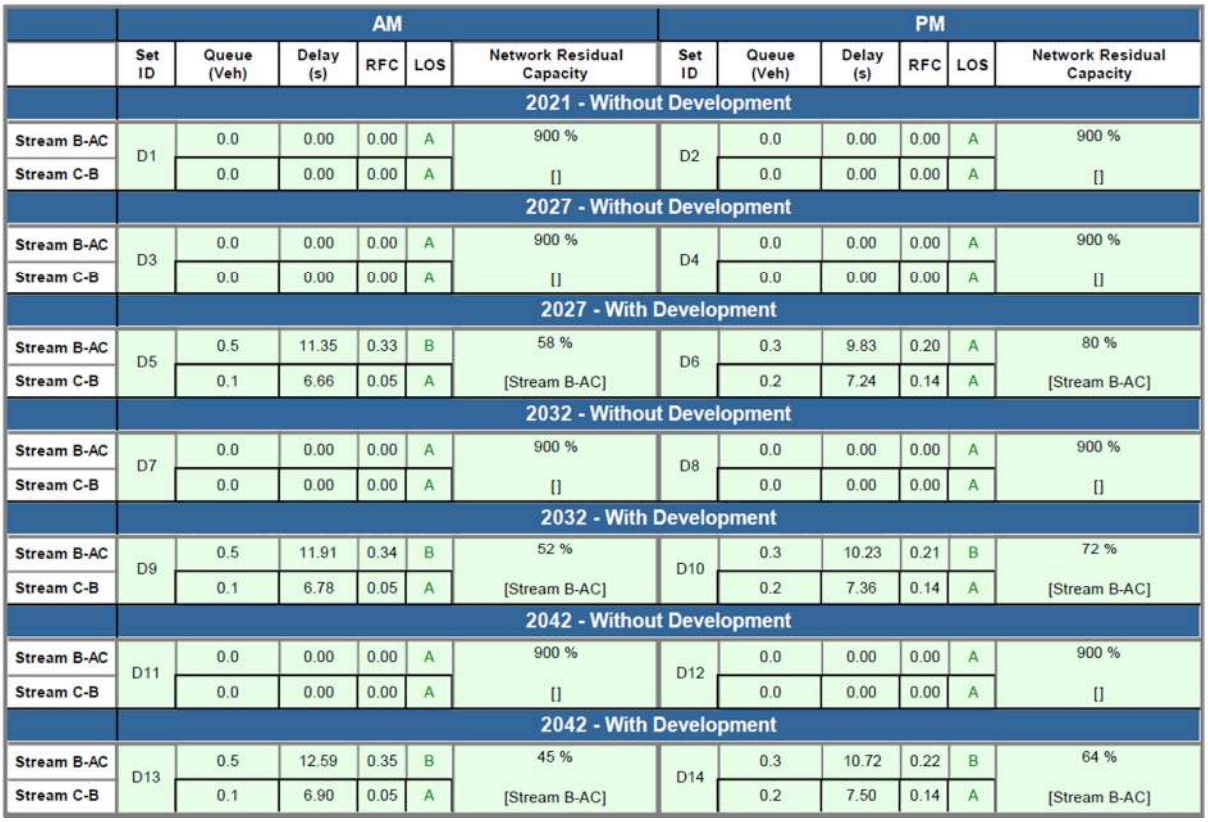
| | AM | | | | | | PM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity |
| **2021 - Without Development** | | | | | | | | | | | | |
| Arm 2 | D1 | 0.3 | 2.31 | 0.23 | A | 317 %<br>[Arm 2] | D2 | 0.3 | 2.31 | 0.23 | A | 316 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.17 | 0.05 | A | | | 0.1 | 2.18 | 0.05 | A | |
| Arm 4 | | 0.3 | 2.18 | 0.21 | A | | | 0.2 | 2.15 | 0.20 | A | |
| **2027 - Without Development** | | | | | | | | | | | | |
| Arm 2 | D3 | 0.4 | 2.40 | 0.26 | A | 271 %<br>[Arm 2] | D4 | 0.4 | 2.40 | 0.26 | A | 271 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.25 | 0.06 | A | | | 0.1 | 2.25 | 0.06 | A | |
| Arm 4 | | 0.3 | 2.26 | 0.24 | A | | | 0.3 | 2.23 | 0.22 | A | |
| **2027 - With Development** | | | | | | | | | | | | |
| Arm 2 | D5 | 0.4 | 2.44 | 0.27 | A | 232 %<br>[Arm 4] | D6 | 0.4 | 2.51 | 0.29 | A | 230 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.28 | 0.06 | A | | | 0.1 | 2.33 | 0.07 | A | |
| Arm 4 | | 0.4 | 2.37 | 0.28 | A | | | 0.3 | 2.28 | 0.24 | A | |
| **2032 - Without Development** | | | | | | | | | | | | |
| Arm 2 | D7 | 0.4 | 2.47 | 0.28 | A | 245 %<br>[Arm 2] | D8 | 0.4 | 2.47 | 0.28 | A | 245 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.30 | 0.07 | A | | | 0.1 | 2.30 | 0.07 | A | |
| Arm 4 | | 0.3 | 2.32 | 0.26 | A | | | 0.3 | 2.28 | 0.24 | A | |
| **2032 - With Development** | | | | | | | | | | | | |
| Arm 2 | D9 | 0.4 | 2.51 | 0.29 | A | 211 %<br>[Arm 4] | D10 | 0.5 | 2.58 | 0.31 | A | 209 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.33 | 0.07 | A | | | 0.1 | 2.39 | 0.08 | A | |
| Arm 4 | | 0.4 | 2.44 | 0.29 | A | | | 0.3 | 2.34 | 0.26 | A | |
| **2042 - Without Development** | | | | | | | | | | | | |
| Arm 2 | D11 | 0.4 | 2.54 | 0.30 | A | 221 %<br>[Arm 2] | D12 | 0.4 | 2.54 | 0.30 | A | 220 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.35 | 0.07 | A | | | 0.1 | 2.36 | 0.07 | A | |
| Arm 4 | | 0.4 | 2.39 | 0.28 | A | | | 0.3 | 2.34 | 0.26 | A | |
| **2042 - With Development** | | | | | | | | | | | | |
| Arm 2 | D13 | 0.5 | 2.58 | 0.31 | A | 192 %<br>[Arm 4] | D14 | 0.5 | 2.66 | 0.33 | A | 189 %<br>[Arm 2] |
| Arm 3 | | 0.1 | 2.39 | 0.07 | A | | | 0.1 | 2.46 | 0.08 | A | |
| Arm 4 | | 0.5 | 2.52 | 0.31 | A | | | 0.4 | 2.41 | 0.28 | A | |

*Junction 3: Proposed development entrance junction*

The Picady results for Junction 3 both with/without development are presented in Table 5.5.3.28 below. The current year (2021) results are representative of how the junction currently operates during peak periods (i.e. no junction present). This is borne out in terms of measured queue and observed delay recorded as part of the data collection process. Figure 5.5.3.3 is referred to for arm designation when interpreting the results. The constructed model is deemed to be fit for purpose.

The results indicate that the junction will operate within capacity during both AM & PM peak for all future years.

Table 5.5.29 Junction 3: Picady software modelling results



| | AM | | | | | | PM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Network Residual Capacity |
| | 2021 - Without Development | | | | | | | | | | | |
| Stream B-AC | D1 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] | D2 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] |
| Stream C-B | | 0.0 | 0.00 | 0.00 | A | | | 0.0 | 0.00 | 0.00 | A | |
| | 2027 - Without Development | | | | | | | | | | | |
| Stream B-AC | D3 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] | D4 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] |
| Stream C-B | | 0.0 | 0.00 | 0.00 | A | | | 0.0 | 0.00 | 0.00 | A | |
| | 2027 - With Development | | | | | | | | | | | |
| Stream B-AC | D5 | 0.5 | 11.35 | 0.33 | B | 58 %<br>[Stream B-AC] | D6 | 0.3 | 9.83 | 0.20 | A | 80 %<br>[Stream B-AC] |
| Stream C-B | | 0.1 | 6.66 | 0.05 | A | | | 0.2 | 7.24 | 0.14 | A | |
| | 2032 - Without Development | | | | | | | | | | | |
| Stream B-AC | D7 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] | D8 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] |
| Stream C-B | | 0.0 | 0.00 | 0.00 | A | | | 0.0 | 0.00 | 0.00 | A | |
| | 2032 - With Development | | | | | | | | | | | |
| Stream B-AC | D9 | 0.5 | 11.91 | 0.34 | B | 52 %<br>[Stream B-AC] | D10 | 0.3 | 10.23 | 0.21 | B | 72 %<br>[Stream B-AC] |
| Stream C-B | | 0.1 | 6.78 | 0.05 | A | | | 0.2 | 7.36 | 0.14 | A | |
| | 2042 - Without Development | | | | | | | | | | | |
| Stream B-AC | D11 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] | D12 | 0.0 | 0.00 | 0.00 | A | 900 %<br>[] |
| Stream C-B | | 0.0 | 0.00 | 0.00 | A | | | 0.0 | 0.00 | 0.00 | A | |
| | 2042 - With Development | | | | | | | | | | | |
| Stream B-AC | D13 | 0.5 | 12.59 | 0.35 | B | 45 %<br>[Stream B-AC] | D14 | 0.3 | 10.72 | 0.22 | B | 64 %<br>[Stream B-AC] |
| Stream C-B | | 0.1 | 6.90 | 0.05 | A | | | 0.2 | 7.50 | 0.14 | A | |

### 5.5.3.6 Mitigation Measures

The scheme is located in an area where local services such as retail provision, schools and church are all within walking distance. The following mitigation measures are proposed to improve pedestrian safety as well as encouraging public transport use via the existing 245-bus stop located within 10 minutes' walk of the entrance.

Extensive upgrade works on the R639 are proposed as part of the proposed development. The proposed works will include footpath and cycle lanes to connect the proposed residential development to the existing pedestrian and cycling network located to the north of the R639 entrance junction.

Additionally, a signalised crossing to be located just south of the development entrance is proposed to provide a safe crossing point for pedestrians and cyclists. The signalised crossing also allows cyclists to safely cross the R639 to access the northbound cycle lane heading towards Fermoy.

### 5.5.3.7 Residual Impacts

If government modal shift targets are achieved in the future, there will remain a percentage of new trips on the roads network because of the proposed scheme. These new trips will add traffic to the assessed junctions reducing their operational efficiency.

A summary of predicted operational phase impacts are presented in Table 5.5.3.29.

Table 5.5.30 Residual Impacts

| Mode | Cause | Impact | Mitigation | Significance | Impact Rating | Duration of Impact |
|---|---|---|---|---|---|---|
| Operational Stage | | | | | | |
| Traffic | Normal residential based traffic generated onto the existing roads network | Slight | Promotion of alternative modes of travel by means of providing off-road safe access to Fermoy and bus stop for pedestrians and cyclists. | Slight | Negative | Long-term |

### 5.5.4 Risk of Major Accidents and Disasters

The likelihood of an accident occurring involving development traffic is unlikely with vehicular access to the site solely from the R639 by means of a priority-controlled junction. The entrance junction is designed in accordance with the Design Manual for Roads & Bridges and achieve the required sightlines for the posted speed limit in the area, 50kph. The provision of footpaths coupled with the provision of a controlled pedestrian crossing will serve to urbanise the area resulting in reduced traffic speed.

## 5.6 Cumulative Impacts

Industry standard growth rates have been applied to background traffic for future year assessments (to account for further development within the area). These growth rates make allowance for modal shift targets as set by national policy but do not take account of site-specific measures that may be implemented to mitigate against traffic generation from a particular development. The application of these growth rates ensures a robust analysis of the surrounding roads network is carried out both with/without development.

## 5.7 Residual Impacts

The following table outlines the residual impacts of the proposed development on the study area.

Table 5.7.1 Residual Impacts

| Mode | Cause | Impact | Mitigation | Significance | Impact Rating | Duration of Impact |
|---|---|---|---|---|---|---|
| Construction Stage | | | | | | |
| Traffic | Development based HGV and other traffic flow onto the existing roads network | Slight | Off-peak construction workers arrival/departure hours, off-peak delivery to from site, non-clustered arrival of imported material HGV's. | Slight | Negative | Short-term |
| Operational Stage | | | | | | |
| Traffic | Normal residential based traffic generated onto the existing roads network | Slight | Promotion of alternative modes of travel by means of providing off-road safe access to Fermoy and bus stop for pedestrians and cyclists. | Slight | Negative | Long-term |

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 6

## Material Assets:
## Services, Infrastructure and Utilities

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 6 Material Assets, Service Infrastructure & Utilities

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# 6 Material Assets, Service Infrastructure & Utilities

## 6.1 Introduction

The material assets chapter of the EIAR was prepared by Walsh Design Group Consulting Engineers in conjunction with McCutcheon Halley Chartered Planning Consultants.

The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports 2017 state that:

“The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils”.

Resources that are valued and that are intrinsic to specific places are called “material assets”. They may be either human or natural origin and the value may arise for either economic or cultural reasons.

This chapter is intended to deal with the physical resource in the environment which may be of either human or natural origin. The objective of the assessment is to ensure that these assets are used in a sustainable manner, so that they are available for future generations, after the delivery of the proposed development.

### 6.1.1 Author Competency

This chapter has been written by Ian Reilly of Walsh Design Group. Ian is a Civil & Structural Engineer who graduated from the Cork Institute of Technology in 2014. Ian has been involved in a variety of residential and commercial projects at their planning, design and construction stages. Ian is a member of Engineers Ireland and completed a postgraduate, master's degree in Structural Engineering in 2015.

### 6.1.2 Methodology

The methodology used to prepare this section of the EIAR is in accordance with the EPA,

> *"Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports August 2017".*

These draft guidelines include information on the assessment of the effects of development on material assets and advises on the nature of the material assets which should be examined as part of the preparation of an EIAR.

To design the proposed surface water and wastewater drainage systems for the development it was essential to have an understanding of the existing infrastructure in the area of the site. The following resources were used in compiling the information required:

- Cork County Council Engineering records on existing surface water and wastewater sewers - paper copies in County Council Office, Fermoy,
- ESB 'dial before you dig' record map, see Appendix 6.1,
- Gas Networks Ireland 'dial before you dig' record map, see Appendix 6.1,
- GPS topographical surveys of the site and the route of the drainage channel to the north, see Appendix 6.2.
- Dynorod Survey 2020 of the culvert under the playing pitch to the North of the site in St.Coleman's land and under College Road and the Convent Grounds, see Appendix 6.3.

The proposed layouts of the wastewater sewer and the water mains for the development were submitted to Irish Water with a pre-connection enquiry.

Irish Water responded to confirm that the water connection is feasible without upgrade to the local infrastructure but the wastewater treatment plant (WWTP) would need upgrades which were to be funded by the developer. Michael Walsh, of Walsh Design Group, consulted with Irish Water Engineers throughout 2021 and in December 2021, following a review of the capacity in the WWTP, it was confirmed by Irish Water that the WWTP would be able to accommodate the flow from the proposed development with minor upgrades that Irish Water would carry out.

Following an Opinion issued by An Bord Pleanála (tri-partite meeting which took place on September 27th, 2021) a detailed design of the wastewater network was submitted to Irish Water for design approval. Irish Water has since issued a statement of design acceptance. See Appendix 6.4 to this report for the Irish Water confirmation of feasibility letter, statement of design acceptance and Michael Walsh's memo regarding his consultations with Irish Water Engineers.

The wastewater sewer, water mains and surface water sewers were designed in accordance with the following documents:

- Code of Practice for Wastewater Infrastructure (IW CDS 5030-03, July 2020),
- Code of Practice for Water Infrastructure (IW CDS 5020-03, July 2020),
- Recommendations for Site Development Works for Housing Areas (1998, DoELG),
- CIRIA C753 The SUDS Manual (November, 2015),
- Greater Dublin Strategic Drainage Study (2005).

### 6.1.3 Difficulties Encountered

The location of most of the existing services in the area was available from the County Council, Irish Water, the ESB and Gas Networks Ireland. The exact path of the stone culvert to the north of the site was an unknown and passed under 3rd party lands. Using CCTV and a GPS tracking system, Dynorod were able to provide a condition survey of the culvert and its route towards Fermoy Town and the River Blackwater.

## 6.2 Description of the Existing Environment

This site is 11.56ha in total area and is currently laid out as agricultural pastureland. It is located just South of Fermoy town on the eastern side of the R639 Fermoy to Rathcormac road. The site generally slopes gently downwards from west to east and there is an existing open drainage channel along the eastern boundary. Where the proposed entrance road to the development meets the R639 the ground level is 57.57m but within the site the high point is 56.99m in the southwest corner and this falls to a low point of 51.11m in the northeast corner (all levels are to Malin Head datum).

The southern boundary of the site is shared with agricultural land. The western boundary is shared with private dwellings at the southern end and an ESB facility and commercial properties at the northern end. An existing lay-by and weigh station is situated adjacent to the proposed development entrance, beside the R639. The northern boundary is shared with the St. Coleman's sports ground and the eastern boundary is shared with land, beyond the drainage channel that is currently forested.

### 6.2.1 Ownership and Access

The subject lands are in the ownership of the applicant.

Vehicular access and egress to and from the site will be provided via a single entrance from the R639 regional road.

MHL Consulting Engineers have prepared Chapter 5 of this report, ‘Material Assets Traffic and Transport’ and they address the impact of the proposed development on the surrounding road network.

### 6.2.2 Surface Water Drainage

There is no existing surface water network within the existing development site. There are a number of small open agricultural drains which fall gently with the site topography from west to east to join the drainage channel running from south to north along the eastern boundary. Apart from these drains the rainwater percolates directly to groundwater. The channel along the eastern boundary continues northwards, beyond the site, through the St. Coleman’s sports grounds until discharging into an old stone culvert under College Road and the grounds of the Convent. A satellite image of the current site condition is shown in Figure 6-1.

Figure 6.1 Satellite Image of Greenfield Site Overlaid with the Application Boundary

### 6.2.3 Wastewater Drainage

There are no records of any wastewater infrastructure within the proposed site. It is proposed to discharge the outflow from the development into existing Irish Water infrastructure located on the R639 just north of the proposed development entrance. The proposed wastewater network has been designed in accordance with Irish Water specifications and a pre-connection enquiry was submitted to Irish Water. Irish Water have confirmed that connection is feasible with minor upgrades to the WWTP.

### 6.2.4 Watermain Design

It is proposed to connect the watermain for the development to an existing 150mm watermain that runs past the proposed entrance in the R639. Irish Water has confirmed that this connection is feasible without upgrade to the local water supply infrastructure.

### 6.2.5 Natural Gas

There is an existing 125mm PE-80 4 bar gas distribution pipe passing the proposed entrance to the development in the R639, see Figure 6-2. It is not envisaged that the development will require gas connections; however, subject to a permission granted on site, Gas Networks Ireland will be consulted prior to carrying out any works near their infrastructure.

Figure 6.2: Gas Networks Ireland - Map of Existing Infrastructure

### 6.2.6 Electricity Supply

ESB networks were contacted regarding power lines running in the vicinity and through the site. There are no buried cables running through the site but there are several medium voltage 10kV/20kV overhead lines and one high voltage 38kV (or higher) overhead line indicated on the map provided by the ESB, see Figure 6-3.

It is proposed to underground the 38kV cables that are currently overhead from the southern boundary to the ESB distribution facility to the west of the site. A form NW1 was submitted to the ESB requesting the diversion and subsequently, the diversion route as shown on the following drawings was agreed:

- Site Layout & Levels - Sheet 1 of 2 (19074-P-001-1),
- Site Layout & Levels - Sheet 2 of 2 (19074-P-001-2).

The works proposed include the construction of a new Type F lattice steel mast near the southern boundary at which the overhead cables coming from the South would be diverted underground. From the lattice mast new ducting will be laid in the ESB's trefoil 5-way duct formation along the route shown in the drawings. This duct trench is 600mm wide and shall have a 4.0m wide wayleave for access which is centred on the trench.

Subject to a permission granted on site, a separate diversion agreement shall be entered into with ESB networks to have the 10kV/20kV overhead lines rerouted to suit the proposed layout. These works are less complex than those on the 38kV line and do not involve large structures.

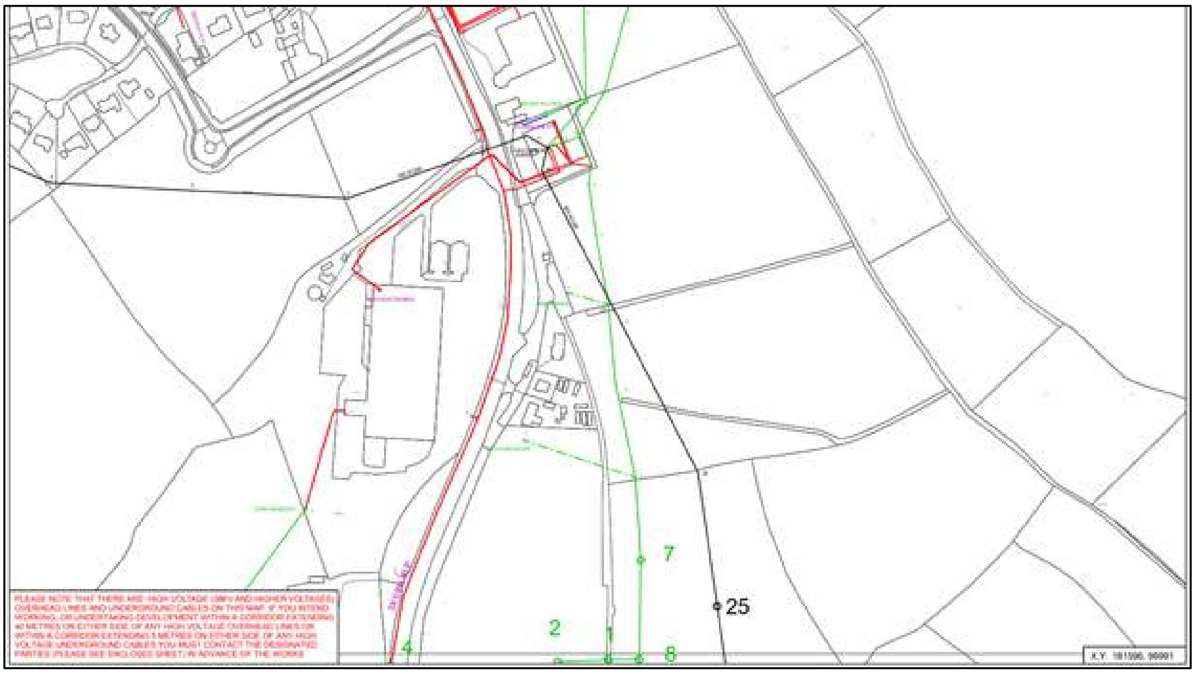

Figure 6.3: ESB Map of Existing Infrastructure

### 6.2.7 Communications

Virgin Media, Enet and Eir were contacted regarding any existing infrastructure in the vicinity of the site. Virgin Media and Enet confirmed that they have no assets in the area and Eir did not respond to requests for information.

### 6.2.8 Waste

There are no waste facilities on site as it is currently agricultural land. Cork County Council approved waste collectors service the adjacent properties along the R639 and it is anticipated that these private collectors will remove waste from the site during the operational phase of the development.

## 6.3 Characteristics of the Proposed Development

The proposed development consists of 336 dwelling units consisting of 250 houses, 86 duplex apartments and 1 crèche and all associated site development works. Vehicular and pedestrian access to the site will be via the proposed entrance from the R639. For further details of the entrance please see Chapter 5 of this report prepared by MHL Consulting Engineers and MHL have prepared a TTA as a standalone document accompanying the application.

### 6.3.1 Surface Water Network

The surface water sewers for the proposed development have been designed in accordance with the recommendations in the greater Dublin strategic drainage study (GDSDS) and the 7th edition of sewers for adoption.

The surface water network layout and the typical details for the surface water infrastructure are shown in the following drawings:

- Site Layout - Drainage - Sheet 1 of 3 (19074-P-002-1),
- Site Layout - Drainage - Sheet 2 of 3 (19074-P-002-2),
- Site Layout - Drainage - Sheet 3 of 3 (19074-P-002-3),
- Surface Water Drainage Typical Details (19074-P-500).

The networks were designed using the MicroDrainage design software and the Wallingford procedure for the design and analysis of urban drainage. The overall drainage system has been designed in 6 separate networks (numbered 2-7) due to the topography of the site and the proposed street layout. Each of the 6 networks will have its discharge limited to the QBAR rate of flow for its catchment area. See Figure 6-4, Figure 6-5 and Figure 6-6 for an overview of the drainage layout.

The proposed SuDS elements in the proposed design are; proprietary permeable paving, tree pits and filter drains, water butts, subsurface EcoCell attenuation tanks, hydrocarbon interceptors and hydrobrakes on each outfall. It is also proposed to retain the wetland area in the east of the site as described in Chapter 9 by Kelleher Ecology Services. Apart from its benefits in terms of biodiversity, any damage to this wetland would reduce the capacity of the site to retain its surface water and allow percolation of the naturally filtered surface water to ground water. In Chapter 4 and the landscape Architects drawings, Cathal O'Meara has also proposed a wet meadow along the development edge of the drainage channel which will retain surface water and allow percolation to ground water.

The main drainage channel which forms the eastern boundary of the site has a very gentle fall from south to north and continues north past the St. Coleman's sports ground. Before the channel reaches College Road it is currently channeled under an astro-turf playing pitch owned by the Loreto Convent in an old stone culvert.

It is proposed to discharge the attenuated surface water runoff from the completed networks into the existing open drainage channels in the site which in turn, eventually discharge to the River Blackwater. Due to anecdotal instances of localised flooding at points along the old culvert, it is proposed to partially divert the flow in the drainage channel, just before the stone culvert, into a new 750mm diameter pipe flowing westward across the northern end of the St. Coleman's sports ground to Devlin Street where it will connect to an existing manhole and the 900mm diameter surface water sewer downstream. see the following WDG drawings:

- Site Layout - Drainage - Sheet 3 of 3 (19074-P-002-3),
- Surface Water Outfall - North - Long Section (19074-P-304).

It is envisaged that the new 750mm dia. pipe will carry almost all of the water westward, however, two 100mm dia. openings shall be constructed in the head wall at the culvert opening to ensure that the culvert remains active but with a low flow.

Calculations showing that the proposed pipes, manholes and tanks are appropriately sized are provided in the appendices of the Civil Engineering Report which also includes the calculation method for the QBAR of each catchment and the size of each attenuation tank. The network models were tested using Microdrainage in simulated storm events up to and including a 24 hour, 100 year rainfall event with a 20% increase allowed for climate change in accordance with the recommendation of the GDSDS.

For design information please consult the Civil Engineering Report and the following drawings included with this application:

| | |
|---|---|
| 19074-P-002-1 | Site Layout - Drainage (Sheet 1 of 3), |
| 19074-P-002-2 | Site Layout - Drainage (Sheet 2 of 3), |
| 19074-P-002-3 | Site Layout - Drainage (Sheet 3 of 3). |

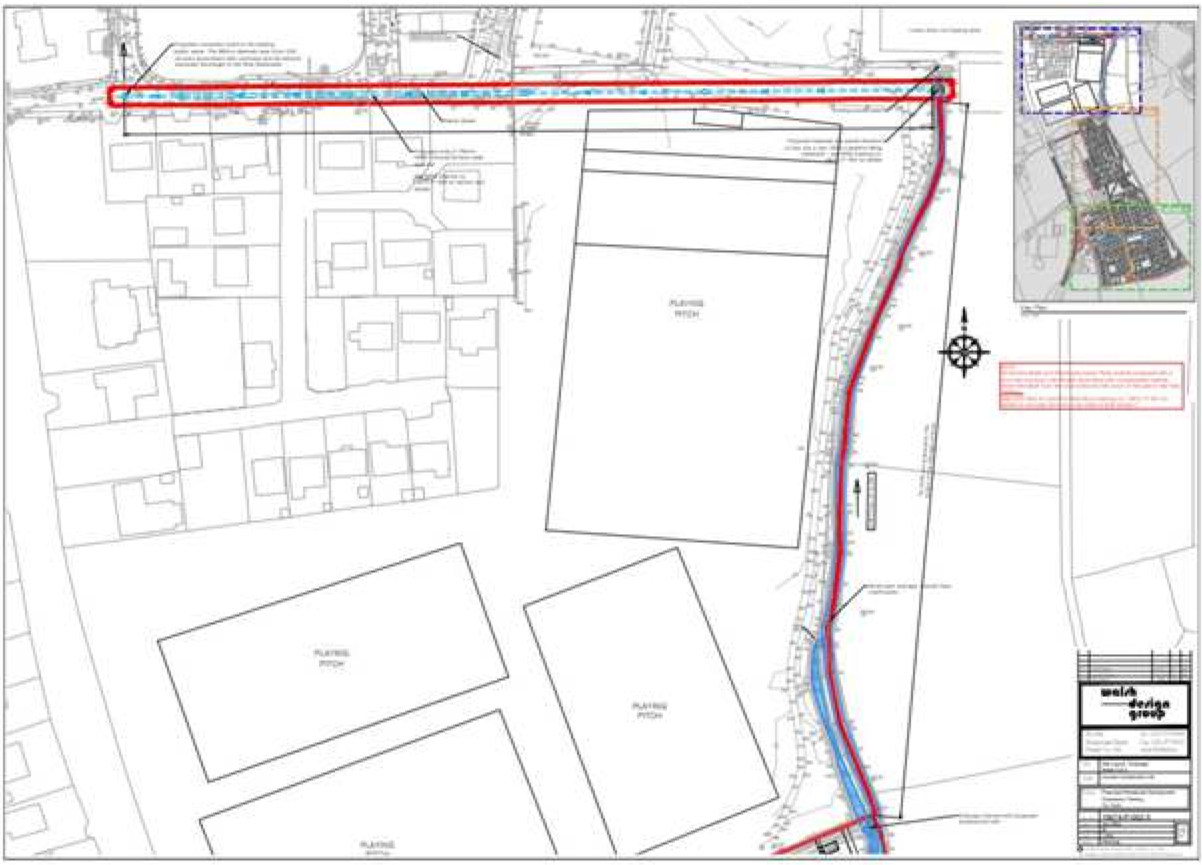

Figure 6.4: WDG Drawing No. 19074-P-002-3 - Northern Extension of the Site Drainage Layout (Not to Scale)

Figure 6.5: WDG Drawing No. 19074-P-002-1 - Northern Half of the Development Site Drainage Layout (Not to Scale)

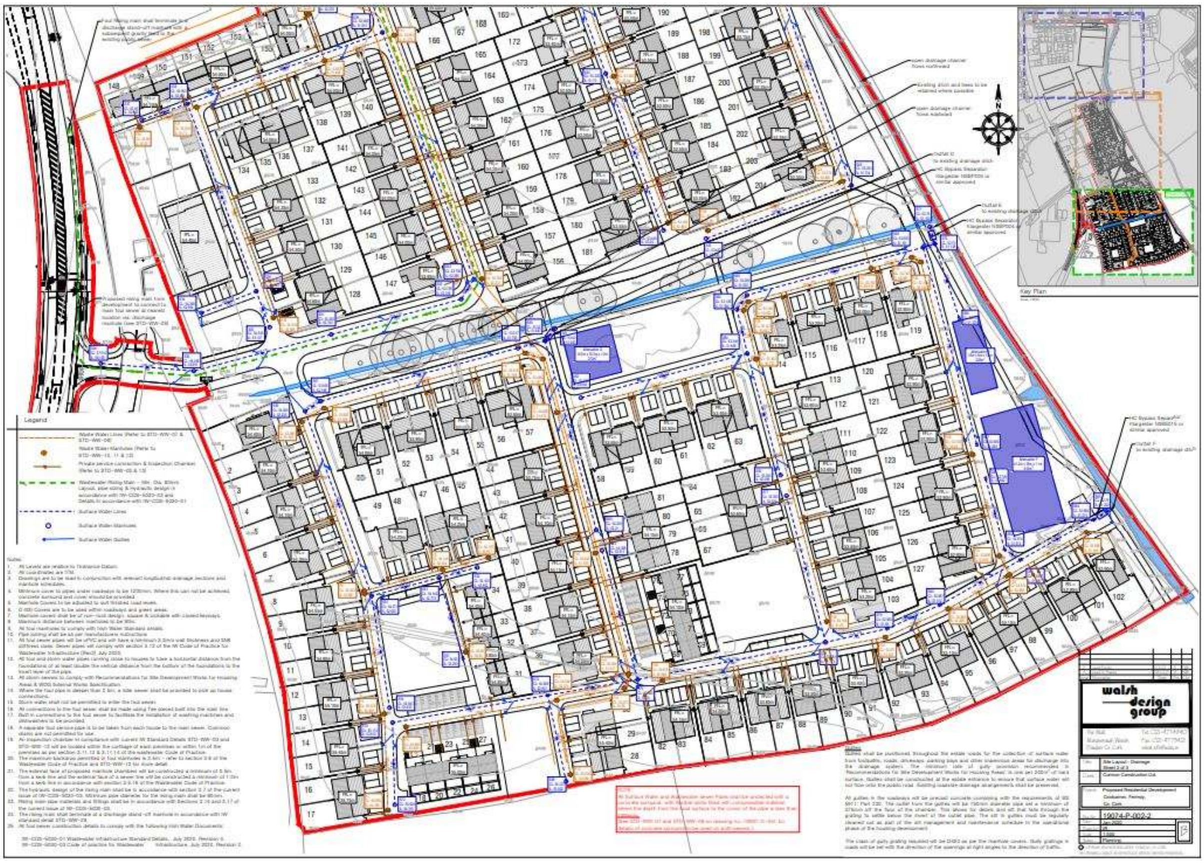

Figure 6.6: WDG Drawing No. 19074-P-002-2 - Southern Half of the Development Site Drainage Layout (Not to scale)

### 6.3.2 Wastewater Network

The layout of the proposed wastewater drainage network for the development and the typical details for the wastewater infrastructure are shown on the following drawings submitted as part of this Strategic Housing Development application:

- Site Layout - Drainage - Sheet 1 of 3 (19074-P-002-1),
- Site Layout - Drainage - Sheet 2 of 3 (19074-P-002-2),
- Irish Water Standard Details - Wastewater (19074-P-501).

The network is a conventional piped, gravity sewer flowing to a wastewater pumping station in the East of the site from which it is proposed to pump the wastewater, via rising main, to the public wastewater sewer in the R639 (See Figure 6-5 and Figure 6-6 for an overview of the wastewater drainage layout). The proposed pumping station will be a Type 3 station, designed and constructed in accordance with Part 5 of Irish Water's Code of Practice for Waste Water Infrastructure – A Design and Construction Guide for Developers (Revision 2) July 2020.

All sewers within the curtilage of individual houses have been designed and are to be installed in accordance with TGD Part H (2010) and will consist of 100 mm diameter uPVC Sewers from individual houses laid to falls of min 1:60 to connect to a 225mm uPVC sewer to be laid under the estate streets. Inspection chambers will be constructed within 1m of the boundary of each private property in accordance with Irish Water Standard Details. All foul sewers have been designed in compliance with Irish Water's Code of Practice for Waste Water Infrastructure – A Design and Construction Guide for Developers (Revision 2) July 2020. All construction details within the public realm will be in accordance with Irish Water, Wastewater Infrastructure Standard Details (Revision 4), July 2020. The wastewater sewer will be entirely separate to the surface water sewer.

The wastewater sewer system was designed using the Microdrainage software and the following parameters, as required in Irish Water document IW-CDS-5030-03, Section 3.6:

Flow per person: 150 L/day,

Average persons per household: 2.7 persons,

Unit consumption allowance (infiltration) 10%,

Minimum velocity for pipe running full: 0.75 m/sec,

Peak flow: 4.5 DWF.

The detailed hydraulic design parameters and calculations for the wastewater network are included in the Civil Engineering Report.

A domestic peak flow factor of 4.5 has been applied to the wastewater network. The number of dwellings that will discharge to the sewer via the proposed network is 336. Using Irish Water's figure of 2.7 average persons per household, this amounts to a population equivalent of 908. Section 2.2.5 of Appendix B of Irish Water document IW-CDS-5030-03 states that, where the population served is between 751 and 1000 a peaking factor of 4.5 should be used.

For design information please consult the Civil Engineering Report included with this application.

Following an Opinion issued by An Bord Pleanála (tri-partite meeting which took place on September 27th, 2021) a detailed design of the wastewater network was submitted to Irish Water for design approval. The proposed design has now received a statement of design acceptance from Irish Water (see the appendices of the Civil Engineering Report).

The proposed development of 336 dwellings and 1 crèche will ultimately discharge to the Irish Water infrastructure. As such, a separate connection agreement will be required with Irish Water and it is anticipated that the current design team will liaise closely with Irish Water prior to making a connection application.

### 6.3.3 Watermain Network

It is proposed that a connection to the existing Irish Water infrastructure will be made in the R639 road. The water main layout and typical details are shown on the following WDG drawings:

- Site Layout - Watermains - Sheet 1 of 2 (19074-P-003-1),
- Site layout - Watermains - Sheet 2 of 2 (19074-P-003-2),
- Irish Water Standard Details - Watermain - Sheet 1 of 2 (19074-P-502),
- Irish Water Standard Details - Watermain - Sheet 2 of 2 (19074-P-503).

Following an Opinion issued by An Bord Pleanála (tri-partite meeting which took place on September 27th, 2021) a detailed design of the water main network was submitted to Irish Water for design approval. The proposed design has received a statement of design approval from Irish Water (see the appendices of the Civil Engineering Report).

Private properties will each have a separate service connection, fitted with an Irish Water approved boundary box immediately outside the boundary. Fire hydrants are placed so that no domestic property within the development is more than 46m from a hydrant, see Figure 6-7 and Figure 6-8 for an overview of the proposed development watermain layout. All potable water infrastructure will be constructed in accordance with the following Irish Water documents:

IW-CDS-5020-03 Code of Practice for Water Infrastructure – Connections and Developer Services, July 2020 (Revision 2)

IW-CDS-5020-01 Water Infrastructure Standard Details - Connections and Developer Services, July 2020 (Revision 4).

The mains water demand for the development was calculated, according to Irish Water criteria, using the following parameters:

- 150 litres/person/day,
- 2.7 persons per housing unit,
- Domestic ADPW = 1.25,
- 336 Housing Units,
- 1 Crèche.

For design information please consult the Civil Engineering Report included with this application.

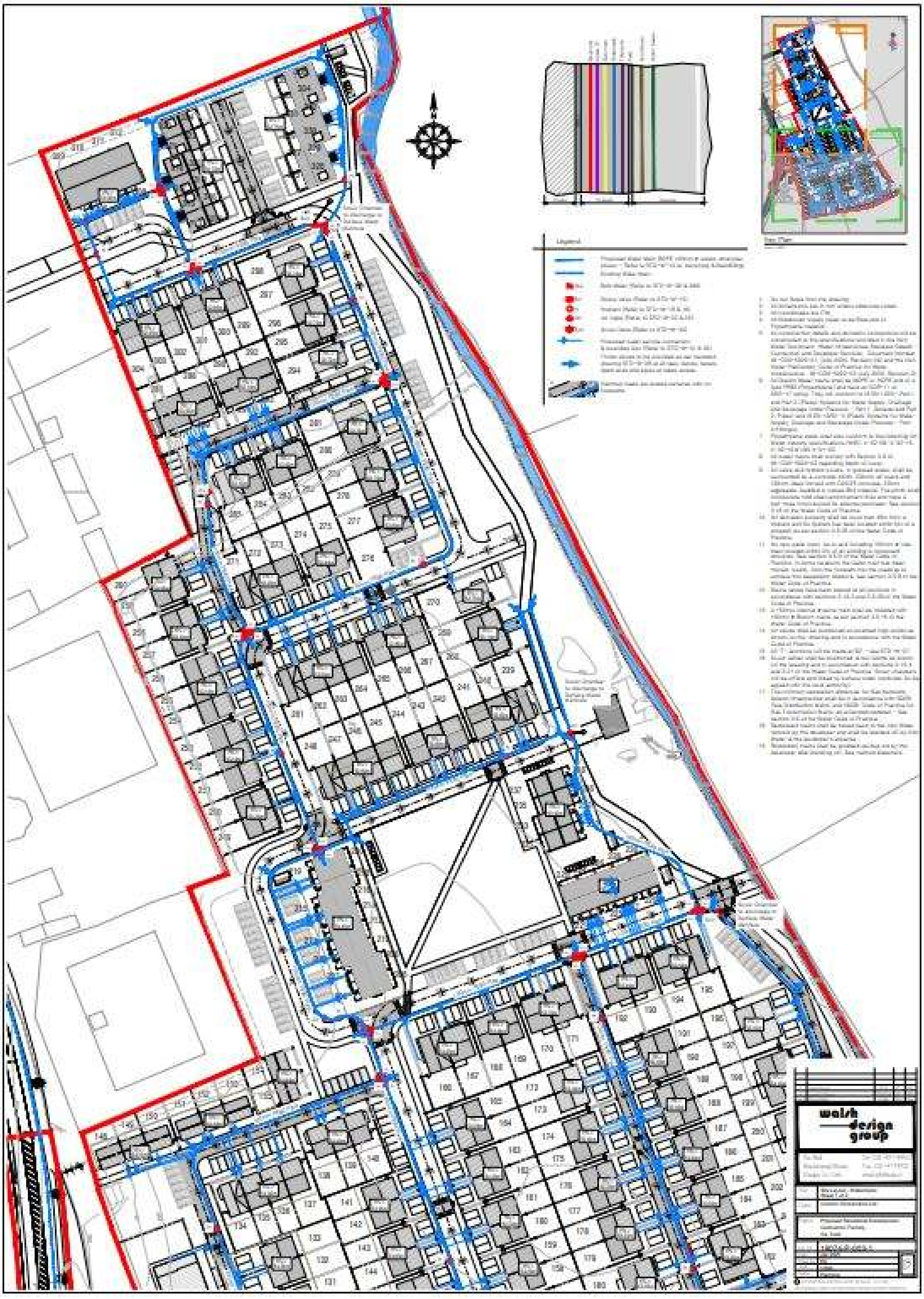

Figure 6.7: WDG Drawing No. 19074-P-003-1 - Northern Half of the Site Watermain Layout

Figure 6.8: WDG Drawing No. 19074-P-003-2 - Southern Half of the Site Watermain Layout

### 6.3.4 Road Network

The sole vehicular access to the development is via the entrance from the R639. The layout of the proposed streets and how they connect with the entrance is shown on the following WDG drawings:

- Site Layout & Levels - Sheet 1 of 2 (19074-P-001-1),
- Site Layout & Levels - Sheet 2 of 2 (19074-P-001-2),

and the MHL drawings of the junction with the R639. Longitudinal sections through the roads are shown on the following WDG drawings:

- Road Longitudinal Sections - Sheet 1 of 2 (19074-P-301-1),
- Road Longitudinal Sections - Sheet 2 of 2 (19074-P-301-2).

The proposed streets within the estate have been designed in substantial compliance with the following:

- Design Manual for Urban Roads and Streets (DMURS) - Dept. of Environment and Dept. of Transport Tourism and Sport-2019
- Recommendations for Site Development Works for housing areas – DOE 1998.

### 6.3.5 Estimated Earthwork Volumes

The development of the subject site will require the cutting of top and sub soils and the excavation or fill of ground to formation level.

The volume of material in the initial site strip of 0.3m depth has been estimated at approximately 33,900 m3. With an anticipated bulk density of 1.9 tonne/m3 this equates to ca. 64,410 tonnes of soil. The bulk density conversion is based on industry experience of similar soils. The subsoil strip to formation level is estimated to be c. 15,340m3 or 29,146 tonnes. The site fill required under structures is estimated at c. 40,360m3 or 64,580 tonnes of stone (at an assumed crushed stone bulk density of

1.6 tonne/m3) and the site fill required to landscaped areas is estimated at c. 29,100m3 or 55,290 tonnes.

The earthwork cut and fill volumes are described in more detail in the preliminary Construction and Demolition Waste Management Plan 19074-ER-04, accompanying this application.

## 6.4 Potential Impact of the Proposed Development

This section of the chapter gives a description of the direct and indirect impacts that the proposed development may have on its surrounding area during is construction and operational phases.

### 6.4.1 Construction Stage

The construction stage of the proposed development is likely to result in short term impacts on the existing sub-urban settlement in the vicinity of the site. It is proposed to construct the development in 5 phases, refer to Geraldine Coughlan Architect's Development Phasing Plan which accompanies this Strategic Housing Development application for further phasing details. At this (planning) stage of the development it is predicted that each of the 5 phases will take approximately 1 year to complete leading to an overall completion of construction towards the end of 2027.

#### 6.4.1.1 Ownership and Access

The subject lands are not developed at present. There will be some temporary disturbance during construction to the surrounding area; however, this will be minimised as far as possible through appropriate mitigation measures as set out in the Construction and Environmental Management Plan (CEMP). Potential impacts on the local road network are assessed in Chapter 5 and mitigation measures are proposed.

Once a contractor has been appointed a detailed and final CEMP including a detailed construction traffic management plan will be prepared and agreed prior to the commencement of the development. The surrounding road network is suitable to accommodate the construction traffic associated with the proposed development and the Construction Traffic Management Plan will include a range of mitigating measures as identified in the CEMP to ensure the safety of the workforce while working on the site and accessing the site, and the safety of the public on the surrounding roads and to minimise construction traffic generation and disruption on the surrounding road network.

#### 6.4.1.2 Surface Water Drainage

The proposal will involve discharging from the newly constructed networks to the existing drainage channel along the eastern boundary of the site. All of this construction will happen within the site and without disruption to existing surface water sewers. The flow in the drainage channel shall not be impeded during the construction stage. Site stripping and construction activity is likely to result in a temporary, moderate increase in runoff from the site and an increase in suspended particles in the surface water runoff to the drainage channel.

To mitigate these impacts, temporary silt fences and settlement swales will be constructed in series across the site to allow settlement of suspended silt and infiltration of surface water to ground water, as described in the construction management plan. This will result in the reduction of the significance of these impacts to slight.

Any fuels or hazardous substances used during the construction stage must be stored in bunds that will contain any accidental spillage and prevent pollution of the surface or ground water.

The new 750mm diameter pipeline proposed from the stone culvert north of the site to the existing infrastructure in Devlin Street will result in disruption to the users of St. Coleman’s sports grounds and the local streets traversed during its construction.

In the sports grounds the impact would be on access from the north end to the south end across the line of the pipe. This will be mitigated by scheduling the construction so as to leave a safe crossing point at all times, reducing the impact to neutral, not significant and momentary.

In Devlin Street, the impact will be on road users during the construction of the pipeline. It is estimated that the road works will take between 1 and 2 weeks to complete. A traffic management plan will have to be formulated by the appointed contractor and the necessary road opening license applied for. An effective traffic management plan will mitigate the impact of the works to negative but slight and temporary.

#### 6.4.1.3 Wastewater Drainage

The proposal involves providing a new connection to the existing foul water network in the R639. The proposed service will consist of a new stand-off manhole constructed in the roadway, adjacent to the existing manhole, from which the rising sewer from the development will discharge, via gravity to the existing network. The construction in the public roadway will be carried out in one week. The impact will be negative, moderate and temporary on road users for that week.

To mitigate the above, best practice construction practices should be adhered to and Irish Water procedures followed. A traffic management plan shall be formulated by the appointed contractor and the necessary road opening license applied for. The R639 is a wide roadway where it is possible that, with the correct safety measures in place, the roadworks can continue whilst maintaining two-way traffic. This would mitigate the impact on road users to neutral and not significant.

The impact on foul drainage during the construction stage will be brief, neutral and imperceptible and no long-term impacts will result from the construction stage.

#### 6.4.1.4 Watermain

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 Irish Water 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 risk of contamination to the existing water supply during the construction phase when the development is being connected to the water supply. To prevent contamination, all water mains will be cleaned and tested in accordance with Irish Water guidelines and standards prior to connection to the public water main.

To mitigate the above, best practice construction practices shall be adhered to and Irish Water procedures followed.

There will be a minor water demand for the site works, compound and offices during the construction stage.

Any potential impacts to water supply will be brief, neutral and imperceptible.

#### 6.4.1.5 Natural Gas

No works are envisaged to the local gas network; however, Gas Networks Ireland shall be informed of any works near their infrastructure at the proposed site/development entrance.

#### 6.4.1.6 Electricity Supply

Construction related activities will require temporary connection to the local electricity supply network. It is proposed to underground the 38kV cables that currently cross the site from south to north. When the structures, ducting and new cabling is in place and ready for connection there will need to be a short scheduled outage of power supply to the local area as the overhead cables are shut down and the underground cables become live. This 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.

#### 6.4.1.7 Communications

Telecoms ducting and cables will be laid within the development site during the construction stage. Prior to the operational phase of the development this internal network will be connected to the local infrastructure of one or more of the telecoms providers in the area.

The potential impact from the construction phase of the proposed development on the local telecoms network is likely to be brief, neutral and imperceptible.

#### 6.4.1.8 Waste Management

The construction phase of the proposed development will give rise to the requirement to remove or to bring to the site quantities of material, including excavated material not suitable for reuse. Construction related material will also be created on the proposed development site. This has the potential to impact on the local municipal waste disposal network, but this will be short term and moderate. Refer to the Construction and Demolition Waste Management Plan (CDWMP) for further details.

### 6.4.2 Operational Stage Impacts

The proposed development will result in the provision of an additional 336 residential units, a crèche, open space and recreational areas to the local area in Fermoy.

#### 6.4.2.1 Ownership and Access

The proposed development includes for a single vehicular access to the proposed development from the R639 road. A Traffic and Transport Assessment has been prepared by MHL & Associates and is submitted with this planning application as a standalone report. The potential impacts are also identified in Chapter 5 Material Assets: Traffic and Transportation.

The Traffic and Transport Assessment assesses the anticipated levels of traffic generated by the proposed development and models the impacts of the proposed development on surrounding road infrastructure. Having reviewed the Traffic Impact Assessment by MHL the proposed development will have no impact to the existing road network.

#### 6.4.2.2 Surface Water Drainage

The runoff from the hardstanding areas of the proposed development will be attenuated and limited to greenfield runoff rates ensuring that neither the volume nor the rate of flow of the runoff will increase beyond current levels. Hydrocarbon interceptors will also ensure that the runoff from the development is free from pollutants. In this regard the development will have no impact on the local surface water network.

The finished pipe outfalls shall be constructed in accordance with the 7th edition of Sewers for Adoption to ensure that they will not obstruct the flow in the channel.

As described in paragraph 6.3.1, the provision of the new 750mm pipeline from the entrance of the old stone culvert to the existing infrastructure in Devlin Street will result in a reduction of the water volumes flowing through the culvert and therefore a reduction in the localised flood events caused by its limited capacity. This will have a positive, significant and permanent impact on the local area downstream of the development.

#### 6.4.2.3 Wastewater Drainage

During the operational phase there will be an increase in the foul discharge from the proposed development. Irish Water have confirmed, in consultations, that a connection is feasible to the Fermoy wastewater treatment plant (WWTP) downstream of the development requiring only minor upgrades that will be carried out by Irish Water. Refer to Appendix 6.4 to this report for Irish Water's Confirmation of Feasibility and Michael Walsh's memo regarding his consultations with Irish Water Engineers.

As a result, significant impacts to the system are not considered likely.

#### 6.4.2.4 Watermain

The potential impact from the operational phase on the water infrastructure is an increase in the quantity of water to be treated and supplied through the network. Irish Water have confirmed that there is enough capacity in the Irish Water network to supply the development without upgrade, refer to the Appendix 6.4 to this report for Irish Water's Confirmation of Feasibility.

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 Irish Water have confirmed that the existing Irish Water watermain has capacity to accommodate the proposed development, significant impacts to the system are not considered likely.

#### 6.4.2.5 Natural Gas

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

#### 6.4.2.6 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.

#### 6.4.2.7 Communications

The installation of the telecoms ducting and cables will be in accordance with the requirements of the utility providers 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.

#### 6.4.2.8 Waste

Household waste and waste from the crèche facility will be collected by Cork County Council approved, private waste collection companies. There will be an increased demand on the municipal waste disposal system operated by Cork County Council. All the waste generated will be subject to the County Cork Waste Management Bye Laws, 2019. The impact is likely to be negligible.

#### 6.4.2.9 Potential Cumulative Impacts

The cumulative effects of the development on material assets have been assessed considering other existing, planned and permitted developments in the surrounding area as identified in Table 1.2 of Chapter 1.

The cumulative effects 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.

## 6.5 Mitigation Measures

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

### 6.5.1 Construction Stage

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 and Demolition 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 roads and services will be constructed and provided in strict accordance with the relevant codes of practice.

### 6.5.2 Operational Stage

All new foul and surface water drainage pipes to be pressure tested and CCTV surveyed to identify any possible defects,

Water conservation measures to be implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments,

Ensure that all Hydrobrakes are designed to limit the flow of water from the development to the greenfield run off rate of flow,

All watermain pipes to be cleaned and pressure tested in accordance with Irish Water standards.

## 6.6 Residual Impacts

### 6.6.1 Construction Stage

The construction stage of the proposed development will involve site clearance and preparation, excavation and the construction of the proposed development over 5 phases of 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 disturbance. Provided mitigation measures are adhered to there is unlikely to be any adverse impacts on material assets during the construction stage and any residual impacts on the existing water supply, surface water and wastewater systems would be temporary and slight.

### 6.6.2 Operation Stage

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 growing population.

The loading on the wastewater and watermains from the proposed development will be adequately accommodated in Irish Water’s wastewater and watermain networks.

In compliance with the SUDS manual the runoff rate from the development will match the existing greenfield runoff rate and hence have no impact on the surrounding network.

## 6.7 Monitoring

Monitoring is proposed of water usage during the construction stage. Once operational, the water usage in the development will be monitored by a bulk water meter and compared to anticipated usage. This will allow Irish Water to monitor any potential leaks.

Monitoring of the surface water outfall to the drainage channel during the construction stage is also proposed to ensure that the measures proposed to reduce pollution from construction materials and suspended particle levels in the water are effective.

## 6.8 Interactions

Interactions between Material Assets and other environmental topics are assessed in other disciplines throughout this EIAR document and potentially significant interactions are summarised in Chapter 14.

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 7

## Soils and Geology

# Volume II

Environmental Impact Assessment Report

Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 7 Soils and Geology

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## Tables

# 7 Soils and Geology

## 7.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by McCutcheon Halley Planning Consultants, (MHP), on behalf of Cumnor Construction Ltd., (CCL), to complete the Land and Soils (Geology) Chapter for Environmental Impact Assessment Report (EIAR) required for the proposed Strategic Housing Development of 336 no. residential units and associated infrastructure at Coolcarron, near Fermoy.

The work was completed by Mr. Darragh Musgrave, Senior Geo-Environmental Scientist with Viridus Consulting Ltd., (VCL).

### 7.1.1 Author Information and Competency

Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006). He has 30 years' experience working in the geological, geotechnical and environmental sector and has completed Environmental Impact Assessments and Reports for numerous infrastructure and residential development projects.

Darragh has been appointed to assess, as per Annex IV of Directive 2014/52/EU, the Land and Soils (Geology) elements of the EIAR for the proposed CCL residential development in the town land of Coolcarron on the south side of Fermoy town in County Cork.

### 7.1.2 Reference to Guidelines Relevant to Discipline

The Land and Soils (Geology) Chapter for the EIAR follows the guidelines outlined in Directive 2014/52/EU and Annex IV amendments, as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Irish Environmental Protection Agency (EPA) document, Draft Guidelines on the information to be contained within an EIAR, (2017).

The work also is cognisance of the two Environmental Impact Statement (EIS), EPA draft guideline documents, from September 2015, which outline the process of preparation and the content required for an EIS. The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, (NRA 2008).

### 7.1.3 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study and Site Walkover which included the collation and review of all available information pertaining to the site including any geological information relevant to the development site area including the following:

- Ordinance Survey of Ireland, (OSI) On-line Maps and Aerial Photographs, (www.geohive.ie),
- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie/mapping.htm),
- Teagasc/Cranfield Soil Mapping On-line Data sets, (www.teagasc.ie/soils),
- Environmental Protection Agency (EPA) web based mapping, (www.epa.ie),
- The GSI "Geology of East Cork Sheet 24" 1:100,000 Scale Geology Map & Booklet 1995.
- Cumnor Trial Pit Logs from 2004 SI Survey

The initial Site Walkover recognisance work enabled the physical examination of the geological, geomorphological and land use characteristics of the site and its setting in the locality.

In this chapter the existing baseline conditions and character of the land, soil and geological characteristics of the site are presented and the potential impacts anticipated from the development are identified and discussed. Mitigation measures are proposed, residual impacts are assessed, and any relevant monitoring options are considered.

This chapter should also be read in conjunction with Chapter 2 (Project Description), Chapter 8 (Hydrology and Hydrogeology), and Chapter 14 (Significant Interactions).

Information on the proposed development of the site is presented in the Walsh Design Group (WDG) Civil Engineering Report from January 2021, (Doc 19074-ER-01), and the WDG Preliminary Construction & Demolition Waste Management Plan, from January 2022 (Doc 19074-ER-04).

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including An Bord Pleanala (ABP), the GSI, Cork Co. Co., and EPA. A summary of the third-party responses received are included in Chapter 1 of the EIAR and presented in Appendix 1.

### 7.1.4 Difficulties Encountered in Compiling Information

There were no difficulties encountered in the compilation of the information required for this chapter although it would have been beneficial to have had photographs of the 2004 trial pit works.

## 7.2 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).

### 7.2.1 Site Location and Setting

The proposed Coolcarron development area is located about one kilometre south of Fermoy Main Street, on agricultural lands near the urban fringe and within the development boundary of the town.

The site is on relatively flat ground occupying a broad north south orientated valley which has a drainage ditch along the length of its eastern boundary. The R639 Cork Road is located to the west of the site and there are some residential housing, a substation, Texaco service station and commercial warehousing units between the road and the western site boundary. The different sizes of the boundary properties creates a stepped edge, narrowing northwards, along the north-western boundary of the site.

The southern boundary follows an existing hedge line separating the adjacent agricultural lands to the south. The site is at its widest in its southern half and narrows in stepped increments to its northern boundary which is formed by an existing boundary hedge adjacent to the playing pitches St. Colman's College Sports Campus.

The history of the site is one of agricultural use and the field pattern evident today is seen on the old OSI 1840's 6" and early 1900's 25" Map Surveys. Refer to the OSI maps presented in Appendix 7.1.

### 7.2.2 Land Use and Local Topography

The primary land use in the whole site area, which is 11.56 hectare (ha) in size, is agricultural farmland, under grass pasture, with three open fields occupying the site. The fields are separated by mature hedge lines and occasionally remnant stone wall sections which run east-west. The land in the northern and southern fields and along the drainage feature on the eastern boundary is quite wet and boggy and there are a number of ditches that drains the land eastwards to the boundary watercourse.

The site is relatively flat with a slight sloping gradient from the west to east. The water feature on the eastern boundary flows northwards but is very weeded and is stagnant along much of its length.

At the time of the site walkover an area of land on the eastern side of the central area of the site, adjacent to the boundary stream, was fenced off and was not being grazed as ground conditions were too boggy. The northern field and part of the southern field are very boggy with rushes, long grasses, and scrub vegetation. Refer to the VCL site photos, from January 2021, in Appendix 7.2.

Local ground heights vary along the eastern boundary from a low of about 51.1mOD, in the northeast corner, where the water feature exits the site, rising to a height of about 52.3 mOD on the eastern boundary at a position about 300m north of the southeast corner of the site.

The southeast corner has a height of about 52mOD and this rises along the southern boundary to a height about 57mOD in the southwestern corner of the site. The adjacent land rises to the south and the southwestern boundary represented the highest part of the site area with heights of about 57mOD to 55mOD. The land gradually drops along the western boundary to a height of about 52.5mOD in the north-western corner of the site.

The northern boundary slopes eastwards from 52.5mOD to 50.8mOD and is about 2m lower than the adjacent playing pitches where the original ground level has been raised.

There is a slight rise in ground level in the central part of the site where a height of 55.8mOD is recorded. Refer to the detailed topography map of the site area presented in Appendix 7.3.

The proposed site layout will have numerous private gardens as well as public green and open space areas which will be connected to the local road infrastructure by internal cycle and walking paths.

Some of the hedge lines will be retained and the total land take for the development is around 11.22ha with over 1.7ha remaining as open space. Refer to the Phased Development Layout Drawing in Appendix 7.3

### 7.2.3 Soils and Subsoils

Topsoil and Subsoils (Quaternary sediments) in the South of Ireland were deposited during or after the last ice age that occurred in this part of the country and essentially comprise the unconsolidated natural mixes and variable thicknesses, of fine clay, silt and sand which may contain variable quantities of courser gravel, cobble and boulder size stone materials. These subsoil deposits, with mixes of a wide variety of clast sizes are known as Diamict (diamicton) sediments and would typically cover the underlying bedrock except where soils are absent, and exposures of bedrock occur.

Subsoils in Ireland are dominated by these natural deposits of glacial origin, called tills, with more segregated outwash deposits of sands and gravels, deposits of peat, river alluvial and coastal sediments occurring in particular environmental settings.

The old An Foras Talúntais soils mapping for the Soil Map of Ireland, (1980), indicates that this part of Cork is defined by Rolling Lowland Physiography and the whole site area is underlain by very common Brown Podzolics with Acid Brown Earths and Gleys, with parent material of Sandstone, Lower Avonian Shale Glacial Till. Refer to the Soil Map of Ireland extracts presented in Appendix 7.4.

The on-line GSI Quaternary Physiography Mapping indicate that the site occupies an area of Rolling Ice Moulded Sediments in a Rolling Ice Moulded Topography with Glacial Sediments located between the Mountain to Hill Topography to the West and the Hill to Rolling Lowland Bedrock Ridge Topography to the East. Refer to the GSI Physiography Mapping Presented in Appendix 7.4.

Brown Podzolics are described as moderately drained acidic soils formed in hilly areas with a good mix of mineral and organic matter towards the surface layer, while Acid Brown Earths are described as mature well drained soils with a uniform brown horizon, capable of high fertility.

The GSI Quaternary and EPA Subsoil Map Data, from their on-line databases, indicates that the subsoil at the site comprise of variable undifferentiated Lacustrine Sediments, derived from Glaciolacustrine deposits. These deposits are identified to occur in a small pocket, more or less represented by the extent of the site area, surrounded by Glacial Tills and/or areas of Bedrock Exposure/Rock Close to Surface. Refer to the GSI and EPA Subsoil Maps presented in Appendix 7.4.

Recent (2013) soil mapping presented in the online EPA/Teagasc/Cranfield Database identify that the Ross Carbury Soil Association, (0900RO), as being present in the site area. This is described as “Coarse loamy drift with sillceous stones”. This soil association occurs in a 5.31km2 pocket of soil identified on the south side of Fermoy but are a very common and widespread soil especially in the West Cork area. A map of the local extent of the Ross Carbury Soil Association is presented in Appendix 7.4.

A site-specific Site Investigation (SI) on the nature and depth of subsoil around the site, consisting of the excavation of 30 trial pits, was competed on the site in October 2004. The 27 available trial pit logs from this investigation were provided to VCL and are included in Appendix 7.5.

A summary of the general findings of the available trial pit logs are presented in Table 7.1.

Table 7.1 Summary of SI Trial Pit Logs – October 2004.

| General Lithology Description | Typical Thickness (m) | Thickness Range (m) | No of Trial Pits |
|---|---|---|---|
| Brown Earthy TOPSOIL | 0.3 | 0.2 to 0.6 | All 30 |
| Black PEAT Material | 0.3 | 0.2 to 0.8 | 5 |
| Grey silty sand gravelly CLAY | 1.0 but very variable | 0.2 to 3.1 | 17 |
| Brown silty gravelly CLAY | 0.8 but very variable | 0.4 to 1.3 | 12 |
| Brown silty sand gravels with cobbles & boulders and some clay | 2.0m but variable | 1.0 to 3.3 | 17 |
| Brown sand or clayey SILT | 0.5 to 1.0 | 0.5 | 3 |
| Water Inflows Encountered | Typically >2m | Depth range 0.5 to 3m | 17 |
| Bedrock | Encountered in only 3 TPs in SW corner at 1.1m, 1.9m & 3.1m. | | |
| Trial Pit Depths | Excavations typically to 3m with a depth range of 1.1m to 3.6m. | | |

The trial pit logs indicate that there is brown, earthy topsoil cover, about 30cm thick, across the whole site area, occurring mainly over horizons of grey or brown sand, silty, gravelly CLAY or brown sand SILT with some gravels or sand GRAVELS with cobbles and boulders and some clay. While there is some variability in the description of the sediment deposits encountered, they all represent variable mixes of natural sediments such as clays, silts, sands and gravels with occasionally some cobbles/boulders occurring. These variable undifferentiated deposits are typical of glacial sediments.

The GSI identify the site area as being underlain by Lacustrine Sediments and while the trial pits identify some thick sequences of clay, silt, sand and gravel deposits that could represent a depositional lake setting they are not found to be consistently deposited across the whole site area so may represent glacial outwash deposits mixed with bounder clays that have some local lacustrine characteristics.

Weathered bedrock, described as purple MUDSTONE/SANDSTONE, was encountered in three trial pits, two located in the south-western corner and one on the southern boundary of the site.

The trial pit logs from the 2004 site investigation received by VCL are included in Appendix 7.5

### 7.2.4 Made Ground

None of the trial pits recorded any Made Ground or Fill material being encountered. A review of the historic maps and aerial photographs of the locality did not identify any quarries or show any historic excavations or depositional activity on the site. Refer to the historic OSI Aerial Photos of the site included in Appendix 7.6.

### 7.2.5 Bedrock Geology

The Coolcarron site is identified by the regional 1:100,000 scale GSI 'Geology of South Cork' (GSI Booklet and Map Sheet 22, (1995)), and the current GSI on-line bedrock maps, (www.gsi.ie), as being underlain by the Upper Devonian aged Ballytrasna Formation (BS) geological unit. This bedrock is described by the GSI as 'dusky-red to purple mudstones with sub-ordinate pale red sandstones'. These bedrock sequences tend to be thinly bedded and folded, with a steeply dipping orientation.

The geological units in the south Munster area tend to have an East-West bedding trend which can be off-set by North-South orientated faults. No large geological faults or bedrock structures or rock outcrop are mapped by the GSI within the study area. Refer to the GSI Geology Map in Appendix 7.7.

The regional geological setting is one of very large-scale East-West trending upward (anticline) and downward (syncline) fold features which create both variability and repeating geological sequences in the underlying bedrock, especially as you travel North-South across this part of County Cork.

The upland hills and broad ridges, such as Corrin Hill located to the southwest and the upland area from Strawhall to the east of the site, are part of the northern side of a large anticline fold structure that has younger geological Carboniferous aged limestone underlying the Blackwater River Valley to the north.

Typically, the upper horizons of this type of stratified bedrock, which is extensively encountered in the Munster area, are slightly weathered and very fractured and are easily diggable and/or rippable by heavy construction machinery. Bedrock was encountered at depth (>1.1m) by the trial pit excavations in the south-west corner and on the southern boundary of the site. No deep excavations are proposed

### 7.2.6 EPA Ebmconomic Geology and Geological Heritage Sites

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 (within 5km) and there are no Geological Heritage Sites identified in this part of Cork. Refer to the GSI Geological Heritage Site Mapping presented in Appendix 7.7.

### 7.2.7 Soft or Unstable Ground and Geo-Hazards

The completed trial pit assessment from October 2004 identified four locations (TP4, TP7, TP15 and TP25) along the eastern boundary of the site, (beside the water feature), where potentially soft unstable 'black peat' material is described. This material is identified to a depth of between 0.3m and 1.1m below ground level and could pose unstable ground if built on. Based on the proposed layout no building is proposed directly beside the drain feature.

More specific soil assessment as part of the site preparation, will ensure that any pockets of peat or soft ground are removed as part of the topsoil removal prior to construction commencing. One thick sequence (2.7m) of soft grey clay material was identified in the TP4 log and such pockets of potentially soft clay could create unstable building conditions and will need further assessment and stabilisation prior to the construction stage.

The bedrock geology is comprised of interbedded sedimentary Mudstone/Siltstone and Sandstone deposits and therefore there is no limestone karst risk geo-hazard associated with the site.

The GSI has developed a database of historical landslides and landslide susceptibility in Ireland. This database indicates that no recorded landslide events lie within or in the general locality (~5km) of the study area. All of the site area and local area is considered to have a low landslide susceptibility. Refer to the GSI Landslide Susceptibility Map in Appendix 7.7.

### 7.2.8 Radon

Radon is a naturally occurring radioactive gas coming from the soil/bedrock geology that can cause serious ill health if there is long exposure. It is measured in bequerels per cubic metre, ($Bq/m^3$).

EPA Radon Mapping shows a prediction of the number of homes in a given grid square that exceed the national exposure Reference Level. They identify that the Coolcarron area is in a 'Moderate Radon Area'.

A moderate Radon Area is defined as one where between 5 to 10% of the existing homes in a 10km grid square could have potentially elevated radon gas concentrations in excess of the national Reference Level of 200 Bq/m3. Refer to the EPA Radon Map presented in Appendix 7.8.

All modern buildings are fitted with radon barriers to eliminate the risk of radon entering a property.

### 7.2.9 Legacy Landfills and Contaminated Sites

In 1996 the Environmental Protection Agency (EPA) began licensing certain activities in the waste sector. These include landfills, transfer stations, hazardous waste disposal and other significant waste disposal and recovery activities. The EPA website indicates that there are no waste licensed facilities within the general locality around the site.

Information from the EPA indicates that there are no Landfill Sites or Waste Facilities situated within the study area or in the general locality of the site. Refer to the EPA map search for the site location and general area presented in Appendix 7.9.

Reviews of the historic maps and aerial photographs do not indicate any old quarry features or excavations which could have been back filled with waste or imported material.

### 7.2.10 EPA Industrial Emission (IE) Licensed Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994 and since 2003 this had been done under the Integrated Pollution Prevention Control (IPPC) Directive and more recently the Industrial Emission (IE) Licencing system. A review of the EPA On-line mapping resource shows that there are no EPA licensed facilities within 1km of the study area. Refer to the EPA map search for the site location and general area presented in Appendix 7.9.

### 7.2.11 Areas of Scientific Interest

A review of the EPA and National Park & Wildlife Service (NPWS) on-line databases show that the River Blackwater, which is 1km to the north of the site, is designated as a Salmonoid River, (as per regulations S.I. 293) as well as a Special Protection Area (SPA) (Ref 002170). Downstream of Fermoy Town is the proposed Blackwater River Callows National Heritage Area (pNHA – 000076). These sites are discussed in more detail in the Chapter 9 – Biodiversity.

### 7.2.12 Groundwater

The groundwater (hydrogeology) assessment of the site is included in Chapter 8.

### 7.2.13 Conceptual Site Model

As per the IGI Guidance recommendations a Conceptual Site Model (CSM) has been developed for the site examining the interaction of the project with the geological environmental. The main interaction is the need for the stripping of topsoil and removal of shallow subsoil to formation level. Site levels will require the in-filling of areas of the eastern side of the site to enable building and landscaping works to be completed at the required gradients to the proposed design layout. The shallow nature of the development means that interaction with the bedrock or water table is not anticipated or will be minimal.

### 7.2.14 Type of Land and Soil/Geological Environment

As per Step 3 of the IGI Guidelines the baseline information and CSM enables the type of soil/geological and hydrogeological environment to be determined for the development. From the range of generic environments outlined in the IGI document (Types A to E) the Cumnor Coolcarron development at Fermoy is interpreted to have a:

**Type A - Passive Geological/Hydrogeological Environment.**

This is based on the fact that the area is underlain by well mapped, reasonably homogenous sedimentary bedrock which is a historically stable geological environment. The bedrock units are classified as a locally important aquifer, which is generally moderately productive only in local zones.

The site does not represent any aspect of a Type B groundwater discharge area with a regionally important aquifer, Type C Man-Made Dynamic Hydrogeological Environment with mining or quarrying below the water table, or with nearby waste discharges to ground or a Type D Sensitive Geological/Hydrogeological environment with karst limestone or water supply SPAs or a Type E Groundwater Dependent Ecosystem or wet land with a river with a high base flow of groundwater.

### 7.2.15 Criteria for Rating the Site/Attribute Importance – Geological Features

Based on the NRA 2008 matrices, (Tables C2 of the IGI Guidelines), the importance of the land and soil/geological attributes of the Cumnor Coolcarron site are rated as Medium to Low. See Table 7.2.

**Table 7.2 Rating of Land/Geological Site Attribute Importance.**

| Attribute | Criteria | Typical Example | Importance |
|---|---|---|---|
| Topsoil/Subsoil | Attribute has a medium significance or value on a local scale | Moderately drained and/or moderate fertility soils | Medium-Low |
| Bedrock Resource | Attribute has a medium quality significance or value on a local scale | Very common bedrock aggregate sub-economic for extraction at this location | Low |
| Geological Heritage | Attribute has a low quality significance or value on a local scale | Common soil/geology with no geological heritage or features of importance | Low |

Based on the rating of the site attributes the soil profile is identified as having a medium to Low Importance as it represents an area of moderately to poorly drained moderately fertile soils on a local scale. The other relevant geological attributes are considered to be of low importance.

### 7.2.16 Activities Associated with the Proposed Development

As per Step 4 of the IGI Guidelines a range of Generic Activities that can potentially interact and impact with the geological/ hydrogeological /environment are presented in the Activities/Environment Matrix identified as Figure 2 of the IGI Guidelines. A copy of this Matrix is presented in Appendix.7.10.

The activity which is associated with the construction phase of the proposed development relates to:

**Earthworks and Excavation of Materials above the Water Table.**

This activity will be completed in a Type A (Passive) geological environment.

As recommended by the IGI Activities/Environments Matrix invasive site investigations in the form of trial holes have been undertaken to characterise the nature and thickness of the soil/subsoil and depth to bedrock around the site. The water table was typically encountered at a depth of 1.5m to 3m.

It is proposed to complete the earthworks and construction of the site in five phases which will enable an orderly and structured site development.

### 7.2.17 Construction Related Cut and Fill Activities

In order to get suitable foundation conditions and achieve the requirements of the Design Manual for Urban Roads and Streets some earthworks and cut and fill operations will be required for the development of all areas of the site. As well as the stripping of the topsoil off the construction areas some subsoil excavation will be required to achieve the required construction levels in some areas. Soils will also be reused in landscaping, backfilling green areas and as topsoil cover where required.

The WDG Preliminary Construction & Demolition Waste Management Plan, (CDWMP), present estimates of the volumes of soil & stone material needed for the different phases of the construction and these involve overall totals of 33,900m3 (~64,410 tonnes) of stripped topsoil, 15,340m3 (~29,146 tonnes) of subsoil cut, 40,361 m3 (~64580 tonnes), of site fill under structures and 29,100m3 (~55,290 tonnes) of site fill for landscaped areas. As far as possible excavated material will be retained and reused on site either as structural fill, (if suitable), and/or as landscaping fill.

Calculations of the volumes soil and stone and of cut and fill have been made by the WDG for the construction and these are discussed in Section 3.4.1 and summarised in Table 1 of the CDWMP.

Generally, the site layout has been designed to try to match the amount of cut and fill material needed so that the amount of material needing to be imported or exported is kept to a minimum.

### 7.2.18 Operational Activities

There will be no operational phase activities as there will be no interaction with the land and geological elements once the site area is fully developed.

The use of domestic Air to Heat systems rather than kerosene oil burners in the houses heating systems will greatly reduce the risk of oil spillages impacting the soils, underlying bedrock and aquifer.

## 7.3 Impact Assessment and Determination

The potential impact of the proposed development on the land and soils/geology is primarily the removal of the topsoil cover, and in some areas the excavation of the underlying subsoils, down to the required formation level. In the eastern side of the site and in landscape greenspace the ground level will be raised by the infilling of excavated subsoil. Generally, there will be little impact the nature of the subsoil and bedrock in terms of their depth and the topography of the development area.

The excavation work and soil/subsoil removal during the construction phase will create on-site transport requirements and potential on-site sediment management issues in terms of potential dust generation and suspended sediment runoff to surface waters.

### 7.3.1 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the proposed Cumnor Coolcarron Residential Development on the land and soils/geology during and after the construction phase, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Document, (2017) and NRA Guidance (2008/9) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in the following section.

The impact assessment was undertaken using the following considerations:

- Quality of an Impact: Described as being Positive, Neutral or Negative where:
- Positive Effects = ones which improve the quality of the environment.
- Neutral Effect = represents no effects or effects that are imperceptible.
- Negative/Adverse Effects= change which reduces the quality of the environment.
- Duration of Impacts: The duration of each impact was considered to be either temporary, short-term, medium-term, long-term or a permanent impact. Temporary impacts are considered to be those which are construction related and last less than one year. Short term impacts were seen as impacts lasting one to seven years. Medium-term impacts are impacts lasting seven to 15 years. Long-term impacts are impacts lasting 15 to 60 years and permanent impacts are impacts lasting over 60 years.
- Magnitude of an Impact:

The rating of the potential magnitude of impacts at EIAR stage are defined by the NRA guidance (2008), which includes typical examples, as outlined in Table 7.3.

Table 7.3 Criteria for Rating Land/Soil Impact Magnitude at EIS stage, (NRA Guidance Box 5.1).

| Impact Magnitude | Criteria | Typical Example |
|---|---|---|
| Large Adverse | Results in loss of attribute and/or quality and integrity of attribute | Irreversible loss of high proportion of local high fertility soils<br>Removal of entirety of geological heritage feature<br>Requirement to excavate and replace a high proportion of peat, organic soils and/or soft mineral soils |
| Moderate Adverse | Results in impact on integrity of attribute or loss of part of attribute | Irreversible loss of moderate proportion of local high fertility soils<br>Removal of part of geological heritage feature<br>Loss of moderate portion of future quarry or pit reserves. |
| Small Adverse | Results in minor impact on integrity or attribute or loss of small part of attribute | Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils.<br>Removal of small part of geological heritage feature<br>Sub-economic extractable mineral or rock resource. |
| Negligible | Results in an impact on attribute but insignificant magnitude to affect either use or integrity | No measurable changes in attributes. |

(**Information sourced from Box 5.1 of the NRA 2009 EIA Guidelines Pages 103).

Given the potential irreversible loss of a small proportion of local, moderately to poorly drained, high fertility soils which would result in the loss of a small part of the attribute the impact for the development would be considered to be Small Adverse on a local level to Negligible when considered on a more reginal level.

- Significance of an Impact: The impact significance was considered as having either an: Imperceptible/Not Significant, Slight, Moderate, Significant/Very Significant or Profound impact.

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Draft Guidelines 2017 – Section 3 Table 3.3 Page 50 as shown in Table 7.4. (The word 'effect' is used interchangeably with the work 'impact' in the EPA EIAR guidelines).

Table 7.4 Describing the Significance and Quality of Potential Effects for EIARs

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

The rating of potential environmental impacts on the land/soil (Geological) environment can also be assessed based on the matrix presented in Table 7.5, which takes account of both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed development on it. The criteria apply to potential impacts during both the construction and operational phases.

Table 7.5 Rating of Significant Environmental Impacts at EIA Stage***

| | | **Magnitude of Impact (Table 7.4)** | | | |
|---|---|---|---|---|---|
| | | **Negligible** | **Small Adverse** | **Moderate Adverse** | **Large Adverse** |
| **Importance of Attribute (Table 7.2)** | **Extremely High** | Imperceptible | Significant | Profound | Profound |
| | **Very High** | Imperceptible | Moderate/ Significant | Significant/Profound | Profound |
| | **High** | Imperceptible | Slight/Moderate | Moderate/Significant | Significant/Profound |
| | **Medium** | Imperceptible | Slight/Not Significant | Moderate | Significant |
| | **Low** | Imperceptible | Imperceptible | Slight | Slight/Moderate |

(***Based on NRA Guidelines (2009) – Box 5.4 Page 106).

The magnitude of each impact was considered from negligible to large. Negligible impacts are effects that result in an impact on an attribute but of insufficient magnitude to affect either its use or integrity. A major impact results in the significant loss of an attribute and/or quality and integrity of an attribute.

Based on Table C4 of the IGI 2013 Guidelines, Assessing the Criteria for Rating Impact Significance at EIS Stage – Estimation of the Magnitude of Impact on the Geological Attributes, (after NRA 2008), the potential impact of the Cumnor Coolcarron Development would be considered to be 'Small Adverse' for land/soils as there would be a loss of some of the attribute on a local scale, however on a regional scale the magnitude of impact is be considered to be 'Negligible' as the development would 'result in an impact on the attribute but of insufficient magnitude to effect either use or integrity', as the soil and bedrock types are so locally and regionally extensive.

- Type of Impact: These are described as 'Do Nothing', Cumulative, Indeterminable, Irreversible, Residual, Synergistic or 'Worse Case' scenarios. (These are examined in Section 7.4).

## 7.4 Predicted Impacts

### 7.4.1 Do Nothing

In the scenario of the development not progressing then the land will remain in agricultural use and the geological regime will remain unchanged. Given its location on the fringes of Fermoy Town and within its development boundary, it is unlikely that the land will remain undeveloped in the long term.

### 7.4.2 Construction Phase

The nature of the proposed residential development at Coolcarron will result in a number of potential direct and indirect construction phase impacts on the geological environment. These are identified as:

- the removal of the existing unconsolidated topsoil,
- the excavation of some subsoils to achieve the required formation level or to remove soft ground,
- the proposed backfilling works, especially increases in ground heights on the eastern side of the site,
- potential occurrence of areas unstable peat or soft clay subsoils,
- fuel spills from construction machinery working on the site or during re-fuelling,
- uncontrolled sediment runoff,

#### 7.4.2.1 The removal of the existing unconsolidated soils

These comprise of the Ross Carbury Soil Association, described as coarse loamy drift with siliceous stones. These are very common and extensive soils and no particular agricultural or geological importance or heritage value is attributed to them. The impact would be PERMANENT across the site area and is rated as SMALL ADVERSE but given the extensive abundance of this type of soil in the country and the relatively small area of moderate quality agricultural land to be developed it is considered to be a NOT SIGNIFICANT, NEUTRAL quality impact on the soil attribute.

#### 7.4.2.2 The sterilization of the underlying bedrock

The interbedded mudstones, siltstones and sandstones of the Ballytrasna Formation are not an unusual geological unit and no economic importance or heritage value has been attributed to them or occurs locally. While the development of the land area would be PERMANENT the bedrock importance is low and the sterilization of the bedrock by the housing would be considered to be an INPERCEPTABLE NEUTRAL quality impact.

#### 7.4.2.3 The proposed excavation and backfilling works

The proposed excavation and backfilling works will slightly change the ground levels and the local topography in some areas of the site. This will have a PERMANENT impact but one which would not be considered to alter the overall topographical character of the area and would be considered to have an INPERCEPATABLE NEUTRAL quality impact on the attribute.

#### 7.4.2.4 The occurrence of soft subsoil conditions

The presence of soft clays and peat was identified in a few of the trial pits excavated on the site which could create poor ground conditions for building on. These small areas will either excavated or not built on so it is considered that they would have a TEMPORARY NEGATIVE site impact if not mitigated. More detailed investigations and soil assessment will be carried out during construction.

#### 7.4.2.5 Fuel Spills

The activity of plant and machinery and plant equipment operating in the development area could result in small scale fuel spills to the ground surface. This would be a potential TEMPORARY or SHORT TERM NEGATIVE impact if an accidental oil or fuel spill was to occur.

#### 7.4.2.6 Uncontrolled Sediment Runoff

The potential occurrence of suspended sediments in rainfall runoff from work areas would be a potentially BRIEF to TEMPORARY NEGATIVE impact if the runoff was to effect the local drainage system a and migrate to the Blackwater River located about 1km to the north of the site. Mitigation measures will reduce the risk of this occurring.

### 7.4.3 Operational Phase

There are considered to be no operational phase impacts as there will be no interaction with the land and geological elements once the site area is fully developed.

### 7.4.4 Risk of Major Accident and Disasters

Possible scenarios which may create accident risk would include the loss of fuel or chemicals, (such as bulk cement), during the construction phase or the collapse of unsupported excavations or soil stockpiles during construction. Foundation failure due to soft subsoils could create post construction accident risks.

The accidental loss of fuel from active machinery in the development or the spillage of fuel during the re-fuelling of construction machinery would be considered to pose an environmental risk. This would impact on the soil quality which could, if left unmanaged, impact on the water quality of the aquifer under the site and may also result in surface water runoff being contaminated. In either case the potential volume of fuel loss would be relatively small in the 10’s rather than 100’s of liters and the duration of the impact would be temporary to short term. Designated re-fueling areas and bunded fuel storage would greatly reduce this risk.

The other potential ‘worst case scenario’ would involve the collapse of soil from a stockpile or exposed excavation face which could pose a human health risk or if weather conditions were bad, result in sediment runoff to the local drainage system and Blackwater River. It is considered that this scenario would be very unlikely once stockpile heights and their location are managed. Any deep excavations will be properly supported by suitable temporary works and drainage runoff controlled.

The potential for a major accident or disaster to occur with regard to the soil and geology attribute is considered very unlikely, especially if temporary stockpile heights are controlled during the construction phase and any retaining wall structures are promptly and correctly installed. During the operational phase the remediation of structures can be undertaken if any visible signs of foundation subsidence, such as settlement or tension cracks, are observed.

### 7.4.5 Cumulative Impacts

A review of the CCC planning system identified are a number of other construction projects proposed for the general locality in this area of Fermoy. Including;

- Part 8 Housing Scheme 11 no. residential housing units at Uplands, Fermoy, CCC Part 8 Application,
- Retention for Internal woks for new technology room, sanitary rooms, 3 no. new classrooms, 1 no. new computer room at St. Colmans College, Monumental Hill, Fermoy, Planning Ref: 21/4049, July 2021.
- The change of use (through intensification) of part of an existing light industrial building currently used for the assembly and commissioning of stainless steel vessels to provide for an electropolishing area within the building footprint; b) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor; and c) ancillary external site works to connect to the existing on-site sewer network. Planning Ref 20/6246 permitted in 2020.
- The demolition of 2 No. dwelling houses and associated sheds/outhouses and the construction of 28 No. residential units and all ancillary site development works, including access, car/bike parking, bin storage and amenity areas. Planning Ref: 21/7241 – Under Review by CCC.
- To demolish existing pump canopy, shop and stores, for construction of valeting buildings, car wash, boundary fencing & 2 no. signs together with associated works. Planning Ref: 19/6221 Permitted 2020.

Any cumulative construction and operational impacts of other projects would be considered insignificant as the scale and footprint of the development area is extremely small when compared to the soil and geological attributes which are very widespread both in a local and regional context.

## 7.5 Mitigation Measures

The sensitivity and value of the receiving environment combined with the magnitude and duration of the potential impact defines the environmental significance of the effect and is examined both before and after the application of mitigation measures. Generally, the more significant and long term the impact the more difficult it is to mitigate it.

While the magnitude of the potential long term impact on the land and soil, (geology), from the development are considered to be negligible there are potential brief to temporary or short term impacts that may arise, especially during the development/construction stage, which could cause environmental risks and there are a number of mitigation measures that would help eliminate and/or reduce the occurrence of these potential impacts.

### 7.5.1 Construction Phase Mitigation

The areas where the excavation of unconsolidated soil and subsoils is required within each building phase should be kept to a minimum and only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of preventing the release of dust in dry weather and suspended sediments in wet conditions. Potential impacts are therefore avoided.

Limiting activities to work areas and not allowing machinery or construction activity in proposed future green, open space and/or undeveloped areas will ensure that there is no dust or sediment runoff generated and limited soil compaction will occur in those areas.

An exclusion zone should be established near the eastern drainage feature and silt fences should be placed between it and the work areas to protect this surface water system from sediment runoff.

An initial construction waste management plan has already been prepared by WDG for the proposed development and this will amended to allow for planning conditions and input from the appointed contractor as necessary prior to any works commencing.

Designated roadways and internal access/construction routes should be clearly designated and fenced off in order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Machinery traffic on bare soils is a significant generator of silt.

Dust can be reduced by damping down of the works areas and especially along roads and access tracks where vehicle activity increases the generation of dust and fine particulates.

A designated contractor compound located in an area of level ground should be established for the different phases of site development. This compound will enable the safe storage of building materials, car parking, waste skips and should include a designated re-fuelling station and concrete wash down area.

Designated stockpile areas for the temporary storage of topsoil and subsoil material required for site re-use should be established at least 10m away from any drainage feature and as far as possible for the stream on the eastern boundary. Stockpile heights should be kept low to prevent instability and silt fencing installed around stockpile areas.

Any finished construction and green areas should be fully landscaped and re-grassed as soon as possible after completion to limit the potential for dust and silty water generation from those areas.

Activity of plant equipment and machinery operating in the construction area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc.

All fuel storage areas on the site should be sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.

Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.

Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used.

Irish Water Protection Guidelines such as the “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites” should be followed to ensure there is no potential for site activities to impact the local drainage network that connects to the Blackwater River.

The recommendations of the CIRIA Environmental Good Practice (3rd Edition 2010) and the should be adhered to and incorporated into the Construction Management Plan for the Development.

### 7.5.2 Operational Phase

VCL understand that the heating systems to be used in the proposed residences will be Air to Heat type systems which are electrically powered and no individual heating oil and above ground kerosene storage tank infrastructure will be used on the site. This eliminates the risk of oil spills impacting on the soil and water quality on the site during the operational phase of the development.

### 7.5.3 Monitoring

During the construction all topsoil and subsoil excavation work will be observed by a banks man. Although no buried waste or foreign material is anticipated the operative will be instructed to lookout for any physical evidence, (discolouration, odour, sheen etc,), of contamination in the excavations. A soil management plan, including segregation, sampling and suitable disposal off-site will be in place for the works and this plan will be instigated if necessary.

## 7.6 Residual Impacts

With the importance of the land and soils/geology attribute's being 'Medium to Low' and the potential Magnitude of Impact as 'Negligible' then the potential impacts are rated as 'Imperceptible'.

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. The mitigation measures described will further reduce the potential for any significant brief to temporary or short-term environmental impacts occurring during construction.

No significant residual operational phase impacts area anticipated.

No significant residual impacts are predicted for the land and soils/geology aspects of the proposed development. The consideration of cumulative projects does not change the residual impact rating.

A summary assessment of the predicted impacts, mitigation measures, monitoring and residual impacts during the construction and operational phase are shown in Table 7.6.

**Table 7.6 Predicted Land and Soil/Geological Impacts for the Cumnor Construction Residential Development at Coolcarron, Fermoy, Co. Cork.**

| Feature | | Impact Assessment Operational | | | | | |
|---|---|---|---|---|---|---|---|
| **Name** | **Importance** | **Magnitude of Impact** | **Criteria for Impact Assessment** | **Significance of Impact** | **Duration of Impact** | **Mitigation Measure** | **Residual Impact** |
| Inert Soil and Subsoil Strata | Medium-Low (moderately fertile soils) | Negligible | Removal of unconsolidated topsoil cover and some subsoil areas | Imperceptible | Long term to Permanent | Re-use of topsoil in landscaping and excavated subsoil as back fill material around the site. | Imperceptible |
| Inert Soil and Subsoil Strata | Medium-Low (moderately fertile soils) | Negligible | Potential sediment runoff from excavated soil material | Imperceptible | Temporary | Use of silt fencing and stockpiles positioned away from the sites boundary drainage feature. | Imperceptible |
| Inert Soil and Subsoil Strata | Medium-Low (moderately fertile soils) | Negligible | Stability of exposed sub-soil during excavations. | Imperceptible | Temporary | Use of retaining structures to support exposed faces to prevent any instability during works. | Imperceptible |
| Inert Soil and Subsoil Strata | Medium-Low (moderately fertile soils) | Negligible to Small Adverse | Potential for contamination of soils due to accidental spillages of oils or fuels. | Imperceptible | Short term | Bunded fuel storage and good operational practices in place to ensure that the potential for accidental spills and risk of soil contamination is minimised. | Imperceptible |
| Bedrock Strata | Low (common sequences of sandstone & siltstones) | Negligible | Building over Devonian aged mudstone sandstone and siltstone bedrock | Imperceptible | Permanent | Very common geological bedrock unit which is a non-economic resource. | Imperceptible |

## 7.7 References for Land, Soils/Geology Chapter

Environmental Protection Agency. *“Draft Guidelines on the information to be contained within an EIAR”,* (EPA 2017).

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**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 8

## Hydrology and Hydrogeology

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 8 Hydrology and Hydrogeology

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## Tables

# 8. Hydrology and Hydrogeology

## 8.1 Introduction

Viridus Consulting Ltd., (VCL) were appointed by McCutcheon Halley Planning Consultants, (MHP), on behalf of Cumnor Construction Ltd., (CCL), to complete the Hydrology and Hydrogeology, (Water), Chapter for the Environmental Impact Assessment Report (EIAR) required for the proposed Strategic Housing Development of 336 no. residential units and associated infrastructure at Coolcarron, near Fermoy. The work was completed by Mr. Darragh Musgrave, Senior Geo-Environmental Scientist with Viridus Consulting Ltd., (VCL).

### 8.1.1 Author Information and Competency

Darragh has an honours degree in Geology (Earth Science) from the National University of Ireland Galway, (NUIG 1992) and a Higher Diploma in Environmental Protection from the Institute of Technology Sligo (ITS 2006). He has 30 years experience working in the geological, hydrogeological, hydrological and environmental sector and has completed Environmental Impact Assessments and Reports for numerous infrastructure and residential developments.

Darragh has been appointed to assess, as per Annex IV of Directive 2014/52/EU, the Water, (Hydrology and Hydrogeology) elements of the EIAR for the proposed CCL residential development in the town land of Coolcarron on the south side of Fermoy town in County Cork.

### 8.1.2 Reference to Guidelines Relevant to Discipline

The Water Chapter for the EIAR follows the recent guidelines outlined in Directive 2014/52/EU and Annex IV amendments, as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and the Irish Environmental Protection Agency (EPA) document, Draft Guidelines on the information to be contained within an EIAR, (2017).

The work also is cognisance of the two Environmental Impact Statement (EIS), EPA draft guideline documents, from September 2015, which outline the process of preparation and the content required for an EIS. The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, (NRA 2008).

### 8.1.3 Methodology

The methodology and scope of the assessment involved the completion of a Desk Study and Site Walkover which included the collation and review of all available information pertaining to the site including any hydrological studies or databases relevant to the proposed site including the following:

- Water Framework Directive (WFD) On-line Maps, (www.wfdireland.ie),
- Environmental Protection Agency (EPA) Envision and Water Quality Data website, (www.epa.ie),
- EPA Catchment Maps, (www.catchments.ie),
- National Parks and Wildlife Service (NPWS) web based mapping, (www.npws.ie),
- Office of Public Works (OPW) National Flood Hazard Mapping Web site (www.floodinfo.ie)
- Ordinance Survey of Ireland, (OSI) On-line Maps and Aerial Photographs, (www.geohive.ie),
- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie/mapping.htm),

The initial Site Walkover recognisance work enabled the physical examination of the geomorphological and hydrological characteristics of the site and its setting in the local catchment.

In this chapter the existing baseline conditions and character of the hydrological characteristics of the site and local catchments are presented and the anticipated potential impacts from the development are identified and discussed. Mitigation measures are proposed, residual impacts are assessed and any relevant monitoring options are considered.

This chapter should also be read in conjunction with the full EIAR, in particular, Chapter 2 Project Description, Chapter 7 Land/Soils (Geology), Chapter 9 Biodiversity and Chapter 14 Significant Interactions.

Consultation was carried out with the relevant bodies by the project planning co-ordinator, including An Bord Pleanala (ABP), NPWS, Inland Fisheries Ireland (IFI), Cork Co. Co., and EPA. A summary of all third party responses received are included in Chapter 1 of the EIAR and presented in Appendix 1.

### 8.1.4 Difficulties Encountered in Compiling Information

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

## 8.2 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, waste water and drainage infrastructure are presented in Chapter 6 Material Assets (Service Infrastructure and Utilities).

### 8.2.1 Site Location and Setting

The proposed Coolcarron development area is located about one kilometre south of Fermoy Main Street, on agricultural lands near the urban fringe and within the development boundary of the town.

The site is on slightly sloping to flat ground occupying the centre of a broad north south orientated valley that has a drainage ditch/stream feature along the length of its eastern boundary. The R639 Cork Road is located to the west of the site and there are some residential housing, an ESB substation, Texaco service station and commercial warehousing units between the road and the western site boundary. The different sizes of the boundary properties forms a stepped edge, narrowing northwards, along the north-western boundary of the site.

The southern boundary follows an existing hedge line separating the adjacent agricultural lands to the south. The site is at its widest in its southern half and narrows in stepped increments to its northern boundary which is formed by an existing boundary hedge adjacent to the playing pitches St. Colman’s College Sports Campus. The small water feature on the eastern boundary drains northwards through the town to the River Blackwater.

The history of the site is one of agricultural use with the field pattern and drainage features evident today are also seen on the old OSI 1840’s 6” and early 1900’s 25” Map Surveys. Refer to the OSI maps presented in Appendix 7.1.

### 8.2.2 Land Use and Topography

The primary land use in the whole site area, which is 11.56 hectare (ha) in size, is agricultural farmland, under grass pasture, with three open fields occupying the site. The fields are separated by mature hedge lines and occasionally remnant stone wall sections which run east-west. The land in the northern and southern fields and along the drainage feature on the eastern boundary is quite wet and boggy and there are a number of ditches that drain the fields eastwards to the boundary watercourse.

The site is relatively flat with a slight sloping gradient from the west to east. The water feature on the eastern boundary flows northwards but is very weeded and is stagnant along much of its length.

At the time of the site walkover an area of land on the eastern side of the central area of the site, adjacent to the boundary stream, was fenced off and was not being grazed as ground conditions were too boggy. The northern field and part of the southern field are very boggy with rushes, long grasses, and scrub vegetation. Refer to the VCL site photos, from January 2021, in Appendix 8.5.

Local ground heights vary along the eastern boundary from a low of about 51.1mOD, in the northeast corner, where the water feature exits the site, rising to a height of about 52.3 mOD on the eastern boundary at a position about 300m north of the southeast corner of the site.

The southeast corner has a height of about 52mOD and this rises along the southern boundary to a height about 57mOD in the southwestern corner of the site. The adjacent land rises to the south and the southwestern boundary represents the highest part of the site area with heights of about 57mOD to 55mOD. The land gradually drops along the western boundary to a height of about 52.5mOD in the north-western corner of the site. The fields directly to the south of the site have a higher topography and represent the boundary of local catchment divide with rainfall runoff from about 200m south of the site mapped by the EPA as draining southwards rather than northwards towards the development.

The northern boundary slopes eastwards from 52.5mOD to 50.8mOD and is about 2m lower than the adjacent playing pitches where the original ground level has been raised.

There is a slight rise in ground level in the central part of the site where a height of 55.8mOD is recorded. Refer to the detailed topography map of the site area presented in Appendix 7.3.

The proposed site layout will have numerous private gardens as well as public green and open space areas which will be connected to the local road infrastructure by internal cycle and walking paths.

Some of the drainage features and hedge lines will be retained and the total land take for the development is around 11.22ha with over 1.7ha remaining as open space. Refer to the Phased Development Layout Drawing in Appendix 7.3

### 8.2.3 Local Hydrological Catchments

Under the Water Framework Directive (WFD) the Blackwater (Munster) River catchment area is identified as Hydrometric Area 18, (HA18), which has a land area of 3,310km2. It is a large catchment which includes 158 river, 3 transitional and one coastal waterbodies and 18 groundwater bodies.

In order to present water quality information on the status, objectives and management measures for more manageable geographical areas, under the WFD the HA18 is divided into 28 Sub-Catchments. Refer to the Hydrometric Area 18 Catchment Report Maps in Appendix 8.1.

The site area is located at the eastern end of the WFD Sub-catchment Blackwater (Munster)_SC_110 (sub-catchment ID code 18_14). See the WFD Cycle 2 Report for the sub-catchment in Appendix 8.2.

The WFD River Sub Basin Waterbody in this part of the catchment is identified as Blackwater (Munster)_190, (Waterbody Code IE_SW_18B022300), which has an area of 18km2 and occupies the northern and southern side of the River Blackwater around Fermoy Town. As well as Blackwater River (segment code 18_1158), there are three small watercourses identified by the EPA in this sub basin catchment area. About 1.5km west of the study area the small Way Avondhu Stream is shown as a tributary of the Deer Park watercourse (segment code 18_1611), while about 1.1km to the east there is the Wood Fermoy watercourse (segment code 18_1151). These small watercourses flow from south to north to join the west to east flowing Blackwater River. Refer to the EPA Mapping presented in Appendix 8.3.

The drainage feature on the eastern boundary of the proposed site area is not identified as a stream or watercourse by the WFD or EPA mapping. This is probably due to its short length, low flow and uncertain subterranean discharge pathway northwards to the Blackwater River via Fermoy Town.

The EPA has Q-Rating micro-invertebrate water quality monitoring stations at the Fermoy Bridge and at Licklash, 2.1km downstream of the town. The recent EPA water sampling has identified Q4 (Good Status) at the Bridge and Q3/Q4 (Moderate Status) downstream. Refer to the EPA mapping in Appendix 8.3 and the Ecological Assessment presented in Chapter 9 (Biodiversity).

The EPA monitor the Blackwater (Munster)_190 sub basin for micro-invertebrate, physio-chemical, and ecological status with the WFD 3rd Cycle Catchment Report indicating that the surface water quality is classified as being of ‘good’, status which is ‘At Risk’ due to Urban Runoff and Hydro-morphological pressures. It is not a High Status Objective Waterbody. Refer to the extract from the WFD Waterbody Summary Classification information presented in Appendix 8.1.

### 8.2.4 Existing Site Surface Water Drainage

The site has a number of surface ditches which drain the relatively flat and boggy ground eastwards to the large drainage channel feature located along the eastern boundary of the site. This feature, which is identified as a stream on the old OSI 6” scale mapping from the mid 1840’s (refer to the OSI mapping presented in Appendix 7.1), flows northwards from the north-eastern corner of the site area along the side of the adjacent St. Colman’s playing pitches to a subterranean stone culvert drain that flows under the Loreto Astro-Turf Pitch and down into Fermoy Town. Not far downstream from when it leaves the development area the drainage channel is divided into two parallel sections with water in the western channel diverted into a buried drainage pipe that reportedly takes water under the playing pitches in a north westerly direction to the towns existing surface water drainage system at John Redmond Street. Refer to the WDG local area drainage plans presented in Appendix 8.4 and the VCL Site Walkover Photographs presented in Appendix 8.5..

### 8.2.5 Hydrogeology and Aquifer Classification

The EPA Catchment Mapping shows that the proposed site and surrounding area are located within the Glenville Groundwater Body (EPA Code Ref - IE_SW_G_037). The WFD Third Cycle Report indicates that the quality designation for this aquifer is ‘Good’ but that the Ground Waterbody Quality Risk Projection is ‘At Risk’ due to Agricultural Pressures. Refer to the EPA Groundwater Catchment Map included in Appendix 8.6.

Aquifers are described as “bodies of saturated geological materials that both store and transmit important quantities of water”, (Young 2007). Given that a groundwater supply suitable for domestic use can be derived from nearly all the bedrock types in Ireland and this would be deemed an “important quantity of water”, nearly the whole county is considered by the EPA to be underlain by an “aquifer”. The GSI has devised a system for classifying the aquifers in Ireland based on the hydrogeological characteristics of the bedrock as well as the potential size and productivity of the groundwater resource.

Groundwater in Ireland is primarily derived from open fracture or fissures in the bedrock which is identified as secondary permeability rather than groundwater coming from pores or openings in the rock fabric, or from pores in unconsolidated sands and gravels, which is identified as primary permeability. The GSI aquifer classification depends on a number of parameters including, the aerial extent (km2), well yield (m3/d), specific capacity (m3/d/m), aquifer transmissivity (m2/d) and groundwater flow.

The general locality and whole site area is identified by the GSI mapping as being underlain by Upper Devonian aged Ballytrasna Formation (BS) which is described as ‘‘dusky-red to purple mudstones with sub-ordinate pale red sandstones’. These bedrock sequences tend to be thinly bedded and folded, with a steeply dipping orientation. Refer to Chapter 7 Land/Soils (Geology) and the GSI Geology Map in Appendix 7.7.

The Ballytrasna bedrock are classified by the GSI as a “Locally Important Aquifer which is moderately productive only in local zones”, (Ll). Refer to the GSI Aquifer Mapping presented in Appendix 8.7.

### 8.2.6 Site Hydrogeology

No boreholes were found to be present on the Coolcarron site or were identified in the local area. There are no springs or rises identified in the site area by the OSI mapping and none were identified during the site walkover.

The GSI Groundwater Wells & Springs Mapping identifies no wells or boreholes within the immediate area (~2km) of the site. The Fermoy-Coolroe Public Water Supply Scheme is located about 3km to the west of the site water supplies of the proposed site area. Refer to the GSI Wells Location Mapping presented in Appendix 8.7.

### 8.2.7 Groundwater Vulnerability

The vulnerability of a groundwater body is the term used to describe the ease with which the groundwater in the area can be contaminated by human activities. The vulnerability is determined by many factors including the speed at which the contamination can enter the aquifer, the quantity of contaminants and the capacity of the deposits overlying the bedrock to attenuate contaminants. These factors in turn are based on the type, thickness and permeability of the subsoils, e.g. groundwater in bedrock which has a thick cover of low permeability clay is less vulnerable than the groundwater in bedrock which is exposed at the surface.

The criteria for determining groundwater vulnerability, as developed by the GSI and Department of Environmental and Local Government (DoELG), are shown in Table 8.1.

**Table 8.1 GSI Groundwater Vulnerability Mapping Guidelines (DoELG 1999)**

| **Vulnerability Rating** | **Hydrogeological Conditions** | | | | |
|---|---|---|---|---|---|
| | **Subsoil Permeability (Type) & Thickness** | | | **Unsaturated Zone** | **Karst Features** |
| | **High Permeability (sand/gravel)** | **Moderate permeability (e.g. sandy subsoil)** | **Low permeability (e.g. clayey subsoil, clay, peat)** | **(sand/gravel aquifers only)** | **(<30m radius)** |
| **Extreme (E)** | 0 – 3.0m | 0 – 3.0m | 0 – 3.0m | 0 – 3.0m | - |
| **High (H)** | >3.0m | 3.0 – 10.0m | 3.0 – 5.0m | >3.0m | N/A |
| **Moderate (M)** | N/A | >10.0m | 5.0 – 10.0m | N/A | N/A |
| **Low (L)** | N/A | N/A | >10.0m | N/A | N/A |

Notes: (1) N/A = not applicable

(2) Precise permeability values cannot be given at present

(3) Release point of contaminants is assumed to be 1-2m below ground surface

Regional Groundwater Vulnerability Maps have been produced for the country by the GSI (in association with the local county councils), and these have six classifications. ‘Extreme’ and ‘Extreme rock near surface’ or ‘karst’ are those areas most at risk from contamination and mitigation measures should be put in place for their protection. Areas classified as having ‘High’ vulnerability are less vulnerable to contamination; however they still need a certain measure of protection. ‘Low’ vulnerability areas have natural protection in place and mitigation measures do not need to be put in place. In areas which have been classified as ‘High-Low’ only an interim study has taken place.

The GSI Vulnerability Mapping in the Coolcarron site area identified a Moderate (M) Vulnerability rating over the study area. There is a small area of High Vulnerability identified in the south-western corner of the site. This indicates a thick subsoil thickness cover of possible 3m to >10m across the site area . The sites GSI Vulnerability Map is presented in Appendix 8.7.

This classification is generally supported by the 2004 trial hole survey results which indicated soils of >3m thickness across the site area except for the southern boundary where rock was encountered at depth so 1m to 3m below ground level. This would indicate a Moderate to High Vulnerability across the site area and High to Extreme vulnerability in the southern edge of the site. Refer to the trial pit information presented in Chapter 7 - Land/Soils (Geology) and Appendix 7.5 of the EIAR.

The effect of the building work on the site will potentially increase the thickness of the soils/subsoils in some areas with a reduction in vulnerability in areas of impermeable hard standing such as buildings, roads, car parking, paths, etc. and in areas where subsoil thicknesses are increased.

### 8.2.8 Groundwater Flow Direction

The direction of natural groundwater movement is principally influenced by topography and the groundwater table is generally a subdued reflection of the ground surface. For the Coolcarron study area ii would be expected that the groundwater would flow to the northeast towards the local drainage feature and ultimately towards the Blackwater River to the north of the site.

### 8.2.9 Groundwater Interaction

No groundwater abstraction or dewatering is proposed for the Coolcarron Residential development and no interaction with the water table is anticipated. The trial hole survey typically identified water in-flows at depths 2m to 3m with occasionally shallower inflows occurring near the drainage feature on the eastern boundary. (Refer to Chapter 7 and the Trail Pit Logs in Appendix 7.5).

While the shallow building excavations are not anticipated to intersect the groundwater table buried attenuation tanks are proposed to be installed as part of the surface water runoff management and these are likely to be deeper than building foundations. The land area in the eastern boundary area will be raised which will bring the attenuation systems above the lower water table in this area.

### 8.2.10 Rainfall and Groundwater Recharge

The nearest Met Eireann weather station is located at Cork Airport approximately 40km south of the site. The 30 year Mean Annual Rainfall (1941 to 1970) is given as a total of 1,166mm. The potential evapotranspiration (EP) is estimated by Met Eireann to be 500mm. The GSI identify the Effective Rainfall (ER) as 666mm/yr for the locality, the re-charge coefficient is 22.5% and the recharge capacity as 140mm/yr. Refer to the GSI Maps in Appendix 8.7.

### 8.2.11 Flooding History & Storm Water Management

The Office of Public Works (OPW) operates the National Flood Hazard Mapping websites (www.floodmaps.ie) (now replaced by www.floodinfo.ie), which has collated the records of historic flooding events throughout Ireland and presents information on all the ongoing flooding assessments and plans currently ongoing. The websites show some historic flood events and flood records at Fermoy Bridge on the River Balckwater to the North of the site area.

The project design team WDG have included a flood assessment in Section 1.2 their Civil Engineering Report for the Coolcarron Development. This report assesses the existing OPW CEFRAMS flood risk mapping the potential flood risk and concludes that the projected flood extents are localised in the lower lying areas Fermoy Town near the river and do not extend southwards to the proposed site which is on higher ground. The past flood events layer is also shown in the map, indicated with the hazard signs. These events are in Fermoy Town and there is no indication that there has been a flood event in the Coolcarron area.

WDG have also completed a Sustainable Urban Drainage Systems (SuDs) design to manage the surface water attenuation infrastructure and once this is installed to control the runoff there will be no negative impact or increased flooding risk to the drainage regime of the local drainage or the Blackwater River.

### 8.2.12 Storm Water Management

As described in Section 3 of the WDG Civil Engineering Report the attenuation of storm water runoff will be achieved by a number of engineering techniques based on SuDS including maintaining green areas and using areas of permeable paving to allow initial storage with percolation to ground, installing swales, storm water filter drains, hydro brake manholes and buried attenuation systems to temporarily hold storm water underground and then using hydrobrakes to release it at pre-development runoff rates. Refer to the WDG Civil Engineering Document which is included with this application as a standalone report.

For the purposes of the management of the storm water runoff the proposed site area has been divided into a number of networks and each of these networks will have its own underground attenuation system. Located in green areas these will collect runoff via the sites drainage network and are designed to control the calculated volume of storm water generated in that part of the site area.

The main attenuation system proposed for the development is known as ESS Eco Cells 'Underground Attenuation Tanks' and is described in the Civil Engineering Report as – 'cellular water storage modules of moulded polypropylene that have an internal void ratio in excess of 95%. That are arranged to form attenuation tanks. The proposed attenuation tanks have been sized so that no flooding will occur in any rainfall event up to and including the 24 hour 100 year event with a further allowance of 20% for future climate change.

Six attenuation tanks are proposed for instillation around the site with each one designed for a particular surface water network for different areas of the site. The sizes outlined in the WDG Engineering Report for the different network are described as:

- Network 2 Tank – 41.2m x 18.0m x 1.1m deep = 816m3,
- Network 3 Tank – 25.0m x 9.0m x 1.0m deep = 225m3,
- Network 4 Tank - 16.5m x 16.5m x 1.0m deep = 272m3,
- Network 5 Tank - 26.5m x 26.5m x 1.4m deep = 984m3,
- Network 6 Tank - 16.0m x 30.0m x 1.2m deep = 576m3,
- Network 7 Tank - 9.0m x 17.8m x 1.3m deep = 208m3.

The cellular storage modules will be laid on a flat, level and smooth base of selected, compacted granular material. A vent pipe from the top of the tank will allow the release of air during tank filling and allow air to be drawn into the tank as the water level falls. Refer to the WDG design drawings.

The storm water drainage system in the development area will connect to the existing site discharge channel on the eastern boundary of the site. As well as the exiting historic stone culvert and piping under the Coleman's pitches a new proposed headwall and partial diversion of drainage channel flow into a new 750mm pipeline falling westward will divert storm water to the existing surface water infrastructure The 850mm diameter pipe downstream falls northward with the network discharging the storm water to the River Blackwater. Refer to the WDG SuDS design and water drainage drawings.

### 8.2.13 Conceptual Site Model

A conceptual site model (CSM) represents the charaterisitics of a site, in graphic or diagrammatic form, and shows the possible relationships between potential contaminates (source), pathways (pollutant linkages), and receptors (environmental targets).

The main risks to waters from the development from the construction phase are via pollutants, such as fine sediments, directly impacting surface water runoff quality and entering the local drainage channel or by pollutant losses, such as hydrocarbons, to ground and entering the hydrological cycle via the groundwater. The main operational impact of the development on the water environment relates to potential pollution due to leaks from the buried sewage drainage infrastructure and changes to surface water drainage due to changes in topography and the extent of the hard surface area and its discharge to the local drainage channel and ultimately the Blackwater River.

### 8.2.14 Type of Environment

As outlined in Section 7.2.13 in Chapter 7, Step 3 of the IGI Guidelines recommends that the type of Geological and Hydrogeological Environment are assessed. Based on the stable geology and locally important aquifer classification the site is deemed to have a Type A - Passive Geological/Hydrogeological Environment while the activities associated with the Coolcarron residential development relate to Earthworks and Excavations of Materials Above the Water Table. No direct interaction with the sites groundwater or in stream works are anticipated.

The potential impact of the proposed construction activity associated with the development on the hydrological regime is primarily the removal of the topsoil cover and in some areas the excavation or build-up of material to achieve the required design levels, which are designed to be above the water table. The site is relatively flat and no major changes in topography are anticipated.

Combined with the construction of roads, housing, paving and drainage of all hard surface areas the excavations/infilling works will impact the nature of the sites surface water runoff. The excavation work and soil/subsoil removal will create on-site transport and sediment management issues in terms of potential dust generation and suspended sediment runoff to local surface waters.

The extent of development work will be managed by completing the works in a number of distinct phases which will enable an orderly and structured site development. The building phases are identified Chapter 2 – Project Description.

The main operational impact of the development on the water environment relate to the buried drainage infrastructure designed to discharge the storm water runoff and waste water from the site.

Surface water drainage from the site is proposed to be discharged to the existing drainage channel on the eastern boundary of the site via a number of new storm water outfalls from the different surface water drainage networks designed for the phased development of the site. The drainage networks will be installed with a series of hydro-brake manholes, stormwater attenuation tanks and interceptors to help ensure the runoff will mimic green field runoff rates and prevent pollution.

Sewage will be piped directly to the Irish Water Waste Water Treatment infrastructure. A description of storm and waste water infrastructure is presented in the WDG engineering reports and in Chapter 6 – Service Infrastructure and Utilities. The environmental assessment is included in Chapter 9.

## 8.3 Impact Assessment and Determination

The potential impact of the proposed development on the hydrological and hydrogeological regime is primarily short term pollution risks during construction and longer term changes in topography and the ground surfaces which will affect the long term surface water runoff.

The excavation work, soil/subsoil removal during the construction phase will create on-site transport requirements and the potential for on-site pollution management issues in terms of potential fuel spills to ground and possibly groundwater and suspended sediment runoff in surface water.

### 8.3.1 Rating Site Attribute Importance

The hydrological attribute Site Importance rating follows the NRA use of five importance criteria – Extremely High, Very High, High, Medium and Low depending on the attribute quality.

The three attributes that are relevant to Coolcarron site are the underlying aquifer, the existing drainage feature on the eastern boundary, and the Blackwater River which is ultimately the final receiving water that will get the piped storm water runoff discharge from the site. The site importance criteria, with examples, are applied to the Cumnor Coolcarron site in Table 8.2.

Table 8.2 Criteria for rating Site Importance for Hydrological Elements at EIS stage.

| Importance | Criteria | Typical Example | Coolcarron Site |
|---|---|---|---|
| Extremely High | Attribute has a high quality or value on an international scale. | River, wetland or surface water body ecosystem protected by E.U Legislation e.g. Salmonoid River or SAC/SPA | Yes – rainfall runoff from the site is proposed to indirectly discharge to the Salmonoid River Blackwater which is also an internationally protected river habitat SAC (Code 002170).<br>There is also a bird habitat SPA area (Blackwater River Callows – Code 004094) downstream of Fermoy Town. |
| Very High | Attribute has a high quality or value on a regional or national scale. | River, Wetland or Surface Water body ecosystem protected by national legislation e.g. pNHA,<br>Regionally Important Aquifer with multiple wells,<br>Potable Water Supply >2500 homes | No – SW from the site already has a higher importance.<br>No large potable wells in area. |
| High | Attribute has a high quality or value on a local scale | Salmon Fishery,<br>Regionally Important Aquifer,<br>Potable Water Supplying >1000 homes. | No - no salmon fishery or amenity importance locally and limited wells in the area.<br>Locally Important Aquifer |
| Medium | Attribute has a medium quality or value on a local scale | Coarse Fishery,<br>Locally Important Aquifer<br>Local potable water supply to >50 homes. | Yes – Locally important Groundwater Aquifer under site area. |
| Low | Attribute has a low quality or value on a local scale | Poor Bedrock Aquifer<br>Local potable supply <50 home. | Yes – small local drainage feature would have a low quality value. |

As per the relevant guidelines for hydrological/hydrogeological attributes the bedrock aquifer classification of Locally Important gives the site a groundwater rating of Medium Importance. While the local watercourses would be of Low Importance the storm water discharge indirectly enters the River Blackwater River, which is designated as part of the internationally important Blackwater River (Cork/Waterford) Special Area Conservation (SAC) which would have an Extremely High hydrological attribute rating. The Blackwater Callows Special Protection Area (SPA) for birds starts just east of the new M8 bridge on the east side of Fermoy Town. The Blackwater river is also a designated Salmonoid River as per S.I. 293.

### 8.3.2 Impact Assessment Methodology

An analysis of the predicted impacts or effect of the proposed Coolcarron Residential Development on the hydrology/hydrogeology during and after the construction phase, as per Annex IV of Directive 2014/52/EU, EPA EIAR Guidance Document, (2017) and NRA Guidance (2008/9) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in this section.

- **Quality of an Impact**: Described as being Positive, Neutral or Negative.
- **Duration of Impact:** The duration of each impact was considered to be either brief, temporary, short-term, medium-term, long-term or a permanent impact. Brief construction impacts are considered to last a day or so, Temporary impacts last less than one year. Short-term impacts are seen as impacts lasting one to seven years. Medium-term impacts are impacts lasting seven to 15 years. Long-term impacts are impacts lasting 15 to 60 years and Permanent impacts are impacts lasting over 60 years.
- **Magnitude of an Impact**: The significance of each impact was considered as having either an Imperceptible, Slight, Moderate, Significant or Profound effect.

The rating of the potential magnitude and significance of impacts at EIS stage are defined by the NRA guidance (2008 – Boxes 5.2 & 5.3), which includes typical examples, as outlined in Table 8.3.

Table 8.3 Criteria for rating Hydrology and Hydrogeology impact magnitude at EIS stage.

| Impact Magnitude | Criteria | Typical Example |
|---|---|---|
| Large Adverse | Results in loss of attribute and/or quality and integrity of attribute | Loss or extensive change to a water body or dependent habitat.<br>Increase of predicted flood level >100mm.<br>Removal of large proportion of aquifer, or changes to aquifer resulting in extensive change to existing water supply or river base flow.<br>Extensive loss of fishery or high risk of pollution to surface or groundwater from routine runoff. |
| Moderate Adverse | Results in impact on integrity of attribute or loss of part of attribute | Moderate loss or change to a water body or dependent habitat.<br>Increase of predicted flood level >50mm.<br>Removal of moderate proportion of aquifer, or changes to aquifer resulting in moderate change to existing water supply systems or river base flow.<br>Moderate loss of fishery or medium risk of pollution to surface or groundwater from routine runoff. |
| Small Adverse | Results in minor impact on integrity or attribute or loss of small part of attribute | Small loss or change to a water body or water dependent habitat.<br>Increase of predicted flood level >10mm.<br>Removal of small proportion of aquifer, or changes to aquifer resulting in small change to existing water supply systems or river base flow.<br>Minor loss of fishery or potential low risk of pollution to surface or groundwater from routine runoff. |
| Negligible | Results in an impact on attribute but insignificant magnitude to affect either use or integrity | No measurable changes in attributes.<br>Negligible change in predicted peak flood level.<br>Risk of serious pollution incident <0.5% annually. |

(After Table C4 of the IGI 2013 and NRA 2008 Guidelines),

- **Significance of an Impact**: The significance of each impact was considered as having an Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant or Profound effect.

The descriptions of the 'Significance of an Impact' used are as presented in the EPA EIAR Draft Guidelines 2017 – Section 3 Table 3.3 Page 50 as shown in Table 8.4. (The word 'effect' is used interchangeably with the work 'impact' in the EPA EIAR guidelines).

Table 8.4 Describing the Significance and Quality of Potential Effects for EIARs

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

The rating of potential environmental impacts on the hydrological and hydrogeological (Water) environment can also be assessed based on the matrix presented in Table 8.5, which takes account of both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed development on it. The criteria apply to potential impacts during both the construction and operational phases.

Table 8.5 Rating of Significant Environmental Impacts at EIA Stage***

| | | Magnitude of Impact (Table 8.3) | | | |
|---|---|---|---|---|---|
| | | Negligible | Small Adverse | Moderate Adverse | Large Adverse |
| Importance of Attribute (Table 8.2) | Extremely High | Imperceptible | Significant | Profound | Profound |
| | Very High | Imperceptible | Moderate/ Significant | Significant/Profound | Profound |
| | High | Imperceptible | Slight/Moderate | Moderate/Significant | Significant/Profound |
| | Medium | Imperceptible | Slight/Not Significant | Moderate | Significant |
| | Low | Imperceptible | Imperceptible | Slight | Slight/Moderate |

(***Based on NRA Guidelines (2009) – Box 5.4 Page 106).

The magnitude of each impact is considered from negligible to large. Negligible impacts are effects that result in an impact on an attribute but of insufficient magnitude to affect either its use or integrity. A major impact results in the significant loss of an attribute and/or quality and integrity of an attribute.

- **Type of Impact:** These are described as ‘Do Nothing’, Construction, Operational, Cumulative, Synergistic or ‘Worse Case’ scenarios, which look at Major Accident Risks. (These are examined in Section 8.4).

## 8.4 Predicted Impacts

### 8.4.1 Do Nothing

In the ‘Doing Nothing’ scenario with the development not progressing then the land will remain in agricultural pastoral grassland use and the hydrological and hydrogeological regime will remain unchanged.

The water runoff from the site would potentially have elevated nitrate and phosphate parameters from this type of agricultural activity which would cause nutrient enrichment and increased eutrophication risk to the River Blackwater.

Given the site location on the fringes of Fermoy Town, within the town development boundary and adjacent to the M8 route way it is unlikely that the land will remain undeveloped in the long term.

### 8.4.2 Construction Phase

The nature of the proposed Coolcarron residential development will result in a number of potential direct and indirect construction phase impacts with regard to hydrological and hydrogeological attributes including:

- Suspended Sediment Runoff During Earthworks
- Construction and Plant Activity
- Changes to the Ground levels and Site Topography
- Changes to Surface Water Runoff Characteristics
- Groundwater quality and aquifer potential

#### 8.4.2.1 Suspended Sediment Runoff During Earthworks

The potential occurrence of suspended sediments in rainfall runoff from earthwork activities in the construction areas is probably the highest pollution risk to the local drainage features and River Blackwater. Polluted runoff would be direct BRIEF to TEMPORARY, NEGATIVE impact on the receiving waters if elevated fine sediment runoff was to occur. However such a brief impact would be of insufficient magnitude to affect either the use or integrity of the local drainage features or the much larger Blackwater River system and would be considered as NEGLIGIBLE at a regional scale.

The proper management of the sites runoff and the implementation of mitigation measures will be important because, even though the runoff from the site is not going directly to the River Blackwater and the runoff volume is insignificant when compared to the River Blackwater catchment area upstream of Fermoy, Freshwater rivers are sensitive to long term sediment loading. Fine particulates more nutrients into the river system and can clog gravels on the stream bed which can impact fish spawning and the juvenile development of vulnerable species such as the Freshwater Pearl Mussel. See Chapter 9 Biodiversity for the ecological assessment of the proposed development.

#### 8.4.2.2 Construction and Plant Activity

The activity of plant machinery and construction equipment operating in the development area could result in small scale fuel spills or the loss of chemicals (i.e. cement) to the ground surface. This would be a potential TEMPORARY to SHORT-TERM NEGATIVE impact on the local drainage feature and underlying groundwater, and possibly indirectly the River Blackwater, if a small accidental spill was to occur. However, the scale and temporary nature of such an impact would not of a sufficient magnitude to affect either the use or integrity of the aquifer, the local drainage channel or River Blackwater so the impact magnitude would be considered NEGLIGIBLE.

Post construction the risk of fuel spills and hydrocarbon runoff to the local environment will be reduced and mitigated by the installation of interceptors on the sites drainage system and the use of electrical heat pumps rather than kerosene oil home heating systems.

#### 8.4.2.3 Changes to the Ground Levels and Site Topography

The changes to the site topography that the cut and fill excavation and building works with involve are minimal but the changes to the nature of the ground surface will change the rate and direction of the surface water runoff in some areas. The resulting changes will generally increase the runoff characteristics, but these will be mitigated by the use of hydrobrake and attenuation tank infrastructure. This impact will be PERMANENT in areas of the site where it occurs but will not create a significant overall change to the local topography or site runoff characteristics and is considered to be a NEUTRAL NEGLIGIBLE quality impact.

#### 8.4.2.4 Groundwater Flow Direction and Aquifer Potential

There are no groundwater abstractions or dewatering works proposed for the development. The scale of the site is insignificant in the context of the underlying aquifer and while changes to the percolation rate would be considered PERMANENT this would not change the shallow groundwater regime or potential for base flow to the local drainage feature or Blackwater River, it is considered to be a NEUTRAL NEGLIGIBLE quality impact.

### 8.4.3 Operational Phase

The nature of the proposed Coolcarron residential development will result in a number of potential direct and indirect Operational Phase impacts with regard to the local Water attributes including:

- removal of protective soils and possibly some subsoil's
- changes to the ground levels and the site topography,
- changes to the aquifer re-charge rates
- changes to the groundwater quality
- changes to the surface water quality
- changing the direction and volume of storm water runoff,

#### 8.4.3.1 Removal of protective Soils and Subsoil's

The removal of the natural Soils and Subsoil deposits which protect the underlying bedrock from pollution will increase the vulnerability of the groundwater aquifer. However these works will be in areas where permanent hard surfacing, such as roads, pavements and housing will be built and these structures will protect the aquifer from surface spills and land activities in the longer term. This change in Vulnerability will be PERMANENT in areas of the site where it occurs and could be considered to be a POSITIVE NEGLIGIBLE quality impact.

Note that the shallow nature of the proposed excavations and possible raising of ground levels in some areas are unlikely to change the overall GSI Vulnerability classification of Moderate to High for the site area.

#### 8.4.3.2 Changes to the ground levels and site topography

The changes to the topography that the cut and fill excavation and building works with involve will change the rate and direction of the surface water runoff for the site. The resulting changes will generally result in more level ground surfaces around the site. This impact will be PERMANENT in areas where it occurs but will not create a significant overall change to the local topography or site runoff characteristics and is considered to be a NEUTRAL NEGLIGIBLE quality impact.

#### 8.4.3.3 Changes to Aquifer Recharge

The development of roads, construction of houses and related infrastructure will change the permeability of the ground surface and result in more surface runoff from hard surfaces around the site. This diversion of rainwater from some areas of the site will be LONG TERM to PERMANENT but will not limit the wider recharge of the bedrock in green areas or outside the site and will not change the potential of the aquifer or the classification of the aquifer as locally important and therefore would be considered to be a NEUTRAL NEGLIGIBLE quality impact.

#### 8.4.3.4 Changes to Groundwater Quality

During the operation of the development there is a risk of leaking sewage pipe and drainage infrastructure leaking to the ground and entering the aquifer. Such an impact would have a TEMPORARY to SHORT-TERM NEGATIVE impact depending on the extent and period of the incident. This may limit the use of the aquifer as a potable drinking water source until the polluting parameters, such as ecoli, are naturally attenuated, diluted and dispersed. Therefore the magnitude of such an operational impact could be considered as SMALL ADVERSE in the short term to NEGLIGIBLE in the long term. The receptor risk is low as there are no known groundwater users near the site and no groundwater use or interaction is proposed for the development.

#### 8.4.3.5 Changes to Surface Water Quality

During routine operation pollutants such as oils, hydrocarbons from fuel combustion and engine leaks, herbicides and salts form road maintenance will be deposited on the road surfaces around the development. The implications for water quality relate to the potential for such pollutants to be transported in surface water runoff to the local drainage channel via the road drainage system. The impact will depend on the volume and type of traffic using the road, the provision of pollution control measures and the sensitivity of the receiving waters.

The concentration of contaminates is widely accepted to be dependent on traffic volumes experienced on the carriageway. The UK Design Manual for Roads and Bridges (DMRB – UK 1998) restricts pollution impacts on receiving waters to roads with more than 30,000 average annual daily traffic (AADT). None of the carriage ways in the development will carry such traffic volumes and therefore the relatively low traffic volumes combined with the installation of interceptors on the road drainage system networks will ensure there is no negative impact on the local drainage system during the operation of the development in the short or long term. Therefore the magnitude of such an operational impact could be considered as BRIEF to SHORT TERM and SMALL ADVERSE in the short term to NEGLIGIBLE in the long term.

#### 8.4.3.6 Changes to Storm Water Runoff Direction and Volume

The control of surface water runoff and its diversion to the proposed drainage network systems, which will discharge eastwards to the drainage channel, will mimic the greenfield runoff volume so no change in the overall volume is anticipated. The volumes of water involved when compared to the Blackwater River catchment areas is minute and the control of its release via attenuation structures will ensure the volume changes are spread over a longer time period and mimic the greenfield runoff. The magnitude of this operational impact would be considered to be BRIEF to TEMPORARY with a NEGLIGIBLE impact in the long term.

### 8.4.4 Risk of Major Accidents and Disasters

In terms of Human Health a drinking water risk would occur if pollutants such as facial bacteria or hydrocarbons entered the groundwater at high concentrations and contaminated local wells, or impacted potable water supplies. This risk is deemed as unlikely as the waste water sewage system will be constructed to the required engineering standards and there will be no home heating oil used in the housing scheme. Also even if a leak was to occur there are no known groundwater users or water supplies near the site.

Similarly, if there was a release of pollution to surface waters entering the Blackwater River, which is considered to have an extremely high ecological and amenity value, the volumes of water involved are extremely small when compared to the overall size and water volume flows of the Blackwater River at Fermoy and any impact would be temporary with a negligible impact in the long term.

The control of storm water runoff to green field rates will help reduce the risk of flooding in the Blackwater River Catchment which will mitigate the risk of the development contributing to flooding.

### 8.4.5 Cumulative Impacts

A review of the CCC planning system identified are a umber of other construction projects proposed for this part of Fermoy. Including;

- Part 8 Housing Scheme 11 no. residential housing units at Uplands, Fermoy, CCC Part 8 Application,
- Retention for Internal woks for new technology room, sanitary rooms, 3 no. new classrooms, 1 no. new computer room at St. Colmans College, Monumental Hill, Fermoy, Planning Ref: 21/4049, July 2021.
- The change of use (through intensification) of part of an existing light industrial building currently used for the assembly and commissioning of stainless steel vessels to provide for an electropolishing area within the building footprint; b) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor; and c) ancillary external site works to connect to the existing on-site sewer network. Planning Ref 20/6246 permitted in 2020.

- The demolition of 2 No. dwelling houses and associated sheds/outhouses and the construction of 28 No. residential units and all ancillary site development works, including access, car/bike parking, bin storage and amenity areas. Planning Ref: 21/7241 – Under Review by CCC.
- To demolish existing pump canopy, shop and stores, for construction of valeting buildings, car wash, boundary fencing & 2 no. signs together with associated works. Planning Ref: 19/6221 Permitted 2020.

It is probable that there will be other construction projects being undertaken in the Blackwater River catchment during the site development but proper management of the construction phase with the required mitigation measures will greatly reduce the potential for cumulative pollution impact to occur.

The control and attenuation of the storm water runoff rates to green field conditions will help ensure that there will be no significant change in the existing discharges to the local drainage channel or Blackwater River system and no significant cumulative adverse impacts are anticipated to occur.

### 8.4.6 Rating of Significant Environmental Impacts

As described in the previous sections and based on the criteria outlined in Tables 8.3 and Table 8.4 the potential impact of the Coolcarron Development would be considered to be 'Small Adverse to Negligible' with 'Not Significant to Imperceptible' effects for the attributes of the underlying aquifer and local drainage channel and Blackwater River system as the development would potentially 'result in impacts on the attribute but of insufficient magnitude to effect either its use or integrity'. A summary of the Impact Magnitude is presented in Table 8.6.

Table 8.6 Criteria for rating Hydrology and Hydrogeology impact magnitude at EIS stage

| Attribute | Importance | Potential Incidence | Impact Magnitude |
|---|---|---|---|
| Locally Important Aquifer | Medium | Small spill of fuel to ground during construction phase | Negligible |
| Locally Important Aquifer | Medium | Leak of sewage from buried piping on site during operation | Small Adverse to Negligible |
| Site Runoff to Local Drainage Channel | Low | Brief to Short term sediment runoff during construction phase | Negligible |
| Stormwater to Local Drainage Channel | Low | Minor changes in surface water discharge to local watercourse | Small Adverse to Negligible |
| Blackwater River | Extremely High | Short term sediment or hydrocarbon impact due to runoff from construction site | Negligible |
| Blackwater River | Extremely High | Short term hydrocarbon impact due to operational road runoff | Negligible |

As shown in risk matrix in Table 8.5, (which is based on Table C6 of the IGI Guidelines, Rating of Significant Environmental Impacts at EIS Stage (Box 5.4 of NRA 2008)), with the Importance of the hydrological attribute's being 'Extremely High, Medium or Low' and the Magnitude of Impact as 'Small adverse to Negligible' then the Rating of Significant Environmental Impacts on the Water Attribute would be considered to be 'Slight to Imperceptible'.

## 8.5 Mitigation Measures

### 8.5.1 Construction Mitigation Measures

While the magnitude of the potential impacts on the water attributes from the development are considered slight to negligible, a number of potential brief to temporary or short-term construction impacts may arise during the development/construction stage that could create increased environmental risks. There are a number of mitigation measures that would help eliminate and/or reduce the risk of these potential impacts occurring. These are outlined below and are to be included in the sites Construction Environmental Management Plan (CEMP), a draft of which is to be included as part of this application, and all other environmental management plans for the site.

- The areas where the excavation of unconsolidated soil and subsoils is required within each building phase should be kept to a minimum and only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of preventing the release of dust in dry weather and suspended sediments during or after wet conditions. Potential dust and suspended solids runoff impacts are therefore reduced or avoided.
- Sediment runoff impacts can also be greatly reduced and mitigated by controlling and limiting construction and machinery activity occurring adjacent to the drainage channel and site wide during or soon after very wet weather.
- Buffer areas with silt fences should be established between the construction works the drainage channels.
- Limiting activities to work areas and not allowing machinery or construction activity in proposed future green, open space and/or undeveloped areas will ensure that there is sediment runoff generated and no soil compaction will occur in those areas. No heavy machinery activity allowed in areas with attenuation tanks.
- Designated roadways and internal access/construction routes should be clearly designated and fenced off in order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Similarly existing hedge rows and site features which are to be maintained should be fenced off.
- A designated contractor compound located in an area of level ground away from the drainage system will be established for the building phases. This compound will enable the safe storage of building materials, car parking, toilet facilities, waste skips and will include a designated refueling station and wash down area.
- Designated stockpile areas for the temporary storage of topsoil, subsoils and rock material required for site use should be established in areas where the ground level is flat and away (>20m) from any drainage feature. If there is a need for the long term storage of soil stockpiles then they should be seeded.
- Sand and gravel stockpiles on site should be kept to a minimum and stored away (>20m) from water courses and covered if necessary.
- Shallow berms, silt fences and/or cut-off trenches can be established around compound, work and stockpile areas which will prevent clean surface water runoff from flowing across these areas and will also help contain any impacted runoff flowing away from these parts of the site.
- Any sediment laden runoff should be channeled through silt traps and settlement ponds to allow, as far as possible, the settlement of suspended solids. The diffuse discharge of silty water over grassland areas will help to filter the fine sediments and allow percolation to ground should be applied as necessary, (this should not be done in areas of the site adjacent to the local drainage ditches or the eastern drainage channel).
- Runoff from machine service and/or concrete mixing areas should not be allowed to enter the sites drainage system or go to watercourses. Dedicated concrete wash down bunded areas should be established.
- Any finished construction, landscaped and green areas should be finished and re-grassed as soon as possible after completion to limit the potential for dust and surface water generation from those areas.
- Activity of plant equipment and machinery operating in the construction area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including staff training, regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc.
- All fuel storage areas on the site are sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.
- Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.
- Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used.

- All construction works will be completed in line with the recommendations of the Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site 4th Ed (C741 - 2015) & Control of Water Pollution from Construction Site (C532 - 2001).
- The SuDs Manual (C752) Construction Industry Research and Information Association (CIRIA), 2015.
- UK Environmental Agency Guidance Series for Pollution Prevention (GPP), including GPP5: Works and maintenance in or near water (NRW, NIEA, SEPA), January 2017 and GPP22: Dealing with Spills, (NRW, NIEA, SEPA), October 2018
- Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters, - (Inland Fisheries Ireland, 2016),
- Best practice environmental guidance will be incorporated into the Construction Environmental Management Plan (CEMP) for the development.

### 8.5.2 Operational Phase Mitigation

The heating systems to be used in the proposed development residences will be Air to Heat type systems which are electrically powered and no individual heating oil and above ground kerosene storage tank infrastructure will be used on the site. This eliminates the risk of oil spills impacting on the soil and groundwater quality on the site during the operational phase of the development.

Interceptors and storm water attenuation will be installed on the sites surface water drainage systems and once these are maintained they will limit the potential for pollutants and highwater volumes to emanate from the site.

### 8.5.3 Monitoring

The potential for surface water runoff to arise from work, stockpile and compound areas will be observed by the appointed contractor during wet weather events to ensure that it is not impacting the local drainage channel or indirectly the Blackwater River. Both hydrocarbons and silt cause discolouration so are easy to visually monitor for their presence. If necessary water sampling and monitoring of the local drainage channel can be completed to test for Total Suspended Solids (TSS) and Hydrocarbon concentrations during the construction phase if required.

The surface storm water drainage system on the site will be controlled by buried storage systems which are designed to mimic the green field runoff rates. A system of interceptors and filters will ensure that the runoff is kept clean as hydrocarbons and sediment material is removed. This infrastructure will need to be maintained and serviced to ensure its long term operation is successful. A visual inspection and maintenance schedule should be implemented for this infrastructure to ensure this infrastructure operates correctly for the operational phase of the development.

## 8.6 Residual Impacts

With the importance of the Surface Water attribute's being 'Extremely Important and Low' and the Groundwater attribute being moderate and the potential Magnitude of Impact as 'Small Adverse to Negligible' then the potential impacts are rated as 'Slight to Imperceptible'.

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. The mitigation measures described will further reduce the potential for any significant brief to temporary or short-term environmental impacts occurring during the construction works.

Also, with proper maintenance of the water drainage infrastructure, no significant residual operational phase impacts area anticipated.

No significant residual impacts are predicted for the hydrology and hydrogeology aspects of the proposed residential development. The consideration of cumulative projects does not change the residual impact rating.

A summary assessment of the predicted impacts, mitigation measures, monitoring and residual impacts during the construction and operational phase are shown in Table 8.7.

Table 8.7 Predicted Hydrological and Hydrogeological Impacts for the Cumnor Coolcarron Residential Development, Fermoy, Co. Cork.

| Attribute Description | Attribute Importance | Magnitude of Impact | Criteria for Impact Assessment | Duration of Impact | Significance of Impact | Mitigation Measure | Residual Impact |
|---|---|---|---|---|---|---|---|
| Locally Important Aquifer | Medium | Negligible to Small Adverse | Potential for contamination of aquifer due to accidental spillages of hydrocarbons to ground. | Temporary to Short Term | Imperceptible | Bunding of fuel storage areas and good operational practices will be in place to ensure that the potential for accidental spills and risk of GW contamination is minimised. | Imperceptible |
| Locally Important Aquifer | Medium | Negligible | No excavation below the natural groundwater table is proposed and no pumping or interaction with groundwater is anticipated. | Temporary to Short Term | Imperceptible | If excavations intercept the water table then it will be pumped to a settlement pond with diffuse over land flow . | Imperceptible |
| Locally Important Aquifer | Medium | Negligible | Leaking of sewage from buried waste water drainage system to ground. | Short to Medium Term | Slight to Imperceptible | Good construction and QA methods will ensure no leaks or breaks in piping. If impact occurs then it would be a local impact which could be remediated. | Imperceptible |
| Small Local Drainage Channel | Low | Negligible | Potential for contamination of watercourse due to pollution by suspended sediment or oily water runoff from site. | Temporary | Imperceptible | Control of exposed bare soil area, providing buffer zones near the drainage channel, installing silt fencing and/or swales around work areas. Working in dry weather and planning works to minimise runoff. Fuel management and regular visual inspection of the site drainage ditch. | Imperceptible |
| Small Local Drainage Channel | Low | Negligible | Potential for increased storm water runoff to catchment by diversion of surface water runoff to existing drainage system. | Brief to Temporary | Slight to Imperceptible | Control of storm water discharges by instillation of on-site attenuation systems to mimic greenfield runoff. | Imperceptible |
| River Blackwater | Extremely High | Negligible | Potential for contamination of river waters due to suspended sediment runoff from site. | Temporary | Imperceptible | Control of cut/fill works, providing buffer zones, installing silt fencing, channels and settlement ponds around work areas. Working in dry weather and planning works to minimise runoff. | Imperceptible |
| River Blackwater | Extremely High | Negligible | Hydrocarbon impact due to spills or operational road runoff | Temporary to Short Term | Imperceptible | Instillation of interceptors on internal roads will eliminate the risk of fuel spills impact to the local watercourse. | Imperceptible |

## 8.7 References for Hydrology and Hydrogeology

Preparation of Soils, Geology & Hydrogeology Chapters of Environmental Impact Statements, IGI Guidelines, (2013).

Environmental Protection Agency. "*Advice Notes on Current Practice in the preparation of Environmental Impacts Statements*", (EPA 2003 and Re-issued Draft 2015).

Environmental Protection Agency. "*Guidelines on the Information to be Contained in Environmental Impact Statements*" (EPA 2002 and Re-Issued Draft 2015).

Office of Public Works (OPW) Guidelines for Planning Authorities – The Planning System and Flood Risk Management, (OPW 2009).

National Roads Authority (NRA) Environmental Impact Assessment for National Road Schemes. (2008)

National Roads Authority (NRA) Guidelines in Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes, (NRA 2008).

Environmental good practice on site - Forth Edition, CIRIA (2015) C741.

Environmental Protection Agency Envision Environmental Maps – Water Quality Data (online).

Geology of East Cork - Waterford - Bedrock Map Series, scale 1:100,000, Sheet 22 (GSI, 1995).

Geological Survey of Ireland National Bedrock/Aquifer/Vulnerability Maps – (www.gsi.ie).

Ordnance Survey of Ireland Discovery Series Map Nos 81 - 1:50,000 Scale and online Geohive Data.

Control of water pollution from construction sites guidance for consultants & contractors CIRIA (2001) C532.

Water Framework Directive (2000/60/EC), Irish Database (www.wfdireland.ie).

The EPA Catchment Management Plans, (www.catchments.ie)

The Blackwater River Flood Risk Assessment and Management Study (CFRAMS)

Walsh Design Group - Civil Engineering Report for the Coolcarron Residential Development (WDG 2022).

Walsh Design Group - Preliminary Construction Demolition Waste Management Plan (CDWMP) (WDG 2022).

Walsh Design Group - Various Design Drawings for the Cumnor Coolcarron Residential D

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 9

## Biodiversity

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 9 Biodiversity

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# 9 Biodiversity

## 9.1 Introduction

The biodiversity study and impact assessment of the proposed residential development at Coolcarron, Fermoy, Co. Cork was undertaken by Kelleher Ecology Services Ltd. and Croft Ecology. A series of baseline field surveys were completed at the EIAR study site including: habitat & flora, aquatic, bird, mammal, bat and other taxa. The baseline field surveys along with desktop review were then used to inform the biodiversity evaluation of the EIAR study site, assessment of potential impacts arising from the proposed development, consideration of appropriate mitigation measures to reduce potential negative impact(s) to an acceptable level where possible.

## 9.2 Statement of Competence

### 9.2.1 Dr Katherine Kelleher

Katherine Kelleher is a graduate of University College Cork with a BSc in Zoology and PhD in Ecology, and established Kelleher Ecology Services in 2011. She has over 15 years of experience in ecological consultancy, acting as project manager on a range of ecological assessments & projects including solar/wind farm, road, gas pipeline, landfill, grid connection, industrial development, retail and housing. Katherine has significant experience of research, evaluative and analytical work in relation to planning applications, planning compliance, commitments, licensing, baseline assessments, scoping studies *etc.*

### 9.2.2 Dr Daphne Roycroft

Daphne has over 10 years of experience in the field of Ecological Consultancy and holds a BSc and PhD in Ecology from the National University of Ireland, Cork. She is a self-employed Ecological consultant, trading as Croft Ecology. Daphne is experienced in the preparation of Ecological Impact Assessment Reports and Appropriate Assessment screening appraisals as well as Natura Impact Statements for a variety of projects including wind farms, solar farms, roads, pipelines, residential developments, ports and landfill sites. She has published research papers in several peer-reviewed scientific journals and has lectured on several degree and certificate courses in The National University of Ireland, Cork.

### 9.2.3 Michelle O’Neill

Michelle has 10 years of experience working as an ecological consultant within the public and private sector on projects that include habitat and botanical surveys, breeding and winter bird surveys, mammal surveys, data analysis, assessment and report writing. To date, she has completed habitat and botanical surveys for a range of projects as part of National Surveys, Ecological Monitoring, Ecological Impacts Assessments (EcIA/EIAR) and Appropriate Assessment (AA/NIS). She has a particular interest in botany and habitats and has worked on an Irish semi-natural grassland survey (2009—2012) and a habitat mapping project for the provision of a Teagasc pilot methodology for farmland habitat assessment of sustainability scheme. She has also contributed to ecological impact assessments for a range of developments.

### 9.2.4 John Deasy

John is an independent ecological consultant with experience across a range of ecological disciplines including botanical and habitat surveys, bird surveys, mammal surveys and protected invertebrate surveys. He has over 7 years of experience as a professional ecologist and has undertaken a range of botanical and habitat surveys including baseline surveys for renewable energy projects, shared-use greenways and domestic and commercial properties. These surveys have included non-native invasive species surveys, rare species surveys and evaluations of habitats listed on Annex I of the EU Habitats Directive. John holds a MSc. in Ecological Assessment and BSc. in Earth and Environmental Science from University College Cork and is a member of the Botanical Society of Britain and Ireland.

### 9.2.5 Rory Dalton

Rory is an ecologist with eight years of experience with a BSc. Hons in Environmental Science from University College Cork. He worked for three years as an ecologist with a consultancy, and for the last five years he has been running his own company. While his expertise is aquatic ecology, he carries out general work in the areas of birds, mammals and habitats. The projects he is involved with range in size from small bridge surveys to the largest wind energy project in the country and the largest water quality project in Europe. He carries out work for a number of County Councils, State Bodies, Semi-State Bodies, Engineering Consultants, Ecology Consultants, Environmental Consultants and Laboratories.

### 9.2.6 Dr. Isobel Abbott

Isobel Abbott is a freelance ecological consultant, specialising for over 10 years in bat surveys, monitoring and mitigation. She graduated first in class in 2007 with a BSc in Zoology, and in 2012 with a PhD in Ecology from University College Cork. She has published a number of scientific papers relating to bat ecology and conservation. Isobel has worked on a variety of projects including national bat surveys, wind farms, solar farms, road construction, bridge repairs, quarries, and residential and industrial developments. She has extensive experience of designing and conducting bat surveys, evaluating potential impacts, and designing appropriate mitigation for a range of bat species. Isobel has been granted >35 NPWS bat licenses associated with planning permission applications or research. She currently holds nationwide NPWS licenses to capture/handle bat species, and to disturb bat roosts for the purpose of impact assessment.

## 9.3 Methods

This EIAR study involved undertaking a desktop review and a baseline field assessment, which are described in the relevant sections below; where due regard was taken of guidelines relating to ecological assessments (e.g. EPA 2017, CIEEM 2018).

Field surveys were undertaken between October 2019 and March 2022 during suitable weather conditions (see Appendix 9.1), with reference to standard ecology survey techniques cited in the relevant sections below. The field survey in December 2021 provided an opportunity to verify the status of the study site since the initial field surveys that were undertaken from 2019 in line with an advice note by CIEEM (2019). In this case, no changes of significance had occurred at the study site since 2019 (e.g. habitat loss/damage, land management changes *etc.*), such that the outcome of surveys from 2019 are still considered valid for the purposes of this EIAR.

Appropriate survey equipment was used where required (e.g. GPS units, binoculars, bat detector). A desktop review of relevant data available for the study site included online ecology databases (e.g. National Biodiversity Data Centre NBDC, National Parks & Wildlife Service NPWS and Environmental Protection Agency EPA) and relevant publicly available documents such as the currently adopted Cork County Development Plan 2015-2021 (CCC 2014) and Fermoy Municipal District Local Area Plan (CCC 2017). Furthermore, relevant organisations/bodies were also consulted (see Chapter 1 and associated Appendix 1.1 of this EIAR).

### 9.3.1 Designated Nature Conservation Sites

Designated nature conservation sites at and/or in the wider area of the study site were identified through a desktop review (using MapInfo Pro, a geographic information system software programme), where focus was given to sites where a potential impact-receptor pathway or zone of influence with the study site may be relevant. In other words, designated sites that may potentially have a link to the study site (e.g. through hydrological link, overlapping, proximity, ex-situ usage) were focused on for this aspect of the biodiversity assessment.

Such conservation sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Nature Reserves and other Refuges for Fauna. Many designated sites overlap, e.g. a site can be designated as both NHA and SAC.

While NHAs are legally protected by the Irish Wildlife Acts (1976 – 2018 as amended), pNHAs are not and only have limited protection through recognition by planning/licensing/forestry authorities and agri-environmental schemes. Nature Reserves and Refuges for Fauna are also protected under the Irish Wildlife Acts (1976 – 2018 as amended). SACs and SPAs are European designated nature conservation sites that have been designated under the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (2009/147/EC) respectively. SACs and SPAs are collectively known as Natura 2000 sites and are legally protected by Irish law.

A Natura Impact Statement (NIS), in support of the Appropriate Assessment (AA) process, has been undertaken to consider mitigation measures regarding potential significant adverse effects on a Natura 2000 site where relevant to the proposed development here; this assessment is available as a separate standalone document (see KES 2022 accompanying the planning application), with key findings summarised in this EIAR chapter.

Evaluation of the relevant designated conservation sites in terms of their biodiversity value was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.2 Habitats & Flora

A desktop review of botanical data available for the study site was undertaken by consulting online biodiversity databases to identify botanical species of interest (e.g. rare, protected, invasive) previously recorded within the relevant national grid squares that overlap the study site. In this case a review was undertaken of the (i) NBDC online biodiversity maps reports for the 2km W89D national grid square overlapping the study site as well as the 2km W89E national grid square overlapping the area adjoining the proposed northern east-west part of the stormwater drain connection route (ii) records of legally protected plants (Flora Protection Order 2015) that overlap with the overall study site from the BSBI online mapping database for the 10km W89 national grid square and (iii) records of legally protected bryophytes that overlap with the overall study site from the NPWS Flora Protection Order bryophyte online mapping database.

The habitat and flora site assessment was carried out with reference to current guidelines (Smith *et al*. 2011). This involved a walkover of the study site, where the dominant habitats present were classified according to Fossitt (2000) and recorded on a field map. The botanical survey was conducted in-parallel with the habitats survey, where botanical species were identified and recorded according to dominant habitat type with abundance documented using the DAFOR Scale (*i.e.* Dominant, Abundant, Frequent, Occasional and Rare). Any other records of interest (e.g. invasive plant species) were also noted.

Where applicable, additional vegetative community classification was completed with reference to the online resource ERICA; a web application provided by NBDC (in association with BEC Consultants Ltd. and NPWS), which can be used to assign dominant vegetative data collected to groups or communities as defined by the new Irish Vegetation Classification (IVC) system (Perrin 2019, Perrin 2016). ERICA works with both quantitative vegetation cover data (e.g. relevés/quadrats) and presence/absence data, such as species lists (Perrin 2019). In this instance, wet grassland habitat at the study site was further classified regarding plant communities with reference to ERICA by using the dominant wet grassland species present.

It is acknowledged that the habitat and flora site walkovers occurred at a time of year (November & December, see Appendix 9.1) that is sub-optimal for floral surveys due to being outside of the primary plant growing season for Ireland (*i.e.* April – September/October). However, in this case, botanical species that were identified garnered adequate information to contribute to the classification of habitats and wet grassland communities in question.

The conservation status of habitats and flora was considered in respect of the following: Irish Red Data Book for Vascular Plants (Wyse Jackson *et al*. 2016); Red List of Bryophytes (Lockhart *et al*. 2012); Flora Protection Order (1999 as amended 2015); Annex I of the EU Habitats Directive (92/43/EEC) with reference to the European Commission (2013) and NPWS (2013). Evaluation of the habitats present in terms of their biodiversity value was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.3 Aquatic Features: Drainage Channels

Aquatic assessment of the drainage channels associated with the study site was undertaken through visual assessment during a dedicated study site walkover that focused on potential of the water-features under consideration for fisheries (see Appendix 9.1). The aim of the walkover was to assess the aquatic habitats, the riparian habitats, the physical and hydromorphological characteristics, to look for signs of species of interest, to identify issues pertaining to the aquatic environment and determine their causes and effects where possible. Notes were taken and linked to a field map. Aquatic habitat assessment was conducted in line with methodology in Environment Agency (2003). Habitats of use to the various life stages of salmonids were assessed based on information provided in Crisp (2000). Assessment of lamprey ammocoete habitat quality as well as the suitability of adult spawning habitat was based on Maitland (2003) and Gardiner (2003). The highly modified nature of the drainage channels in question meant that they were unsuitable for standard biological water quality sampling (*i.e.* kick-sample).

Evaluation of the aquatic/fisheries habitats present in terms of their biodiversity value was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.4 Birds

A desktop review of bird data available for the study site was undertaken by consulting online databases to identify avian species of interest (e.g. rare, conservation concern) previously recorded within the relevant national grid squares that overlap the residential area of the study site. In this case, a review was undertaken of the 2km W89D national grid square from the NBDC online biodiversity maps reports.

A baseline bird assessment was completed by undertaking line-transect surveys (see Bibby *et al*. 2000 and Sutherland *et al*. 2004). A total of three transects of approximately 170m length were located within the study site, ensuring that an adequate distance was maintained between them in order to minimise double-counting individual birds across the site (see Figure 9.1). Two surveys of each transect were undertaken during the 2019/2020 winter season with one in the 2020 breeding season (late breeding season visit undertaken only, with the early season visit cancelled due to the initial onset of the Covid-19 pandemic and associated restrictions), where the same transect locations were visited on each occasion (see Appendix 9.1 for survey schedule).

At each transect, all bird species encountered (seen or heard) within 50m of the observer were recorded and their abundance noted. Only adult birds were counted where possible, although this can be difficult for flocking species that move about quickly (e.g. corvids). The total number of birds per species was derived by adding abundance data from all transects from each survey visit. This allowed a measure of relative abundance to be examined for all bird species recorded during the transect study. The maximum count per visit was then derived for each species and used for subsequent analysis and interpretation of results.

Any species occurring more than 50m from the observer, flying over the site and not using it or noted when walking between transects were not included in subsequent relative abundance analysis, but were considered as 'additional' species for subsequent consideration; additional bird species casually encountered during other aspects of the biodiversity field study but outside of the dedicated bird surveys were also recorded as 'additional' species. This approach allowed a current taxa list of the birds present at/near the study site and their relative abundance to be generated despite the absence of early season breeding season transect surveys due to Covid-19 as mentioned above.

The conservation status of bird species recorded was considered in respect of the following: Irish Wildlife Acts (1976 – 2018 as amended); Birds of Conservation Concern in Ireland (BoCCI) Red, Amber and Green lists (see Gilbert *et al*. 2021); EU Birds Directive Annex I list. The biodiversity value of the site for birds was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.5 Mammals: Non-volant

A desktop review of mammal data available for the study site was undertaken by consulting online databases to identify mammal species of interest (e.g. rare, protected, of ecological concern) previously recorded within the relevant national grid squares that overlap/adjoin the study site. In this case a review was undertaken of the relevant 2km W89D national grid square from the NBDC online biodiversity maps reports.

A baseline mammal assessment of the study site was undertaken by completing walkovers (see Appendix 9.1), which primarily included the vegetated boundaries of study site here. Identification of mammal species or signs of mammal activity seen (e.g. droppings, tracks, burrows *etc.*) was confirmed where possible; observations were recorded using field notes and/or hand-held GPS units. Techniques used to identify mammal activity followed recognised guidelines (e.g. Clark 1988, Sutherland 1996, Bang & Dahlstrom 2004 and JNCC 2004). Trail cameras (that take photographs or video when triggered by heat or motion) were also deployed for various periods up to 62 consecutive nights at four locations overall to record mammal activity, although one camera malfunctioned in its first night of deployment (see Figure 9.1 and Appendix 9.1).

The conservation status of mammals was considered in respect of the following: Irish Wildlife Acts (1976 – 2018 as amended); Red List of Terrestrial Mammals (Marnell *et al*. 2019); EU Habitats Directive. The biodiversity value of the site for mammals was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.6 Mammals: Bats

A desktop review of bat data available for the study site was undertaken by consulting online databases to identify bat species of interest (e.g. rare, of ecological concern) previously recorded within the relevant national grid squares that overlap the study site. In this case a review was undertaken of the 2km W89D national grid square from the NBDC online biodiversity maps reports. The NBDC online biodiversity maps tool also hosts the Model of Bat Landscapes for Ireland, which has assessed the relative importance of landscape and habitat associations for bat species across Ireland (see Lundy *et al*. 2011); therefore, the landscape resource value for bats in the relevant national 1km W8197 national grid square overlapping the study site was also included here.

A baseline bat assessment of the study site was achieved by undertaking a passive detector survey (see Appendix 9.1) with reference to current best practice guidelines (Collins 2016, Kelleher & Marnell 2006). Passive bat detectors (Wildlife Acoustics SM3/SM4BAT full spectrum) were deployed at four locations within the study site in mid-October 2019 (see Appendix 9.1 & Figure 9.1). Detectors were set to record bat calls (*i.e.* bat passes) from sunset to sunrise every night where GPS locations were set on each detector so that the units could automatically adjust their start and finish times based on sunrise/sunset times relative to the GPS locations.

For all bat detectors used here (both passive & active), bat calls were recorded onto SD cards within the detectors that were later analysed using Kaleidoscope Pro software to confirm bat species, times of activity and behaviour where possible. It is important to note that bat recordings are generally a measure of bat activity rather than a measure of abundance as recordings from the same species cannot be readily distinguished between individuals per se, especially in the absence of observations as is the situation with passive detectors (see Collins 2016). In this case, a bat call or bat pass was defined as a recording of an individual species echolocation within a recording of up to 15 seconds duration (as prescribed in the settings of the Wildlife Acoustic detectors used); this allowed a relative comparison of bat passes between passive monitoring units in this study. To standardise relative comparison between the passive locations and control for the relatively large amount of bat call recordings that passive detectors can generate, sound analysis focused on (the same) two consecutive nights per passive within each deployment period (see Appendix 9.1) when weather conditions[1] were largely dry, winds generally <20km/hr and night-time temperatures generally above 7 degrees Celsius. Bat call recordings from the passive study were also analysed in respect of species confirmation where possible as well as percentage proportional species activity.

The study site lacks any structures (e.g. building) that could provide permanent roosting opportunities of significance for bats. However, the suitability of relevant on-site vegetated features was visually assessed in relation to roosting, foraging and commuting potential for bats during daylight hours with reference to guidance after Collins (2016). This included a visual assessment of one mature Ash tree at the southern boundary and a group of 9 Beech/Poplar dominated trees of mixed age at the western access point (that need to be removed) regarding its potential suitability for roosting bats, which was carried out from ground level.

The deployment of passive detectors in October (see Appendix 9.1) occurred outside of the optimal time of year to survey bats when they are most active (usually April/May to September). However, October represents a period when bats are preparing to move into their winter sites for torpor but are still active albeit at lower levels than the optimal survey period, especially as weather conditions during the survey period were still relatively mild with night-time temperatures generally above 7 degrees Celsius. There is also the context here that the study site does not support roosting opportunities of significance for bats such that the importance for bats here largely relates to foraging/commuting activity. Therefore, a passive detector study in October would still record bat activity considered representative of the study site in question.

The conservation status of bats was considered in respect of the following: Irish Wildlife Acts (1976 – 2018 as amended); Red List of Terrestrial Mammals (Marnell *et al*. 2019); EU Habitats Directive. The biodiversity value of the site for bats was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.7 Other Taxa

A desktop review of other taxa data available for the study site was undertaken by consulting online databases to identify other taxa species of interest (e.g. rare, protected, of ecological concern) previously recorded within the relevant national grid squares that overlap the study site. In this case, a review was undertaken of the of the relevant 2km W89D national grid square from the NBDC online biodiversity maps reports.

Assessment of other taxa usage of the study site was achieved by noting observations made during other biodiversity field surveys undertaken overall (as described above; see Appendix 9.1).

The conservation status of other taxa was considered in respect of the following: Irish Wildlife Acts (1976 – 2018 as amended); Irish Red List for Butterfly (Regan *et al*. 2010); Irish Red List for Damselflies & Dragonflies (Nelson *et al*. 2011); Irish Red List for Amphibians, Reptiles & Freshwater Fish (King *et al*. 2011); Regional Red List of Irish Bees (Fitzpatrick *et al*. 2006); EU Habitats Directive. The biodiversity value of the site for other taxa was assessed using criteria amended after NRA 2009 and Nairn & Fossitt 2004 (see Appendix 9.2).

### 9.3.8 Biodiversity Site Evaluation & Impact Assessment

Biodiversity evaluation of the study site follows criteria amended after NRA 2009 and Nairn and Fossitt 2004 (see Appendix 9.2). The description and evaluation of potential and residual impacts associated with the proposed development on the existing ecology of the study site and surrounding area follows guidelines published by the EPA (2017) with reference to CIEEM (2018).

Figure 9.1 Biodiversity Sampling: Birds & Mammals

## 9.4 Existing Environment

### 9.4.1 Designated Nature Conservation Sites

The study site is not located within or adjacent to any designated site nor does it require resources from any, thereby ruling out any direct habitat loss/damage at such conservation sites. The nearest designated conservation area to the study site is the Blackwater River (Cork/Waterford) SAC, which is located c.0.5 km from the study site boundary (see Figure 9.2).

There are no Nature Reserves (including Ramsar Sites) or Refuges for Fauna within or in close proximity to the study site.

As previously mentioned, a NIS in support of the AA process has been undertaken in relation to the proposed development here (see KES 2022 accompanying the planning application), with key findings summarised in this EIAR chapter.

#### 9.4.1.1 Potential Impact-Receptor Pathways: Overview

**Surface-Water Links**

There is a potential impact-receptor pathway via surface-water links between the study site and the following designated sites that are associated with the Blackwater River; Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA. Surface-water run-off associated with the site will discharge into the Blackwater River and associated downstream designated sites via existing drains, the public stormwater network and outfalls that range c. 1.0 – 3.1km downstream of the study site to the Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA overall (see Figure 9.2). Therefore, the potential for indirect hydrological (water quality) impacts on these designated sites via surface-water run-off arising from the development site are further considered in Section 9.5.1 of this report.

There are two additional aquatic related designated sites that are downstream and thereby potentially hydrologically linked to the study site as well; Blackwater River and Estuary pNHA and Blackwater Estuary SPA. However, no significant adverse effects related to surface-water run-off associated with the development are considered likely for these sites due to the large downstream distance involved (>25km) combined with the location of the Blackwater Estuary SPA within Youghal estuary/harbour area that has significant water throughput associated with the tidal regime from the Celtic Sea.

**Waste-Water/Foul Effluent Links**

Construction stage waste-water/foul effluent will be managed and controlled at the temporary site compound through the use of portaloos and welfare units with storage tanks, where sanitary waste will be removed from site via a licenced waste disposal operator. In this instance, there will be no impact-receptor pathway between construction stage waste-water and any designated site.

It is proposed to direct waste-water from the developed residential site into the public waste-water network for ultimate treatment at Fermoy Wastewater Treatment Plant (WWTP) during the operational stage. Treated waste-water from Fermoy WWTP discharges into the Blackwater River, where the Blackwater River (Cork/Waterford) SAC and Blackwater River Callows pNHA are present at the primary discharge point and the Blackwater Callows SPA is located 0.4km downstream of the discharge point (see Figure 9.2 and Table 9.1). A potential impact-receptor pathway therefore exists between the study site and Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA via waste-water discharge during the operational phase of the proposed development that is further considered in Section 9.5.1 of this report.

**Disturbance/Displacement**

Consideration needs to be given to the potential for disturbance/displacement impacts of fauna that are listed as qualifying interests of designated sites through noise and/or visual cues arising from the proposed development. This also includes ex-situ disturbance/displacement impacts on highly mobile species that are qualifying interests of the relevant designated sites; ex-situ impacts occur when highly mobile species occur outside of the boundaries of their designated sites (e.g. to forage or commute).

The conservation objectives of Blackwater Callows SPA and Blackwater River Callows pNHA relate to qualifying interests that include mobile wintering waterbird fauna (see Table 9.1). While such fauna could suffer disturbance/displacement impacts as a result of the construction/operation of a development such as described here, the proposed development site in this case does not overlook the SPA/pNHA due to distance combined with screening from existing buildings/vegetation. While wet grassland is present at the proposed development site, the extent of it is relatively small and it is not within a relatively open setting to be particularly attractive to pNHA/SPA wintering waterbird interest species. Furthermore, no such pNHA/SPA wintering waterbird interest species were noted during winter bird site surveys, where the study site is not of known importance for wintering waterbirds (see Crowe 2005 and IWeBS online mapping[1]). Taking the above into consideration, there is no impact-receptor pathway regarding potential disturbance/displacement impacts (including ex-situ) on either the Blackwater Callows SPA or Blackwater River Callows pNHA.

The conservation objectives of Blackwater River (Cork/Waterford) SAC relate to aquatic based habitats/fauna (see Table 2.1). Similar to the SPA, the site does not overlook the SAC due to distance combined with screening from existing buildings/vegetation. While Otter *Lutra lutra* is a mobile semi-terrestrial qualifying interest species of the Blackwater River (Cork/Waterford) SAC (Table 9.1), there are no aquatic habitats of ecological value for this species within the study site, where the open drainage channels are not considered suitable for this species (due to lack of conditions to support a viable fish/lamprey population prey base, see Section 9.4.3 below). The remaining qualifying interest species of the SAC are aquatic species that would not be subject to disturbance/displacement impacts from the proposed development, including on an ex-situ basis where the open drainage channels lack conditions to support a viable fish/lamprey population associated with the SAC (see Section 9.4.3 below). Taking the above into consideration, there is no impact-receptor pathway regarding potential disturbance/displacement impacts (including ex-situ) on the Blackwater River (Cork/Waterford) SAC.

Daubenton's Bat Myotis daubentonii is a mobile qualifying species of Cregg Castle pNHA, located *c.* 3.9km from the study site (Figure 9.2). This species is associated with watercourses and riparian corridors, particularly where trees are present along the watercourse and where no artificial lighting is present (Roche *et al*. 2014). The modified open drain habitat at the study site is not suitable for this bat species, especially given its lack of over-ground links to the Blackwater River (where the drain is piped under Fermoy town to the north of the study site) and riparian zone habitat features. The Blackwater River, located *c.* 500m to the north of the study site, is likely to be used by this bat species where suitable habitat features occur. No disturbance/displacement of Daubenton's Bat at the Blackwater River is considered likely here given the distance between the study site and the river combined with screening in place between the site and the river from existing buildings/vegetation. Taking the above into consideration, no significant adverse disturbance/displacement impacts on Daubenton's Bat from Cregg Castle pNHA are considered likely here.

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[1] https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a

**Invasive Plants**

Activities associated with development works can inadvertently result in the spread of invasive plants, where a water-feature such as open drains here can subsequently act as a potential impact-receptor pathway regarding indirect habitat loss/damage to downstream locations in the wider area including designated nature conservation sites that are present.

In this case, the invasive non-native plant species noted at the study site comprised of the terrestrial Cherry Laurel and Winter Heliotrope that were not located in close proximity to any water-features at the study site. Accordingly, there is no impact-receptor pathway regarding potential indirect habitat loss/damage impacts as a result of the spread of invasive species to any designated nature conservation site under consideration here.

**Flooding/Floodplain**

The site is not identified in the Fermoy Local Area Plan or in the CFRAMS mapping as an area susceptible to flooding and there is no history of flooding at the site (see Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application). Therefore, there is no impact-receptor pathway regarding potential flooding/floodplain impacts on designated sites in this case.

#### 9.4.1.2 Potential Impact-Receptor Pathways: Summary

In summary, there is a potential impact-receptor link between the study site and the Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA via (i) potential construction/operational surface-water run-off impacts and (ii) potential operational waste-water discharge impacts. While all pNHAs are of national importance, all SAC/SPAs are of international importance.

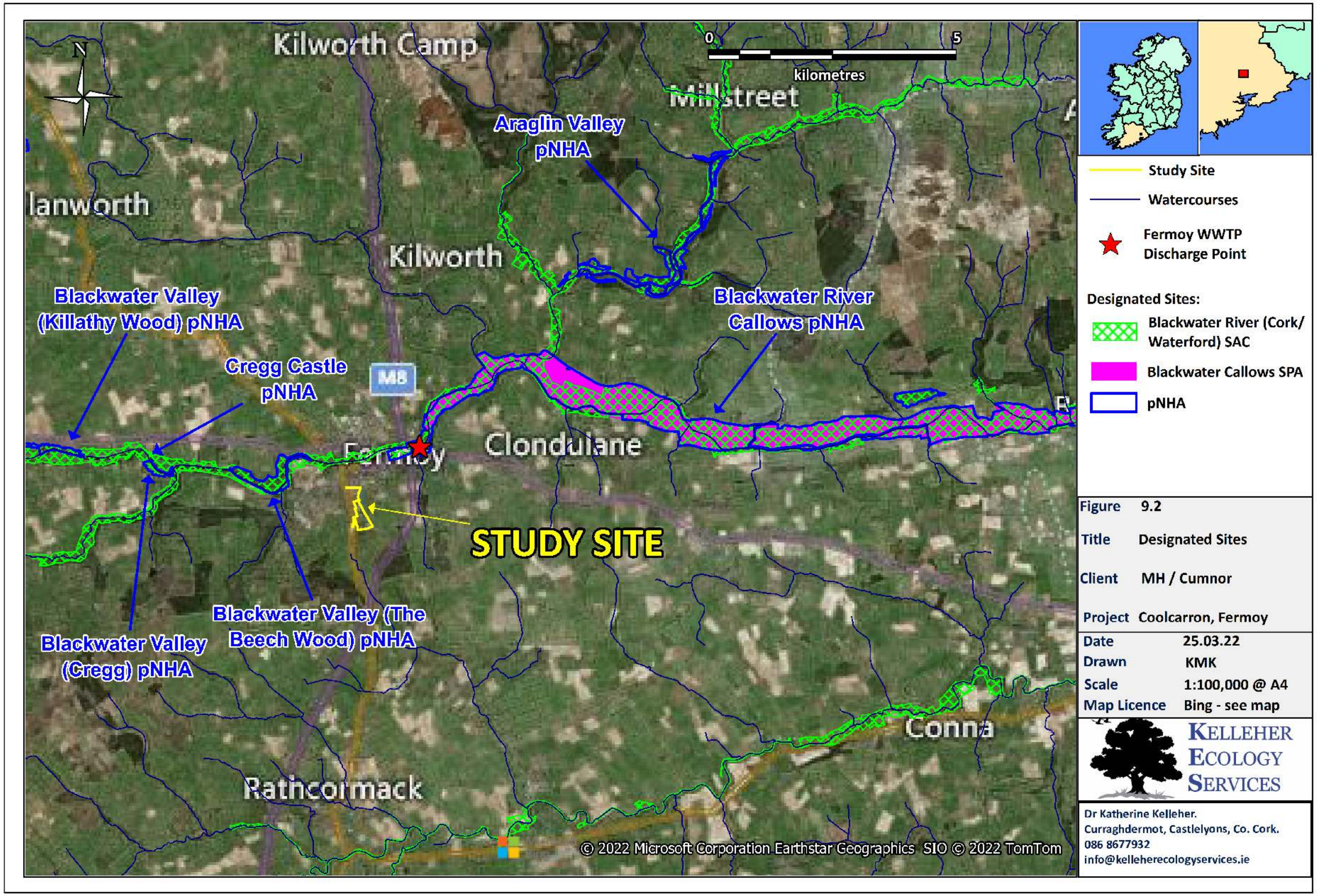

Figure 9.2 Designated Sites

**Table 9.1 designated nature conservation sites with a potential link to the study site.**

| Site Name & Code | Key Conservation Objective | Relevant Minimum Distances |
|---|---|---|
| Blackwater River (Cork/Waterford) SAC 002170 | Overall, the Blackwater River is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Its conservation objectives relate to the following habitats and species (after NPWS 2012);<br>▪ Freshwater Pearl Mussel *Margaritifera margaritifera*<br>▪ Freshwater Crayfish *Austropotamobius pallipes*<br>▪ Sea Lamprey *Petromyzon marinus*<br>▪ Brook Lamprey *Lampetra planeri*<br>▪ River Lamprey *Lampetra fluviatilis*<br>▪ Twaite Shad *Alosa fallax*<br>▪ Atlantic Salmon *Salmo salar* (only in fresh water)<br>▪ Estuaries<br>▪ Mudflats and sandflats not covered by seawater at low tide<br>▪ Perennial vegetation of stony banks<br>▪ Salicornia and other annuals colonizing mud and sand<br>▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)<br>▪ Otter *Lutra lutra*<br>▪ Mediterranean salt meadows (*Juncetalia maritimi*)<br>▪ Killarney Fern *Trichomanes speciosum*<br>▪ Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation<br>▪ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles<br>▪ Alluvial forests with Common Alder *Alnus glutinosa* and Ash *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)<br>▪ Yew *Taxus baccata* woods of the British Isle | Study Site Boundary:<br>Over-land: 0.5km<br>Discharge Points:<br>Surface-water: 1.0km<br>Waste-water: 0.0km |
| Blackwater River Callows pNHA 000073[3]<br>Blackwater Callows SPA 004094 | The conservation objectives of the Blackwater Callows SPA relate to the following (after NPWS 2021);<br>**(i)** Maintenance or restoration of the favourable conservation condition of the following wintering bird species;<br>▪ Whooper Swan *Cygnus cygnus*<br>▪ Wigeon *Anas penelope*<br>▪ Teal *Anas crecca*<br>▪ Black-tailed Godwit *Limosa limosa*<br>**(ii)** Maintenance or restoration of the favourable conservation condition of the wetland habitat at Blackwater Callows SPA as a resource for the regularly occurring migratory waterbirds that utilise it. | Site Boundary:<br>Over-land pNHA: 0.8 km<br>Over-land SPA: 1.7km<br>Discharge Points:<br>Surface-water pNHA:1.6-2.2km<br>Surface-water SPA: 2.4-3.1km<br>Waste-water pNHA: 0.0km<br>Waste-water SPA: 0.4km |

### 9.4.2 Habitats & Flora

#### 9.4.2.1 Desktop Review

The NBDC[2] online database for the 2km W89D national grid square that overlaps the study site does not hold records for any rare, legally protected or invasive non-native plant species. The NBDC database for the 2km W89E that overlaps the area adjoining the proposed northern east-west part of the stormwater drain connection route also does not hold records for rare or legally protected plant species, but does hold records of invasive non-native plant species including Canadian Waterweed *Elodea canadensis,* Giant Hogweed *Heracleum mantegazzianum*, Himalayan Balsam *Impatiens glandulifera* and Sycamore *Acer pseudoplatanus*. Canadian Waterweed, Giant Hogweed and Himalayan Balsam are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (*i.e.* species of which it is a legal offense to disperse, spread or otherwise cause to grow in any place), and are also classified as 'risk of high impact' invasive species (Kelly *et al.* 2013). Himalayan Balsam and Giant Hogweed have also been identified as an invasive alien plant species of European Union concern (IAS Regulation 1143/2014). Sycamore has been assessed as ‘risk of medium impact’ (Kelly *et al.* 2013); although, there has been more recent discussion on whether Sycamore may now be considered as an archaeophyte here (*i.e.* ancient introductions; see Stolze & Monecke, 2017).

The BSBI[3] database holds historic records (Pre-1930's) for Small cudweed (*Logfia minima*) and Wood/Heath cudweed (*Omalotheca sylvatica syn. Gnaphalium sylvaticum*) in the 10km W89 national grid square.

No records for bryophyte species listed on the Flora Protection Order (2015) were found on the NPWS[4] bryophyte web-mapping database within the study site. The NBDC database for the W89E 2km grid square overlapping the area adjoining the proposed northern east-west part of the stormwater drain connection route contains records of *Scleropodium cespitans* and *Orthotrichum rivulare* from 2012. *Scleropodium cespitans* was recorded at W808984 on the southern side of the River Blackwater, north of the proposed development site. *Orthotrichum rivulare* was recorded at W9098 1km grid scale northwest of the proposed development site. Both of these bryophyte species have been classified as 'near threatened'.

#### 9.4.2.2 Site Assessment

No habitats listed under Annex I the EU Habitats Directive are present within the study site. Also, no botanical species protected under the Flora (Protection) Order 2015, listed in Annex II or IV of the EU Habitats Directive (92/43/EEC), or red-listed in Ireland (Wyse-Jackson *et al.* 2016) were recorded during the site surveys.

Dominant habitats present at the study site include habitats of higher local importance (wet willow-alder-ash woodland WN6, hedgerow WL1, mature treeline WL2, mature scattered trees and parkland WD5 and marshy wet grassland habitat GS4M) or lower local importance (improved agricultural grassland GA1, drier and semi-improved areas of wet grassland GS42/GSi4, bramble-dominated scrub WS1, drainage ditches FW4, stone walls and other stone work BL1, amenity grassland GA2, immature treelines WL2, immature scattered trees and parkland WD5 and recolonising bare ground ED3). Buildings and artificial surfaces habitat that will be impacted by the proposed development is of negligible biodiversity

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[2] https://maps.biodiversityireland.ie/Map (accessed 24/01/2022)

[3] https://bsbi.org/maps (accessed 24/01/2022)

[4] http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e (accessed 24/01/2022)

importance. The small area of wet willow-alder-ash woodland WN6 that is of higher local importance will be retained as part of the project.

No invasive species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place) were recorded within the study site. Non-native invasive plant species (not listed on the Third Schedule) noted at the study site included Cherry Laurel *Prunus laurocerasus* and Winter Heliotrope *Petasites pyrenaicus.* Cherry laurel was recorded as a mature bush next to the existing field-gate entrance at the western boundary from the R639, this non-native species has been assessed as being a 'risk of high impact' (Kelly *et al,* 2013). Winter heliotrope was recorded scattered under the mature trees near an existing weighbridge/weighbridge office building at the western boundary from the R639. A small patch was also recorded near a park bench on Devlin street in association with the northern east-west part of the stormwater drain connection route. Winter heliotrope has been assessed as being a 'risk of low impact' (Kelly *et al*, 2013). Butterfly bush *Buddleja davidii,* which has been identified as an invasive species with a risk of medium impact (Kelly *et al*, 2013), was recorded growing in a property adjacent to the north-western side of the site (outside of the study site) with the bushes leaning over the boundary wall.

The following habitats (with Fossitt codes) were recorded within the study site (see Figure 9.3);

- Improved Agricultural Grassland (GA1)
- Wet Grassland (GS4)
- Hedgerow (WL1)
- Treeline (WL2)
- Scrub (WS1)
- Wet Willow-Alder-Ash Woodland (WN6)
- Drainage Ditch (FW4)
- Stone Walls and Other Stone Work (BL1)
- Amenity Grassland (GA2)
- Scattered Trees and Parkland (WD5)
- Recolonising Bare Ground (ED3)
- Buildings and Artificial Surfaces (BL3)

Figure 9.3 Habitats

### Improved Agricultural Grassland (GA1)

This habitat was recorded on the western and southern side of the main study site (Plate 9.1). Perennial rye grass *Lolium perenne* was frequent along with Yorkshire fog *Holcus lanatus*. Creeping buttercup *Ranunculus repens*, Meadow-grass *Poa sp.,* Common bent grass *Agrostis capillaris.* were recorded occasionally. Common nettle *Urtica dioica* and Broad-leaved dock *Rumex obtusifolius* were rarely recorded. The sward in the improved grassland field was uniform and short, *c.* 5 - 8 cm high.

The ecological valuation of the improved agricultural grassland habitat is considered to be of lower local importance.

Plate 9.1 Improved grassland habitat within the study site.

### Wet Grassland (GS4)

The wet grassland habitat was primarily found at the northern, eastern and southern areas of the residential area of the study site. A number of wet grassland types were recorded on site corresponding to changes in land levels, drainage and soil moisture conditions. Interestingly, historic OSi mapping (6 inch and 25 inch) does not indicate wet ground features overlapping the areas where wet grassland currently occurs. The current day waterlogging of these areas is thought to be influenced by the slow-flowing/near stagnant large drainage ditch at the eastern boundary that runs adjacent to these wet grassland areas.

Marshy wet grassland (GS4M) habitat was recorded along the northern and eastern areas of the study site (Plate 9.2). Moving west across the northern half of the study site, ground conditions were relatively drier. As a result, the wet grassland here also contained species associated with drier grassland habitats. These areas were annotated as 'GS42' for clarity. In the southern end of the study site a transitional zone of semi-improved wet grassland (GSi4) was observed between the improved agricultural grassland (GA1) and the marshy wet grassland (GS4M).

The marshy wet grassland habitat contained abundant Creeping buttercup along with frequent Creeping bent grass *Agrostis stolonifera*, Meadowsweet *Filipendula ulmaria,* Hard rush *Juncus inflexus,* Willowherb *Epilobium sp.*, Yorkshire fog and Marsh bedstraw *Galium palustre.* Soft rush *Juncus effusus*, Bog stitchwort *Stellaria alsine*, Creeping thistle *Cirsium arvense*, Purple loosestrife *Lythrum salicaria,* St. John's wort *Hypericum sp.,* Water mint *Mentha aquatica* and Common nettle *Urtica dioica* were occasionally recorded. Marsh thistle *Cirsium palustre,* Common mouse-ear *Cerastium fontanum* and a sedge *Carex sp.* were rarely recorded. Alder *Alnus glutinosa* and Willow *Salix sp*. saplings were occasionally recorded. The sward was *c.* 10-20 cm and. There was evidence of light grazing levels.

The marshy wet grassland in the field on the southern side of the study site contained a similar suite of species but was found to be wetter in places with small areas of standing water where along with the species listed above there was frequent sharp-flowered rush *Juncus acutiflorus*. Sweet grass *Glyceria sp*. and Lesser spearwort *Ranunculus flammula* were recorded occasionally. Carnation sedge *Carex panicea* and Silverweed *Argentina anserina* were rarely recorded. The sward was *c.* 10-20 cm. There was evidence of light grazing levels.

The marshy wet grassland in the field on the northern side of the study site was similar to that in the central field but contained a higher proportion of rushes and meadowsweet. Soft rush and hard rush were frequent along with Yorkshire fog, creeping bent grass, creeping buttercup, purple loosestrife. Common sorrel *Rumex acetosa*, bog stitchwort, water mint, sharp-flowered rush and reed canary grass Phalaris *arundinacea* were occasionally recorded. Marsh thistle, willowherb sp., wild angelica *Angelica sylvestris* and greater birds-foot-trefoil *Lotus pedunculatus* were rarely recorded. The sward was long (*c.* 20 -30 cm), lodged and rank in places, with the rushes and canary grass reaching higher than this in places. There was evidence of light grazing.

Utilising the Irish Vegetation Classification (with reference to the online resource ERICA), the majority of the marshy wet grassland habitat within the study site corresponds to GL2A *Agrostis stolonifera – Ranunculus* repens marsh-grassland with the smaller wet areas in the southern side of the study site also showing some correspondence to GL1B *Agrostis stolonifera – Filipendula ulmaria* marsh-grassland. The habitats were not found to correspond to habitats listed on Annex I of the EU Habitats Directive, specifically, Molinia meadows (6410) and Hydrophilous tall herb (6430). The ecological valuation of the marshy wet grassland habitat is considered to be of higher local importance.

**Plate 9.2 Marshy wet grassland (GS4M) habitat within the study site.**

The drier wet grassland (GS42) areas contained frequent creeping bent grass, soft rush and curled dock *Rumex crispus*. common sorrel, creeping thistle and sharp-flowered rush were occasionally recorded (Plate 9.3). Broad-leaved dock *Rumex obtusifolius*, common knapweed *Centaurea nigra*, perennial rye grass and meadow buttercup *Ranunculus acris* were rarely recorded. The ecological valuation of the drier wet grassland habitat is considered to be of lower local importance.

Plate 9.3 Drier wet grassland (GS42) habitat within the study site.

The semi-improved wet grassland (GSi4) located between the improved and marshy wet grassland areas contained frequent creeping buttercup, curled dock, hard rush, rush *Juncus sp* and yorkshire fog (Plate 9.4). Common sorrel, common mouse-ear and meadow buttercup were recorded occasionally. Meadow buttercup and marsh ragwort were rarely recorded. The sward height was *c.* 5-8 cm. The ecological valuation of the semi-improved wet grassland habitat is considered to be of lower local importance.

Plate 9.4 Semi-improved wet grassland (GSi4) habitat within the study site.

### Hedgerow (WL1)

This habitat was recorded along the southern and northern boundaries of the study site (Plate 9.5). The habitat contained frequent hawthorn *Crataegus monogyna* along with bramble *Rubus fructicosus agg*., ivy *Hedera hibernica* and herb robert *Geranium robertianum*. common nettle was occasionally recorded. Elder Sambucus nigra, dog rose *Rosa canina* and mature ash *Fraxinus excelsior* trees were rarely recorded. The northern hedgerow also contained holly *Ilex aquifolium,* oak *Quercus sp*. and willow. The ecological valuation of the hedgerow habitat is considered to be of higher local importance.

Plate 9.5 Hedgerow habitat within the study site.

### Treeline (WL2)

Treeline habitat was recorded separating fields and along the study site boundary (Plate 9.6). A double treeline was recorded on either side of drainage ditch along the northern margin of the southern field within the study site. This treeline contained frequent mature alder and ash trees along with occasional holly and hawthorn.

Another treeline habitat was recorded along the western boundary of the study site. The habitat contained frequent mature beech *Fagus sylvatica* and rarely willow around the existing field entrance. bramble, privet *Ligustrum vulgare*, hawthorn and ivy were recorded beneath the treeline.

The south-western side of the study site contained frequent mature ash along with sycamore *Acer pseudoplatanus* which was rarely recorded. Hedgerow species growing beneath the trees included frequent hawthorn, bramble as well as privet and dog rose.

The ecological valuation of the treeline habitat is considered to be of higher local importance.

Plate 9.6 Treeline habitat within the study site.

An immature treeline of recently planted specimens is present along the edge of the walkway in the St. Colman's College pitches along the proposed stormwater drain route. The treeline included immature oak and beech. The ecological valuation of this immature treeline habitat is considered to be of lower local importance.

### Scrub (WS1)

This habitat was recorded in patches across the study site (Plate 9.7), most frequently on the western side of the northern end of the site. At this location, the scrub habitat was dominated by bramble with willow *Salix sp.* rarely recorded.

Areas of scrub in the southern side of the study site contained abundant bramble along with occasional willow. Immature ash trees were rarely recorded.

Scrub habitat near the existing field entrance on the western side of the study site contained abundant Bramble along with frequent hawthorn and common nettle. Immature sycamore and ash trees and elder were rarely recorded.

The ecological valuation of the bramble dominated scrub habitat is considered to be of lower local importance.

Plate 9.7 Scrub habitat within the study site.

### Wet Willow-Alder-Ash Woodland (WN6)

This habitat was recorded on the eastern side of the study site and consisted of a small area of semi-mature and immature trees containing frequent Alder (Plate 9.8). The field layer consisted of frequent bramble clumps, creeping bent grass and creeping buttercup. Yorkshire fog, greater tussock sedge *Carex paniculata* and branched bur-weed *Sparganium erectum* were occasionally recorded. Common nettle and wild angelica were rarely recorded. The ecological valuation of the wet willow-alder-ash woodland habitat is considered to be of higher local importance.

Plate 9.8 Wet willow-alder-ash woodland habitat within the study site.

### Drainage Ditch (FW4)

Drainage ditches were recorded across the study site (Plate 9.9). The largest drain was located along the eastern boundary of the study site. This was a *c.* 3 m wide, slow-flowing/near stagnant drain. Species growing in the drain included frequent fool's water-cress *Apium nodiflorum* along with occasional branched bur-weed and duckweed *Lemna sp*. Historic OSi mapping (6 inch and 25 inch) indicates a relatively linear stream/water-feature with water flow where this large drainage ditch currently occurs.

A number of other drains were recorded both along the field margins and within fields. Species present included frequent fool's water-cress and water-cress *Nasturtium officinale* along with sweet-grass sp. and duckweed sp. Branched bur-weed was rarely recorded. Evidence of previous deepening of the southern drain was recorded in the form of a series of piles of spoil along the length of the drain.

The ecological valuation of the drainage ditch habitat is considered to be of lower local importance.

Plate 9.9 Drainage ditch habitat within the study site.

### Stone Walls and Other Stone Work (BL1)

This habitat was recorded at two locations within the study site (Plate 9.10). One stone wall was recorded on the north-western side of St. Colman's College pitches where the proposed stormwater drain route exits to Devlin Street. The stone and mortar wall was *c.* 1.2 m high and supported ivy-leaved toadflax *Cymbalaria muralis,* red valerian *Centranthus ruber*, dandelion *Taraxacum sp.,* cocksfoot *Dactylis* *glomerata,* rusty back fern *Asplenium ceterach*, polypody fern *Polypodium sp*. and maidenhair spleenwort fern *Asplenium trichomanes*.

The habitat was also recorded within the main study site in the form a field boundary. The low stone wall, which had collapsed in places, supported frequent bramble and ivy along with privet, yorkshire fog and elder which were rarely recorded.

The ecological valuation of the stone walls and other stone work habitat is considered to be of lower local importance.

**Plate 9.10 Stone walls and other stone work habitat within the study site.**

### Amenity Grassland (GA2)

This habitat was recorded in St. Colman's College pitches along the proposed stormwater drain route (Plate 9.11). Perennial rye grass was abundant along with frequent white clover *Trifolium repens* and creeping buttercup. Shepherd's purse Capsella bursa-pastoris and annual meadow grass Poa annua were occasionally recorded. The sward was short (*c.* 4-5 cm high) and maintained by frequent mowing.

Another area of amenity grassland was recorded under the scattered trees and parkland habitat near the existing entrance at the weighbridge. This area of grassland is maintained to a short sward of *c.* 5 -8 cm with regular mowing. Species present included frequent dandelion, red fescue Festuca rubra, creeping buttercup, yarrow *Achillea millefolium* and *Rhytidiadelphus squarrosus*. Cats ear *Hypochaeris radicata*, perennial rye grass, yorkshire fog, creeping bent grass, ox-eye daisy and meadow buttercup were recorded occasionally. Cocksfoot, ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense* and birds foot trefoil *Lotus corniculatus* were rarely recorded.

The ecological valuation of the amenity grassland (improved) habitat is considered to be of lower local importance.

**Plate 9.11 Amenity grassland (improved) habitat within the study site.**

### Scattered Trees and Parkland (WD5)

This habitat was recorded in the south-eastern corner of St. Colman's College pitches in the form a small area where recently planted immature trees have been planted (Plate 9.12). Species present included ornamental varieties of Cherry *Prunus sp*., Birch *Betula sp.*, Crab apple *Malus sp*. and Oak *Quercus sp*. The ecological valuation of the immature scattered trees and parkland habitat is considered to be of lower local importance.

**Plate 9.12 Immature scattered trees and parkland habitat associated with St. Colman's College pitches.**

Another area of scattered trees and parkland habitat was recorded close to the existing field entrance to the study site near the weighbridge where the road access point at the western boundary is proposed (Plate 9.13). This area was dominated by mature beech as well as occasional poplar *Populus sp*. Ornamental bushes including *Cotoneaster sp*. were occasionally recorded beneath the trees.

The ecological valuation of the mature scattered trees and parkland habitat is considered to be of higher local importance.

Plate 9.13 Mature scattered trees and parkland habitat associated with proposed western access point at the study site.

### Recolonising Bare Ground (ED3)

This habitat was recorded on the proposed stormwater drain route, next to the stone wall on the north-western side of St. Colman's College pitches and consisted of an area of bare ground where grass clippings and garden waste have been dumped (Plate 9.14). Species present included creeping buttercup, willowherb sp., common nettle, common ragwort *Jacobaea vulgaris*, groundsel *Senecio vulgaris*, nipplewort *Lapsana communis*, fumitory *Fumaria sp.,* broad-leaved dock, ox-eye daisy *Leucanthemum vulgare,* annual meadow grass, common field speedwell *Veronica persica*, bird's foot trefoil *Lotus corniculatus* and red dead-nettle *Lamium purpureum*. The ecological valuation of the recolonising bare ground habitat is considered to be of lower local importance.

Plate 9.14 Recolonising bare ground habitat within the study site.

### Buildings and Artificial Surfaces (BL3)

This habitat was recorded within the study site in the form of the existing access road to the weighbridge and also the regional Cork road R639 that runs adjacent to the proposed development site (Plate 9.15). The habitat consisted of a tar and chip road surface with no vegetation. The habitat was also recorded in the form of the adjoining weighbridge office which consisted of a single storey building constructed from red brick and concrete tile roof. The habitat was also recorded on the proposed stormwater drain route at Devlin Street and the tarmac walkway around the St. Colman's College pitches. The ecological valuation of the buildings and artificial surfaces habitat is considered to be of negligible importance.

**Plate 9.15 Buildings and artificial surfaces habitat within the study site.**

### 9.4.3 Aquatic Features: Drainage Channels

Water-features within the site consist of a large wide drainage channel running approximately south-north along the eastern boundary into which five smaller land drains flow (from within the study site).

The five land drains within the site contained little or no visible flow. The northern three drains were "drowned out" as they were dug below water table level and had a body of standing water. These were quite wide (*c.*3m) and the standing water was not much below the field level. They contained stands of macrophytes (mainly watercress, fools watercress and iris) and the beds of these drains had accrued quite an accumulation of infill which likely consisted mostly of dead organic debris as opposed to inorganic silt that would not have a significant source or vector to allow for such an accumulation. These three drains appeared to have been deeper when initially dug and have filled in with accumulated matter since. The two southerly drains were perched above the water table and did not contain the standing water that their counterparts in the northern half of the site did. The southern-most drain contained a very light flow or trickle, and the one further into the site was dry. The five land drains are not of any fisheries value in their own right. They are heavily modified and, because of the flat topography and low flow rates, three of them are extremely heavily silted and the other two are more dry.

The main drainage channel could potentially be of very limited fisheries value but there are several issues pertaining to this water-feature that cast doubt as to whether viable fish/lamprey populations exist as follows:

- No habitat suitable for the spawning of salmonids or lamprey exists within the section of the main drainage channel bordering the study site, and although suitable lamprey ammocoete habitat exists, lamprey would not be present without suitable habitat to spawn in.
- While the main drainage channel (*i.e.* drain along eastern boundary) contained a steady flow during the site survey that was carried out following a heavy period of rain in February 2021, it is considered likely that the flow in this drain would cease or almost cease during dry spells (with water still remaining but not flowing *i.e.* waterlogged, stagnant), and that the drain may even dry up in prolonged summer droughts.
- This water-feature drops from an altitude of *c.* 50m or 60m (at the site) to an altitude of *c.* 20m (at the confluence with the Blackwater) mostly within a covered subterranean flume (either pipe or stone/concrete culvert) where the drain is directed under the urban environs of Fermoy Town on route to the Blackwater. Also, within the northern half of the study site, the drain is completely overgrown with a mat of very dense grass. The subterranean feature and mat of grass would both be significant barriers to fish passage.

- The drainage channel contains a deep bed of detritus, much of which is anoxic and releases bubbles that smell as if anaerobic digestion is taking place; this is an indicator of very low oxygen levels within the drainage system that would not be conducive to supporting populations of most fish.
- The main drainage channel bordering the site would ordinarily have some potential to contain a small number of eel, just as any drainage channel network close to a main river channel has; however, the poor oxygen levels and propensity for flow to cease or almost cease during dry spells (with water still remaining but not flowing *i.e.* waterlogged, stagnant) would likely deem it unsuitable in this case. There may be stickleback fish present as they can survive very low oxygen levels, however, this depends on how the drain reacts to drier periods.

In summary, the open drainage channels at the study site lack conditions to support a viable fish/lamprey population in general and are considered to be of no to lower local value for fisheries overall.

### 9.4.4 Birds

A total of 27 bird species were recorded overall within 50m of the observer during the avian transect surveys on the study site (see Table 9.2). This comprised of 20 species in the winter season and 16 species in the breeding season. The higher number of species noted during the winter season is likely influenced by the fact that each transect was surveyed twice in comparison to once for the breeding season due to the onset of Covid-19 pandemic and associated restrictions in the early part of the nesting season as previously outlined. Snipe had the highest overall relative abundance at the study site winter transects (19), followed by Redwing (15) and Fieldfare *Turdus pilaris* (10), where the latter two species were present as mixed flocks during the winter season (Table 9.2). The most abundant species during the breeding season was Wren *Troglodytes troglodytes (*see Table 9.2).

No Annex I species of the EU Birds Directive were noted. Three red-listed species of high conservation concern in Ireland (Gilbert *et al*. 2021) were recorded during the transect surveys; Meadow Pipit *Anthus pratensis*, Redwing *Turdus iliacus* and Snipe *Gallinago gallinago (*see Table 9.2). Meadow Pipit and Redwing are red-listed as they are species of global conservation concern, while Snipe are red-listed due to severe breeding population decline nationally (>50% over 25 years, Gilbert *et al*. 2021). The three red-listed species were recorded during the winter season transects only. Redwing does not nest in Ireland but is a common flocking winter visitor at open fields as reflected by the winter maximum count of 15 individuals in Table 9.2 below. Meadow pipit is a common species in Ireland that primarily occurs at rough pastures and upland areas; in this case, much of the rough pasture present at the study site is too wet or waterlogged all year round to provide suitable ground conditions for this passerine bird species as reflected by the winter maximum count of just one individual with none in the breeding season; see Table 9.2 below). Snipe is widely distributed in Ireland during the winter season using a variety of wet/damp habitats for daytime resting such as the wet grassland features present at the site here, which is reflected by the winter maximum count of 19 individuals in Table 9.2 below that was also the highest count of all bird species noted here (where a maximum observation of 28 individuals was also casually noted during a site visit in December 2021). Snipe also use wet habitats for ground nesting, however the absence of Snipe during the breeding season transect survey suggests that the study site is not used by nesting Snipe. Even though there is the context that only a late breeding season transect was possible in this case (as previously outlined), the presence of some Snipe would have been expected during the late nesting season visit undertaken here (on the 1st June 2020, see Appendix 9.1) if nesting had occurred. The study site is therefore considered to be of value for wintering Snipe using the study site for daytime resting at least.

Four amber-listed species of medium conservation concern in Ireland were also noted during the transect surveys, where abundance of these species was generally low (i.e. 1-2 individuals, see Table 9.2). The amber-listed species are likely to be associated with hedgerows and scrub on the site as well as the open wet grassland habitat. The remaining species recorded are not currently of conservation concern in Ireland.

Table 9.2 Summary of bird species recorded within 50m during the transect survey study.

| Species | Maximum Abundance Winter Season | Total[5] Abundance Breeding Season | BoCCI Conservation Status* |
|---|---|---|---|
| Blackbird *Turdus merula* | 3 | 2 | Green |
| Blackcap *Sylvia atricapilla* | 0 | 2 | Green |
| Blue Tit *Cyanistes caeruleus* | 2 | 0 | Green |
| Chaffinch *Fringilla coelebs* | 7 | 2 | Green |
| Chiffchaff *Phylloscopus collybita* | 0 | 3 | Green |
| Coal Tit *Periparus ater* | 3 | 1 | Green |
| Dunnock *Prunella modularis* | 2 | 1 | Green |
| Fieldfare *Turdus pilaris* | 10 | 0 | Green |
| Great Tit *Parus Major* | 2 | 0 | Green |
| Goldcrest *Regulus regulus* | 2 | 0 | Amber |
| Hooded Crow *Corvus corone cornix* | 5 | 0 | Green |
| Lesser Redpoll *Carduelis cabaret* | 0 | 1 | Green |
| Long-tailed Tit *Aegithalos caudatus* | 4 | 0 | Green |
| Magpie *Pica pica* | 2 | 1 | Green |
| Meadow Pipit *Anthus pratensis* | 1 | 0 | Red |
| Mistle Thrush *Turdus viscivorous* | 1 | 0 | Green |
| Redwing *Turdus iliacus* | 15 | 0 | Red |
| Reed Bunting *Emberiza schoeniclus* | 0 | 1 | Green |
| Robin *Erithacus rubecula* | 4 | 1 | Green |
| Snipe *Gallinago gallinago* | 19 | 0 | Red |
| Song Thrush *Turdus philomelos* | 1 | 1 | Green |
| Starling *Sturnus vulgaris* | 1 | 0 | Amber |
| Swallow *Hirundo rustica* | 0 | 1 | Amber |
| Treecreeper *Certhia familiaris* | 0 | 1 | Green |
| Willow Warbler *Phylloscopus trochilus* | 0 | 2 | Amber |
| Woodpigeon *Columba palumbus* | 2 | 3 | Green |
| Wren *Troglodytes troglodytes* | 6 | 10 | Green |

*after Gilbert *et al.* 2021

An additional 13 species were recorded at the study site, either during the transect surveys (>50m or flying over) or on a casual basis (see Table 9.3). No Annex I or red-listed species were recorded, however three amber-listed species were noted (Gilbert *et al*. 2021), Black-headed gull *Chroicocephalus ridibundis*; House Sparrow *Passer domesticus* and Lesser black backed gull *Larus fuscus*. Both gull species were recorded

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[5] Maximum abundance not possible to generate from one transect survey

flying over the site where there are no habitats of ecological significance for these species at the study site. House Sparrow are likely to occur at the site in association with woody habitat features, however there are no suitable breeding sites (*i.e.* cavities at buildings) for this species within the study site.

**Table 9.3 Summary of additional bird species recorded >50m or flying over during the transect survey study or casually outside of the transect study.**

| Species | BoCCI Conservation Status* |
|---|---|
| Black-headed gull *Chroicocephalus ridibundis* | Amber |
| Buzzard *Buteo buteo* | Green |
| Goldfinch *Carduelis carduelis* | Green |
| House Sparrow *Passer domesticus* | Amber |
| Jack Snipe *Lymnocryptes minimus* | Green |
| Jackdaw *Corvus monedula* | Green |
| Jay *Garrulus glandarius* | Green |
| Lesser black backed gull *Larus fuscus* | Amber |
| Pheasant *Phasianus colchicus* | n/a |
| Pied Wagtail *Motacilla alba* | Green |
| Raven *Corvus corax* | Green |
| Rook *Corvus frugilegus* | Green |
| Siskin *Carduelis spinus* | Green |

*after Gilbert *et al.* 2021

Four additional bird species have been recorded historically in the 2km national grid square overlapping the study site (*i.e.* W89D, after NBDC database); Peregrine Falcon *Falco peregrinus*, Kestrel *Falco tinnunculus,* Raven *Corvus corax* and Sparrowhawk *Accipiter nisus*. Peregrine Falcon is an Annex I species of the EU Birds Directive and there are no suitable breeding sites (*i.e.* cliffs, tall buildings) for this species at the site and no habitats of ecological significance are present for this species on the study site. Kestrel is a red-listed species that would be expected to at least occur on the site from time to time. The remaining species are not currently of conservation concern in Ireland.

Most bird species are protected under the Irish Wildlife Acts (1976 – 2018 as amended), where it is an offence to hunt, interfere with or destroy their breeding or resting places (unless under statutory licence/permission). Woody habitats at the study site (*i.e.* hedgerow, treeline, scrub, wet woodland, scattered trees and parkland) provide foraging, commuting (*i.e.* wildlife corridor), nesting and perching opportunities for terrestrial-based bird species in general, while the wet grassland habitat provides cover and perhaps feeding opportunities for over-wintering species such as red-listed Snipe. The open improved grassland areas of the site are of lower ecological value for most avian species, while the biodiversity value of scrub is compromised by the dominance of bramble. The study site is therefore considered to be of lower to higher local value for birds overall.

### 9.4.5 Mammals: Non-volant

Three non-volant mammal species were confirmed to occur at the study site with one additional species historically recorded in the wider area.

Direct observations of Rabbit *Oryctolagus cuniculus*, Irish Hare *Lepus timidus hibernicus* and Fox *Vulpes vulpes* were recorded during the site walkovers, while the trail camera study confirmed that Rabbit and Fox are widespread on the study site (where Fox is likely to predate on Rabbits at the study site).

One additional non-volant mammal species Red Squirrel *Sciurus vulgaris* has been recorded historically in the 2km national grid square overlapping the study site (*i.e.* W89D, after NBDC database). The historical record is located *c.* 800m southwest of the study site, however suitable woodland habitat for this species is present just east of the development where conifer plantation occurs and to a lesser extent at the study site itself where woody features (*i.e.* wet woodland, hedgerow, treeline) are relatively small in extent and most suited for commuting (*i.e.* wildlife corridor).

No Badger *Meles meles* setts were noted at the study site and the area is considered too wet to support Badger in general, however this species may forage/commute at the drier parts of the site from time to time. There are no habitats of ecological value for Otter *Lutra lutra* on the site, where the modified open drainage channels are not considered suitable for this species due to a lack of conditions to support a viable fish/lamprey population prey base combined with a lack of over-ground connectivity to the Blackwater River (as the drain is piped/culverted under Fermoy town to the north of the study site).

The study site currently provides commuting (*i.e.* wildlife corridors), resting and feeding opportunities for a number of non-volant mammals, largely through the presence of woody habitat features (*i.e.* hedgerow, treeline, scrub, wet woodland, scattered trees and parkland) that also have connectivity with an adjacent woodland and other similar woody features in the surrounding landscape (*i.e.* hedgerows). Rough pasture present at the study site also provides cover for a range of small mammal species, although much of the rough pasture in question is too wet or waterlogged all year round to provide suitable ground conditions. The improved grassland habitat is of low ecological value for most non-volant mammal species, while the biodiversity value of scrub is compromised by the dominance of bramble. The study site is considered to be of lower to higher local value for non-volant mammals overall.

All of the mammal species mentioned above are relatively widespread and common nationally (see Lysaght & Marnell 2016, Marnell *et al*. 2019) and are considered to be of least concern in terms of conservation status (Marnell *et al*. 2019). With the exception of Fox and Rabbit, all of the other mammal species mentioned above are legally protected by the Irish Wildlife Acts (1976 – 2018), where it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). Irish Hare is also listed on Annex V of EU Habitats Directive as a species where measures can be undertaken to ensure that its exploitation and taking in the wild is compatible with maintaining it in a favourable conservation status.

### 9.4.6 Mammals: Bats

A total of three bat species were confirmed to be using the study site during the passive detector surveys; Soprano Pipistrelle Pipistrellus pygmaeus, Common Pipistrelle *Pipistrellus pipistrellus* and Leisler's Bat *Nyctalus leisleri (*see Table 9.4). Three additional bat species have been historically recorded in the wider area; Brown Long-eared Bat *Plecotus auritus*, Daubenton's Bat *Myotis daubentonii* and Natterer's Bat Myotis nattereri (after NBDC, 2km W89D). Lundy *et al*. (2011) suggest that the study site is part of a landscape that has a moderate to high resource value for bat species in general with the main exceptions being Nathusius' Pipistrelle and Lesser Horseshoe Bat as the study site is primarily outside of their known national distribution (see Roche *et al*. 2014).

Soprano Pipistrelle overwhelmingly dominated the activity recorded during the passive detector study, comprising of at least 78% of bat activity on all four detectors (see Table 9.4). Common Pipistrelle activity ranged from 1% to 20% of bat activity across the four detectors with only one record of Leisler's Bat (see

**Table 9.4 Summary of bat species recorded during the passive detector study*.**

| Species | P1 | P2 | P3 | P4 |
|---|---|---|---|---|
| Common Pipistrelle<br>*Pipistrellus pipistrellus* | 1% (27) | 8% (12) | 12% (3) | 20% (19) |
| Soprano Pipistrelle<br>*Pipistrellus pygmaeus* | 99% (2053) | 92% (137) | 88% (22) | 79% (74) |
| Leisler's Bat *Nyctalus leisleri* | 0% (0) | 0% (0) | 0% (0) | 1% (1) |
| Totals | 100% (2080) | 100% (149) | 100% (25) | 100% (94) |

*Total bat recordings are in brackets

There are no structures (e.g. buildings) within the study site that could be used by roosting bats, however some of the more mature trees present on the site may potentially provide transient roosting opportunities for bats during the summer period that is likely to involve small numbers of non-breeding bats. A visual assessment of one mature Ash tree at the southern boundary that will need to be removed to facilitate the proposed development, found it to have low potential suitability for bat roosts where it may provide transient roosting opportunities for small numbers of non-breeding bats during the summer period. A visual assessment of a group of 9 Beech/Poplar dominated trees of mixed age at the western access point that will need to be removed to facilitate access, found them to be of negligible potential suitability for bat roosts due to a lack of features that could support bat roosting opportunities (e.g. crevices, ivy).

In terms of commuting/foraging opportunities for bats, the potential suitability of on-site vegetation for commuting/foraging bats is considered moderate here given the presence of linear woody habitat features (hedgerow, treeline, scrub, wet woodland) that also have connectivity with other woody features in the surrounding landscape thereby providing a wildlife corridor that could be used by commuting/foraging bats. The linear woody features in question are confined to an internal double treeline boundary and parts of the outer boundary. In fact, the relative importance of the internal double treeline for bats was highlighted by the particularly high level of bat activity recorded at the passive detector (P1) that was located at this feature in comparison to the other passives (see Table 9.4).

All of the bat species mentioned above are considered to be relatively widespread and common nationally (Roche *et al*. 2014, Marnell *et al*. 2019) and are considered to be of least concern in terms of conservation status (Marnell *et al*. 2019). All bat species occurring in Ireland are legally protected under the Irish Wildlife Acts (1976 – 2018 as amended), where it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). Furthermore, all bat species are listed on Annex IV of the EU Habitats Directive as species requiring strict protection.

The study site currently provides commuting (*i.e.* wildlife corridors), feeding and potentially transient roosting opportunities for bats through the presence of linear woody habitat features with some mature trees (hedgerow, treeline, scrub, wet woodland, scattered trees and parkland) that also have connectivity with other woody features in the surrounding landscape (*i.e.* wildlife corridor). The open grassland fields at the study site are considered to be of lower value for bats in general, while the biodiversity value of scrub is compromised by the dominance of bramble. The study site is therefore considered to be of lower to higher local value for bats overall.

### 9.4.7 Other Taxa

A number of other taxa were noted during this EIAR study; Common Frog *Rana Temporaria,* Buff-tailed Bumblebee *Bombus terrestris* and Dock Bug *Coreus marginatus*. Common Frog was confirmed to occur in association with a number of the drains and wet areas of the site in February 2021 through the presence of frog spawn. There is ample suitable habitat (*i.e.* drains and wet grassland) for this species on the study site. Buff-tailed Bumblebee and Dock Bug were also noted at the study site. All three species are common and widespread in Ireland at present (see Reid *et al*. 2013, King *et al*. 2011, Fitzpatrick *et al*. 2006). It should be noted that most of the ecological surveys at the study site took place during the winter months, which is a sub-optimal time for the recording of other taxa in general. A wide range of other taxa species (e.g. odonata, lepidoptera, hymenoptera) would be expected to occur at the study site given the range of habitats present.

While Common Frog is nationally widespread/common and of no particular conservation concern at present (Reid *et al*. 2013 and King *et al*. 2011), it is listed on the Irish Wildlife Acts (1976 – 2018 as amended) and on Annex V of the EU Habitats Directive as a species of ‘community interest whose taking in the wild and exploitation may be subject to management measures’. Under the Irish Wildlife Acts protection, it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). The remaining other taxa species recorded at the study site do not have any legal protection in Ireland at present.

Several other taxa records have been historically recorded in the wider area (*i.e.* 2km grid square W89D, NBDC dataset), one of which is of conservation interest; Wall Butterfly *Lasiommata megera*. Wall Butterfly is an endangered species that has suffered a population reduction of over 50% in Ireland between 1995 and 2009 and is associated with unimproved dry calcareous grassland, coastal dunes, machair, vegetated sea-cliffs, limestone pavement and cutover bog (Regan *et al*. 2010) - habitats that are absent from the study site here. It should be noted that the historical record in question dates from 1971 and is located *c.*1km south of the study site.

The study site currently provides resting, breeding and feeding opportunities for other taxa in general through a mixture of woody (*i.e.* hedgerow, treeline, scrub, wet woodland, scattered trees and parkland) and wet habitat features (wet grassland, open drainage ditches). The open improved/semi-improved grassland fields at the study site are considered to be of lower value for other taxa in general, while the biodiversity value of scrub is compromised by the dominance of bramble. The study site is therefore considered to be of lower to higher local value for other taxa overall.

### 9.4.8 Study Site: Overall Biodiversity Evaluation

Taking the above into consideration, the study site is considered to be of lower to higher local biodiversity value overall, where the higher local value is driven by the presence of woody habitat features (hedgerows, treelines, wet woodland) along with areas of marshy wet grassland.

## 9.5 Potential Impacts & Associated Effects

The proposed development area will primarily impact features of higher or lower local value, where the higher local value features are confined to areas of marshy wet grassland in this case.

Potential impacts on existing biodiversity of the site and wider area arising from the proposed development at the residential development requires consideration. Such impacts can arise during the construction and/or operational phases of the proposed development and are considered below for each biodiversity aspect examined here, as well as the do-nothing and cumulative scenarios.

### 9.5.1 Designated Nature Conservation Sites

The study site is not located within or adjacent to any designated conservation site, nor does it require any resources from any such designated site. The nearest designated conservation area to the study site is the Blackwater River (Cork/Waterford) SAC, which is located *c.*0.5 km from the study site boundary.

As outlined in Section 9.4.1 above, there is a potential impact-receptor link between the study site and the Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA via (i) potential construction/operational surface-water run-off impacts and (ii) potential operational waste-water discharge impacts.

As previously mentioned, a NIS in support of the AA process has been undertaken has been undertaken in relation to the proposed development here (see KES 2022 accompanying the planning application), with key findings summarised in this EIAR chapter.

#### 9.5.1.1 Construction Phase Impacts: Surface-Water Run-Off

The construction phase of the proposed development will involve various activities such as site clearance, vegetation removal, excavation/earthworks, the import of building materials, use of heavy machinery and refuelling. Such activities have the potential to release silt or other contamination into the open drains at site and downstream Blackwater River with associated Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA through construction stage run-off via the public network and outfalls at the Blackwater River. As construction progresses, part of the proposed surface-water drainage network may also become active that will also ultimately discharge into the Blackwater River and associated designated sites via the existing open drains on the site and the public stormwater network and outfalls at the Blackwater River. The outfalls at the Blackwater River range *c.* 1.0 – 3.1km downstream of the study site to the Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA overall.

Standard environmental controls will be implemented as part of the project to ensure the appropriate management and control of construction stage surface-water run-off potentially arising from development activities at the site (as outlined in Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application). Such construction related controls will be specific to the site, proposed works, site water-features (open drains) and downstream Blackwater River with associated Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the construction stage that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including any designated site (see Construction and Demolition Waste Management Plan by Walsh Design Group 2022d accompanying the planning application).

Taking the above into consideration, potential construction phase impacts in relation to surface-water runoff on designated sites are considered neutral.

#### 9.5.1.2 Construction Phase Impacts: Other Impacts

As outlined in Section 9.4.1 above, potential construction phase impacts on designated sites via other impacts such as direct habitat loss/damage, waste-water/foul effluent, disturbance/displacement, invasive plant spread and flooding/floodplain are not relevant here and are therefore considered neutral.

#### 9.5.1.3 Operational Phase Impacts: Surface-Water Run-Off

Operational stage surface-water run-off arising from the proposed development will be collected by a series of new surface-water drainage networks (as outlined in Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application), which will discharge at six locations into two open drains on the site and and downstream Blackwater River with associated Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA via the public stormwater network and outfalls at the Blackwater River. The outfalls at the Blackwater River range *c.* 1.0 – 3.1km downstream of the study site to the Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA overall. The surface-water drainage strategy includes SuDS measures (such as permeable paving, tree pits & filter drains, infiltration areas, water butts) along with attenuation storage and hydrocarbon interception. Furthermore, a cleaning and maintenance schedule will be implemented for the proposed storm drainage system during the operation phase

The surface-water drainage system will manage and control run-off associated with new hardstanding elements of the development during the operational stage that will be specific to the site, operations, site water-features (open drains) and downstream Blackwater River with associated Blackwater River (Cork/Waterford) SAC, Blackwater River Callows pNHA and Blackwater Callows SPA. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the operational stage where appropriate and required that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including any designated site.

Taking the above into consideration, potential operational phase impacts in relation to surface-water runoff on designated sites are considered neutral.

#### 9.5.1.4 Operational Phase Impacts: Waste-Water/Foul Effluent

Operational phase waste-water from the developed residential site will be directed into the public waste-water network for ultimate treatment at Fermoy WWTP, which outfalls into the Blackwater River and associated Blackwater River (Cork/Waterford) SAC and Blackwater River Callows pNHA (both SAC & pNHA present at the outfall), with Blackwater Callows SPA located 0.4km downstream.

**Fermoy WWTP Status & Water Quality**

While Fermoy WWTP was non-compliant in regard to its 2020 emissions, this is due to the technical inclusion of a secondary discharge of process wastewater and cooling water that is not treated by the WWTP but is discharged through the stormwater network via SW004 (see Section 2.1.3 of Irish Water 2021 and Section 2.1 of EPA 2021). In fact, treated waste-water/foul effluent discharge from the WWTP was compliant in 2020 (see Section 2.1.2 of Irish Water 2021), which is of relevance to the waste-water/foul effluent arising from the proposed development here that will be treated by the WWTP. Furthermore, there is remaining capacity currently available at Fermoy WWTP regarding organic loading (*i.e.* 2,337 PE; see Irish Water 2021) such that the additional foul effluent here (*i.e.* 908 PE) can be facilitated as confirmed by Irish Water where the following is important to note. At the time of the original confirmation of feasibility, a higher number of dwelling units (374) was being considered and Irish Water noted that the capacity of Fermoy WWTP would require upgrading to accommodate the proposed development (see letter dated 18th January 2021 in Appendix C of Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application). Subsequent consultation between Walsh Design Group and Irish Water established that capacity at Fermoy WWTP was in fact available after all and that required upgrades to the WWTP would now be modest (see memo dated 3rd March 2022 in Appendix C of Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application) such that Irish Water has since accepted the proposed design for the wastewater infrastructure layout and details (see letter dated 18th February 2022 in Appendix C of Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application).

Ambient monitoring associated with the WWTP is stated as indicating negative water quality and Water Framework Directive (WFD) status impacts on the receiving waters of the Blackwater River/SAC in 2020 (see Section 2.1.4 of Irish Water 2021). However, it is considered that where such negative impacts exist, these are more likely due to the influence from the secondary discharge of process wastewater and cooling water into the Blackwater River/SAC (that is not treated by the WWTP) given its non-compliance status in 2020 as mentioned above combined with 'good' contemporary water quality/WFD status upstream and downstream of the WWTP discharge point summarised as follows:

- Current WFD status (2013-2018) of the Blackwater River is good both upstream and downstream of the WWTP discharge point.
- Current Blackwater River/SAC WFD risk is not at risk (*i.e.* is currently meeting its Water Framework Directive objectives) *c.* 815m downstream of the WWTP discharge point, whereas Blackwater River/SAC risk status upstream of/at the WWTP discharge point is at risk4.
- Current Blackwater River water quality is Q4 good status *c.* 6.9km downstream of the WWTP discharge point , where Blackwater River/SAC river water quality upstream of the WWTP discharge point is also Q4 good status.

### Blackwater River SAC Objectives & Water Quality

A review of the attributes and targets for qualifying interests set out in the relevant Conservation Objectives Series for the Blackwater River SAC (NPWS 2012) finds that water quality is a specific attribute/target for the following qualifying interests; Freshwater Pearl Mussel *Margaritifera margaritifera*, White-clawed Crayfish *Austropotamobius pallipes,* Twaite Shad *Alosa fallax,* Atlantic Salmon *Salmo salar* and Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (all of which are qualifying interests of the SAC). Of these, Freshwater Pearl Mussel, Twaite Shad, Atlantic Salmon and Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation occur within the main SAC river channel downstream of Fermoy WWTP discharge point. Water quality targets for the latter three qualifying interests include river water quality of Q4 good status and WFD good status overall, both of which are currently being achieved downstream of the WWTP discharge point as outlined above.

Water quality targets for Freshwater Pearl Mussel (FWPM) include high status, which is not currently being achieved upstream or downstream of the WWTP discharge point as outlined above. It is thought that a scattered FWPM population is likely to exist along the Blackwater River main channel from upstream of Mallow to Lismore (see NS2 2010), which includes the section of the Blackwater River relevant to the WWTP discharge point here. It appears that the Munster Blackwater FWPM population comprises of aged adults, with no evidence of recruitment for at least 20 years such that it is of unfavourable conservation status and functionally extinct (see NS2 2010). The negative effects of several pressures have been identified as contributing to the unfavourable condition of the Munster Blackwater FWPM habitat, including a number of WWTPs within the Munster Blackwater catchment that are considered to have a significant adverse effect on FWPM or its habitat (see NS2 2010). However, Fermoy WWTP was not identified as one of these WWTPs (see NS2 2010).

### Blackwater Callows SPA / Blackwater River Callows pNHA Objectives & Water Quality

The conservation objectives for the Blackwater Callows SPA / Blackwater River Callows pNHA does not currently specify any attributes/targets (including for water quality). The qualifying interests for this SPA/pNHA relate to wintering waterbirds and supporting wetland habitats of the Blackwater River (NPWS 2021; see Table 9.1 above); in this case, the waterbird interest species in question also feed in adjoining seasonally flooded fields associated with the floodplain as well as nearby open farmland fields (both part of and ex-situ of the SPA/pNHA). Therefore, water quality is not of the same significance for qualifying interest waterbird species of the SPA/pNHA in comparison to the more aquatic dependent qualifying interest species of the Blackwater River SAC considered above.

**Conclusion**

As described above, the WFD status of the Blackwater River is good both upstream and downstream of the WWTP discharge point (as affirmed by Q-value sampling by the EPA) and the watercourse is 'not at risk' downstream of the WWTP discharge point. Treated discharge from Fermoy WWTP is compliant (see Section 2.1.2 of Irish Water 2021) with 'good' contemporary water quality/WFD status upstream and downstream of the WWTP discharge point at the Blackwater River and associated Blackwater River (Cork/Waterford) SAC, Blackwater Callows SPA and Blackwater River Callows pNHA. Furthermore, Fermoy WWTP has remaining design capacity in relation to additional organic loading arising from the proposed development here (where 13% or 1,429 PE spare capacity at the WWTP will remain after acceptance of the additional organic loading of 908 PE from the proposed development, which is based on remaining organic capacity of 2,337 PE cited in Irish Water 2021). Therefore, water quality in the Blackwater River and associated Blackwater River SAC/Blackwater Callows SPA/ Blackwater River Callows pNHA should not be diminished by the proposed increase in loading from the wastewater flows produced by the residential development via WWTP discharges. Even if the relevant section of the Blackwater River & associated SAC was of high status, as required for Freshwater Pearl Mussel, it would be expected that Fermoy WWTP would not contribute negatively to such a status as per the existing situation regarding good status downstream.

Taking the above into consideration, significant adverse effects on the qualifying interests of the Blackwater River (Cork/Waterford) SAC, Blackwater Callows SPA and Blackwater River Callows pNHA related to operational phase waste-water discharge are considered unlikely in this case. Accordingly, potential operational phase effects on designated sites in relation to treated waste-water discharge are considered neutral.

#### 9.5.1.5 Operational Phase Impacts: Other Impacts

As outlined in Section 9.4.1 above, potential operational phase impacts on designated sites via other impacts such as direct habitat loss/damage, disturbance/displacement, invasive plant spread and flooding/floodplain are not relevant here and are therefore considered neutral.

### 9.5.2 Habitats & Flora

No Annex I habitat listed under the EU Habitats Directive and no botanical species protected under the Flora (Protection) Order 2015 or listed in the EU Habitats Directive were documented within the study site. The proposed development area will primarily impact habitat features of higher local value (marshy wet grassland, scattered trees and parkland), lower local value (improved agricultural grassland, drier and semi-improved areas of wet grassland, bramble-dominated scrub, drainage ditches, stone walls and other stone work, amenity grassland) or of no value (buildings and artificial surfaces).

#### 9.5.2.1 Construction Phase Impacts

**Habitat Loss/Change**

The permanent loss/change of existing artificial surfaces BL3 due to the proposed development, which are of no biodiversity value, will be of neutral effect. Effects on higher local value habitat features that will not require wholesale removal (treelines WL2, hedgerow WL1, wet willow-alder-ash woodland WN6) will be neutral. This includes the context that one mature ash tree will require removal from the southern hedgerow boundary and that understory vegetation up to 4m on either side of proposed road/pedestrian bridging points at the double internal treeline with drainage ditch may be removed/damaged during construction but can be reinstated afterwards with planting.

The permanent loss/change of scattered trees and parkland WD5 and amenity grassland GA2 relates to a very small area at the proposed road access point at the western boundary that will be of neutral imperceptible effect, which includes the context that a group of 9 Beech/Poplar dominated trees of mixed age will require removal here. Scattered trees and parkland WD5 and amenity grassland GA2 in the vicinity of the stormwater drain connection route at St. Colman's College pitches will not be permanently impacted by the proposed development such that effects on these features will be neutral.

The permanent loss of the following lower local value habitat features is considered as negative but not significant overall due to a combination of their modified nature, poor floral species diversity or lack of riparian zone vegetation in the case of drainage ditches; improved agricultural grassland GA1, bramble-dominated scrub WS1, drainage ditches FW4 and stone walls & other stone work BL1.

There will be a permanent net loss of wet grassland that has a more limited availability in the wider area than other habitat features such as hedgerow. The wet grassland in question comprises of three communities, where the marshy wet grassland community areas are of higher value than the drier or semi-improved wet grassland communities. The proposed Landscape Layout for the development includes for the translocation of 940 sqm of existing wet grassland turf from the south-eastern part of the residential site (where higher value marshy wet grassland community occurs) to a wet swale area further north as well as maintenance of natural wildflower meadow through management of existing soil seed bank (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR and Landscape Design Report by Cathal O'Meara 2022 accompanying the planning application). While some areas of wet grassland will be retained along the eastern boundary of the study site including the aforementioned translocation of an area of wet grassland turf as part of the landscape layout, the extent of this habitat will still be much reduced compared with the existing situation resulting in a net loss. However, it is worth noting that the retained wet grassland areas will largely favour the higher value marshy wet grassland community over the lower value drier or semi-improved wet grassland communities. It is therefore considered that the loss of wet grassland habitat will result in a slight to moderate negative effect on semi-natural habitat and flora at the site and surrounding locality.

As previously mentioned, just 10 trees will require removal in order to facilitate the proposed development with no loss of hedgerow or treeline anticipated. Native/non-native pollinator friendly dominant planting in line with All Ireland Pollinator Plan recommendations is proposed as part of the Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR). Landscaping proposals include ornamental grasses & perennials, shelter planting with native dominant trees/shrubs (777 new trees proposed), 4,600 linear metres of new hedgerow of which 600 linear metres will comprise of new native hedgerow planted in association with retained drainage ditches, supplementary planting of existing hedgerow with native trees/shrubs where appropriate (e.g. southern boundary) as well as the translocated/natural wet wildflower meadows already mentioned above. Some existing habitat features will also be retained as part of the Landscape Layout such as a wet woodland copse along the eastern boundary (*i.e.* wet willow-alder-ash woodland WN6) as well as perimeter boundary hedgerow, treeline & scrub. The landscaping proposals will result in an overall net gain of native-dominant woody features at the site (trees, hedgerow, shrub) that will easily compensate for the loss of one tree. The successful dominant planting of native/non-native pollinator friendly trees/shrubs as part of the proposed landscaping plan will lead to a slight positive effect on semi-natural habitat and flora at the site and surrounding locality.

### Invasive Plants

The presence and potential for the inadvertent spread of invasive non-native plant species also needs consideration. While no Third Schedule listed invasive plants are present at the study site, two species of non-native invasive plants are present (Cherry Laurel and Winter Heliotrope) with another species bordering (Butterfly Bush). As the invasive plant species noted at the study site were not located in close proximity to any on-site water-features that could act as a conduit for the spread of invasive plant species into downstream aquatic habitats in the wider area, potential effects related to invasive plant spread are relevant to the study site in itself. Although not listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats), the spread of such invasive plants will not be facilitated and cognisance of current guidelines for the appropriate management of same will be implemented as part of the proposed development project (e.g. NRA 2010). The management of all invasive plant species will need to be integrated into the final CEMP, where the up-to-date status of invasive plants relative to the works area will be confirmed in advance of works to inform the CEMP on the need to manage works accordingly (see mitigation measures in Section 9.6 below). The appropriate management/eradication of invasive non-native plants would have a positive effect for the study site and wider locality in general, while a failure in management/eradication resulting in the spread of same would potentially have a slight to moderate negative effect.

### Off-Site Aquatic Links

Habitats/flora associated with downstream water-features in the wider area such as the off-site drainage ditch and Blackwater River could be negatively affected by the proposed development through hydrological or water quality impacts such as increased siltation, nutrient release and/or contaminated run-off arising from the development works area. In this case, this potentially applies to construction phase surface-water run-off.

As previously outlined, standard environmental controls will be implemented as part of the project to ensure the appropriate management and control of run-off potentially arising from construction related activities at the site (as outlined in the Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application) that will be specific to the site, proposed works, open drains and downstream Blackwater River with associated designations. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the construction stage that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment (see Construction and Demolition Waste Management Plan by Walsh Design Group 2022d accompanying the planning application). Taking the above into consideration, potential construction related effects on fauna associated with downstream water-features in the wider area via surface-water run-off impacts are considered neutral.

#### 9.5.2.2 Operational Phase Impacts

**Habitat Loss/Change**

No additional removal of habitat or flora is anticipated during the operational phase of the proposed development, such that no further potential impacts and associated effects are relevant in relation to habitat and flora loss in general. Potential additional loss effects arising from the operation of the proposed development on habitats/flora are therefore considered neutral.

The Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR) sets out proposals that will support a diversity of native/non-native pollinator friendly dominant planting in line with All Ireland Pollinator Plan recommendations during the operational phase. While such landscaping proposals will result in an overall net gain of native-dominant woody features at the site, it is important to acknowledge that there will be a net loss of wet grassland habitat despite the retention of some areas of wet grassland along the eastern boundary of the study site (including the previously mentioned proposed translocation of an area of wet grassland turf as part of the landscape layout). Although, it is worth remembering that the retained wet grassland areas will largely favour the higher value marshy wet grassland community over the lower value drier or semi-improved wet grassland communities (where the proposed translocation of an area of wet grassland turf is from an area of higher value marshy wet grassland community). While the loss of wet grassland habitat will continue as a slight to moderate negative effect in its own right during the operational phase, the successful implementation of new planting proposals will result with a slight positive effect on semi-natural habitat and flora at the site and surrounding locality overall as native/non-native pollinator friendly dominant planting matures. If such native/non-native pollinator friendly dominant landscaping fails, the resulting effect is considered as slight to moderate negative overall. There is an opportunity to maximise the biodiversity effects of habitats/landscaping during the operational phase through the successful implementation of a management plan of same (see mitigation measures in Section 9.6 below).

**Invasive Plants**

As previously mentioned, two species of non-native invasive plants are present at the study site (Cherry Laurel and Winter Heliotrope) with another species bordering (Butterfly Bush). The appropriate management/eradication of such invasive non-native plants may still be of relevance for at least some invasive plants during the operational phase depending on progress of same made during the construction phase. Where invasive plants continue to be successfully managed/eradicated at the study site during the operational phase, the associated effect would continue to be positive. In the event that the management/eradication of invasive plants at the study site fails for whatever reason allowing for the spread of same, the associated effect would potentially be slight to moderate negative during the operational phase.

**Off-Site Aquatic Links**

Habitats/flora associated with downstream water-features in the wider area such as the off-site drainage ditch and Blackwater River could be negatively affected by the proposed development through hydrological or water quality impacts such as increased siltation, nutrient release and/or contaminated run-off arising from the operational development. In this case, this potentially applies to operational surface-water run-off via the drainage network as well as operational waste-water/foul effluent via Fermoy WWTP.

The proposed operational surface-water drainage strategy will appropriately manage and control run-off associated with the development (see Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application). Such surface-water operational management proposals will be specific to the site, operations, site water-features (open drains) and downstream Blackwater River with associated designated sites. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the operational stage that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including off-site aquatic features.

Regarding treated waste-water/foul effluent, treated discharge from Fermoy WWTP is compliant (see Section 2.1.2 of Irish Water 2021) with 'good' contemporary water quality/WFD status upstream and downstream of the WWTP discharge point at the Blackwater River and associated designated sites (as outlined in Section 9.5.1.4 above). Furthermore, there is remaining capacity currently available at Fermoy WWTP to cater for the additional proposed foul effluent here that has been confirmed by Irish Water (as previously outlined in Section 9.5.1.4 Fermoy WWTP Status & Water Quality).

Taking the above into consideration, potential operational related effects on fauna associated with downstream water-features in the wider area via surface-water run-off and waste-water discharge impacts are considered neutral.

### 9.5.3 Fauna: Birds, Non-volant Mammals, Bats, Other Taxa & Aquatic

The study site is of lower to higher local value for fauna overall, where the open drainage channels at the study site are of no to lower local value for fisheries as they lack conditions to support a viable fish/lamprey population in general. While red-listed Meadow Pipit, Redwing and Snipe bird species were noted at site; the non-breeding wintering season that is of less conservation consequence for these species was of particular relevance here. The wet habitat features of the study site support Common Frog, and although this species is of no particular conservation concern at present, it is nevertheless listed on the Irish Wildlife Acts (1976 – 2018 as amended) and on Annex V of the EU Habitats Directive as a species of 'community interest whose taking in the wild and exploitation may be subject to management measures'.

Relatively linear vegetated and/or natural water-features function as commuting wildlife corridors when connected to ecological receptors in the wider landscape, where wildlife corridors provide a necessary and essential role for the movement and connectivity of biodiversity to fulfil their various ecological needs and support species richness (see Bennett 2003). Such features also support associated biodiversity in general by providing commuting, resting/roosting, breeding, feeding and growing opportunities. Supporting biodiversity and associated features is of significant benefit to humans in terms of ecosystem services (air quality, clean water, food supply *etc.*) and general well-being (see Science for Environment Policy 2015, Sandifer *et al*. 2015, Harrison *et al*. 2014). The importance of wildlife corridors and the protection of same is recognised by the currently adopted Cork County Development Plan (e.g. paragraphs 13.1.7 & 14.3.22 in CCC 2014). In this case, woody habitat features (hedgerows, treelines, scrub, wet woodland) and to some degree wet habitat features (wet grassland, open drainage ditches) at the study site represent the most valuable wildlife corridor here. It should be noted that the biodiversity value of some wet grassland present is compromised where it is semi-improved or drier, while the biodiversity value of drainage ditches is compromised by their modified state that lacks riparian zone or in-stream features.

#### 9.5.3.1 Construction Phase Impacts

**Habitat Loss/Change**

The permanent loss of habitats arising from construction of the development will negatively affect fauna through reduced commuting, resting/roosting, breeding and feeding opportunities in general. It is considered that the permanent loss of habitats that are of lower value and not of ecological significance for fauna in this case (such as improved grassland, amenity grassland, bramble-dominated scrub, drainage ditches, stone walls and other stone work) will have a neutral imperceptible to negative but not significant effect on fauna here overall.

Habitats of higher value for fauna here include woody features (hedgerows, treelines, wet woodland, scattered trees and parkland) and wet grassland (marshy in particular). Bar the need to remove trees overall, the woody features in this case will be retained as part of the proposed development where similar woody features are also available in the surrounding area. There will be a permanent net loss of wet grassland that has a more limited presence in the wider surrounding area. The proposed Landscape Layout for the development includes for the translocation of 940 sqm of existing wet grassland turf from the south-eastern part of the residential site to a wet swale area further north as well as maintenance of natural wildflower meadow through management of existing soil seed bank (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR and Landscape Design Report by Cathal O'Meara 2022 accompanying the planning application). While some areas of wet grassland will be retained along the eastern boundary of the study site, the extent of this habitat will be much reduced compared with the existing situation resulting in a net loss such that associated faunal species like Common Frog or wintering Snipe are will be reduced in numbers and/or displaced. It is therefore considered that the loss of wet grassland habitat will result in a slight to moderate negative effect on fauna overall.

As previously mentioned, just 10 trees will require removal in order to facilitate the proposed development with no loss of hedgerow or treeline anticipated (including the internal double treeline that had a relatively high amount of bat activity during the passive detector study). Native/non-native pollinator friendly dominant planting in line with All Ireland Pollinator Plan recommendations is proposed as part of the Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR). Landscaping proposals include ornamental grasses & perennials, shelter planting with native dominant trees/shrubs (777 new trees proposed), 4,600 linear metres of new hedgerow of which 600 linear metres will comprise of new native hedgerow planted in association with retained drainage ditches, supplementary planting of existing hedgerow with native trees/shrubs where appropriate (e.g. southern boundary) as well as the translocated/natural wet wildflower meadows already outlined above. Some existing habitat features will also be retained as part of the Landscape Layout such as a wet woodland copse along the eastern boundary as well as perimeter boundary hedgerow, treeline & scrub. The landscaping proposals will result in an overall net gain of native-dominant woody features at the site (trees, hedgerow, shrub) allowing wildlife corridors to be maintained while also easily compensating for the loss of 10 trees. The removal of one tree will have an imperceptible effect on fauna at the study site regarding habitat loss, while the successful dominant planting of native/non-native pollinator friendly trees/shrubs as part of the proposed landscaping plan will lead to a slight positive effect on fauna overall.

#### Disturbance/Displacement

Construction works and associated activities can potentially lead to disturbance/displacement of fauna at or close to the study site through noise and/or visual cues. Woody habitat features (woodland, hedgerows, treelines) are available in the surrounding area so that affected fauna can move into the wider area during the five-phased development programme that will take *c.* 1-2 years per phase to complete (see Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application), moving back when works are complete. The faunal assemblage occurring at the study site largely comprises common and widespread species, where breeding activity was only confirmed for Common Frog with spawn noted at on-site wet habitat features (wet grassland, drainage ditches). Taking the above into consideration, potential effects on fauna arising from disturbance/displacement impacts associated with the construction phase are considered negative but not significant.

For bats, disturbance/displacement also arises from (externally based) artificial light used during the construction stage, where bats are active at night and most bat species are negatively affected by artificial light in general (see Bat Conservation Ireland 2010, Stone 2013). However, the use of artificial lighting during the construction stage is largely considered irrelevant as works will generally occur during daylight hours (see Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application) when bats will not be active. Measures can otherwise be taken to reduce light spillage nuisance on bats as well as other fauna generally active at night during relatively limited periods where some works may occur during some hours of darkness by directing external lighting towards the works area and away from retained/new woody features as well as adjoining areas (see mitigation measures in Section 9.6 below).

The permanent loss of structures (intact buildings, mature trees) can potentially negatively affect bats that are protected under the Irish Wildlife Acts (1976 - 2018) through reduced roosting opportunities and/or injury or fatality of roosting individuals if present during demolition/felling works. The permanent loss of trees can potentially negatively affect bats through reduced roosting opportunities. In this case, there are no structures such as buildings at site and only one tree is earmarked for removal from the southern boundary. A visual assessment of the tree due for removal noted that it has low potential for roosting bats where it may provide transient roosting opportunities for small numbers of non-breeding bats during the summer period. Where no roosting activity is present at the time of tree removal, potential effects on bats arising from the tree loss is neutral imperceptible. In the event that a small number of non-breeding roosting bats are present at the time of tree removal, potential effects are possibly negative and not significant with the relatively limited loss of likely non-breeding roosting sites, and possibly significant negative in general terms with injury/fatality of a small number of non-breeding roosting bats. However, such possible injury/fatality effects on non-breeding transient roosting bats can be reduced to neutral by implementing various measures as part of tree removal works (see mitigation measures in Section 9.6 below).

The removal of woody vegetation (scrub, hedgerow, trees) during the bird nesting season has the potential to cause injury, fatality or nest failure of adult birds and eggs/chick that are protected under the Irish Wildlife Acts (1976 – 2018 as amended). While fatality for adult nesting birds is unlikely as they can escape, eggs and chicks are likely to suffer fatality in such a scenario. The significance of such impact on nesting birds depends on variables involved such as scale (number of affected nests), seasonal timing (the later the season, the less likely that nesting pairs will try another breeding attempt for that season) and species (multi or single brooders, conservation concern). In general terms, up to a significant negative temporary effect is possible for bird nests at site that fail due to woody vegetation removal during the bird nesting season. However, such impacts can be avoided by removing woody vegetation outside of the bird nesting season (see mitigation measures in Section 9.6 below).

The removal of or construction activities within wet habitat features (wet grassland, drainage ditches) have the potential to cause injury or fatality to Common Frog individuals/spawn, which is protected under the Irish Wildlife Acts (1976 – 2018 as amended). While more mature individuals may have the ability to escape injury or fatality during relevant development activities, spawn and tadpoles/froglets are more vulnerable to suffer injury/fatality in such scenarios. The significance of such impact on Common Frog depends on variables involved such as scale (numbers) and seasonal timing (spawn laying to dispersing froglets generally occurs from early spring to summer). In general terms, a negative temporary effect is possible from injury/fatality impacts where Common Frog individuals/spawn are present at on-site wet habitat features when relevant development activities occur at such features (e.g. removal, machinery tracking through *etc.*). However, such impacts can be avoided by checking for Common Frog individuals/spawn and translocating to areas with appropriate habitat away from construction activities as required or fencing off from relevant construction activities (see mitigation measures in Section 9.6 below).

Other potential disturbance/displacement issues in relation to fauna that can also arise during the construction phase include unforeseen and generally rare scenarios such as breeding/resting activity or accidental trapping within excavations left open overnight. Measures can be taken to address such potential disturbance/displacement scenarios in relation to fauna during the construction phase (see mitigation measures in Section 9.6 below).

#### Off-Site Aquatic Links

Fauna associated with downstream water-features in the wider area such as the off-site drainage ditch and Blackwater River could be negatively affected by the proposed development through hydrological or water quality impacts such as increased siltation, nutrient release and/or contaminated run-off arising from the development works area. In this case, this potentially applies to construction phase surface-water run-off.

As previously outlined, standard environmental controls will be implemented as part of the project to ensure the appropriate management and control of run-off potentially arising from construction related activities at the site (as outlined in the Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application) that will be specific to the site, proposed works, site water-features (open drains) and downstream Blackwater River with associated designated sites. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the construction stage that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including off-site aquatic features (see Construction and Demolition Waste Management Plan by Walsh Design Group 2022d accompanying the planning application). Taking the above into consideration, potential construction related effects on fauna associated with downstream water-features in the wider area via surface-water run-off impacts are considered neutral.

### 9.5.3.2 Operational Phase Impacts

#### Habitat Loss/Change

The proposed Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O’Meara Landscape Architects in Appendix 4.1 of this EIAR) will create various new habitats for fauna (including pollinators) that will provide resting/roosting, breeding and feeding opportunities for various fauna by supporting a diversity of native/non-native pollinator friendly dominant planting in line with All Ireland Pollinator Plan recommendations during the operational phase. Landscaping proposals will result in an overall net gain of native-dominant woody features at the site and continuance of wildlife corridors, but it is important to acknowledge that there will be a net loss of wet grassland habitat and associated faunal opportunities. While the loss of wet grassland habitat will continue as a slight to moderate negative effect on associated fauna in its own right from the existing situation, the successful implementation of new planting proposals will result with a slight positive effect on fauna overall as native/non-native pollinator friendly dominant planting matures in line with All Ireland Pollinator Plan recommendations (e.g. NBDC 2016). If such native/non-native pollinator friendly dominant landscaping fails, the resulting effect on overall fauna is still considered as slight to moderate negative. There is an opportunity to maximise the biodiversity effects of habitats/landscaping during the operational phase through the successful implementation of a management plan of same (see mitigation measures in Section 9.6 below).

### Disturbance/Displacement

There will be an on-going level of disturbance potentially affecting fauna at the study site during the operational phase of the proposed development. While affected fauna will be able to move into the surrounding landscape, other fauna will become habituated to anthropogenic activity associated with the operational development. As no further tree removal is required during the operational phase, potential impacts on tree-based bat roosts are not relevant. Taking the above into consideration, potential operational phase effects regarding disturbance/displacements impacts on fauna are therefore considered neutral imperceptible.

Operational stage disturbance effects also include disturbance to bats arising from artificial light spillage into the environment from the associated lighting scheme. Lighting types that emit a narrow spectrum with no UV (e.g. low pressure sodium) attract relatively less insects than broad spectrum types with high or low UV (e.g. high pressure sodium, Metal halide and mercury; see Bat Conservation Ireland 2010, Stone 2013). Therefore, the narrow spectrum types with no UV have a relatively lower impact on bats by not attracting their insect prey base away from the nearby habitats where bats will be searching for prey (see Bat Conservation Ireland 2010, Stone 2013). The use of directional lighting and luminaire accessories (shield, louvre) are also very successful approaches to reducing light spillage nuisance into the surrounding environment (see Bat Conservation Ireland 2010, Stone 2013, BCT & ILP 2018) in relation to bats. Of course, minimising light spillage nuisance also benefits other fauna that are active/resting at night. In this case, areas of the study site that are considered sensitive to artificial lighting in relation to bats coincide with existing trees/new tree planting areas at the study site or the adjoining area in general. The proposed lighting scheme here will focus lighting on areas where it is needed as much as possible (roads, streets, footpaths) and minimise spillage onto relevant sensitive areas such as retained/new woody features (hedgerow, trees) at the study site or the adjoining area in general (see Street Lighting Report by Walsh Design Group 2022c accompanying the planning application). Potential effects on fauna at the study site arising from the operation of the proposed development are considered neutral imperceptible where the lighting scheme ensures that artificial light spillage is minimised in relation to sensitive areas such as retained/new woody features at the study site or the adjoining area in general (see mitigation measures in Section 9.6 below).

### Access

The existing hedgerow feature along the southern boundary will be retained with supplementary native planting where appropriate during the operational phase, while the eastern boundary will have a 1.2m high steel mesh fence inset into a new native planted hedgerow and the northern/western boundaries will have a 1.8m high block wall (see Landscape Design Report by Cathal O'Meara 2022 accompanying the planning application). Perimeter fencing/walls could impact negatively on mammal movement by creating an impediment or barrier during the operational phase. However, potential effects on fauna at the study site arising from impediment/barrier associated with new fencing during the operational phase could be neutral imperceptible where continued access for mammals is maintained (i) either through the incorporation of mammal access points at regular intervals (at least every 50-75m) along the proposed new eastern boundary fencing in question (*i.e.* 1.2m high steel mesh fence inset into a new native planted hedgerow) or (ii) ensuring that a minimum gap of 200mm is maintained between the bottom of this eastern boundary fence and ground throughout (see mitigation measures in Section 9.6 below). Such measures will be designed to allow small and medium sized mammals to pass through freely. In the case where access points are incorporated into the perimeter fence at regular intervals, such mammal access points will be designed in accordance with standard guidelines for the provision of mammal access (e.g. DMRB 1997), where openings will be at least 250mm high x 220mm wide.

**Off-Site Aquatic Links**

Fauna associated with downstream water-features in the wider area such as the off-site drainage ditch and Blackwater River could be negatively affected by the proposed development through hydrological or water quality impacts such as increased siltation, nutrient release and/or contaminated run-off arising from the operational development. In this case, this potentially applies to operational surface-water run-off via the drainage network as well as operational waste-water/foul effluent via Fermoy WWTP.

As previously outlined, the proposed operational surface-water drainage strategy will appropriately manage and control run-off associated with the development (see Civil Engineering Report by Walsh Design Group 2022a accompanying the planning application). Such surface-water operational management proposals will be specific to the site, operations, site water-features (open drains) and downstream Blackwater River with associated designated sites. Furthermore, other wastes associated with the development will be collected and removed from site by licensed operators during the operational stage that will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including off-site aquatic features.

Regarding treated waste-water/foul effluent, treated discharge from Fermoy WWTP is compliant (see Section 2.1.2 of Irish Water 2021) with ‘good’ contemporary water quality/WFD status upstream and downstream of the WWTP discharge point at the Blackwater River and associated designated sites (as outlined in Section 9.5.1.4 above). Furthermore, there is remaining capacity currently available at Fermoy WWTP to cater for the additional proposed foul effluent here that has been confirmed by Irish Water (as previously outlined in Section 9.5.1.4 Fermoy WWTP Status & Water Quality).

Taking the above into consideration, potential operational related effects on fauna associated with downstream water-features in the wider area via surface-water run-off and waste-water discharge impacts are considered neutral.

### 9.5.4 Do-Nothing Scenario

In the ‘do-nothing’ scenario the study site will continue to be of lower to higher local importance for biodiversity, where land use continues to comprise of existing agricultural farmland (varying from intensively managed improved grassland to less intensively managed wet grassland) with areas of scrub, wet woodland and hedgerow/treeline.

Depending on the level of management in place at the site, it is possible that scrub present in the existing situation will continue to expand in area and encroach into other existing habitats in the short-term to long-term/permanent, including the wet grassland fields. Alternatively, the areas of wet grassland could be brought back to more intensive agricultural use with associated reduced biodiversity value where ground water is drained and rough pasture is reduced.

However, a change from the existing scenario is most likely to involve future development given that the study site is zoned for residential development under the current Fermoy Municipal District Local Area Plan (see Objective FY-R-08, CCC 2017).

### 9.5.5 Cumulative Effects

Cumulative effects could potentially relate to a reduction in biodiversity through habitat loss/change collectively arising from other relevant Fermoy area proposed/permitted developments. Potential cumulative effects could also include surface-water run-off and operational related waste-water/foul effluent via Fermoy WWTP into downstream water-features such as the Blackwater River with associated designations here through hydrological or water quality impacts such as increased siltation, nutrient release, contaminated run-off collectively arising from other relevant proposed/permitted developments locally.

In this case, other such proposed/permitted projects include (i) proposed 11 no. residential housing units at Uplands, Fermoy (Part 8 Housing Scheme, Cork County Council), (ii) proposed extension at St. Colmans College, Monumental Hill, Fermoy (Planning Reference 21/4049), (iii) permitted change of use (through intensification of use) of part of an existing light industrial building (Planning Reference 20/6246), (iv) proposed 28 no. residential units and all ancillary site development works at Cork Road, Coolcorran, Fermoy (Planning Reference: 21/7241) and (v) permitted construction of valeting buildings, car wash, including demolition of buildings/structures (Planning Reference: 19/6221).

#### 9.5.5.1 Habitat Loss/Change

Construction of the proposed development will primarily impact features of higher or lower local value, where the higher local value features are confined to areas of marshy wet grassland in this case. Only 10 trees will need to be removed to facilitate the development, with all remaining trees/treelines, hedgerows as well as a wet woodland copse being retained. The proposed Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR) will support a diversity of native/non-native pollinator friendly dominant planting that will result in an overall net gain of native-dominant woody features (trees, hedgerow, shrub) at the site and allow a continuance of wildlife corridors. Although, it is acknowledged that there will be a net loss of wet grassland habitat arising from the development here that is considered as a slight to moderate negative effect in its own right within the context that some areas of wet grassland will be retained along the eastern boundary of the study site (including a proposed translocated area of wet grassland turf from an area of higher value marshy wet grassland community as part of the landscape layout). Following the successful implementation of new planting proposals however, the resulting effect on overall biodiversity from the current situation is considered as slight positive.

Taking the above into consideration, no significant adverse cumulative effects in respect of loss/change impacts in habitat and associated flora/fauna are considered likely as a result of the proposed development in combination with other relevant permitted developments.

#### 9.5.5.2 Off-Site Water-Features

The currently adopted Cork County Development Plan outlines a county-based objective in relation to the management of surface water by new developments through the incorporation of SuDS and provision of adequate storm-water infrastructure (Section 11.5 & Objective WS 5-1; CCC 2014). The current Fermoy Municipal District Local Area Plan also makes reference to an objective for new development to adequately provide for storm-water infrastructure and to plan surface-water management in an integrated way that considers land use, water quality, amenity and habitat enhancements as appropriate (Objective FY-GO-11; CCC 2017). The surface-water design strategy incorporated into the development here compliments both the Cork County Development Plan and Fermoy Municipal District Local Area Plan objectives relating to surface-water management through the inclusion of operational SuDS related aspects such as permeable paving, tree pits & filter drains, infiltration areas and water butts.

Treated discharge from Fermoy WWTP is compliant (see Section 2.1.2 of Irish Water 2021) with 'good' contemporary water quality/WFD status upstream and downstream of the WWTP discharge point at the Blackwater River and associated Natura 2000 sites (as outlined in Section 9.5.1.4 above). Furthermore, there is remaining capacity currently available at Fermoy WWTP to cater for the additional proposed foul effluent here that has been confirmed by Irish Water (as previously outlined in Section 9.5.1.4 Fermoy WWTP Status & Water Quality).

Assuming that all other Fermoy related developments closely adhere to standard environmental practice regarding soil and water management, as per the development under consideration here (as outlined in Section 9.6.1 below), then significant adverse cumulative effects are considered unlikely in relation to off-site water-features with associated designations.

Taking the above into consideration, along with the proposed environmental management and controls integrated into the project design here (see Section 9.6.1 below), significant adverse effects on off-site water-features (with associated designations) related to cumulative and in-combination effects are not considered likely in this case.

## 9.6 Mitigation

The following mitigation measures will be implemented as part of the proposed project in order to minimise potential impacts on existing ecology as discussed above, where these measures have taken cognisance of the currently adopted Cork County Development Plan regarding the protection/enhancement of biodiversity and associated objectives (e.g. Chapter 12 of CCC 2014).

### 9.6.1 Designated Nature Conservation Sites

The following mitigation measures will be integrated as part of the proposed development regarding environmental protection specific to the site, works/operations, site water-features (open drains) and downstream Blackwater River with associated Blackwater River (Cork/Waterford) SAC, Blackwater Callows SPA and Blackwater River Callows pNHA in relation to potential construction/operational phase surface-water run-off drainage effects.

#### 9.6.1.1 Construction Phase

Implement the following construction related run-off controls that are proposed as part of the development in question (after Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application);

- To ensure that there will be no contamination of surface water, any excess excavated material will be immediately removed (*i.e.* either used within the development for landscaping or removed to a licenced fill facility);
- The short term storage and removal/disposal of excavated material will be planned and managed such that the risk of pollution from these activities is minimised;
- Silt fencing will be erected and maintained in place during the construction phase and until such time as the integrity of the re-instated ground/material has been fully established;
- The silt fencing will be checked twice daily during construction and once per day thereafter to ensure that it is working satisfactorily until such time as the re-instated ground/material has been fully established;
- Sediment traps (such as earthen berms and/or settlement ponds) and/or silt fences will be provided to prevent run-off from the site;
- Drainage channels beside construction roads will flow into settlement ponds or swales in series to allow primary and secondary settlement of sediment. Each swale series will have an outfall manhole directly downstream in which final settlement can take place and the outfall can be monitored. Outfall manholes will be regularly emptied of sediment during periods of heavy rainfall. These measures will prevent run-off from the site and total suspended solid levels in all discharge shall be in compliance with the Quality of Salmonid Water Regulations (SI 293:1988);

- Through all stages of the construction phase the contractor will ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution of all types;
- The storage of oils, hydraulic fluids *etc.* will be in a bunded facility with filling and take off points within the bunded area in accordance with current best practice;
- The pouring of concrete, sealing of joints, application of water proofing paint *etc.* will be completed in the dry to avoid pollution of the freshwater environment. As grout /cementitious materials are highly toxic to aquatic life all such works must be contained in complete isolation of all waters and storm water systems.

#### 9.6.1.2 Operational Phase

Implement operational stage run-off management proposals to be integrated into the development under consideration here that are summarised as follows (see Civil Engineering Report by Walsh Design Group 2022a and Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application):

- The proposed SuDS surface-water drainage design will release stormwater at the existing greenfield run-off rate through a combination of source control interception (*i.e.* permeable paving, tree pits & filer drains, infiltration areas, water butts) along with hydrocarbon interceptors and attenuation storage.
- The storm drainage calculations shall ensure that the proposed storm drainage networks are appropriately sized to serve the new development as proposed;
- A cleaning and maintenance schedule will be implemented for the proposed storm drainage system during the operation phase. Each gully will be fitted with silt traps to be emptied as part of the silt management and maintenance schedule;
- The proposed storm network will be inspected following construction to ensure that no cross connection between the proposed foul and storm network exists;
- The storm drainage system will be cleaned appropriately and inspected prior to being fully commissioned *i.e.* before being allowed to discharge to receiving waters.
- Water sampling of the receiving waters upstream and downstream of the proposed outfall will be undertaken before construction commences and for a period of 6 months following the completion of the development to ensure that the proposed water quality controls (both for the construction and operational phases) are appropriate and operating satisfactorily;
- There will be bunding of any domestic heating oil tanks to prevent possible spillage runoff.
- Hydrocarbon interceptors shall be installed upstream of the attenuation tank in each of the 6 surface water networks to further protect the quality of the surface water discharged.

### 9.6.2 Habitats & Flora

#### 9.6.2.1 Construction Phase

- No removal/damage of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase, where the development site works area/footprint will be clearly marked for associated site staff.
- The final landscape plan will incorporate a native/non-native pollinator friendly dominant tree/shrub and ground flora planting scheme (in line with All Ireland Pollinator Plan recommendations and associated guidance such as NBDC 2016) that will result in a net gain of native tree/hedge/shrub planting. This is achieved by landscaping proposals for the proposed development here (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR and Landscape Design Report by Cathal O'Meara 2022 accompanying the planning application).
- A site assessment will be undertaken by a suitably qualified/experienced Ecologist or Invasive Plant Specialist prior to enabling/construction activities to assess the most up-to-date status of invasive plants (e.g. Cherry Laurel *Prunus laurocerasus*, Winter Heliotrope *Petasites fragrans*, Buddleia *Buddleia davidii*) at the site relative to the works area. Where relevant, invasive plants will be managed/eradicated and monitored in line with current guidelines where available (e.g. NRA 2010) under the advice/supervision of a suitably qualified/experienced Ecologist and/or Invasive Plant Specialist. The management of invasive plants will need to be incorporated into the final Construction and Environmental Management Plan for the project to inform the need to manage works accordingly.

- Existing trees/hedgerow/shrubs being retained at/close to the development area will be protected in line with tree protection recommendations where relevant (e.g. Tree Survey Report by Arbor-Care 2020 accompanying the planning application) as well as current guidelines (e.g. NRA 2006, BS 5837).
- Measures summarised in Section 9.6.1.1 above regarding potential surface-water related impacts and associated effects will be implemented to ensure protection of downstream water-features in the wider area (drainage ditch and Blackwater River in this case) and associated habitats/flora.

#### 9.6.2.2 Operational Phase

- Ongoing maintenance and management of habitats/landscaped areas associated with the development will include wildlife considerations such as pollinators that will be implemented through a Habitats & Landscape Wildlife Management Plan under the advice/supervision of a suitably qualified Ecologist or similar specialist. The Habitats & Landscape Wildlife Management Plan will address the following at a minimum in line with current guidelines (e.g. NBDC 2016): reduced grass/lawn mowing frequency; avoidance/reduction of pesticide/herbicide use within green areas; native supplementary planting at retained hedgerow sections; reduced hedgerow trimming frequency. This measure overlaps with operational phase mitigation for fauna below.
- As mentioned in Section 9.6.1.2 above, a cleaning and maintenance schedule will be implemented for the proposed storm drainage system during the operation phase (including hydrocarbon interceptors *etc.*). Such maintenance will ensure that excessive build-up of sludge is identified and appropriately removed before it becomes a pollution (risk) item in relation downstream water-features in the wider area (drainage ditch and Blackwater River in this case).

### 9.6.3 Fauna: Birds, Non-volant Mammals, Bats, Other Taxa & Aquatic

#### 9.6.3.1 Construction Phase

- Subject to other environmental concerns (e.g. soil and run-off management), the removal of woody vegetation (tree, scrub) during site enabling/clearance/construction activities will not be undertaken during the bird nesting season (currently defined as March 1st to August 31st inclusive by the Irish Wildlife Acts 1976 – 2018 as amended). This will protect nesting birds and eggs/chicks from disturbance (especially through nest failure), injury, fatality.
- In tandem with study site enabling/clearance/construction activities, a suitably qualified/experienced Ecologist will supervise/check areas where woody vegetation removal is due (e.g. scrub) to identify potential unforeseen wildlife issues (e.g. unknown badger sett) so that appropriate measures can be undertaken in accordance with best practice guidelines and in consultation with NPWS where relevant.
- Regarding tree felling and bats;
    - The mature Ash tree (at the southern boundary) due for felling that was identified as having low potential suitability for bat roosts will be re-assessed in advance of felling by a suitably qualified/experienced Ecologist in accordance with best practice guidelines (e.g. BTHK 2018, Collins 2016). If this tree is considered to have potential to support bat roosts at the time, it will be marked in the field to allow easy identification for all site staff and thereby ensure protection from inappropriate felling (e.g. erect a notice as per NRA 2005). The subsequent felling of this tree will be undertaken under the advice/supervision of a suitably qualified/experienced Ecologist in accordance with best practice guidelines (e.g. NRA 2005) and in consultation with NPWS where relevant (e.g. derogation licence to remove bat tree roost; see NRA 2005).
    - Where unforeseen circumstances require the removal of additional trees, as above - all such trees will be assessed in advance of felling by a suitably qualified/experienced Ecologist in accordance with best practice guidelines (e.g. BTHK 2018, Collins 2016), to identify tree specimens with potential to support bat roosts. All trees with potential to support bat roosts will be marked in the field to allow easy identification for all site staff and thereby ensure protection from inappropriate felling (e.g. erect a notice as per NRA 2005). The subsequent felling of all such trees to be undertaken under the advice/supervision of a suitably qualified/experienced Ecologist in accordance with best practice guidelines (e.g. NRA 2005) and in consultation with NPWS where relevant (e.g. derogation licence to remove bat tree roost; see NRA 2005).
- Regarding fauna species actively breeding/resting;
    - Given the wet nature of the site and known usage by Common Frog, wet features (wet grassland, drains) will be checked as required in advance of and during site enabling/clearance/construction activities for the presence of Common Frog individuals/spawn that are protected by the Irish Wildlife Acts 1976 – 2018 (as amended). Where individuals/spawn are present, they will be translocated to areas with appropriate habitat away from construction activities and/or fenced off from relevant

construction activities for protection under the advice/supervision of a suitably qualified/experienced Ecologist in accordance with best practice guidelines and in consultation with NPWS where relevant (e.g. licence).
    - Where a fauna species is found actively using the development footprint for breeding/resting (e.g. bird nest, bat roosting, hare, common frog) during site enabling/clearance/construction activities, relevant works will cease immediately and the area will be cordoned off until advice is sought from a suitably qualified/experienced Ecologist.
- Construction operations during the hours of darkness will be kept to a minimum; this will minimise disturbance to species that are roosting/resting or active at night.
- Where open excavations must be left in-situ overnight during the construction phase, measures will be taken to ensure that fauna such as mammals do not become inadvertently trapped and potentially injured within such open excavations. Such measures (covering, fencing off, allowing access/egress) will be decided under the advice of an Ecologist.
- The construction phase lighting scheme will be designed to minimise light spillage nuisance at retained/new woody features of the study site and adjoining areas by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories (e.g. shielding plates). This will benefit bats as well as other fauna active/resting at night.
- The final landscape plan will incorporate native/non-native pollinator friendly dominant tree/shrub and ground flora planting scheme (in line with All Ireland Pollinator Plan recommendations and associated guidance such as NBDC 2016) that will result in a net gain of native tree/hedge/shrub planting, while also ensuring that new planting connects to woody habitat/other vegetation in order to maintain and provide connectivity for fauna via wildlife corridors. This is achieved by landscaping proposals for the proposed development here (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR).
- Measures summarised in Section 9.6.1.1 above regarding potential surface-water related impacts and associated effects will be implemented to ensure protection of downstream water-features in the wider area (drainage ditch and Blackwater River in this case) and associated fauna.

#### 9.6.3.2 Operational Phase

- Ongoing maintenance and management of habitats/landscaped areas associated with the development will include wildlife considerations such as pollinators that will be implemented through a Habitats & Landscape Wildlife Management Plan under the advice/supervision of a suitably qualified Ecologist or similar specialist. The Habitats & Landscape Wildlife Management Plan will address the following at a minimum in line with current guidelines (e.g. NBDC 2016): reduced grass/lawn mowing frequency; avoidance/reduction of pesticide/herbicide use within green areas; native supplementary planting at retained hedgerow sections; reduced hedgerow trimming frequency. This measure overlaps with operational phase mitigation for habitats and flora above.
- The operational phase lighting scheme will be designed to minimise light spillage nuisance at retained/new woody features of the study site and adjoining areas by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories (e.g. shielding plates). This will benefit bats as well as other fauna active/resting at night. The proposed lighting scheme here will focus lighting on areas where it is needed as much as possible (roads, streets, footpaths) and minimise spillage onto relevant sensitive areas such as retained/new woody features (hedgerow, trees) at the study site or the adjoining area in general (see Street Lighting Report by Walsh Design Group 2022c accompanying the planning application) – in the event the proposed operational artificial lighting scheme will be changed, the revised scheme will also be reviewed by an Ecologist/Bat Specialist and altered accordingly under their advice.
- As mentioned in Section 9.6.1.2 above, a cleaning and maintenance schedule will be implemented for the proposed storm drainage system during the operation phase (including hydrocarbon interceptors *etc.*). Such maintenance will ensure that excessive build-up of sludge is identified and appropriately removed before it becomes a pollution (risk) item in relation downstream water-features in the wider area (drainage ditch and Blackwater River in this case).
- Mammal access to the study site will be maintained (i) either through the incorporation of mammal access points at regular intervals (at least every 50-75m) along the proposed new eastern boundary fencing in question (*i.e.* 1.2m high steel mesh fence inset into a new native planted hedgerow) or (ii) ensuring that a minimum gap of 200mm is maintained between the bottom of this (same) eastern boundary fence and ground throughout. In the case where access points are incorporated into the perimeter fence at regular intervals, such mammal access points will be designed in accordance with standard guidelines for the provision of

mammal access (e.g. DMRB 1997), where openings will be at least 250mm high x 220mm wide. Such measures will be designed to allow small and medium sized mammals to pass through freely under the advice and/or supervision of an Ecologist.

## 9.7 Monitoring

### 9.7.1 Construction Phase Monitoring

A suitably qualified/experienced Ecologist will be engaged in the role of Ecological Clerk of Works (ECoW) for the construction phase of the project, whose role will include the following monitoring in relation to relevant proposed mitigation measures (as outlined in Section 9.6) through liaising with relevant experts/team-members where required;

- Ensure that the development works area/footprint is clearly marked out with no removal of habitats or movement of construction machinery outside of this area.
- Review final landscaping plan to ensure it is in line with/equivalent to planting proposals regarding native and non-native pollinator friendly tree/shrub planting and wildlife corridor connectivity.
- Ensure that retained trees/shrub are adequately protected.
- Ensure that invasive plants are appropriately managed/eradicated with a field assessment to determine the most up-to-date status of invasive plants (e.g. Cherry Laurel, Winter Heliotrope Buddleia) relative to the works area.
- Ensure that measures summarised in Section 9.6.1 above (as based on Construction & Environmental Management Plan by Walsh Design Group 2022b accompanying the planning application) regarding potential surface-water related polluting activities are implemented to ensure protection of downstream water-features in the wider area (drainage ditch and Blackwater River in this case).
- Ensure that the removal of woody vegetation features (tree, scrub) does not occur during the bird breeding season.
- Ensure that areas where woody vegetation removal is due (e.g. scrub) are checked for unforeseen wildlife issues (e.g. unknown badger sett) with appropriate follow-up actions where required.
- Ensure that a pre-felling/removal assessment of bat roosting potential/activity in relation to trees due for removal is undertaken, with subsequent protection and appropriate follow-up actions where required.
- Ensure that wet features (wet grassland, drains) are monitored for Common Frog individuals/spawn as needed in advance of and during site enabling/clearance/construction activities for the presence of Common with appropriate follow-up actions where required.
- Ensure that where a fauna species is found actively using the development footprint for breeding/resting (e.g. bird nest, bat roosting, hare, common frog) during site enabling/clearance/construction activities, relevant works are ceased immediately and that the area is cordoned off until appropriate follow-up actions are undertaken where required.
- Assess the potential for overnight open excavations to inadvertently trap mammals with appropriate follow-up actions where required.
- Review construction/operational phases lighting plan to ensure minimal light spillage nuisance at retained/new woody features of the study site and adjoining areas.
- Ensure that mammal access is correctly incorporated into proposed new eastern boundary fencing comprising of 1.2m high steel mesh fence inset into a new native planted hedgerow.

### 9.7.2 Operational Phase Monitoring

The following operational stage monitoring will be undertaken in relation to relevant proposed mitigation measures (as outlined in Section 9.6) by engaging the relevant experts;

- Ongoing maintenance and management of habitats/landscaped areas associated with the development will include wildlife considerations such as pollinators that will be implemented through a Habitats & Landscape Wildlife Management Plan under the advice/supervision of a suitably qualified Ecologist or similar specialist. The Habitats & Landscape Wildlife Management Plan will address the following at a minimum in line with current guidelines (e.g. NBDC 2016): reduced grass/lawn mowing frequency; avoidance/reduction of pesticide/herbicide use within green areas; native supplementary planting at retained hedgerow sections; reduced hedgerow trimming frequency.

- A cleaning and maintenance schedule will be implemented for the proposed storm drainage system during the operation phase (including hydrocarbon interceptors *etc.*). Such maintenance will ensure that excessive build-up of sludge is identified and appropriately removed before it becomes a pollution (risk) item in relation downstream water-features in the wider area (drainage ditch and Blackwater River in this case).

## 9.8 Conclusion: Residual Effects

The study site and associated proposed development works footprint is of lower to higher local biodiversity value overall, where the higher local value features are confined to areas of marshy wet grassland in this case. The proposed Landscape Layout (see Landscape Layout Drawing Nos. 1920 LA_P001, 1920 LA_P002 & 1920 LA_P003 by Cathal O'Meara Landscape Architects in Appendix 4.1 of this EIAR) will support a diversity of native/non-native pollinator friendly dominant planting that will result in an overall net gain of native-dominant woody features (trees and hedgerow) at the site and allow a continuance of wildlife corridors. It is acknowledged that there will be a net loss of wet grassland habitat arising from the development here within the context that some areas of wet grassland will be retained along the eastern boundary of the study site as part of the landscape layout (including a proposed translocated area of wet grassland turf from an area of higher value marshy wet grassland community).

While no impact has been identified with the potential for significant negative effects on any aspect of biodiversity in the absence of mitigation, various biodiversity related mitigation measures have nonetheless been identified that will be implemented as part of the proposed project. Residual effects associated with potential ecological impacts arising from the proposed residential development (as discussed in Section 9.5 above) are considered;

- Neutral for designated sites in the wider area, where a NIS in support of the AA process has been undertaken in relation to Natura 2000 sites of relevance here (see KES 2022 accompanying the planning application).
- Neutral for the downstream water-features in the wider area (drainage ditch and Blackwater River in this case) and associated habitats/flora and fauna.
- Slight to moderate negative for wet grassland habitat in its own right due to a net loss of same but slight positive on semi-natural habitats/flora overall at the study site as new planting/landscaping successfully matures into a native/non-native pollinator friendly dominant scheme with a net gain of native-dominant woody features at the site (trees, hedgerow) in line with All Ireland Pollinator Plan recommendations (e.g. NBDC 2016) or slight to moderate negative for habitats/flora overall at the study site where new planting/landscaping fails to successfully mature into a native/non-native pollinator friendly dominant scheme with a net gain of native-dominant woody features at the site (trees, hedgerow) in line with All Ireland Pollinator Plan recommendations (e.g. NBDC 2016).
- Positive for the study site and wider locality in general with the successful management/eradication of non-native invasive plants or slight to moderate negative for the study site and wider locality in general where management/eradication of invasive plants at the study site fails for whatever reason allowing for the spread of same.
- Slight to moderate negative for wet grassland associated fauna due to a net loss of wet grassland from the existing situation but slight positive on fauna overall at the study site as new planting/landscaping successfully matures into a native/non-native pollinator friendly dominant scheme in line with All Ireland Pollinator Plan recommendations (e.g. NBDC 2016) or slight to moderate negative for fauna overall at the study site where new planting/landscaping fails to successfully mature into a native/non-native pollinator friendly dominant scheme in line with All Ireland Pollinator Plan recommendations (e.g. NBDC 2016).
- Neutral for fauna (including bats) in relation to general on-going operational disturbance/displacement impacts including a lighting scheme that ensures artificial light spillage is minimal onto retained/new woody features at the study site and adjoining area along with continued access for small and medium sized mammals.

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**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 10

## Noise and Vibration

# Volume II

Environmental Impact Assessment Report

Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 10 Noise and Vibration

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# 10 Noise and Vibration

## 10.1 Introduction

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impact associated with the proposed development during both the short-term construction phase and the long-term operational phase on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

### 10.1.1 Author Information and Competency

This section of the EIAR has been prepared by AWN to assess the noise and vibration impact of the proposed development in the context of current relevant standards and guidance. This assessment has been prepared by Leo Williams BAI MAI PgDip AMIOA, Senior Acoustic Consultant at AWN Consulting who has over 5 years' experience as an environmental consultant specialising in Acoustics and Environmental Impact Assessment.

### 10.1.2 Guidelines Relevant to Preparation of EIAR

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following Environmental Protection Agency (EPA) guidelines were considered and consulted in the preparation of this Chapter:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017); and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018).

## 10.2 Methodology

The study has been undertaken using the following methodology:

- Baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site;
- 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, this is summarised in the following sections;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the project at the nearest sensitive locations (NSLs) to the site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- 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.

### 10.2.1 Construction Phase - Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

#### 10.2.1.1 British Standard BS 5228 – 1: 2009+A1:2014

Reference is made to British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise (hereinafter referred to as BS 5228-1:2009+A1:2014) as appropriate criteria relating to permissible construction noise threshold levels for a development of this scale may be found in BS 5228-1:2009+A1:2014.

Potential noise impacts during the construction stage of a project are often assessed in accordance with BS 5228-1:2009+A1:2014. Various mechanisms are presented as examples of determining if an impact is occurring, these are discussed in the following paragraphs.

ABC Method

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities, depending on context.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 10.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

**Table 10.1 Example Threshold of Significant Effect at Dwelling**

| Assessment category and threshold value period (LAeq) | Threshold Value, in Decibels (dB) | | |
|---|---|---|---|
| | Category A Note A | Category B Note B | Category C Note C |
| Daytime (07:00 – 19:00)<br>and<br>Saturdays (07:00 – 13:00) | 65 | 70 | 75 |
| Evenings and weekends Note D | 55 | 60 | 65 |
| Night-time (23:00 to 07:00hrs) | 45 | 50 | 55 |

Note A - Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Note 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.

Note C - Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

Note D - 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur. 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.

The closest neighbouring noise sensitive properties to the proposed development are dwellings to the west of the site along the R639. Other sensitive receivers are located in residential estates to the north and to the east of the proposed development.

**Fixed Limits**

Review of the proposed development surroundings identified several commercial receivers located to the west of the development site.

When considering non-residential receptors, reference is made to BS 5228-1:2009+A1:2014, which gives several examples of acceptable limits for construction noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states: -

“Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut.”

Paragraph E.2 goes on to state: -

“Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed: -

70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;

75 decibels (dBA) in urban areas near main roads in heavy industrial areas”.

**Proposed Threshold Noise Levels**

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 10.3), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development: -

For residential NSLs it is considered appropriate to adopt 65 dB(A) CNT depending on existing noise level. Given the baseline monitoring carried out, it would indicate that Category A values are appropriate using the ABC method.

For non-residential NSLs it is considered appropriate to adopt the 70 dB(A) CNT, given the urban environment in which the community centre resides, in line with BS 5228-1:2009+A1:2014.

Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 10.2 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2017).

Table 10.2: Construction Noise Significance Ratings

| Guidelines for Noise Impact Assessment Significance (DMRB) | CNT per Period | EPA EIAR Significance Effects | Determination |
|---|---|---|---|
| Negligible | Below or equal to baseline noise level | Not Significant | Depending on CNT, duration & baseline noise level |
| Minor | Above baseline noise level and below or equal to CNT | Slight to Moderate | |
| Moderate | Above CNT and below or equal to CNT +5 dB | Moderate to Significant | |
| Major | Above CNT +5 to +15 dB | Significant, to Very Significant | |
| | Above CNT +15 dB | Very Significant to Profound | |

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.

#### 10.2.1.2 Construction Traffic

In order to assist with the interpretation of construction traffic noise, Table 10.3 includes guidance as to the likely magnitude of impact associated with changes in traffic noise levels along an existing road. This is taken from Table 3.17 of the DMRB Noise and Vibration (UKHA 2020).

Table 10.3 Likely Effect Associated with Change in Traffic Noise Level – Construction Phase

| Magnitude of Impact | Increase in Traffic Noise Level (dB) |
|---|---|
| No impact | Less than 1.0 |
| Minor | Greater than or equal to 1.0 and less than 3.0 |
| Moderate | Greater than or equal to 3.0 and less than 5.0 |
| Major | Greater than or equal to 5.0 |

In accordance with the DMRB Noise and Vibration, construction noise and construction traffic noise impacts shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights;
- A total number of days exceeding 40 in any six consecutive months.

### 10.2.2 Construction Phase - Vibration

Vibration standards address two aspects: those dealing with cosmetic or structural damage to buildings and those with human comfort. For the purpose of this scheme, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

#### 10.2.2.1 Building Damage

With respect to vibration, British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 10.4 are recommended.

Table 10.4 Recommended Vibration Criteria During Construction Phase

| **Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:** | | |
|---|---|---|
| Less than 15Hz | 15 to 40Hz | 40Hz and above |
| 12 mm/s | 20 mm/s | 50 mm/s |

Expected vibration levels from the construction works will be discussed further in Section 10.5.

#### 10.2.2.2 Human Perception

People are sensitive to vibration stimuli at levels orders of magnitude below those which have the potential to cause any cosmetic damage to buildings. There are no current standards which provide guidance on typical ranges of human response to vibration in terms of PPV for continuous or intermittent vibration sources.

BS5228-2:2009+A1:2014, provides a useful guide relating to the assessment of human response to vibration in terms of the PPV. Whilst the guide values are used to compare typical human response to construction works, they tend to relate closely to general levels of vibration perception from other general sources.

Table 10.5 below summarises the range of vibration values and the associated potential effects on humans.

Table 10.5 Guidance on Effects of Human Response to PPV Magnitudes

| **Vibration Level, PPV** | **Effect** |
|---|---|
| 0.14mm/s | Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration. |
| 0.3mm/s | Vibration might be just perceptible in residential environments. |
| 1mm/s | It is likely that a vibration level of this magnitude in residential environments will cause complaint. |

Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin and or the duration of vibration is known. For example, ground breaking can typically be tolerated at vibration levels up to 2.5 mm/s if adequate public relations are in place and timeframes are known. These values refer to the day-time periods only.

During surface construction works (demolition and groundbreaking etc.) the vibration limits set within Table 10.5 would be perceptible to building occupants and have the potential to cause subjective effects. The level of effect is, however, greatly reduced when the origin and time frame of the works are known and limit values relating to structural integrity are adequately communicated. In this regard, the use of clear communication and information circulars relating to planned works, their duration and vibration monitoring can significantly reduce vibration effects to the neighbouring properties.

Interpretation of the Human Response to Vibration

In order to assist with interpretation of vibration thresholds, Table 10.6 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014.

Table 10.6 Human Response to Vibration - Significance Ratings

| Criteria | Impact Magnitude | 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 |
| Less than 0.14 mm/s PPV | Very Low | Imperceptible to Not significant |

## 10.2.3 Operational Phase - Noise

### 10.2.3.1 Mechanical Plant

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment is BS 4142 Methods for rating and assessing industrial and commercial sound (2014). This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in "background" noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

> "Specific sound level, LAeq, Tr" is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T. This level has been determined with reference to manufacturers information for specific plant items.

> "Rating level" LAr,Tr is the specific noise level plus adjustments for the character features of the sound (if any), and;

> "Background noise level" is the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the LA90 parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142: 2014 is outlined as follows:

1. determine the specific noise level;
2. determine the rating level as appropriate;
3. determine the background noise level, and;
4. subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10 dB or more is likely to be an indication of a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise impacts are typically considered to be neutral.

### 10.2.3.2 Traffic Noise

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development. In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 10.7 is taken from DMRB Design Manual for Roads and Bridges (DMRB), Highways England Company Limited, Transport Scotland, The Welsh Government and The Department for Regional Development Northern Ireland.

Table 10.7 Significance in Change in Noise Level

| Change in Sound Level (dB) | Subjective Reaction | Magnitude of Impact | EPA Glossary of Effects[1] |
|---|---|---|---|
| 10+ | Over a doubling of loudness | Major | Significant |
| 5 – 9.9 | Up to a doubling of loudness | Moderate | Moderate |
| 3 – 4.9 | Perceptible | Minor | Slight |
| 0.1 – 2.9 | Imperceptible | Negligible | Imperceptible |
| 0 | None | No Change | Neutral |

The guidance outlined in Table 10.7 will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely long-term impacts during the operational phase.

### 10.2.4 Operational Phase - Vibration

The proposed development is residential in nature, therefore it is not anticipated that there will be any significant generation of vibration and therefore no impact associated with vibration during the operational phase.

## 10.3 Description of Existing Environment

### 10.3.1 Baseline Noise Environment

The proposed development is located at lands to the south of the town of Fermoy, County Cork. The site is bounded to the west by the R649 regional road. To the north, east and south are agricultural lands with housing estates located further out to the north and the east.

Baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site.

#### 10.3.1.1 Environmental Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

Choice of Measurement Locations

The measurement locations are described below and shown in Figure 10:1.

| | |
|---|---|
| NM1 | located adjacent to the southern sector of the proposed development adjacent to the R639. |
| NM2 | located adjacent to existing houses at Springfield to the north of the site. |
| NM3 | located adjacent to existing houses at Baile Ard to the east of the site. |

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[1] EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)

Figure 10.1 Noise Monitoring Locations

### Survey Periods

The attended noise survey took place between 13:30hrs and 16:55hrs on 13 October 2021.

### Instrumentation

The noise measurements were carried out using the equipment listed below. The instrument was calibrated before and after the survey with no significant drift noted.

Table 10.8 Monitoring Equipment Details

| Measurement | Manufacturer | Equipment Model | Serial Number | Calibration date |
|---|---|---|---|---|
| Noise | RION | NL-52 | 386771 | 17/2/2021 |

### Measurement Parameters

The noise survey results are presented in terms of the following parameters.

- LAeq is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- LAFmax is the instantaneous maximum sound level measured during the sample period using the ‘F’ time weighting.

- LA90 is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

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 2x10-5 Pa.

### Survey Results and Discussion

The results of the noise survey at the four monitoring locations are summarised below.

Location NM1

Table 10.9 Measured Noise Levels at NM1

| Period | Time | Measured Noise Levels (dB re. 2x10-5Pa) | | |
|---|---|---|---|---|
| | | LAeq | LAmax | LA90 |
| Daytime | 13:33 | 59 | 68 | 55 |
| | 14:56 | 58 | 73 | 50 |
| | 16:00 | 59 | 69 | 52 |

The noise environment at this location comprised traffic noise from the R639 and distant traffic noise from the M8 motorway. Birdsong and foliage noise was also noted. Ambient noise levels were in the range 58 to 59 dB LAeq,15min. Background noise levels were in the range 50 to 55 dB LA90,15min.

Location NM2

Table 10.10 Measured Noise Levels at NM2

| Period | Time | Measured Noise Levels (dB re. 2x10-5Pa) | | |
|---|---|---|---|---|
| | | LAeq | LAmax | LA90 |
| Daytime | 14:01 | 49 | 66 | 44 |
| | 15:17 | 50 | 69 | 45 |
| | 16:19 | 49 | 62 | 45 |

The noise environment at this location comprised birdsong, which was noted as prominent, dogs barking, activity at nearby houses and distant road traffic noise from the R639 road. Ambient noise levels were in the range 49 to 50 dB LAeq,15min. Background noise levels were in the range 44 to 45 dB LA90,15min.

Location NM3

Table 10.11 Measured Noise Levels at NM3

| Period | Time | Measured Noise Levels (dB re. 2x10-5Pa) | | |
|---|---|---|---|---|
| | | LAeq | LAmax | LA90 |
| Daytime | 14:31 | 46 | 64 | 42 |
| | 15:37 | 49 | 75 | 45 |
| | 16:41 | 50 | 71 | 45 |

The noise environment at this location also comprised birdsong, activity at nearby houses, children playing and, local and distant road traffic noise from nearby roads. At times distant traffic noise from the M8 motorway was audible. Ambient noise levels were in the range 46 to 50 dB LAeq,15min. Background noise levels were in the range 42 to 45 dB LA90,15min.

## 10.4 Characteristics of the Proposed Development

The proposed development is residential in nature, comprising ca. 336 dwellings, external amenity areas, a creche and ancillary infrastructure. A full description is provided in Chapter 2 - Project Description.

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction and demolition phase; and,
- Operational phase.

The construction phase will involve demolition, excavation over the development site, construction of foundations and buildings, landscaping, and vehicle movements to site using the local road network. This phase will generate the highest potential noise impact due to the works involved, however the time frame is short term in duration.

The primary sources of outward noise in the operational context are deemed to be long term in duration and will comprise traffic movements to the development site using the existing road network and plant noise emissions from the completed buildings. These issues are discussed in detailed in the following sections.

## 10.5 Predicted Impacts

### 10.5.1.1 Do-Nothing Scenario

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged.

### 10.5.1.2 Construction Phase - Noise

During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, dumper trucks, compressors and generators. Due to the nature of daytime activities undertaken on a construction site such as this, there is potential for generation of elevated levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

Thresholds for significant noise from construction can be determined by referring to Table 10.1 and the baseline ambient noise levels, as outlined in the assessment criteria section. The daytime significance threshold for construction noise at the site is set at 65 dB LAeq,T. A night-time threshold is not included as construction work will not be taking place at night.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB LAeq,T at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB LWA. This worst-case scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other.

Guidance on the approximate attenuation achieved by standard construction hoarding surrounding construction sites is also provided in BS 5228-1. It states that when the top of the plant is just visible to the receiver over the noise barrier, an approximate attenuation of 5 dB can be assumed, while a 10 dB attenuation can be assumed when the noise screen completely hides the sources from the receiver.

This scenario can be assumed in this case due to the proximity of the noise-sensitive locations, i.e. a hoarding height will be chosen so as to completely hide the source. Table 10.12 shows the potential noise levels calculated at various distances based on the assumed sound power level and attenuation provided by the barrier of 10 dB.

The closest noise sensitive locations have been identified as those located along the R639, houses in the Springfield estate to the north and houses at Baile Ard to the east.

Review of the baseline noise survey and the threshold values detailed in Table 10.1 indicates that the appropriate daytime noise criteria for construction noise are as follows:

| | |
|---|---|
| Residential | 65 dB LAeq,1hr |
| Commercial | 70 dB LAeq,1hr |

A night-time threshold is not included as construction work will not be taking place at night, i.e. 23:00hrs to 07:00hrs.

Figure 10.2 Site Context and Noise Assessment Locations

Table 10.12 Potential Construction Noise Levels at Varying Distances Assuming Attenuation of 10 dB from Site Hoarding

| Description of Noise Source | Sound Power Level (dB Lw(A)) | Calculated noise levels at varying distances (dB LAeq,T) | | | | |
|---|---|---|---|---|---|---|
| | | 10m | 20m | 30m | 40m | 50m |
| 3 no. items each with SPL of 81 dB at 10 m operating simultaneously. | 114 | 76 | 70 | 66 | 62 | 56 |

The calculated noise levels in Table 10.12 show that there is potential for the criteria for daytime noise levels to be exceeded at residential receivers at distances up to 30 m from the works. This indicates that additional mitigation measures will be required to prevent likely significant impacts at residential properties. These measures are detailed in Section 10.7.1.

Based on the predicted noise levels it is expected that the construction noise at commercial receivers will be within the criteria for non-residential receivers.

Construction Traffic

During the construction phase of the proposed development there will be additional construction traffic on local roads. Considering that in order to increase traffic noise levels by 1 dB, traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the construction phase will not result in a significant noise impact.

#### 10.5.1.3 Construction Phase - Vibration

During ground-breaking in the excavation phase, there is potential for vibration to propagate through the ground. Empirical data for this activity is not provided in the BS 5228- 2:2009+A1:2014 standard, however the likely levels of vibration from this activity is expected to be below the vibration threshold for building damage on experience from other sites.

AWN have 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
- 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.

The range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity likely required on the proposed site. This range of vibration magnitudes indicate vibration levels at the closest neighbouring buildings are likely to be below the limits set out in Table 10.4 to avoid any cosmetic damage to buildings.

In terms of disturbance to building occupants, works undertaken within close proximity to the residential receptors on the western site perimeter have the potential to emit vibration levels that are just perceptible.

The potential vibration impact during the construction phase if of short-term, negative and not significant impact.

## 10.5.2 Operational Phase

### 10.5.2.1 Mechanical Plant

It is expected that the principal items of building and mechanical services plant will be associated with ventilation and heating of the creche. These items will be selected at a later stage, however, they will be designed and located so that there is no negative impact on sensitive receivers in proximity to the proposed development. The services plant will be designed/attenuated to meet the relevant plant noise criteria for day and night-time periods at nearby sensitive receivers as set out in Section 10.2.3.1.

The effect associated with building services plant, once designed to achieve the relevant noise criteria, is categorised as negative, imperceptible and permanent.

### 10.5.2.2 Traffic Noise

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site on some surrounding roads.

A traffic and transport assessment relating to the proposed development has been prepared and submitted by MHL Consulting Engineers, as part of the SHD application. Using this information, the related noise impacts along the relevant road links has been assessed.

Table 10.13 and Table 10.14 below display the predicted change in noise level at different road links around the site for the year of opening and the design year using the Annual Average Daily Traffic (AADT) flows along the road links under consideration.

**Table 10.13 Predicted Change in Noise Level associated with Vehicular Traffic - 2027**

| Road Link | Road Name | Opening Year (2027) | | |
|---|---|---|---|---|
| | | Do Nothing - AADT Without Development | Do Something - AADT With Development | Change in Noise Level (dB) |
| A | R639 (north) | 5,456 | | 0.2 |
| B | Site Entrance Road | 0 | | N/A |
| C | R639 (south) | 5,702 | | 0.2 |

**Table 10.14 Predicted Change in Noise Level associated with Vehicular Traffic - 2042**

| Road Link | Road Name | Opening Year (2042) | | |
|---|---|---|---|---|
| | | Do Nothing - AADT Without Development | Do Something - AADT With Development | Change in Noise Level (dB) |
| A | R639 (north) | 5,744 | 6,599 | 0.2 |
| B | Site Entrance Road | 1,604 | 1,604 | N/A |
| C | R639 (south) | 6,014 | 6,907 | 0.2 |

For the opening year (2027) traffic flows, the predicted changes in noise level along the road links are of the order of +0.2 dB. For the design year (2042) traffic flows, the predicted changes in noise level along the road links are of the order of +0.2 dB.

With reference to Table 10.3, the predicted change in noise level associated with additional traffic on the existing road network, is negligible in magnitude. The impact is therefore imperceptible and permanent.

## 10.6 Mitigation Measures

### 10.6.1 Construction Phase - Noise

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Whist construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening;
- liaison with the public, and;
- monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

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 should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

#### 10.6.1.1 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.

Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be considered :

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.

- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

#### 10.6.1.2 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m2 to provide adequate sound attenuation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

#### 10.6.1.3 Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

#### 10.6.1.4 Monitoring

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

#### 10.6.1.5 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. In the case that excavation, piling or other high noise-generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

### 10.6.2 Construction Phase – Vibration

The vibration from construction activities will be limited to the values set out in Section 10.2. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage. Limit values have been provided for soundly constructed residential and commercial properties.

### 10.6.3 Operational Phase - Noise

#### 10.6.3.1 Mechanical Services Plant

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria are achieved within the development it is expected that there will be no negative impact at sensitive receivers off site, and therefore no further mitigation required.

#### 10.6.3.2 Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

### 10.6.4 Operational Phase - Vibration

Based on the nature of the proposed development there are no appreciable sources of vibration during the operational phase of the development. No mitigation is deemed necessary.

## 10.7 Residual Impact of the Proposed Development

### 10.7.1 Construction Phase

During the construction phase of the project there is the potential for slight to moderate impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impacts are reduced.

It is predicted that construction activity will have a negative, slight and short-term impact on commercial receptors at distances greater than 20m from the works.

At distances less than 20m it is predicted that construction activity will have a negative, moderate to significant and short-term impact.

Noise levels associated with construction vehicles moving to and from the site are predicted to have an impact that is negative, not significant and short-term.

Vibration levels associated with construction activity are expected to have a negative, not significant and short term impact.

### 10.7.2 Operational Phase

#### 10.7.2.1 Mechanical Services Plant

Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of negative, imperceptible, permanent impact.

#### 10.7.2.2 Additional Traffic on Adjacent Roads

The predicted change noise levels associated with additional traffic is predicted to be of negative, imperceptible and permanent impact along the existing road network.

## 10.8 Risks of Major Accidents and Disasters

Not applicable.

## 10.9 Cumulative Impacts

During the construction phase of the proposed development, construction noise on site will be localised and will therefore likely the primary noise source at the nearest noise sensitive receivers. In the case that a nearby future development be approved and should construction of both sites occur simultaneously there is potential for cumulative noise impacts at noise sensitive receivers equidistant from the sites.

In this scenario, it is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors.

Cumulative construction noise impacts have the potential to be negative, moderate to significant and short-term at times of high activity on both sites.

The contractor will be required to control noise impacts associated with the construction of this future development in line with the guidance levels included in Table 10.1 and follow the best practice control measures within BS 5228 -1.

In the context of the operational phase, permitted developments are included in the traffic impact and therefore the potential for a cumulative impact has been assessed (and found to be negative, imperceptible and permanent).

Any large-scale future projects that are not yet proposed or permitted would also need to be the subject of EIA in turn, to ensure that no significant impacts resulting from noise and vibration will occur as a result of those developments.

## 10.10 References

Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017);

BSI (1993). BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;

BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound;

BSI (2014). BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise;

BSI (2014). BS 5228-2:2009+A:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration;

EPA (2015). Advice Notes for Preparing Environmental Impact Statements. Draft. September 2015;

EPA (2017). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Draft. August 2017;

ISO (2016). ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures;

UK Department of Transport (1998). Calculation of Road Traffic Noise;

UKHA (2020). Design Manual for Roads and Bridges Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2.

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 11

## Air Quality and Climate

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 11 Air Quality and Climate

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# 11.0 Air Quality and Climate

## 11.1 Introduction

AWN Consulting Ltd. has been commissioned to carry out an air quality and climate impact assessment of the potential significant impacts associated with the proposed Strategic Housing Development (SHD) at Fermoy, Co. Cork.

### 11.1.1 Author Information and Competency

This chapter was completed by Dr. Avril Challoner, who is a Senior Environmental Consultant in the Air Quality section of AWN Consulting. She holds a BEng (Hons) in Environmental Engineering from the National University of Ireland Galway, HDip in Statistics from Trinity College Dublin and has completed a PhD in Environmental Engineering (Air Quality) in Trinity College Dublin. She is a Chartered Scientist (CSci), Member of the Institute of Air Quality Management and specialises in the fields of air quality, EIA and air dispersion modelling. She has experience with preparing air quality and climate impact assessments for EIARs for various residential, mixed-use, commercial and industrial developments.

### 11.1.2 Reference to Guidelines Relevant to Discipline

#### 11.1.2.1 Air Quality Guidance

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set. Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011 (S.I. No. 180/2011), which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values in relation to Nitrogen Dioxide (NO2) and Particulate Matter (PM10 and PM2.5) are applicable to the proposed development (see Table 11.1 and Appendix 11.1).

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m2*day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit value of 350 mg/(m2*day) to the site boundary of quarries. This limit value can also be implemented with regard to potential dust impacts from construction of the proposed development.

Table 11.1: Ambient Air Quality Standards 2011 & Dust Deposition Limits

| Pollutant | Regulation Note 1 | Limit Type | Value |
|---|---|---|---|
| Nitrogen Dioxide (NO2) | 2008/50/EC | Hourly limit for protection of human health - not to be exceeded more than 18 times/year | 200 μg/m3 |
| | | Annual limit for protection of human health | 40 μg/m3 |
| Nitrogen Oxide (NOX) | 2008/50/EC | Critical level for protection of vegetation | 30 μg/m3 NO + NO2 |
| Particulate Matter<br>(as PM10) | 2008/50/EC | 24-hour limit for protection of human health - not to be exceeded more than 35 times/year | 50 μg/m3 |
| | | Annual limit for protection of human health | 40 μg/m3 |
| Particulate Matter<br>(as PM2.5) | 2008/50/EC | Annual limit for protection of human health | 25 μg/m3 |

#### 11.1.2.2 Climate Guidance

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland ‘to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050’ (3.(1) of No. 46 of 2015). This is referred to in the Act as the ‘national transition objective’. The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of to achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 - 5 MtCO2e by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

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) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b), 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 will also “provide for carbon budgets and a decarbonisation target range for certain sectors of the economy". The 2021 Climate Act defines the carbon budget as "the total amount of greenhouse gas emissions that are permitted during the budget period".

The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request that each Local Authority produce a climate action plan lasting five years, specifying the mitigation measures and the adaptation measures to be adopted by the Local Authority.

The Cork County Council Draft Climate Adaptation Strategy published in 2019 (Cork County Council Climate Action Regional Office, 2019) outlines a number of goals and plans to prepare for and adapt to climate change in the key sectors of infrastructure and built environment, land use and development, drainage and flood management, natural resources and cultural infrastructure and community, health and wellbeing. Some of the measures promoted within the Adaptation Strategy relevant to infrastructure and built environment include integrating climate considerations into the design, planning, tendering process and construction of new developments and ensuring climate change is considered in locating future developments, the promotion of climate resilient and sustainable design and construction, the promotion of green infrastructure such as living roofs and walls, adequate assessment of the potential flooding related risks and appropriate mitigation measures required for new developments.

### 11.1.3 Construction Stage Methodology

#### 11.1.3.1 Air Quality

The Institute of Air Quality Management in the UK (IAQM) guidelines (2014) outline an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely magnitude of the dust impacts in the absence of mitigation measures. The use of UK guidance is considered best practise in the absence of specific Irish guidance.

Construction phase traffic has the potential to impact air quality. The UK DMRB guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommend by the TII (2011) in the absence of specific Irish guidance, this approach is considered best practise and 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;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

By definition of the above criteria, there are no road links impacted as a result of the proposed development. Therefore, no assessment using the DMRB model was required for the proposed development as there is no potential for significant impacts to air quality as a result of traffic emissions.

#### 11.1.3.2 Climate

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

Construction traffic also has the potential to impact climate through the release of GHG emissions such as CO2. The UK Highways Agency DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019b) outlines the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project. If any of the road links impacted by the proposed development meet the below criteria then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; or
- A change in daily average speed of more than 20 km/hr.

None of the road links in the vicinity of the proposed development meet the above criteria and therefore no assessment using the DMRB model was required as there is no potential for significant impacts to climate as a result of traffic emissions.

### 11.1.4 Operational Stage Methodology

#### 11.1.4.1 Air Quality

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The UK Highways Agency scoping criteria detailed in Section 11.1.3 was used to determine if any road links are affected by the proposed development and require inclusion in an air dispersion modelling assessment. As there are road links present that exceed the scoping threshold, the assessment will proceed to a qualitative model.

The guidance states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling (UK Highways Agency, 2019a). The TII guidance (2011) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. Therefore, according to the scoping criteria in Section 11.1.3.1 the local road links with sensitive receptors within 200 m which can be classed as 'affected' should proceed to an air dispersion modelling of operational phase traffic emissions due to the potential for impacts to air quality.

In 2019 the UK Highways Agency DMRB air quality guidance was revised with LA 105 Air Quality replacing a number of key pieces of guidance (HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15). This revised document outlines a number of changes for air quality assessments in relation to road schemes but can be applied to any development that causes a change in traffic. Previously the DMRB air quality spreadsheet was used for the majority of assessments in Ireland with detailed modelling only required if this screening tool indicated compliance issues with the EU air quality standards. Guidance from TII (TII, 2011) recommends the use of the UK Highways Agency DMRB spreadsheet tool for assessing the air quality impacts from road schemes and can be applied to any development that causes a change in traffic. However, the DMRB spreadsheet tool was last revised in 2007 and accounts for modelled years up to 2025. Vehicle emission standards up to Euro V are included but since 2017, Euro 6d standards are applicable for the new fleet. In addition, the model does not account for electric or hybrid vehicle use. Therefore, this is a somewhat outdated assessment tool. The LA 105 guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a "dirtier" fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a worst-case assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance LA 105 Air Quality states that modelling should be conducted for NO2 for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of PM10 is only required for the base year to demonstrate that the air quality limit values in relation to PM10 are not breached. Where the air quality modelling indicates exceedances of the PM10 air quality limits in the base year then PM10 should be included in the air quality model in the do minimum and do something scenarios. Modelling of PM2.5 is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of PM10 can be used to show that the project does not impact on the PM2.5 limit value as if compliance with the PM10 limit is achieved then compliance with the PM2.5 limit will also be achieved. Historically modelling of carbon monoxide (CO) and benzene was required however, this is no longer needed as concentrations of these pollutants have been monitored to be significantly below their air quality limit values in recent years, even in urban centres (EPA, 2021a). The key pollutant reviewed in this assessment is NO2. Concentrations of PM10 have been modelled for the base year to indicate that there are no potential compliance issues.

### 11.1.4.2 Conversion of $NO_x$ to $NO_2$

NOX (NO + NO2) is emitted by vehicles exhausts. The majority of emissions are in the form of NO, however, with greater diesel vehicles and some regenerative particle traps on HGV's the proportion of NOX emitted as NO2, rather than NO is increasing. With the correct conditions (presence of sunlight and O3) emissions in the form of NO, have the potential to be converted to NO2.

Transport Infrastructure Ireland states the recommended method for the conversion of NOx to NO2 in Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011). The TII guidelines recommend the use of DEFRAs NOx to NO2 calculator (2020) which was originally published in 2009 and is currently on version 8.1. This calculator (which can be downloaded in the form of an excel spreadsheet) accounts for the predicted availability of O3 and proportion of NOx emitted as NO for each local authority across the UK. O3 is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of NO2 or PM10.

The calculator includes Local Authorities in Northern Ireland and the TII guidance recommends the use of 'Armagh, Banbridge and Craigavon' as the choice for local authority when using the calculator. The choice of Craigavon provides the most suitable relationship between NO2 and NOx for Ireland. The "All Non-Urban UK Traffic" traffic mix option was used.

### 11.1.4.3 Update to $NO_2$ Projections using DMRB

In 2011 the UK DEFRA published research (Highways England, 2013) on the long term trends in NO2 and NOX for roadside monitoring sites in the UK. This study marked a decrease in NO2 concentrations between 1996 and 2002, after which the concentrations stabilised with little reduction between 2004 and 2010. The result of this is that there now exists a gap between projected NO2 concentrations which UK DEFRA previously published and monitored concentrations. The impact of this 'gap' is that the DMRB screening model can under-predict NO2 concentrations for predicted future years. Subsequently, the UK Highways Agency published an Interim advice note (IAN 170/12) in order to correct the DMRB results for future years. This methodology has been used in the current assessment to predict future concentrations of NO2 as a result of the proposed development.

### 11.1.4.4 Traffic data used in Modelling Assessment

Traffic data for the Do Nothing (DN) and Do Something (DS) scenarios for the base year 2020 opening year 2027 and design year 2042 were provided. The traffic data is detailed Table 11.2 Background concentrations have been included as per Section 11.1.3.1 of this chapter based on available EPA background monitoring data (EPA, 2021a). The locations of the sensitive receptors modelled are shown in Table 11.3 and Figure 11.1.

**Table 11.2: Traffic Data Used in Local Air Quality Modelling Assessment**

| Link Number | Road Name | Speed (kph) | Base Year | Do-Nothing | | Do-Something | |
|---|---|---|---|---|---|---|---|
| | | | 2020 | 2027 | 2042 | 2027 | 2042 |
| 1 | A - R639 North of site | 60 | 4585 (3%) | 5456 (3%) | 6311 (3%) | 6564 (3%) | 7419 (3%) |
| 2 | B - Site Entrance | 30 | 0 (3%) | 0 (3%) | 0 (3%) | 2204 (3%) | 2204 (3%) |
| 3 | C - R639 South of Site | 60 | 5078 (3%) | 5702 (3%) | 6596 (3%) | 6798 (3%) | 7692 (3%) |

Table 11.3: Sensitive Air Quality Receptors

| Name | Receptor Type | X (ITM) | Y (ITM) |
|---|---|---|---|
| 1 | R1 - Residential | 581006 | 597335 |
| 2 | R2 - Residential | 580977 | 597262 |
| 3 | R3 - Residential | 580889 | 597676 |

Figure 11.1 Sensitive Receptors for Operational Traffic Assessment

### 11.1.4.5 Climate

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013. Which has set a target of a 30% reduction in non-ETS sector emissions by 2030 relative to 2005 levels.

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 11.2.3). Thereafter, the impact of the proposed development on climate is determined. Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO2) which will impact climate.

The UK Highways Agency DMRB scoping criteria detailed in Section 11.1.3.2 was used to determine if any road links are affected by the proposed development and require further assessment. Road links impacted by the proposed development meet the above criteria and therefore an assessment is required as there is no potential for significant impacts to climate as a result of traffic emissions.

### 11.1.4.6 Ecology

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an ecologist (2011). However, in practice the potential for impact to an ecological site is highest within 200m of the proposed scheme or development and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment. In addition, the UK Highways Agency (2019a) states that a detailed assessment does not need to be conducted for areas that have been designated for geological features or watercourses.

Transport Infrastructure Ireland's Guidelines for Assessment of Ecological Impacts of National Road Schemes (2009) and Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition should be conducted:

- A designated area of conservation is located within 200m of the proposed development; and
- A significant change in AADT flows (>5%) will occur.

There are no designated ecological sites within 200m of impacted road links. As such, an assessment of the impact with regards nitrogen deposition was not required.

### 11.1.5 Difficulties Encountered in Compiling Information

There were no specific difficulties encountered when undertaking this assessment.

## 11.2 Description of Existing Environment

### 11.2.1 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. The potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

The nearest representative weather station collating detailed weather records is Cork Airport meteorological station. This station is located approximately 34 km south west of proposed development and has been chosen as a representative meteorological station. For data collated during five representative years (2017 - 2021), the predominant wind direction is south-westerly with predominantly moderate wind speeds. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2mm. A review of historical 30 year average data (1981 – 2010) for Cork Airport meteorological station, the closest station with 30 year average data, indicates that on average 204 days per year have rainfall over 0.2mm (Met Eireann, 2021) and therefore it can be determined that over 50% of the time dust generation will be reduced.

### 11.2.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent EPA published annual report on air quality "Air Quality in Ireland 2020" (EPA 2021a) details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled 'Air Quality in Ireland 2020' (EPA 2021a). 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, the area of the proposed development is categorised as Zone D.

In 2020 the EPA reported (EPA 2021a) that Ireland was compliant with EU legal air quality limits at all air monitoring locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA report 'Air Quality in Ireland 2020' details the effect that the Covid-19 restrictions had on monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section. Long-term monitoring data from previous years has been used to inform estimated background concentrations for this assessment.

NO2 monitoring was carried out at two rural Zone D locations over the period 2015 - 2019, Emo and Kilkitt and the urban sites of Enniscorthy and Castlebar (EPA, 2021a). Over the 2015 – 2019 period annual mean concentrations ranged from 2 – 5 µg/m3 for the rural sites and 7 – 10 µg/m3 for the urban sites (Table 11.4). Hence, long-term average concentrations measured at all locations were significantly lower than the annual average limit value of 40 µg/m3. The hourly limit value of 200 µg/m3 was not exceeded in any year albeit 18 exceedances are permitted per year. The average results over the last five years at the urban Zone D locations suggest an upper average of no more than 10 µg/m3 as a background concentration. Based on the above information a conservative estimate of the background NO2 concentration in the region of the proposed development is 10 µg/m3.

Table 11.4: Trends In Zone D Air Quality - Nitrogen Dioxide ($NO_2$)

| Station | Averaging Period Notes 1,2 | Year | | | | |
|---|---|---|---|---|---|---|
| | | 2015 | 2016 | 2017 | 2018 | 2019 |
| **Castlebar** | Annual Mean NO2 (µg/m3) | 8 | 9 | 7 | 8 | 8 |
| | 99.8th %ile 1-hr NO2 (µg/m3) | - | 65.6 | 59.8 | 60.2 | 58.9 |
| **Kilkitt** | Annual Mean NO2 (µg/m3) | 2 | 3 | 2 | 3 | 5 |
| | 99.8th %ile 1-hr NO2 (µg/m3) | - | 26.1 | 17.0 | 22.3 | 42.3 |
| **Emo** | Annual Mean NO2 (µg/m3) | 3 | 4 | 3 | 3 | 4 |
| | 99.8th %ile 1-hr NO2 (µg/m3) | - | 35.5 | 27.5 | 41.6 | 27.8 |
| **Enniscorthy** | Annual Mean NO2 (µg/m3) | 9 | 10 | - | - | - |
| | 99.8th %ile 1-hr NO2 (µg/m3) | - | 72.5 | - | - | - |

Note 1 Annual average limit value - 40 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 1-hour limit value - 200 µg/m3 as a 99.8th%ile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Long-term PM10 monitoring was carried out at the Zone D locations of Castlebar, Kilkitt, Enniscorthy and Claremorris over the period 2015 – 2019 (EPA, 2021a). Annual mean concentrations range from 10 – 18 µg/m3 for the urban sites and 7 – 9 µg/m3 for the rural site at Kilkitt (Table 11.5). Hence, long-term average PM10 concentrations measured at these locations were significantly lower than the annual average limit value of 40 µg/m3. The 90.4th percentile of 24-hour values was well below the limit value of 50 µg/m3 reaching at most 33.8 µg/m3 in Enniscorthy in 2015. Data for the urban site at Castlebar suggests an upper average annual mean of no more than 16 µg/m3 as a background value. Based on the above data a conservative estimate of the current background PM10 concentration in the region of the proposed development is 16 µg/m3.

Table 11.5: Trends In Zone D Air Quality - $PM_{10}$

| **Station** | **Averaging Period Notes 1,2** | **Year** | | | | |
|---|---|---|---|---|---|---|
| | | **2015** | **2016** | **2017** | **2018** | **2019** |
| **Castlebar** | Annual Mean PM10 (µg/m3) | 13 | 12 | 11 | 11 | 16 |
| | 90th %ile 24-hr PM10 (µg/m3) | 22.2 | 20.0 | 19.1 | 19.9 | 23.8 |
| **Kilkitt** | Annual Mean PM10 (µg/m3) | 9 | 8 | 8 | 9 | 7 |
| | 90th %ile 24-hr PM10 (µg/m3) | 17.7 | 15.0 | 14.0 | 15.3 | 13.2 |
| **Emo** | Annual Mean PM10 (µg/m3) | 10 | 10 | 11 | 12 | 11 |
| | 90th %ile 24-hr PM10 (µg/m3) | 16.5 | 17.4 | 17.3 | 19.9 | 19.7 |
| **Enniscorthy** | Annual Mean PM10 (µg/m3) | 18 | 17 | - | - | - |
| | 90th %ile 24-hr PM10 (µg/m3) | 33.8 | 32.3 | - | - | - |

Note1 Annual average limit value - 40 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 24-hour limit value - 50 µg/m3 as a 90.4th%ile, i.e. not to be exceeded >35 times per year (EU Council Directive 1999/30/EC & S.I. No. 180 of 2011).

The results of PM2.5 monitoring at Claremorris over the period 2015 – 2019 ranged from 4 – 6 µg/m3 (EPA, 2021a), with an average PM2.5/PM10 ratio between 0.4 – 0.6. Long-term average PM2.5 concentrations measured at this location were significantly lower than the annual average limit value of 25 µg/m3. Based on this information, a ratio of 0.7 was used to generate a rural background PM2.5 concentration of 11 µg/m3.

In summary, existing baseline levels of NO2, PM10 and PM2.5 based on extensive long-term data from the EPA are well below ambient air quality limit values in the vicinity of the proposed development.

### 11.2.3 Baseline Climate

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details emissions up to 2020 (EPA, 2021b). The data published in 2021 states that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.73 Mt. For 2021, total national greenhouse gas emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO2eq) with 44.38 MtCO2eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2021 at 37.1% of the total, with the transport sector accounting for 17.9% of emissions of CO2.

GHG emissions for 2020 are estimated to be 3.6% lower than those recorded in 2019. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets by 0.29 MtCO2eq, 2.94 MtCO2eq, 5.57 MtCO2eq,6.85 MtCO2eq and 6.73 MtCO2eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2020 GHG Emissions Projections Report for 2020 – 2040 (EPA, 2021c) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2019. Implementation of these are classed as a "With Additional Measures scenario" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 to 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 12.2MtCO2eq under the "With Existing Measures" scenario and under the "With

Additional Measures" scenario. The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the 2019 Climate Action Plan and the use of the flexibilities available (EPA, 2021c).

### 11.2.4 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' (2014) 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 (between 0m and 350m from the proposed works as outlined in Table 11.6 below) 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.

In terms of receptor sensitivity to dust soiling, there are between 1 and 10 high sensitivity residential receptors within 20m of the proposed site boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered medium based on the IAQM criteria outlined in Table 11.6.

Table 11.6: Sensitivity of the Area to Dust Soiling Effects on People and Property

| Receptor Sensitivity | Number Of Receptors | Distance from source (m) | | | |
|---|---|---|---|---|---|
| | | <20 | <50 | <100 | <350 |
| **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 |

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 from dust emissions. 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 16µg/m3 and there are less than 100 residential properties within 20m of the proposed site boundary. Based on the IAQM criteria outlined in Table 11.7, the worst-case sensitivity of the area to human health is considered to be low.

Table 11.7: Sensitivity of the Area to Dust Related Human Health Impacts

| Receptor Sensitivity | Annual Mean PM10 Concentration | Number Of Receptors | Distance from source (m) | | | | |
|---|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <200 | <350 |
| **High** | < 24 µg/m3 | >100 | Medium | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| **Medium** | < 24 µg/m3 | >10 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| **Low** | < 24 µg/m3 | >1 | Low | Low | Low | Low | Low |

The IAQM guidance also outlines the criteria for determining the sensitivity of an ecological receptor to dust impacts. The sensitivity 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. However, as there are no designated sites within 50m of the site boundary the IAQM guidance no sensitive ecology is deemed to be impacted.

## 11.3 Predicted Impacts

### 11.3.1 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 is considered neutral in terms of air quality and climate.

### 11.3.2 Construction Phase

#### 11.3.2.1 Air Quality

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 11.2.4). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

#### Demolition

There is no scheduled demolition associated with the proposed development and as such has been scoped out of the analysis.

#### Earthworks

Earthworks typically involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large: Total site area > 10,000 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 > 8 m in height, total material moved >100,000 tonnes;
- Medium: Total site area 2,500 m2 – 10,000 m2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;
- Small: Total site area < 2,500 m2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The total site area is 11.56 hectares (115,600m2) with a net developable area of 11.22 hectares Following the IAQM guidance (2014), the proposed earthworks can be classified as ‘large’. This results in an overall medium risk of dust soiling impacts and a low risk of human health impacts as a result of earthworks activities (see Table 11.8). In the absence of mitigation, there is the potential for short-term, localised, significant dust related impacts to air quality as a result of earthworks from the proposed development

Table 11.8: Risk of Dust Impacts - Earthworks

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Medium Risk | Low Risk |
| Low | Low Risk | Low Risk | Negligible |

## Construction

The dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large: Total building volume > 100,000 m3, on-site concrete batching, sandblasting;
- Medium: Total building volume 25,000 m3 – 100,000 m3, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- Small: Total building volume < 25,000 m3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude from construction associated with the proposed works can be classified as 'large', as the total building volume is greater than 100,000 m3. Therefore, there is an overall medium risk of dust soiling impacts and a low risk of human health impacts as a result of the proposed construction activities (Table 11.9). In the absence of mitigation, there is the potential for short-term, localised, significant dust related impacts to air quality as a result of construction from the proposed development

Table 11.9: Risk of Dust Impacts - Construction

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Medium Risk | Low Risk |
| Low | Low Risk | Low Risk | Negligible |

## Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as 'large' as worst-case there may be longer than 100m of unpaved roads during construction. As outlined in Table 11.10, combining this with a medium sensitivity to dust soiling results in an overall low risk of impacts as a result of the proposed trackout activities in the absence of mitigation. There is an overall medium risk of human health impacts as a result of trackout activities as the overall sensitivity of the area to human health impacts is low (Section 11.2.4). In the absence of mitigation, there is the potential for short-term, localised, significant dust related impacts to air quality as a result of trackout from the proposed development

Table 11.10: Risk of Dust Impacts - Trackout

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Medium Risk | Low Risk |
| Low | Low Risk | Low Risk | Negligible |

### Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 11.11 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

Overall, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, a range of best practice dust mitigation measures associated with a medium risk of dust impacts must be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 11.4) and Appendix 11.2 are implemented, fugitive emissions of dust from the site will be short term, negative and imperceptible and pose no nuisance at nearby receptors. In the absence of mitigation, there is the potential for short-term, localised, significant dust related impacts to air quality as a result of the proposed development.

Table 11.11: Summary of Dust Impact Risk used to Define Site-Specific Mitigation

| Potential Impact | Dust Emission Magnitude | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Trackout |
| Dust Soiling | N/A | Medium Risk | Medium Risk | Medium Risk |
| Human Health | N/A | Low Risk | Low Risk | Low Risk |

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 11.1.3.1.

It can therefore be determined that the construction stage traffic will have an imperceptible, neutral and short-term impact on air quality.

#### 11.3.2.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the proposed development. Construction vehicles, generators etc., may give rise to CO2 and N2O emissions. The Institute of Air Quality Management document ‘Guidance on the Assessment of Dust from Demolition and Construction’ states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the potential impact on climate is considered to be imperceptible, neutral and short-term.

#### 11.3.2.3 Human Health

The potential risk to human health is assessed in Section 11.3.2.1. The assessment showed that there is a low risk to human health as a result of construction. In the absence of mitigation, there is the potential for short-term, localised, significant dust related impacts to air quality as a result of trackout from the proposed development.

Impacts to human health as a result of construction related traffic associated with the proposed development will have an imperceptible, neutral and short-term impact on air quality as assessed in Section 11.3.2.1.

## 11.3.3 Operational Phase

### 11.3.3.1 Air Quality

The impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of NO2 emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

Transport Infrastructure Ireland's document 'Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes' (2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact. Impacts were assessed at 3 no. worst-case sensitive receptors (R1 to R3) within 200m of the road links impacted by the proposed development (see Table 11.2. and Table 11.3). These three residential properties are a representative sample of sensitive receptors on the impacted roads.

The results of the assessment of the impact of the proposed development on NO2 in the opening year 2027 are shown in Table 11.12 and or design year 2042 are shown Table 11.13. The annual average concentration is in compliance with the limit value at all worst-case receptors in 2027 and 2042. Concentrations of NO2 are at most 27% of the annual limit value in 2027 and 2042. There are some increases in traffic levels between the opening and design years, therefore any reduction in concentrations is due to reduced background concentrations. In addition, the hourly limit value for NO2 is 200 µg/m3 and is expressed as a 99.8th percentile (i.e. it must not be exceeded more than 18 times per year). The maximum 1-hour NO2 concentration is not predicted to be exceeded in any modelled year (Table 11.14).

The impact of the proposed development on annual mean NO2 concentrations can be assessed relative to "Do Nothing (DN)" levels. Relative to baseline levels, there are predicted to be some small increases in NO2 concentrations at the worst-case receptors assessed. Concentrations will increase by at most 1.4% of the annual NO2 limit value at receptor R1 in 2027. Changes in concentrations are similarly low for the Design Year 2042, concentrations at receptor R2 will increase by 1.5%. Using the assessment criteria outlined in Appendix 11.2 Table A11.3.1 and Table A11.3.2 the impact of the proposed development in terms of NO2 is considered negligible. Therefore, the overall impact of NO2 concentrations as a result of the proposed development is long-term, negative and imperceptible.

Concentrations of PM10 were modelled for the baseline year of 2020. The modelling showed that concentrations were in compliance with the annual limit value of 40 µg/m3 at all receptors assessed, therefore, further modelling for the opening and design years was not required. Concentration increases due to modelled traffic reached at most 0.15 µg/m3. When a background concentration of 16 µg/m3 is included the overall impact is 41% of the annual limit value at the worst case receptor.

The impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible.

Table 11.12: Predicted Annual Mean $NO_2$ Concentrations – Opening Year 2027 (µg/m3).

| Receptor | Impact Opening Year 2027 | | | | |
|---|---|---|---|---|---|
| | DN | DS | DS - DN | Magnitude | Description |
| 1 | 10.3 | 10.9 | 0.57 | Small Increase | Negligible |
| 2 | 10.4 | 10.7 | 0.26 | Imperceptible Increase | Negligible |
| 3 | 10.9 | 11.2 | 0.27 | Imperceptible Increase | Negligible |

Table 11.13: Predicted Annual Mean $NO_2$ Concentrations – Design Year 2042 (µg/m3).

| Receptor | Impact Design Year 2042 | | | | |
|---|---|---|---|---|---|
| | DN | DS | DS - DN | Magnitude | Description |
| 1 | 10.2 | 10.7 | 0.6 | Small Increase | Negligible |
| 2 | 10.3 | 10.6 | 0.2 | Imperceptible Increase | Negligible |
| 3 | 10.8 | 11.1 | 0.3 | Imperceptible Increase | Negligible |

Table 11.14: Predicted 99.8th percentile of Daily Maximum 1-hour $NO_2$ Concentrations (µg/m3).

| Receptor | Opening Year 2027 | | Design Year 2042 | |
|---|---|---|---|---|
| | DN | DS | DN | DS |
| R1 | 36.0 | 38.0 | 35.6 | 37.5 |
| R2 | 36.5 | 37.4 | 36.1 | 36.9 |
| R3 | 38.1 | 39.1 | 37.9 | 38.8 |

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### 11.3.3.2 Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development. Therefore, the impact will be long-term, localised, neutral and imperceptible.

There is also the potential for increased traffic volumes to impact climate. The predicted concentrations of CO2 for the future years of 2027 and 2042 are detailed in Table 11.15. These are significantly less than the 2027 and 2030 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2027 the proposed development will increase CO2 emissions by 0.0005% of the EU 2027 target. Similarly low increases in CO2 emissions are predicted to occur in 2042 with emissions increasing by 0.0005% of the EU 2030 target. Therefore, the potential climate impact of the proposed development is considered negative, long-term and imperceptible.

The proposed development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. These are outlined fully within the Lifecycle Assessment prepared by Geraldine Coughlan Architects and are summarised below.

The development will be a Nearly Zero Energy Building (NZEB) in accordance with the 2021 Part L requirements. Each building will have a Building Energy Rating (BER) with preliminary Dwelling Energy Assessment Procedure (DEAP) conducted to ensure design issues can be resolved at an early stage. The proposed development will be designed to reduce the waste generation, where possible, by using locally sourced materials and materials with a recycled content, where possible. The following measures will be incorporated into the proposed development to achieve a more energy efficient (i.e. less carbon intensive) design:

- High performance U-values;
- Improved air tightness;
- Improved thermal transmittance and thermal bridging;
- Use of natural daylight where possible and energy efficient light fittings;
- Air to water heat pumps are being considered for the proposed development, where practicable; and
- Solar photovoltaic panels are being considered for the proposed development, where practicable.

Overall, these measures will aid in reducing the impact to climate during the operational phase of the proposed development.

Table 11.15: Climate Impact Assessment

| Year | Scenario | CO2 (tonnes/annum) |
|---|---|---|
| 2027 | Do Nothing | 538 |
| | Do Something | 724 |
| 2042 | Do Nothing | 623 |
| | Do Something | 808 |
| Increment in 2027 | | 185.8 Tonnes Note 1 |
| Increment in 2042 | | 185.6 Tonnes Note 1 |
| Emission Ceiling (kilo Tonnes) 2027 | | 36,747 |
| Emission Ceiling (kilo Tonnes) 2030 | | 32,860 |
| Impact in 2027 (%) | | 0.0005654797 % |
| Impact in 2042 (%) | | 0.000564737 % |

Note 1 Target under Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013

### 11.3.4 Cumulative

Should the construction phase of the proposed development coincide with the construction of any other permitted developments within 350m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors (IAQM, 2014). Table 11.16 shows a list of potential cumulative developments. The dust mitigation measures outlined in Appendix 11.2 and Section 11.4.1 should be applied throughout the construction phase of the proposed development, with similar mitigation measures applied for other permitted developments which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality and climate associated with the construction phase of the proposed development are deemed short-term and not significant.

Cumulative impacts have been incorporated into the traffic data supplied for the operational stage air and climate modelling assessments where such information was available. The change in traffic flows on the local road network have been screened out of a detailed air quality and climate assessment as per the DMRB screening criteria (UK Highways Agency, 2007). Therefore, there is an imperceptible impact to air quality and climate during the operational stage.

If additional residential or commercial developments are proposed in the future, in the vicinity of the proposed development, this has the potential to add further additional vehicles to the local road network. However, as the traffic impact for the proposed development has an imperceptible impact on air quality, it is unlikely that other future developments of similar scale would give rise to a significant impact during the construction and operational stages of those projects. Future projects of a large scale would need to conduct an EIAR to ensure that no significant impacts on air quality will occur as a result of those developments.

Table 11.16: Potential Cumulative Developments

| **Proposal/Application** | **Planning Reference** | **Comment** |
|---|---|---|
| Part 8 Housing Scheme 11 no. residential housing units at Uplands, Fermoy | Cork County Council Part 8 Application | Information at: https://www.corkcoco.ie/en/Planning/Part-8-Development-Consultation/active-part-8-development-consultation |
| Retention for Internal woks for new technology room, sanitary rooms, 3 no. new classrooms, 1 no. new computer room at St. Colmans College, Monumental Hill, Fermoy | Planning Ref: 21/4049 | Permitted on 15th July 2021 |
| A) the change of use (through intensification of use) of part of an existing light industrial building currently used for the assembly and commissioning of stainless steel vessels to provide for an electropolishing area within the building footprint; b) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor; and c) ancillary external site works to connect to the existing on-site sewer network. | Planning Ref: 20/6246 | Permitted by 07/12/2020 |
| The demolition of 2 No. dwelling houses and associated sheds/outhouses and the construction of 28 No. residential units and all ancillary site development works, including access, car/bike parking, bin storage and amenity areas | Planning Reference: 21/7241 | Under review by Cork County Council |
| To demolish existing pump canopy, shop and stores, for construction of valeting buildings, car wash, boundary fencing and 2 no. signs together with associated works. | Planning Reference: 19/6221 | Permitted by 11/6/2020 |

## 11.4 Mitigation Measures

There is the potential for a number of impacts to air quality and climate during the construction and operational phases of the proposed development. Construction dust emissions are considered the primary source of air quality impacts associated with the proposed development. To avoid any potential significant impacts the following mitigation measures have been proposed.

### 11.4.1 Construction Phase

The proactive control of fugitive dust will ensure the prevention of significant emissions. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 11.2. These measures have been incorporated into the overall Construction Environmental Management Plan (CEMP) prepared in respect of the proposed development.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility prior to entering onto public roads.

- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

### 11.4.2 Climate

Impacts to climate during the construction stage are predicted to be imperceptible however, good practice measures can be incorporated to ensure potential impacts are lessened. These include:

- 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.

### 11.4.3 Operational Phase Mitigation

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no additional site specific mitigation measures are required beyond the site specific incorporated design mitigation as described in Section 11.3.3.2.

### 11.4.4 Monitoring

#### 11.4.4.1 Construction Phase

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 - 32 days.

#### 11.4.4.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

## 11.5 Residual Impacts

### 11.5.1 Construction Phase

With the implementation of the dust mitigation measures, associated with a medium risk of dust impacts, outlined in Section 11.4.1 and Appendix 11.2 dust impacts from construction will be localised, imperceptible, negative and short-term but will not pose a nuisance at nearby receptors.

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values (see Table 11.1) which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

### 11.5.2 Operational Phase

The impact of the operational traffic associated with proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

The proposed development has been designed to reduce the impact on climate where possible. The proposed development will comply with the NZEB standards.

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**Cumnor Construction Ltd**

Proposed Strategic Housing Development at Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 12

## Cultural Heritage and Archaeology

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 12 Cultural Heritage and Archaeology

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## 12.1 Introduction

This chapter assesses the impacts of the proposed development on the known and potential archaeology, architecture and cultural heritage of the proposed development site and surrounding area. The recorded and potential cultural heritage within the proposed development site and an area of up to 500m from its boundary has been considered for the purposes of this study (hereafter 'the study area').

### 12.1.1 Author Information and Competency

This chapter was prepared by Louise Harrington, Heritage Consultant, in association with Jill Maher, Archaeologist. Louise Harrington holds an MPhil Degree from the Department of Archaeology, University College Cork (UCC), (2000), an MA in Historic Landscape Studies from the Department of Archaeology, University of York (2007), and a BA in History of Art and Architecture (Dublin University), (1996). Jill Maher holds a BA degree in archaeology from UCC (1999). Both have significant experience assessing the impact of development on the archaeological, architectural, landscape and cultural heritage.

## 12.2 Proposed Development

The proposed development consists of the construction of 336. no. residential units, a creche, the provision of landscaping and amenity areas, a vehicular access point on the R639, and all associated ancillary site development works. A detailed description of the project is provided in Chapter 2 - Project Description.

## 12.3 Methodology

The methodology used for this assessment is based on the EPA Draft Guidelines for Information to be Contained in an EIAR (2017), as well as guidelines for the assessment of impacts on the cultural heritage published by the International Council on Monuments and Sites (ICOMOS 2011). The assessment was based upon desk-based research, as well as a field survey to identify any features of archaeological, architectural or cultural heritage significance likely to be affected by the proposed development.

### 12.3.1 Desktop Study

Documentary research on the recorded and potential cultural heritage resource within the study area and its environs 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 unrecorded cultural heritage sites or features.

The principal sources reviewed for the assessment of the recorded archaeological heritage were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) which are maintained by the Department of Culture, Heritage and the Gaeltacht (DCHG). Cork County Council's Record of Protected Structures (RPS) and the DCHG's National Inventory of Architectural Heritage (NIAH) were consulted to assess the designated architectural heritage. Summaries of the legal and planning frameworks designed to protect these elements of the cultural heritage are also provided within the chapter.

Other sources consulted as part of the assessment included the following:

Development Plan

The current Cork County Development Plan (2014) was consulted as part of this assessment. This publication outlines the Council's policies for the protection of the archaeological and architectural heritage within the county. The Fermoy Town Development Plan (2009-2015) contains the Record of Protected Structures for Fermoy and the Fermoy Municipal District Local Area Plan (2017) also contains policy for the protection of architectural conservation areas.

#### Database of Irish Excavation Reports

The Database of Irish Excavation Reports contains summary accounts of all archaeological excavations carried out in Ireland (North and South) from 1970 to 2021. Current data was accessed via www.excavations.ie.

#### Literary Sources

Various literary sources were consulted in order to assess the archaeological, historical, architectural heritage and folklore record of the study area and these are listed in Section 12.8 of this chapter.

Archaeological Inventory of County Cork. Volume 4: North Cork, & Archaeological Inventory of County Cork. Volume 5.

These publications present summary descriptions of the recorded archaeological sites within this area of the County Cork. The current national online database pertaining to the records were also accessed at www.archaeology.ie.

#### Cartographic Sources

The detail on historic cartographic sources can indicate the presence of past settlement patterns, including features of archaeological and architectural heritage significance that no longer have any surface expression.

#### Aerial Imagery

Aerial photographs provided by Ordnance Survey Ireland online (www.osi.ie) were consulted to identify any previously unrecorded features of archaeological, architectural, or cultural heritage significance.

#### Heritage Council Heritage Map Viewer

This online mapping source (www.heritagemaps.ie) is a spatial data viewer which collates various cultural heritage datasets and includes the National Museum of Ireland’s records of artefact discovery locations, as well as datasets provided by, amongst others, the National Monuments Service, local authorities, the Royal Academy of Ireland and the Office of Public Works.

#### Irish National Folklore Collection

Transcribed material from the National Folklore Collection archive has been digitised and published online at www.duchas.ie.

#### 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.

#### Open Topographic Data Viewer

This online resource publishes a range of LiDAR images collated from a number of State bodies. Lands associated with the development of the M8 1km to the east of the study area have been covered, however, the area itself has not.

### 12.3.2 Field Survey

The purpose of the field survey was to assess the physical environment in which the proposed development will take place and identify any possible features of cultural-heritage significance which have not previously been recorded. The current land use, local topography and environmental conditions were assessed to understand the area. Site inspections were carried out on a number of occasions during 2020 and 2021. The survey results are described within the chapter and photographs taken as part of the field survey are included in Appendix 12.1 Field Survey Photos.

### 12.3.3 Impact Assessment

Guiding principles in relation to the assessment of impacts of Cultural Heritage, including current legislation, and EPA Guidelines and Advice Notes pertaining to EIAR (2002; 2003; 2015 Draft and 2017 Draft) have been adhered to as part of the methodological approach, with a view to identifying likely and significant impacts on the resource.

### 12.3.4 Difficulties Encountered in Compiling the Information

No site constraints were encountered during the survey, therefore, no difficulties were experienced in compiling the information.

## 12.4 Description of Existing Environment

### 12.4.1 General Context

The site is located in the townland of Coolcarron within the town of Fermoy, c.1km south of the main street and 26km north of Cork city centre. Approximately 1km to the east, the M8 was constructed in the early 2000s.The general site context is described in Chapter 2. It comprises an area of vacant farmland and contains a mixture of grassland with areas under scrub and woodland. To the north and south, spoils of earth are located on the banks of drainage channels, created in the recent past. A drainage ditch forms its border to the east. Further details on the internal layout of the proposed development site are provided in Section 12.4.4 of this chapter.

### 12.4.2 Legal and Planning Context

The management and protection of the cultural heritage in Ireland is arranged primarily through the following legislation and guidance:

- National Monuments Act 1930 (and amendments in 1954, 1987, 1994 and 2004);
- Framework and Principles for the Protection of Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands (1999);
- Heritage Act (1995);
- National Cultural Institutions Act (1997);
- The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous) Provisions Act (1999);
- Planning and Development Act (2000);
- Architectural Heritage Protection: Guidelines for Planning Authorities (Dept. of Arts, Heritage and Gaeltacht, 2011).

#### 12.4.2.1 Relevant Archaeological Legislation and Planning Policies

The following section outlines a summary of the legal and policy frameworks designed to protect the Irish archaeological resource. The National Monuments Act 1930 and its amendments, is the primary means of ensuring the satisfactory protection of archaeological remains. This provides a number of mechanisms that are applied to secure the protection of archaeological monuments including the designation of National Monument status, the Register of Historic Monuments (RHM), the Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR), and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were reviewed as part of the assessment and none are located in the vicinity of the proposed development.

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 examples through agreement with landowners or under compulsory orders. Archaeological sites within the ownership of local authorities are also deemed to be National Monuments. There are no National Monuments, or recorded archaeological sites subject to Preservation Orders, located within the study area.

The RMP was established under Section 12 (1) of the National Monuments (Amendment) Act, 1994 and was based on the earlier SMR and RHM records. The RMP comprises lists and maps of all known archaeological monuments and places for each county in the State. All archaeological sites listed in the RMP receive statutory protection under the 1994 Act and no works can be undertaken at their locations, without providing two months advance notice to the National Monuments Service (NMS). There are no recorded archaeological sites of any designation located within the proposed development site. There are eight RMP sites located within the study area, or within 500m of the proposed development site, including the historic town of Fermoy (CO035-107---). The nearest example to the proposed development site is the remains of a country house (CO035-101----) located approx. 200m to the east. Details on these recorded archaeological sites are presented in Section 12.4.3 of this chapter. The study area is located in the townlands of Coolcarron, Fermoy and Duntahane, and the SMR does not record any unlocated archaeological sites within this townland.

The Cork County Council Development Plan (2014) outlines a number of objectives in relation to the protection and promotion of the archaeological resource within the County. Of particular relevance to the present study are the following objectives relating to the protection of archaeological sites and materials:

*Objective HE 3-1: Protection of Archaeological Sites*

*a) Safeguard sites and settings, features and objects of archaeological interest generally.*

*b) Secure the preservation (i.e. preservation in situ or in exceptional cases preservation by record) of all archaeological monuments including the Sites and Monuments Record (SMR) (see www.archeology.ie) and the Record or Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, as amended and of sites, features and objects of archaeological and historical interest generally. In securing such preservation, the planning authority will have regard to the advice and recommendations of the Department of Arts, Heritage and Gaeltacht as outlined in the Frameworks and Principles for the Protection of the Archaeological Heritage.*

*12.3.16: Where archaeological materials are found appropriate mitigation measures shall be put in place. Preservation in situ should generally be the presumed option and only compelling reasons can justify preservation by record.*

#### 12.4.2.2 Relevant Architectural Legislation and Planning Policies

Protection of architectural or built heritage is provided for through a range of legal instruments that include the Heritage Act 1995, the Architectural Heritage (National Inventory) and National Monuments (Misc. Provisions) Act 1999, and the Planning and Development Act 2000. 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. There are 93 protected structures within the study area.

The Architectural Heritage Act of 1999 established the National Inventory of Architectural Heritage (NIAH) to create a record of built heritage structures within the State. While inclusion in a NIAH inventory does not provide statutory protection to a structure, the inventory is used to advise local authorities on the compilation of their Records of Protected Structures. There are 97 structures which are included in the NIAH within the study area.

The Cork County Council County Development Plan (2014) presents the following objectives in relation to the protection and promotion of the architectural heritage resource within the County:

*HE 4-1: Record of Protected Structures*

*d) Ensure the protection of all structures (or parts of structures) contained in the Record of Protected Structures.*

*e) Protect the curtilage and attendant grounds of all structures included in the Record of Protected Structures.*

*HE 4-2: Protection of Structures on the NIAH*

*Give regard to and consideration of all structures which are included in the NIAH for County Cork, which are not currently included in the Record of Protected Structures, in development management functions.*

*HE 4-3: Protection of Non- Structural Elements of Built Heritage*

*Protect important non-structural elements of the built heritage. These can include designed gardens/garden features, masonry walls, railings, follies, gates, bridges, and street furniture. The Council will promote awareness and best practice in relation to these elements.*

The Fermoy Town Council Development Plan (2009) includes a Record of Protected Structures for the town of Fermoy. The structures listed is this record are afforded the same protection outlined in the County Development Plan (2014). The Town Council Plan further defines Architectural Conservation Areas (ACAs) as a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of protected structures.

The designated areas and the objectives are incorporated in the Fermoy Municipal District Local Area Plan (2017). The objective for the ACA states:

> *FY-GO-08: Protect and enhance the attractive landscape character setting of the town. Conserve and enhance the character of the town centre (including the special character of Architectural Conservation Areas) by protecting historic buildings, groups of buildings, the existing street pattern, zone of archaeological potential, plot size and scale while encouraging appropriate development in the town.*

## 12.4.3 Desktop Study

### 12.4.3.1 Archaeological and Historical Context

The following section presents a summary of the main periods within the Irish archaeological record with reference to the recorded archaeological sites located within the study area. They are listed in Table 12.1 and their location is shown in Figure 12.1. Datasets have been interrogated and retrieved from State and Local authorities and are considered accurate and current per publicly available sources (Archaeological datasets, Historic Map Viewer: Dept. of Culture, Heritage and the Gaeltacht www.archaeology.ie; archaeological excavation summaries www.excavations.ie, NIAH datasets www.buildingsofireland.ie and the Fermoy Town Development Plan 2009).

There are eight recorded archaeological sites located within the study area. The nearest of these is a country house (CO035-101----), located c. 200m to the east, which is now in ruins. It is noted that the potential also exists for the presence of unrecorded sub-surface archaeological features and artefacts within the study area.

Table 12.1 Recorded Archaeological Sites Within The Study Area

| Monument No. | Class | Townland | ITM Ref (E,N) | Distance |
|---|---|---|---|---|
| CO035-101--- | Country house | Fermoy | 581304, 597749 | 200m |
| CO035-103---- | School | Fermoy | 580869, 598446 | 380m |
| CO035-107---- | Historic town | Fermoy | 581084, 598476 | 410m |
| CO035-023--- | Holy well | Duntahane | 580582 598503 | 500m |
| CO035-024--- | Abbey | Fermoy | 580985, 598496 | 430m |
| CO035-024001- | Graveyard | Fermoy | 580985, 598496 | 430m |
| CO035-077---- | Fulacht fiadh | Coolcarron | 580812, 596777 | 470m |
| CO035-073--- | Bridge | Carrignagrohera | 581143, 598609 | 500m |

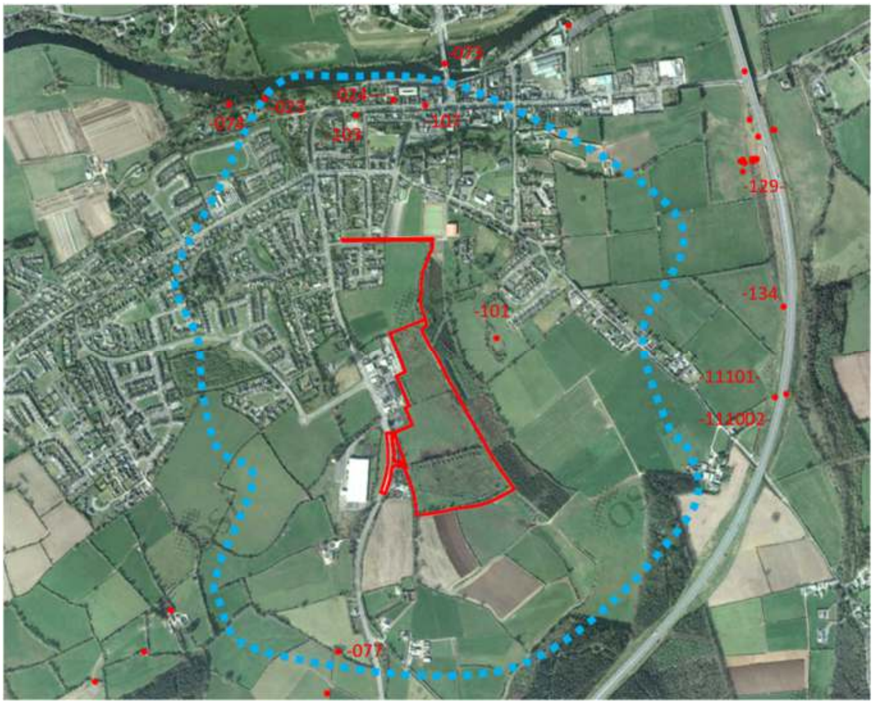

Figure 12.1 Modern OSI Aerial Image Showing Recorded Archaeological Sites Within The Study Area (Approx. Extent Indicated With Dashed Blue-Line).

Early Prehistoric Periods

Recent evidence from a bear bone found in a cave in Co. Clare (Dowd and Carden, 2016) suggests that humans were present in Ireland during the Paleolithic period (12,500 BC). Previously, the earliest recorded evidence for human activity dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers lived on what food they could obtain from hunting and gathering. The archaeological record indicates that these mobile groups used flint and other hard stone to manufacture their tools. Their presence in an area can often be identified by scatters of worked flints in ploughed fields. The Neolithic period (4000-2400 BC) is marked by the transition from hunting and gathering to settled farming. This resulted in more permanent settlements with more substantial housing, as well as monumental megalithic tombs for the dead. There are no known archaeological sites dating to the Mesolithic or Neolithic period within the study area, however, during excavation for the construction of the M8 evidence of Mesolithic activity was found 2.5 km north of the study area (O'Donoghue, 2006).

### Late Prehistoric Periods

The Bronze Age in Ireland dates from approximately 2500 BC to 500BC. The period is characterised by a wealth of new and innovative metalworking techniques, as well as the introduction of ceramic objects to the island. The population of Bronze Age Ireland was highly organised and developed new monuments such as standing stones, stone circles and burnt mounds and/or fulachta fia. New burial practices during the period led to 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). Within the study area, there is one fulacht fiadh (CO035-077----), 500m to the southwest of the proposed development site.

### The Early Medieval Period

The Early Christian, or early medieval period (c. 400–1169 AD), is defined by the introduction of Christianity to Ireland. Urbanisation emerged around monasteries and as Hiberno-Norse ports developed, however, settlement during this period remained largely rural-based in enclosed farmsteads or ringforts. A ritual site/holy well (CO035-023---) is located 500 to the northwest of the proposed development site. The tradition of visiting holy wells goes back to the beginnings of Irish Christianity and probably originated in pre-Christian times. Usually, the well is a spring or a natural collection of water which over time may have come to be surrounded by rock or concrete shelters, and were associated with the healing properties of their waters. The well is called St. Bernard's Well on the 1840, 1903 and 1932 surveys of the Ordnance Survey Maps but it is no longer in use.

There is one ringfort (CO035-074---), 570m to the northwest of the proposed development site, along the banks of the River Blackwater, and many more exist in the broader landscape. The site is now occupied by Mountford House but may have been used to build a strong point or dún to guard a crossing of the River Blackwater to the west of Fermoy (Brunicardi, 1985), however, no visible surface traces remain (Zajac et al. 1995).

### Late Medieval and Post Medieval

The Anglo-Normans arrived in Ireland in 1169 and began their conquest of large parts of Ireland, marking the advent of the late medieval period. By the mid-14th century the influence of the Normans could be seen in the rural landscape, in the form of manorial villages and fortified tower houses, and in the ongoing urbanisation of Ireland. A Cistercian abbey (CO035-024---), 430m to the north of the proposed development site, was founded in Fermoy in 1170 by Dónal Mór O'Brien, King of Limerick (Stalley, 1987). It was dissolved c.1540 by which time much of its land was in waste (Stalley, 1987). Human remains thought to be associated with the abbey were found during excavations of a site in the immediate vicinity (CO035-24001-), (Lane, 2001). Both sites are located within the study area.

### Historical Background

In the post medieval period from the mid-16th century to the late 18th century, Fermoy appears to have remained a small settlement. Richard Boyle established an English settlement of 30 households at Fermoy in 1637 but even by the mid-18th century Smith (1750) still called it a 'small village'. The period saw the expansion of many market towns and port cities, especially in the 17th and 18th centuries, with stone buildings replacing timber-frames. In the countryside large country houses such as Caslehyde (CO035-016---), c.3km from the study area appeared. John Anderson purchased the town of Fermoy in 1791 and oversaw its growth as an important town on the road to Dublin. He was a Scottish merchant who came to Cork in the late 18th century and enjoyed much success in the Trans-Atlantic provisions trade but also secured contracts to provide a mail service from Dublin to Cork. In 1797 he offered to build new military barracks for the British government in Fermoy. The impact of the creation of the Old Barracks, built in 1806, and the New Barracks, 1809, along with the infrastructure required to support the mail and coach business, was manifest in the development a substantial town with a planned complex of streets, an impressive bridge spanning the River Blackwater and a fine square.

At the time of Lewis' survey in 1837, the town's population had grown to nearly seven thousand. He wrote that Fermoy was

> *'a grand military depot', that was 'finely situated on the opposite banks of the river Blackwater, over which is a handsome stone bridge of 13 arches, ... (it) consists of a spacious square of handsome houses, ... several principal streets connected with others in a parallel direction by shorter streets intersecting them at right angles ; ... and a range of neat houses extending from the north end of the bridge. The streets are partially paved and watched, under the provisions of an act of parliament obtained in 1808, and the inhabitants are amply supplied with water'. ... 'There are some extensive flour-mills, paper-mills, and a public brewery, with a large malting establishment attached to it, formerly celebrated for its ale, but now principally brewing porter. The staple trade of the town is in corn and butter, of which considerable quantities are sent off ...' 'Two mails from Cork to Dublin, and Bianconi's cars, pass daily through the town.'*

A number of features dating to the post medieval and early modern periods are located within the study area. This includes a school (CO035-103---), 380m from the proposed development site; a bridge (CO035-073---) at 500m, and the historic town of Fermoy (CO035-107---), all to the north.

Griffith's Valuation records that 25 acres of Fields 1, 2 and 3 of the proposed development site were let out to Michael Molony by Anthony Cliffe, having a value of £30. Field 4 formed a portion of lands let out by Anthony Cliffe to Michael Spillane and Patrick Coghlan. Upland House (CO035-101---), 200m east of the proposed development site and now in ruins, was let out to Thomas Perrot by Sir R Abercrombie, along with 46 acres and a gate lodge to the value of £98.

Excavations Database

The Excavations Database does not contain any entries for archaeological investigations within the study area, however, 1km to the east, the construction of the M8 led to multiple excavations in the early 2000s, revealing a number of fulachtaí fia, pits and mounds. An excavation 430m to the north of the proposed development site exposed human remains from a graveyard (CO035-024001) potentially associated with the Cistercian Abbey (CO035-24---), (Lane 2001).

### 12.4.3.2 Architectural Heritage

There are 93 protected structures and 97 NIAH structures located within the study area (see Appendix 12.2). The vast majority of these are located along the main streets of Fermoy town and will not be impacted by the development. To the northwest of the site three structures (NIAH 20820134-6), will not be affected, and two collections of NIAH structures 20820137-140 (the former military college) and buildings associated with the Loreto and Presentation Convents (NIAH 20820125-128) will not be affected either. An architectural conservation area bounds the proposed development site to the north. The remains of one ruined building are located within the area to be developed for a proposed new surface-water drainage-pipe in the north spur of the proposed development site, towards Devlin Street. The remains, comprising two rendered limestone gable-walls and a single-leaf concrete block wall to the front with a blocked window opening, were built against a random-rubble boundary-wall to the north. The building was built between the publication of the 1878 Fermoy Town OS Map and the 25" OS Map, surveyed in 1903. The walls now enclose earth and debris. The three blocks to the north-west of this area were in use for terraced housing from the early 19th century and form part of the architectural conservation area. In 1912 Fermoy Urban District Council cleared some of the area to build social housing and continued to develop the area into the 1930s and onwards.

Figure 12.2 Modern OS Map Showing Recorded NIAH Structures Within The Study Area.

### 12.4.3.3 Review of Cartographic and Aerial Sources

The cartographic sources examined for the study area include the 1st Edition 6” OS Map (Figure 12.3), surveyed in 1840, and the 25” OS Map (Figure 12.4), surveyed in 1903. The proposed development site is depicted on both editions of the 19th century OS Maps as enclosed fields. No potential unrecorded archaeological features are depicted within the proposed development site. Hedging along an east-west boundary to the north of Field No. 4 is represented with trees in the 1st Edition OS Map, however, these are not included in the 25” OS Map and a boundary running north-south to the west of the field is also absent. The 6” Cassini Map (surveyed 1932) shows part of the latter boundary removed and rushes in Field No. 4 (Figure 12.5). The townland boundary between Coolcarron and Fermoy is shown extending along the east side of the study area on the three editions and is formed by an unnamed drainage channel which is described within the field survey section of this chapter (Section 12.4.4).

In the northern area of the proposed development site, the current Devlin Street, Clancy Street, and John Redmond Streets are formed by the time of the survey of the 1st Edition OS Map, however, they were called Pound Lane, Cross Street and Bog Lane. They were renamed by the time of the survey of the 6” Cassini Map in 1932. The terrace of houses to the south of the proposed new surface-water drainage-pipe were named Springfield Cottages by 1932.

A review of modern aerial images demonstrates that the study area and the lands to the south have retained their agricultural character while the M8 has been developed to the east. The review included an examination of Transport Infrastructure Ireland (TII) LiDAR imagery which has been published online. Land to the south and south-east of the study area along the M8 route is included in that survey (Figure 12.6). No traces of potential archaeological features are visible on later aerial images (Figure 12.7).

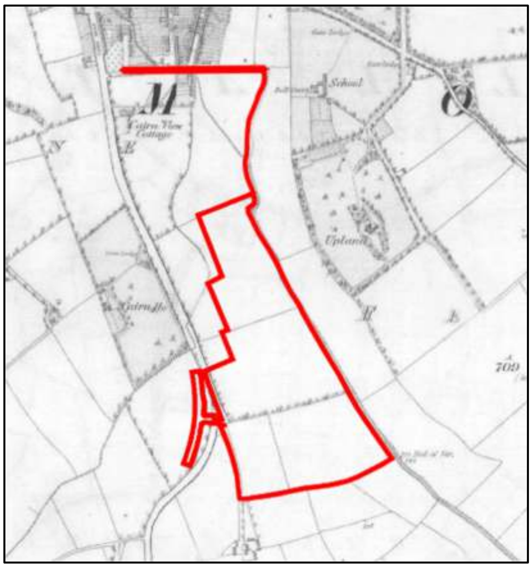

Figure 12.3 Extract from 1st Edition OS Map, surveyed 1840 with site outline.

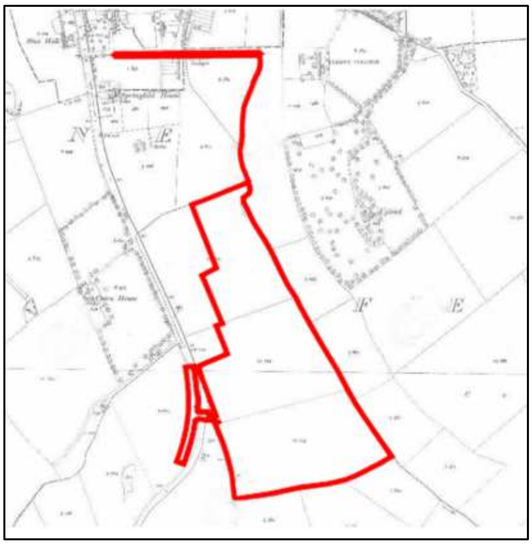

Figure 12.4 Extract From 25” OS Map, Surveyed 1903, With Site Outline.

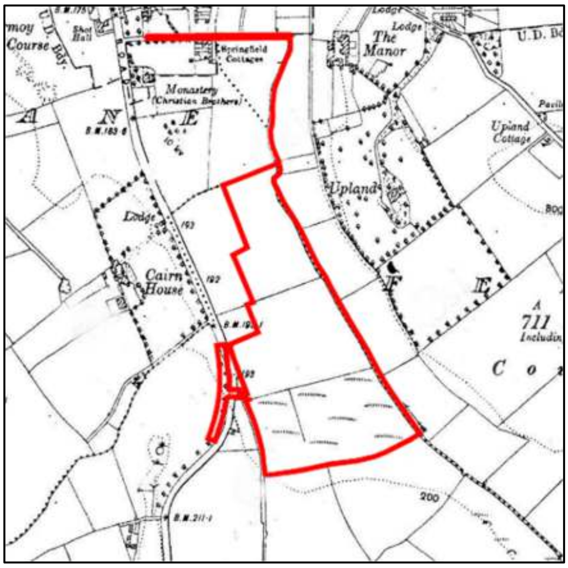

Figure 12.5 Extract From 6” Cassini Map, Surveyed 1932, With Site Outline.

**Figure 12.6 TII LiDAR Imagery At East Side Of Study Area Showing Adjacent Areas Surveyed For M8 Construction.**

**Figure 12.7 Extract From modern OSI Aerial Imagery Showing The Site.**

#### 12.4.3.4 Undesignated Cultural Heritage Assets

Undesignated cultural heritage assets include such features as settlements, demesne landscapes, vernacular structures, folklore, placenames and historical events. The town of Fermoy is a designated historic settlement (CO035-107---) located within the study area, however, there are no undesignated cultural heritage assets in the study area.

Placenames

The majority of the study area is located within Coolcarron townland with a spur to the north in the townlands of Duntahane and Fermoy. Co. Cork has 5471 townlands. Townlands represent a Gaelic system of enclosed divisions of land which were definitively mapped by the Ordnance Survey in the early 19th century; standarising boundaries and anglicising Irish placenames. The Irish 'Cairn' of Coolcarron may refer to the Corrin Hill which lies to the southwest of the site and whose summit affords a panorama of the surrounding landscape. Cairn Thiernagh at the summit of the hill, comprises a hilltop fort and is said to be the burial place of one of the Kings of Munster. The hill has religious associations with devotions taking place annually and a large stone cross erected on the peak in 1933. Fermoy or 'Mainistir Fhear Maí' refers to the 'monastery of the men of the plain'; possibly, a topographical reference to lands adjoining the River Blackwater. The dun or 'dún' of Duntahane is found commonly in Irish placenames, and often refers to a former ringfort within the landscape, in this case, the possible fort of 'Táithín'. Carrignagrohera is a large townland to the north of the town and incorporates another common placename prefix: 'carrig' meaning rock. Loganim.ie does not offer an explanation of 'na Crochairí' which literally translates as 'hangers'. Table 12.2 provides the translations of the Irish townland names within the study area and its environs.

**Table 12.2 Translations Of Townland Names Within The Environs Of The Study Area (Source: www.loganim.ie)**

| Townland | Irish Root | Translations and Loganim Names |
|---|---|---|
| Coolcarron | Cúil an Chairn | Corner or nook of cairn/pile of rocks |
| Carrignagrohera | Carrig na Crochairí | (Crochairí's) Rock |
| Duntahane | Dún Táithín | (Táithín's) fort |
| Fermoy | Mainistir Fhear Maí | Monastery of the men of the plain |

#### Folklore

No references were found in the National Folklore Collection UCD Digitization Project (www.duchas.ie) associated with Coolcarron.

### 12.4.4 Field Survey

The proposed development comprises four separate fields and an approximate area of 11 hectares. An inspection of the proposed development site was undertaken in March 2020 and September 2021 in good weather conditions that provided good landscape visibility. The description of the lands and recorded cultural heritage features, both within and adjacent to the proposed development, are provided in Table 12.3.

In summary, no potential unrecorded cultural heritage sites or features were identified during the inspection of the study area. The description of the field survey results is provided in Table 12.3 and extracts of the photographic record are presented in Appendix 12.1.

Figure 12.8 Field Numbers Assigned During Site Inspection.

## Table 12.3 Description of Field Survey Results

| Field | Description |
|---|---|
| 1 | Sub rectangular-shaped area, measuring c.110 m east to west at the north, by c.130m north to south at the east side [c.1.2ha]. This area is shown as forming the top quarter of a larger field, which includes field no. 2 to the south, and almost the combined area again to the west, on all historic maps. Housing and a petrol station were built on the western portion of the original area and now form the boundary to the west. A townland boundary along a drainage channel forms the eastern limit of this area. A public park forms the boundary to the north where the remains of a stone wall is covered with vegetation. The field is level bar to the northeast where there is a slight rise. The field comprises a mix of grass, rushes and a few willow trees. Drainage channels were dug .75m-1m deep along the western and southern boundaries of the field. The spoil from this is to be found on the edges of the drains and in the field which is boggy. To the northeast, closest to the drainage channel which pools here, the ground is very wet. Here the water is standing and covered in vegetation. Nothing of an archaeological nature was noted during inspection. |
| 2 | Rectangular-shaped area, measuring c.132 m east to west at the north, by c.113m north to south at the east side [c.1.5ha]. This area is shown as forming the bottom quarter of a larger field, which includes field no. 1 to the north, and almost this combined area again to the west on all historic maps. A car showroom was built on the western portion of the original area and now forms the boundary to the west with the partial remains of a stone wall which is now overgrown. A townland boundary along a drainage channel forms the eastern limit of this area. The field is divided from field no.1 by a drain. Drainage channels were dug .75m-1m deep along the western and northern boundaries of the field. The spoil from is found to the edges of the drains and in the field. To the southwest corner of the field there remains a section of stone wall and a concrete gate pier. Other sections of this wall remain along the boundary to the field to the south. The field is level and comprises a mix of rushes and grass. Nothing of an archaeological nature was noted during inspection. |
| 3 | Sub rectangular-shaped area, measuring c.256m east to west at the south, by c.188m north to south at the east side [c.4ha]. Shown as nearly the same as its current form on historic maps with tree-lined hedges on its southern and western boundaries on the 1st Edition OS Map. A weighbridge and layby now form the boundary to the west with an ESB substation in a portion of the original northwest corner of the field. A drainage channel and the remains of a stonewall form the boundary to the north, and the drainage channel forms the boundary to the east. A historic ditch formed by a stone wall and hedge form the boundary to the south. The ground rises to the southeast corner of the field and slopes towards the drainage channel. The field is in pasture bar an area bounding the drainage channel which is fallow. Nothing of an archaeological nature was noted during inspection. |
| 4 | Irregular area measuring c.300m east to west at southern side, by c.145m north to south at eastern side [c.4.5ha]. This area is shown as formed of two fields on the 1st edition OS map. A segment of this boundary is identified on the 6" Cassini Map. A tree-lined stone wall and ditch form the boundary to the north while the drainage channel forms the boundary to the east. Two houses and another field form the boundary to the west. A hedge forms the boundary to the south. To the west and northwest the field is in pasture, the remainder is fallow and boggy in places. Spoil from drainage works is evident in the field, and trees have been planted parallel to the northern boundary. A track runs diagonally from close to the northwest of the field to three quarters of length of the boundary with the field to the south. Nothing of an archaeological nature was noted during inspection. |

| | |
|---|---|
| East Drainage Channel | There is one unnamed drainage channel extending along the east side of the landholding. The watercourse is shown on its existing line on the historic OSI maps and there are no associated features, such as bridges, weirs or stepping stones, shown along it. A visual inspection of the drainage channel was undertaken from its banks during the site survey and it was found to be contained with a shallow linear channel. This narrow drainage channel extends along a broadly linear course between the subject fields and adjacent to a forestry plantation in the area along the eastern boundary of the site. It follows a shallow incline to the southeast. The vegetation was mixed along the banks of the drainage channel, varying from boggy grass and rushes to coppices of small trees at the edge of the fields. The drainage channel was largely accessible. Significant vegetation occurred at the northeast corner of the site where the water was pooling and again at the southeast corner of the site. The drainage channel ranges in width between 3.5m-5m at the northeast corner of the site, and an average of 2m-3m along the remaining length. Where a drainage channel joins the drainage channel at the northeast corner of the site, the depth was recorded at 1m-1.5m deep. Elsewhere the water was clear and the depth was .6m-.9m. The drainage channel bed, which was visible midway along its length to the southeast corner, was composed of small fine pebbles (≤1cm) and silts. Localised deposits of fine gravels were also noted along slight bends in the drainage channel course, although in general there was little deposition noted within the channel. There were no observed inclusions in the river. The drainage channel is shallow and free-flowing apart from the pooling in the northeast corner of the site. No stepping stone or fording features were noted during the inspection. |
| North Spur | The site extends along the drainage channel to an area to the north and turns to the west to provide for drainage services. This area measures approx. 10m by 270m, providing for a 750mm diameter surface-water drainage-pipe running along Devlin Street from the drainage channel to the east. The area comprises lawn that is part of the public park, and hard-surface road and path finishes. A section of a random-rubble stone-wall with partial cement render, approx. 24m long and 2m high with concrete block sections to either end, remains to the south side of the Loreto Convent Astro-turf pitch. The OS Map indicates that the stone wall was in place by the time of the 1st Edition OS Map in 1840. A second section of random-rubble stone wall, approx. 60m long and 1.5m high, bounds the south side of tennis courts to the west. The OS Maps indicate that this wall was also built by the time of the 1st Edition OS Map. The remains of a roofless lean-to building lies at the west end of this wall, comprising rendered rubble-walls with one gable standing at the west side. The ruin comprises two rendered limestone gable-walls and a single-leaf concrete block wall to the front with a blocked window opening. The building is not present on the 1878 Fermoy Town OS Map but is on the 25" OS Map, surveyed in 1903. The walls now enclose earth and debris. |

### 12.4.5 Summary

There are no recorded archaeological sites located within the proposed development site. The closest monument is located at 200m east of its boundary, CO035-101--- (country house,19th century). While no evidence for potential unrecorded archaeological sites was identified during the desktop study and field surveys undertaken as part of this assessment, the potential does exist for the presence of sub-surface archaeological sites, features and artefacts within the study area. The channel to the east of the proposed development site area, forming its eastern boundary, is also deemed to be of archaeological potential.

There are 97 designated architectural heritage structures located within the study area on the National Inventory of Architectural Heritage, 93 of which are included in the Record of Protected Structures. Much of the town of Fermoy to the north of the proposed development site, is located within an architectural conservation area. There is one structure located within the proposed development site which comprises the roofless ruin of a building, the rear wall of which includes the boundary wall to the tennis courts off Devlin Street. The work proposed for the creation of a new surface-water drainage-pipe along the northern spur of the proposed development site will involve the loss of this structure. These walls are considered to be of low cultural heritage value and their loss will be of negligible effect.

## 12.5 Impact Assessment

### 12.5.1 Do Nothing Scenario

A 'Do Nothing Scenario' will see to the continued preservation of recorded and potential cultural heritage features within the study area and its environs.

### 12.5.2 Construction Phase

#### Archaeology

There are no recorded archaeological sites within the proposed development site. Eight recorded monuments are located within 500m of its boundary. The construction phase of the proposed development will, therefore, have a likely imperceptible impact on the recorded archaeological heritage during the construction phase (Table 12.4).

**Table 12.4 Impact On the Recorded Archaeological Heritage During The Construction Phase**

| Monument No. | Class | Townland | Effect | Distance |
|---|---|---|---|---|
| CO035-101--- | Country house | Fermoy | Imperceptible | 200m |
| CO035-103---- | School | Fermoy | Imperceptible | 380m |
| CO035-107---- | Historic town | Fermoy | Imperceptible | 410m |
| CO035-023--- | Holy well | Duntahane | Imperceptible | 500m |
| CO035-024--- | Abbey | Fermoy | Imperceptible | 430m |
| CO035-024001- | Graveyard | Fermoy | Imperceptible | 430m |
| CO035-077---- | Fulacht fiadh | Coolcarron | Imperceptible | 470m |
| CO035-073--- | Bridge | Carrignagrohera | Imperceptible | 500m |

While no evidence for unrecorded archaeological sites or features was identified within the study area during the assessment, the potential exists for the presence of unrecorded, sub-surface archaeological features in undisturbed green field areas and within, and in the environs of, the sections of the drainage channel extending along its eastern boundary. As the existence, nature and extent of any unrecorded archaeological features within the proposed development site are unknown; the level of potential impacts is indeterminable. However, ground works required for housing construction will have the likely potential to result in negative, direct, significant, permanent impacts on any sub-surface or in-channel archaeological features that may exist within the study area boundary.

#### Architectural Heritage

There are 97 designated architectural heritage sites located within the study area, however, these are located largely in a group to the north of the proposed development site, as part of the town centre of Fermoy. The structures located more closely to the site will not be affected. Most of the town of Fermoy is located within an architectural conservation area to the north of the proposed development site. This will not be affected by the proposed development. There is one structure located within the proposed development site which comprises the roofless ruin of a building, the rear wall of which includes the boundary wall to the tennis courts, off Devlin Street. The work proposed for the creation of a new surface-water drainage-pipe along the northern spur of the proposed development site will involve the loss of this structure. These walls are considered to be of low cultural heritage value and their loss will be of negligible effect. The proposed development will, therefore, have an imperceptible impact on the architectural heritage resource during the construction phase.

### Undesignated Cultural Heritage Assets

There are no features of undesignated cultural heritage interest within the proposed development site or adjacent to it.

### 12.5.3 Operational Phase

There are no designated architectural heritage structures located within the proposed development site. There are no recorded archaeological sites within the proposed development site. There is one recorded monument located at 200m east of its boundary which will not be affected by the development. The implementation of the mitigation measures outlined in Section 12.6 will provide for either the avoidance or the proper and adequate recording of any currently unrecorded archaeological features within its boundary. As a result, there will be a likely imperceptible impact on the cultural heritage resource during the operational phase.

### 12.5.4 Cumulative Impacts

There are no recorded archaeological sites, designated architectural heritage structures or undesignated cultural heritage assets located within the proposed development site. The following presents a summary of potential cultural heritage impacts for a number of developments within the wider environs of the study area which is based on a review of online assessments provided by the planning department of Cork County Council and by excavations.ie.

The most significant development within the environs of the site has been the development of the M8 motorway to the east which had significant negative impacts on unknown archaeology. Testing and excavations were made within 1km of the site in advance of the construction of the road. A fulacht fiadh and pits were excavated 1km to the east of the site along the route of the road (CO035-111001- & CO035-111002-), (O'Neill 2006). North of this site, and also at 1km from the proposed development site, domestic pits and post-holes were excavated (CO035-134---), revealing Bronze Age pottery (Murphy 2006). At 1km south of the study area, a fulacht fiadh and two associated circular pits were also excavated and dated to the early Iron Age (CO035-141---), (Sutton, 2006, 2007)

There is no archaeological assessment contained within the online planning files for a proposed intensification of use, along with the provision of an underground containment pit, by ABEC Technologies Europe (planning ref.: 20/6246), located approx. 10 m to the west of the proposed development site. A screening report concluded that an EIAR was not required for the proposed development (RPS Group, 2020).

There is no archaeological assessment contained within the online planning files for a proposed redevelopment of Cavanaugh's forecourt and petrol station (planning ref.: 19/6221), including demolition of an existing canopy, shop and stores, on a site to the immediate northwest of the proposed development site.

An application for the construction of 45 houses at Pike Road, Rath-Healy, Fermoy, (planning ref.: 19/5624), located 1.3 km to the northeast of the proposed development site was granted in 2021. No archaeological conditions are attached to the files available online.

A proposal to build a garden centre (planning ref. 20/5237) at Carrignagrohera, 600m northwest of the proposed development site, was assessed as resulting in no predicted impact on known archaeology in the area, with monitoring recommended for the duration of construction (Cronin, 2020).

Conclusion

Given the adoption of appropriate mitigation measures (Section 12.6), combined with the absence of any identified impacts on the recorded and designated archaeological and the architectural heritage resources, bar the negligible impact of the low value ruins of one building, it is concluded that the proposed development will not contribute to any significant cumulative impacts on the cultural heritage resource of the area.

### 12.5.5 ‘Worst Case Scenario’

If the proposed development were to proceed without the implementation of the archaeological mitigation measures outlined in Section 12.6, then construction works could result in permanent, direct, significant, negative impacts on any unrecorded, sub-surface archaeological features that exist within the site.

### 12.5.6 Human Health

There are no predicted risks to Human Health associated with potential impacts to the cultural heritage resource.

## 12.6 Mitigation and Monitoring of Process

### Archaeology

Given the scale and extent of the proposed development within an undeveloped green field area, a programme of archaeological investigations, to comprise a geophysical survey of undisturbed greenfield areas followed by targeted archaeological test trenching, will be undertaken prior to the commencement of the construction phase. These archaeological investigations will be carried out under licences issued by the National Monuments Service.

There are a number of statutory processes to be undertaken as part of archaeological licence applications and these will allow for monitoring of the successful implementation of the archaeological mitigation measures. Method statements detailing the proposed strategy for all pre-construction site investigations will submitted for approval to the National Monuments Service as part of the licence applications. These will clearly outline the proposed extent of works and outline the consultation process to be enacted in the event that any unrecorded archaeological sites or features are identified. A report will be compiled on all site investigations which will clearly present the results in written, drawn and photographic formats. Copies of these reports will be submitted to the National Monuments Service, Cork County Council and the National Museum of Ireland. In the event that any sub-surface archaeological deposits, features or artefacts are identified during site investigations, the Planning Authority and the National Monuments Service will be consulted to determine further appropriate mitigation measures.

### Architectural Heritage

There are no protected structures or NIAH listed structures within the proposed development site. There is one structure located within the proposed development site which comprises the roofless ruin of a building, the rear wall of which includes the boundary wall to the tennis courts. The work proposed for the creation of new surface-water drainage-pipe along the northern spur of the proposed development site will involve the loss of this structure. Therefore, prior to the commencement of the construction phase, a full photographic, drawn and written record of this structure will be made and submitted to Cork County Council.

### Undesignated Cultural Heritage Features

A drainage channel extending along the eastern boundary of the proposed development site forms the townland boundary between Coolcarron and Fermoy for a distance before continuing in the townland of Fermoy and being culverted. The drainage channel will be investigated as part of the archaeological mitigation measures outlined above.

## 12.7 Residual Impacts

All potential impacts will be addressed by mitigation during the pre-construction phase of the proposed development which will provide for the recording and/or avoidance of any potential sub-surface archaeological features that may exist within the site. There are no designated structures of architectural heritage significance located within the proposed development site or its environs. The remains of one structure which will be impacted by the proposed development will be recorded prior to the commencement of work. As a result, no residual impacts on the cultural heritage are predicted.

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**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 13

## Population and Human Health

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 13 Population and Human Health

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# 13 Population and Human Health

## 13.1 Introduction

This chapter of the EIAR assesses the potential impacts of the proposed Strategic Housing development (SHD) at Coolcarron (townland), Fermoy, Co. Cork on population and human health that are not covered elsewhere in the EIAR. It also details the proposed mitigation measures where necessary. The potential impacts on, and mitigation measures for population and human health were assessed under the following headings: Do Nothing Scenario, Human Health (including Health and Safety), Population and Economic Activity, and Local Amenity.

According to 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 Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft (2017) 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."*

### 13.1.1 Author Information and Competency

This chapter was prepared by the following:

Bryan Murphy: Bryan holds a Master's Applied Coastal and Marine Management and BA Geographical and Archaeological Sciences from University College Cork. Bryan is a Graduate Member of the Chartered Institute of Ecological and Environmental Management and an Associated Member of the Institute of Environmental Science. He has worked on a range of GIS related projects for a number of environmental consultancies and local authorities, which include SEA, Appropriate Assessments and Land Use Zoning. Bryan has contributed to several EIA processes across multiple applications.

Majella O'Callaghan: (MSc in Urban and Regional Planning, Dip in Project Management and BA (Hons) in Geography and Economics) of McCutcheon Halley Planning Consultancy. She holds qualifications in planning and is a Corporate Member of the Irish Planning Institute (IPI). She has worked with multi-disciplinary teams on several projects and has provided input to a variety of development projects that require both environmental and ecological assessment of potential impacts.

### 13.1.2 Reference to Guidelines Relevant to Discipline

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

- Revised Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), draft August 2017);
- Advice Notes for Preparing Environmental Impact Statements (EPA, draft September 2015);
- Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).

### 13.1.3 Methodology

The EPA advice notes (EPA, 2015) 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 activity 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.

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 Fermoy. This comprised of site visits and visual assessments of the proposed site and the surrounding area, as well as an analysis of aerial photography and Ordnance Survey (OS) mapping.

The Primary study area is defined by the Electoral Divisions (ED) of Fermoy that overlap or are immediately adjacent to the proposed development, and are likely to be affected by proposed development.

Information was gathered with respect to the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from the 2011 and 2016 Censuses. The data included information on population, structure, age profile and household size, number of persons at work and the unemployment profile. A desktop survey of the following documents and websites also informed this:

- Cork County Development Plan (CDP) 2014 - 2020;
- Fermoy Municipal District Local Area Plan (MD LAP) 2017;
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education and Sciences (DES) website www.education.ie.

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 (see Chapter 1 Introduction for details and Appendix 1.1 for responses).

The HSE issued a response to the consultation letter commenting on a number of areas specific to Environmental Health. The comments are summarised below and are dealt with in this chapter of the EIAR and other chapters where appropriate:

- Project description.
- Any future monitoring required.
- Consideration of alternatives – the EIAR should fully describe and consider alternatives to this project.
- Public Consultation – the scoping document should describe the measures the applicant shall take to inform the public about the project and details of feedback from the public regarding the proposal should be included within the EIAR.
- Construction – a site specific Construction Management Plan should be prepared.
- Drainage – an integrated approach to surface water management should be implemented.
- Climate – incorporate sustainable design concepts.

- Sustainable Transport – assess construction and operational traffic impact on roads and prepare a detailed travel plan.
- Health Gain – provide landscaping.
- Noise – passing traffic from the M8 should be assessed.
- Sustainable Development – review impact on increased population on key infrastructure and community facilities

Detailed consideration was given to the surrounding area and the potential receptors and receiving environment that might be affected by the proposed development. These are discussed in detail in the following sections and include the following:

- the surrounding residents/homes,
- the community facilities and services in the area,
- local schools and childcare facilities,
- local amenities such as community groups, clubs and societies, and temporary receptors such as pedestrians or drivers passing the site (although these impacts are generally considered to relate to visual impact, covered in Chapter 4 Landscape and Visual Impact.

### 13.1.4 Difficulties Encountered in Compiling Information

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

## 13.2 Existing Environment

The following provides a description of the existing environment with a focus on demography, land use and local amenity. A detailed description of the project is provided in Chapter 2. The assessment of effects on population and human health refers to those environmental topics under which human health effects may occur (e.g. noise, water quality, air quality, etc.). Specific sections of this EIAR provide the baseline scenario relevant to the environmental effect being assessed.

### 13.2.1 Demography

Within the Cork County Development Plan (CDP) of 2014-2021, Fermoy lies outside Cork's Metropolitan area and therefore is located within a 'ring town', designated by the National Spatial Strategy. These ring towns include the areas of Fermoy, Bandon, Kinsale, Macroom and Youghal. The designation defines these 'ring towns' as areas which support a substantial rural hinterland consisting of several villages, smaller settlements and individual dwellings.

These areas provide an important contribution in ensuring a balance of development is achieved throughout the Greater Cork Ring area. Fermoy as noted within the CDP 2014-2017 has economic potential to be a quality urban centre providing services and sources of employment for the surrounding hinterland. Cork County's Development Plan notes that the provision of new housing in the Cork Ring areas is particularly important in order to accelerate the growth and critical mass of population to ensure towns such as Fermoy are maintained as areas that maximise their potential and attracts investment in its services and employment.

Figure 13.1 Fermoy Municipal District

Figure 13.2 Fermoy Electoral Division (Site Outlined in Red)

The Population and Labour Force Projections 2017 – 2051 Report released by the CSO in 2018 identifies that Ireland's population is projected to grow substantially by 2051, from 4.74 million in April 2016 to 6.69 million by 2051. Population growth will be influenced by inward migration and fertility, but even with low inward migration and declining fertility, Ireland's population is still expected to reach 5.58 million in 2051.

The National Planning Framework (NPF) 2040 envisages that Cork will become the fastest-growing city region in Ireland with a projected 50% to 60% increase of its population in the period up to 2040. Within the Cork County Development Plan, Fermoy's population was set to achieve a population target of approximately 7,442 by 2020. As per the core strategy, as the population for Fermoy town is set to grow in the near future, it shall be an objective to work with Cork County Council to ensure that the 'growth is planned and that there is adequate and sufficient appropriate lands zoned to accommodate such growth'.

The Regional Spatial and Economic Strategy (RSES) for the Southern Region which came into effect in January 2020 identifies that the Southern Region is the second most populated Regional Assembly area and that all 10 local authority areas within the region have experienced growth at varying levels since 2006. Population projections anticipate large increases in the 15–24-year (+26%), 45–64-year (+14%) and 65+year (+56%) age groups between 2016 and 2031. The 0-14 year and 25–44-year age groups are projected to decrease by approximately 14%.

The Cork CDP (2014) sets a population target of 620,622 for Cork City and County to be achieved by 2022, representing an increase of c. 15%. However, it is recognised that this will be revised to consider changes to the county boundary. Fermoy is anticipated to increase in its population from a figure of 6,489 in 2011 to a target of 7,589 by 2022. In order to cater for this, increase an estimated 938 units in total will be required to meet this population projection.

**Table 13.1 Tables complied using information from CSO census Statistics Ireland 2011 and 2016 and Cork County Development Plan 2014-2021.**

| Housing Requirement | | | | | Housing Supply | |
|---|---|---|---|---|---|---|
| Census 2011 | Population Target for 2022 | Total New Households 2011-2022 | New Housing Units Required | Net Housing Requirement (ha) | Net Residential Area Zoned in LAP (ha) | Estimated Housing Yield |
| 6,489 | 7,589 | 831 | 938 | 47 | 93.46 | 1,619 |

## Household Size

Fermoy area recorded a population of 6,585 in 2016, this is an increase of 2% from 2011 (i.e. 6,489) and a 34% increase from 2006 (i.e. 2,275). With regards to household size, an average of 2.9 was identified in rural environs of Fermoy whilst an average figure of 2.3 was identified in Fermoy's urban area. These figures are in line with Cork County and City figures of 2.8 and 2.4. This suggests the area caters for a broad dynamic of households (large and small). The suburban nature of Fermoy makes it a popular location for starter and family housing in established and newly developed neighbourhoods.

**Table 13.2 Average Household size in 2016.**

| Area | Households | Persons | Average Household Size |
|---|---|---|---|
| Fermoy Rural | 1660 | 4770 | 2.9 |
| Fermoy Urban | 1022 | 2310 | 2.3 |
| Cork County | 146,442 | 414,062 | 2.8 |
| Cork City | 49,411 | 120,980 | 2.4 |
| State | 1,702,289 | 4,676,648 | 2.7 |

## Household Type

In terms of demographic split, the Census 2016 found that 7.6% of the population of the ED were of pre-school going age (i.e., 0-4 years). This is broadly in line with the figures identified County-wide (7.5%) and across the State (6.9%) for persons within this age category. In terms of primary school aged children (i.e., 5-11 years), it was identified that 11.4% of the population were within this category. Similarly, 10.3% of the population were identified as being of post-primary age (i.e., 12-18 years). These figures are slightly higher than the same figures identified at State level with 10.2% of the population aged between 5-11 years and 9.2% aged 12-18 years. Across all groups, the figures were much greater than Cork County, which further illustrates the popularity of the environs as an area for starter and family housing, see Table 13.3.

The urban centre of Fermoy showed in an increase in population by 0.6% from 2011(2,275) to 2016 (2289). As can be seen from the table below the age of Pre-school attending demographics in comparison to the Age 65+ category. It is evident that there is a greater ageing population in Fermoy.

The total population between the ages of 35-65 is 914 in the urban area of Fermoy, thus showing a greater percentage of 0.3% than the rural areas of Fermoy. However, there is a greater contrast in the preschool (0-4) age group.

Fermoy Rural ED has the highest percentage of children in the pre-school age cohort (0-4 years). This supports the figures for average household size, again suggesting that the rural area is more attractive for larger families.

Table 13.3 Demographic Breakdown of School-Going Children, Census 2016

| Area | Age 0-4 | Age 5-11 | Age 12-18 | Age 19-34 | Age 35-64 | Age 65+ | Total Population |
|---|---|---|---|---|---|---|---|
| State | 331,515 | 484,368 | 435,913 | 990,618 | 1,881,884 | 637,567 | 4,761,865 |
| As percentage of total population | 6.9% | 10.2% | 9.2% | 20.8% | 39.5% | 13.4% | n/a |
| Cork County | 31,337 | 46,583 | 39,969 | 74,664 | 170,524 | 54,116 | 417,211 |
| As percentage of total population | 7.5% | 12.2% | 9.6% | 17.9% | 40.9% | 12.9% | n/a |
| Cork City | 6305 | 8,270 | 8,661 | 37,932 | 44,762 | 19,727 | 125,657 |
| As percentage of total population | 5% | 6.6% | 6.9% | 30.2% | 35.6% | 15.7% | n/a |
| Fermoy Urban | 138 | 179 | 142 | 536 | 914 | 380 | 2289 |
| As percentage of total population | 6% | 7.8% | 6.2% | 23.4% | 39.9% | 16.6% | n/a |
| Fermoy Rural | 371 | 552 | 500 | 905 | 1922 | 609 | 4859 |
| As percentage of total population | 7.6% | 11.4% | 10.3% | 18.6% | 39.6% | 12.5% | n/a |

Fermoy Rural ED has a lower proportion of young adults (i.e. aged 19-34) at 18.6% than is noted comparatively across the State (20.8%) and County (17.9%) but Fermoy Urban is higher with 23.4%. This is consistent with people within this age cohort leaving the area to avail of work opportunities, or further education.

## Travel Trends

Demographic analysis of travel trends, as outlined in Table 13.4, within the Fermoy EDs indicate that the majority of people commute locally to the surrounding Environs, and other employment centres in the immediate vicinity, such as Mallow, Cork City and Mitchelstown. It was noted that 64.4% of the

Fermoy Urban population travel for ½ hour, and 66% of the Fermoy Rural ED population travel for ½ hour. The settlement's position as an important residential base for workers and families within the environs is further reinforced when considering the level of retired population (i.e., those aged 65 and above) is just 12.5% for Fermoy Rural, which is lower than those for the County (12.9%), City (15.7%) and State (13.4%).

Table 13.4 Journey Time to Work, School or College for the Fermoy Urban ED, Census 2016

| Time Taken to Travel to Work, School or College | Total Population Aged 5 years and over |
|---|---|
| Under 15 mins | 543 |
| 1/4 hour - under 1/2 hour | 296 |
| 1/2 hour - under 3/4 hour | 173 |
| 3/4 hour - under 1 hour | 80 |
| 1 hour - under 1 1/2 hours | 67 |
| 1 1/2 hours and over | 19 |
| Not stated | 123 |
| Total | 1301 |

Table 13.5 Journey Time to Work, School or College for the Fermoy Rural ED, Census 2016

| Time Taken to Travel to Work, School or College | Total Population Aged 5 years and over |
|---|---|
| Under 15 mins | 1395 |
| 1/4 hour - under 1/2 hour | 593 |
| 1/2 hour - under 3/4 hour | 430 |
| 3/4 hour - under 1 hour | 227 |
| 1 hour - under 1 1/2 hours | 139 |
| 1 1/2 hours and over | 39 |
| Not stated | 185 |
| Total | 3,008 |

## Tenure

Regarding tenure, the figures for the combined ED's are higher than the states averages and Cork County. In the Fermoy Urban ED 47.5% of households are in rental accommodation (either from a private landlord, local authority or voluntary body) while 48% are owner occupied (including those with and without a mortgage). In the Fermoy Rural 37.6% of households are in rental accommodation while 58.9% are owner occupied (including those with and without a mortgage). The figures are higher than that for the state, where 27.6% of households are renting while 67.6% are owner occupied, and for Cork County. (22.7% of households rent and 72.9% are owner occupied).

The high figure for rental accommodation within Fermoy Rural may reflect the lack of suitable rental accommodation within Fermoy town, which results in a high proportion of families renting outside the town.

Table 13.7 suggests that the level of vacancy in the Fermoy rural ED is also very low, at 8.1% but high in Fermoy Urban with 16.4%. The Fermoy Urban is higher than Cork City (7.6%), County and State levels which are 9% and 9.1% respectively.

Table 13.6 Demographic Breakdown of Household Tenures, Census 2016

| | Total Households | Rented Accommodation | Owner Occupied |
|---|---|---|---|
| State | 1,697,665 | 469,671 | 1,147,522 |
| As percentage of total households | 100% | 27.6% | 67.6% |
| Cork County | 146,052 | 33,180 | 106,559 |
| As percentage of total households | 100% | 22.7% | 72.9% |
| Cork City | 49,370 | 21,736 | 24,840 |
| As percentage of total households | 100% | 44% | 50.3% |
| Fermoy Urban ED | 1,022 | 485 | 491 |
| As percentage of total households | 100% | 47.5% | 48% |
| Fermoy Rural ED | 1,655 | 623 | 975 |
| As percentage of total households | 100% | 37.6% | 58.9% |

Table 13.7 Vacancy Levels, Census 2016

| | Total Permanent Dwellings | Vacant Dwellings | As percentage of Total Permanent Dwellings |
|---|---|---|---|
| State | 2,003,645 | 183,312 | 9.1% |
| Cork County | 173,735 | 15,645 | 9% |
| Cork City | 55,760 | 4,292 | 7.6% |
| Fermoy Urban ED | 1,229 | 202 | 16.4% |
| Fermoy Rural ED | 1,812 | 147 | 8.1% |

### 13.2.2 Economic Activity

#### Employment

As noted, Fermoy lies just outside the Metropolitan area of Cork, within the ‘ring town’ designation. It is within the Cork County Development (2014) Plan’s objective to achieve and sustain a critical mass of population in Fermoy in order to enable its potential and attract new investment within the employment sector.

The CSO releases quarterly publications on labour force estimates for the state (Table 13.8). The table distinguishes Covid-19 adjusted estimates from ‘normal’ predictions.

The Labour Force Survey (LFS) is the official source of labour market statistics for Ireland. It includes the official rates of employment and unemployment, which are based on International Labour Organisation (ILO) concepts and definitions. The Central Statistics Office (CSO) has compiled LFS estimates for Q4 2021 to the usual ILO standards and separate COVID-19 adjusted estimates (refer to Table 13.8).

Table 13.8 Results of CSO Labour Force Survey for the State Q4 2021

| Indicator | Standard LFS Methodology (ILO) | COVID-19 Adjusted Estimates<br>December 2021 |
|---|---|---|
| | Q4 2021 | End of Q4 2021 |
| Employed persons aged 15-89 years | 2,506,000 | 2,439,099 |
| Employment rate for those aged 15-64 years | 73.0% | 70.9% |
| Unemployed persons aged 15-74 years | 127,400 | 195,313 |
| Unemployment rate for those aged 15-74 years | 4.9% | 7.4% |
| In labour force | 2,633,300 | - |
| Not in labour force | 1,411,800 | - |

To summarise, the results indicate growth in the economy, showing that there were 2,633,300 persons in the labour force in Q4 2021, which was up by 8.9% (214,800) from Q4 2020. The participation rate in Q4 2021 stood at 65.1% up from 60.6% a year earlier

The 2016 labour force participation figures for Cork City and County show a decline in unemployment and increased participation in the labour force, as can be expected due to the start of a period of economic recovery. It is also noted that the boundary extension of Cork City will result in significant changes to any future assessment of the Labour Force Participation Rate for Cork City in the forthcoming census.

Table 13.9 Labour Force Participation Rate

| Area | Factor | 2011 | 2016 |
|---|---|---|---|
| State | Labour Force Participation Rate (%) | 61.9% | 61.4% |
| | Unemployment Rate (Rate) | 19% | 12.9% |
| Cork County | Labour Force Participation Rate (%) | 54.4% | 55.2% |
| | Unemployment Rate (Rate) | 22.2% | 15% |
| Cork City | Labour Force Participation Rate (%) | 62.7% | 61.6% |
| | Unemployment Rate (Rate) | 14.8% | 9.2% |

According to the CSO data, the results are indicative of a growing economy, recovering from the most recent downturn. However, it is acknowledged that given the situation at the time of preparation of this EIAR, the economic forecasts and any labour force projections will need to be revised.

### 13.2.3 Land Use and Amenity

The landscape in which the EIAR study area is located is categorised in the CDP as LCT5: Fertile Plain with Moorland Ridge and is characterised by ‘low lying landscape, which comprises an extensive area of predominantly flat or gently undulating topography along the River Blackwater, and which is contained in its periphery by low ridges’ This landscape character is of very high landscape value, very high landscape sensitivity and to be of County Landscape Importance The town centre includes a mixture of traditional commercial units in the Primary Streets and some larger retailing units on the fringe of the town.

Fermoy is a historic market town with a rich heritage and townscape value, which evolved from the bridging point over the River Blackwater in the northern partition of County Cork. The traditional layout of Fermoy’s town centre comprises of several buildings generally 2-4 storeys in height with a consistent front façade. There are currently 244 protected structures within Fermoy’s former town council’s register. Coherently, a large portion of designation within the town centre has been provided for Architectural Conservation and concentrations on heritage within the area.

To the north of the town centre a smaller cluster of development has emerged introducing Aldi, two service stations and smaller retail units. These are zoned within the ‘Existing Built-Up Area’.

The land in relation to this development is in the townland of Coolcaroon to the south of Fermoy town. It is approximately 700 m from the main street of Fermoy. The site is served by the R639 which connects the M8 to the southern region. The areas surrounding the site are characterised by a wide range of uses including retail, residential, recreational, and educational. The site is generally level and comprises of agricultural lands.

Figure 13.3: Site boundary outlined in red.

Fermoy is identified in the Regional Spatial & Economic Strategy for the Southern Region (RSES), as an area with a close network and a functional relationship with Cork City and the metropolitan towns. It is an objective of the RSES to ensure that development plans tailor the appropriate scale nature and location of the settlement. This landscape character type is of Very High Landscape Value, Very High Landscape Sensitivity, and considered to be of National Landscape Importance.

Existing habitats within the site location should also be protected/enhanced and incorporated into a new development. Consideration should also be given to the site’s tributaries corridor and local biodiversity area.

It is key to note that the Fermoy area benefits from a wide selection of community facilities and services including doctor and dentist clinics, library, retail outlets, post office, sport and community playing pitches, gyms, a park, bank and churches. Most of these services are located 2-5 km from Fermoy’s town centre. There are also several educational facilities located I the area including creches, pre-schools primary and secondary school.

Fermoy has a strong network of community groups and clubs hosted at the centre of the town within the community centre run by local volunteers. This association is very active and provides a range of services for the community including Meals on Wheels, Tidy Tows Committee, Community Health projects and a Walking Group.

The settlement of Fermoy also has a network of amenity trails, walks and cycle routes including nearby the site location. In lieu of this, the site layout proposed will provide provision for pedestrian and cycle connectivity for the development to link in with the open space and new residential lands to the north and northeast.

## 13.3 Identification of Principal Potential Receptors

In identifying potential impacts and receptors, consideration was given to the proposed residential scheme and the identified receiving environment. The principal potential receptors that will be affected by the development proposals have been identified as follows:

### 13.3.1 Local Residents

There are several existing residents surrounding the proposed site which have the potential to be impacted by the development, specifically the residents of:

- Several detached dwellings to the east of the site location along College Road.
- Several detached dwellings neighbouring the site to the west along the R639 road.

### 13.3.2 Community Facilities and Services

As previously stated, Fermoy benefits from a wide selection of important community facilities and services which are identified as potential receptors. These include services such as the library, doctor, dentist, pharmacies, post office and sport playing pitches, gyms, community centre and park, bank churches and a selection of local connivence/comparison retail stores.

With regards to childcare facilities, a total number of 6 childcare facilities were identified within a 10–20-minute travel time of the EIAR study area (see table 13.10).

A creche is proposed as part of the proposed development. The closest childcare facility to the site includes the Fermoy Community Preschool Playgroup (600m northeast of the subject site) and Teach na Leanaí (900m from subject site).

The travel time were determined by using the distance and average journey times from Google Maps.

**Table 13.10 Creche/Childcare Facilities Located Within 10-20 Minutes of the Subject Site**

| Name of Creche /Childcare Facility | Distance from EIAR Study Area | Drive Time | Cycle | Walk |
|---|---|---|---|---|
| Blackwater Childcare | 2 km | 3 mins | 5 mins | 20 mins |
| Fermoy Montessori School | 1.6 km | 2 mins | 4 mins | 18 mins |
| O'Reilly Montessori School | 1.5 km | 3 mins | 3.5 mins | 17 mins |
| JellyTots Community Playschool | 1 km | 1.5 mins | 2.5 mins | 10 mins |
| Fermoy Community Preschool Playgroup | 600 m | 1 min | 1.5 mins | 8 mins |
| Teach Na Leanaí | 900 m | 1.5 mins | 2 mins | 9 mins |

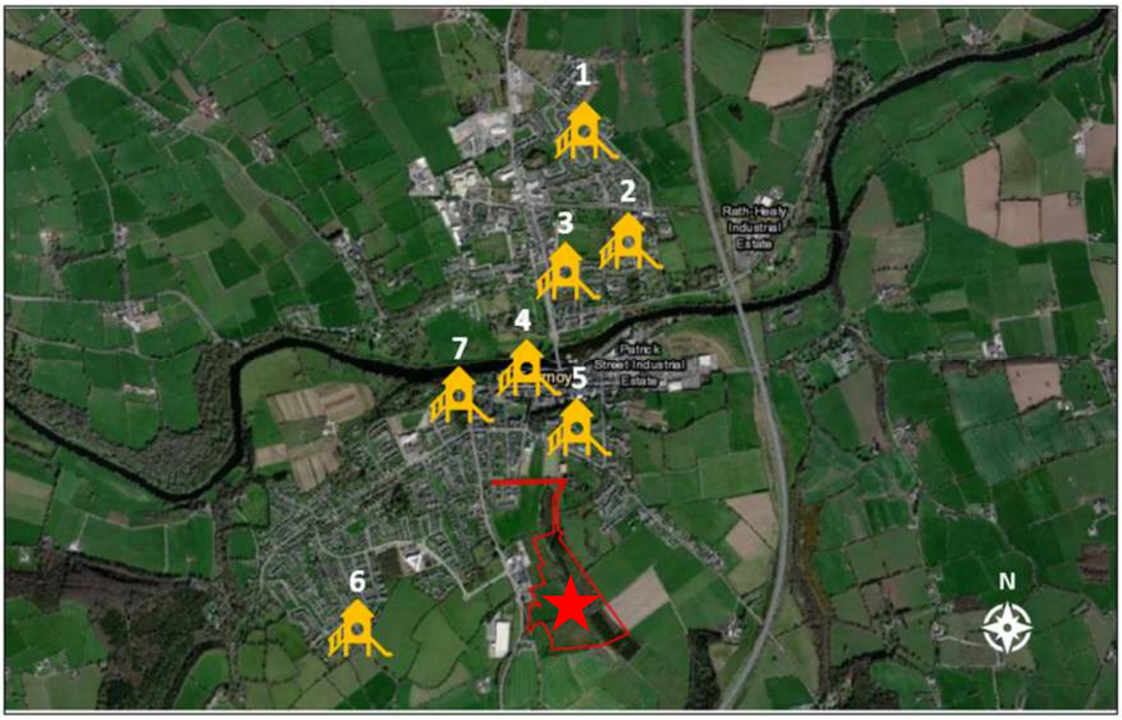

Figure 13.4: Location of Childcare Facilities in Relation to the Site

The Fermoy area is also served by 6 no. primary schools and 3 no. post-primary schools located in the study area are all within a 10–20-minute travel time or 2 km radius of the proposed development. The table below identifies the distance from the subject site to the schools and indicates the various walking, cycling and driving times required to access the schools.

It is noted that planning permission (21/4049) has been permitted for alterations to ancillary school accommodation and internal alterations to upgrade the St. Colman's College. These alterations include provision for an additional 3 no. new classrooms and 2 no. new computer rooms.

Table 13.11 Primary Schools and Distance from the Site (travel times in minutes)

| Primary School | Distance from Site | Walk | Cycle | Drive |
|---|---|---|---|---|
| Bishop Murphy Memorial School | 1 km | 10mins | 4mins | 2mins |
| Scoil Freastogail Muire | 700 m | 7mins | 2mins | 1min |
| Iosef Naofa | 1.9 km | 19mins | 7mins | 3mins |
| Fermoy Adair National School | 1.5 km | 15mins | 6mins | 2mins |
| Gaelscoil de híde | 700 m | 7mins | 2mins | 1min |
| Fermoy Educate Together | 1 km | 10mins | 4mins | 2mins |

Table 13.12 Post Primary Schools and Distance from Site (travel time in minutes)

| Post- Primary School | Distance from Site | Walk | Cycle | Drive |
|---|---|---|---|---|
| Loreto Secondary School | 800 m | 8mins | 3mins | 2mins |
| Colaiste an Chraoibhin | 1 km | 10mins | 4mins | 2mins |
| Colaiste Cholmáin | 800 m | 8mins | 3mins | 3mins |

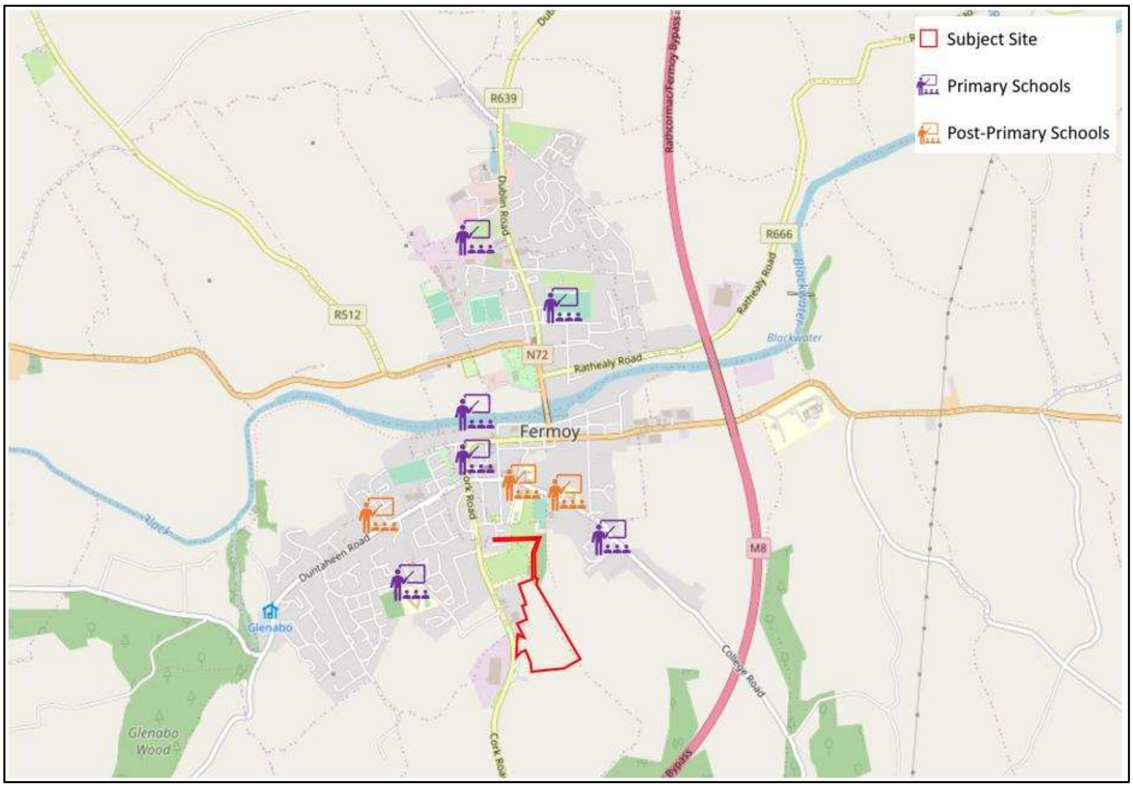

Figure 13.3 Location of School Facilities in Relation to the Site

### 13.3.3 Local Amenity

Section 13.3.2 identifies that Fermoy benefits from a strong network of community groups, clubs and societies. The development is considered and designed to improve and protect the residential amenity by including 4 no. flexible open spaces with natural play features and a linear green route along the western boundary. An awareness is consistent throughout the development to ensure the existing habitats on site should also be protected/enhanced and incorporated into the new development's considerations. Especially given the site's proximity to the River Blackwater and local biodiversity. These have potential to be impacted by the proposed development and therefore have been identified as principal receptors.

### 13.3.4 Economic Activity

Owners and employees of other commercial activities may be impacted by the proposed development i.e. Local business owners, industries, and adjacent farms. Consideration is given under economic activity to the potential impact on other commercial activities.

### 13.3.5 Temporary Receptors

In relation to temporary receptors, the proposed development is adjacent to the R639. Due to the topography of the EIAR study area as well as the notable vegetation and trees along its boundaries, much of the site is screened from view. The site is visible from the adjacent R639 road and to commercial and retail developments to the east of the site. Where visible it is considered that there will be an impact on drivers passing the site. Potential impacts are thoroughly accessed in Chapter 4 Landscape and Visual Impact Assessment.

### 13.3.6 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 that area, However, due to the size of the site in relation to other areas of land zoned for residential development in Cork County Development Plan 2014 and MD LAP 2017 could not be achieved. This would have a negative impact on both the Fermoy Municipal District and the surrounding catchment which feeds into the metropolitan area of Cork as the critical mass of population growth would not be achievable, undermining the Core Strategy of the CDP.

The site is zoned FY-R-08 (Medium A Density residential development) under the Fermoy Municipal District Local Area Plan, and as such, consideration of alternative sites is not necessary. The consideration of an alternative location would equate to a ‘do-nothing’ alternative for the subject site and the site would become overgrown and unkept. This would mean that these residential zoned lands would not be developed in accordance with the objectives of the Local Area Plan.

The MD LAP identifies that Fermoy will be important to provide a better balance of development throughout the Greater Cork Ring Area and fulfil the economic potential and qualities for its surrounding hinterland. Improving these qualities will create opportunity and employment, increase the range of services to serve the needs of the community and attract growth to Fermoy. These objectives are pressing to maintain if the residential development is not provided. In the absence of the relevant policies and specific objectives of the site there would be no framework directing developments to appropriate locations and this would have the potential to result in adverse impacts son the environmental components, which could negatively affect human health.

The land would likely remain in agricultural use. The impacts on land use are therefore envisaged to be neutral for the ‘do nothing’ scenario.

## 13.4 Evaluation of Potential Impacts

### 13.4.1 Construction Phase

General construction activities excavation may give rise to emissions to air or surface water and may generate noise and vibration. The details of the construction phase of the project are provided in Chapter 2 Project Description and in the preliminary Construction and Environmental Management Plan (CEMP). To summarise, the development will be constructed in expected to be completed within the 5-year planning permission. The development will consist of 336 units and a crèche and be completed during 5 phases of construction.

### 13.4.2 Population and Settlement Patterns

The construction phase of the project will be short term and is not likely to result in any changes to the population and settlement patterns as described in Section 13.2. Generally, the potential impacts arising during the construction phase relate to short term impacts to quality of life including visual impact / amenity, noise, air quality and transport. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. It is unlikely that these impacts will be of a scale to either encourage people to move from the area or discourage people from moving to the area. No significant negative impacts are anticipated as a result of the construction phase of the development.

### 13.4.3 Economic Activity

The construction phase of the development is anticipated to result in a temporary 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 by the end of 2027 which will benefit the other industries as a result of demand for construction materials and services. The loss of the agricultural lands is anticipated to have a neutral effect as the lands were under ownership of the applicant.

It is anticipated that the construction phase of the project will result in likely positive short term moderate effects locally and within the wider Fermoy area.

### 13.4.4 Land Use and Amenity

The project is in accordance with the statutory land use zoning objective. There will be no severance of lands or loss of rights of way as a result of the proposed development. In general, construction phase impacts on local amenity and receptors identified in proximity will be mainly related to noise, air quality and traffic. These are dealt with in the specific chapters of the EIA.

The construction works may result in a short-term negative/neutral impact on the following receptors outline above previously:

- Several detached dwellings to the west of the site location along College Road.
- Several detached dwellings neighbouring the site to the east along the R639 road.

Potential impacts will mainly relate to noise from construction plant and traffic, and perception of visual changes associated with removal of trees and hedgerows and emerging plant and machinery.

The assessment of potential impacts of noise and vibration is presented in Chapter 10. No impacts from vibration are anticipated. The assessment identified that during construction the chief source of noise emissions will be from plant used onsite. Rock breaking is unlikely to be required. Construction traffic and HGV's activity will represent a continuation of activity that has occurred in the Fermoy vicinity for many years and is not likely to increase significantly. Overall, the impacts from the construction phase will be slight, localised and short term in duration.

Potential impacts from construction traffic are considered in Chapter 5 Material Assets: Traffic and Transport. A Construction Traffic Management Plan will be developed and implemented to avoid impacts by restricting the majority of HGV movements to local roads at off peak times, and implement the delivery of materials on site to avoid peak traffic periods.

In general, the impact of construction traffic is assessed as moderate negative, but short term.

### 13.4.5 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. Proposed mitigation measures are outlined in the preliminary Construction and Environmental Management Plan, and in Chapter 10 Noise and Vibration to manage construction activities and traffic movements as well as limiting noise and disturbance.

During construction, an average of 110 movements per day are anticipated to visit the site, including a maximum of 15 HGVs and 20 workers/staff on site, please refer to Chapter 5 Traffic and Transport for further detail. The Air Quality and Climate assessment (Chapter 11) identifies that the greatest potential impact on air quality during the construction phase is from construction dust emissions and the potential for nuisance dust, with potential for significant dust soiling 20m from the source. A number of mitigation measures are proposed and following implementation of these measures potential significant impacts are unlikely, and any effects will be negative, short-term and imperceptible with respect to human health.

The site will be made secure, and the general public will be separated from the site by means of fencing and hoarding. All site facilities will be contained within the site area. The main entrance gate will be controlled by site personnel (gateman) for deliveries. Site lighting and a camera security system may be used to secure the site in out of hour times, and any proposed site lighting will be set up with consideration for adjoining properties.

A temporary construction compound will be established within the red line boundary of the proposed development site.

Following implementation of these measures the construction phase of the project adverse effects will be unlikely, neutral, and short term.

### 13.4.6 Operational Phase

Due to the nature of the development, there will be few hazards associated with the operational phase of the development and therefore no potential significant negative impact in terms of health and safety.

### 13.4.7 Population and Settlement Patterns

The proposed development complies with the statutory land use zoning. It will deliver 336 residential units and a creche, including 10% of units that will be provided for the purposes of Part V Social Housing. The total number of units capable of accommodating families 2-bed and over equates to 242. Based on a national average household size of 2.75, the proposed development is likely to generate a population of 924 persons. According to the trends for the Fermoy this would result in a demand for approximately 59 no. creche/pre-school places, 104 primary and 73 post-primary school places.

A creche will be provided as part of the development, which will provide 86 no. places. In addition, the Childcare Demand Report which accompanies this application as a standalone report identifies that there are 6 childcare providers within 20 minutes of the site with available capacity. However, it is anticipated that not all children will require childcare, proposed crèche will be sufficient to cater for the needs of the proposed development. A School Demand Report has also been prepared, which demonstrates that the existing provision of primary and post-primary school places is sufficient to accommodate the potential demand generated by the proposed development.

Given the existing housing crisis, it is anticipated that a medium density residential development (39.7 units/ha) at this location would result in a likely significant positive impact with a permanent duration as it would realise the aim of increase housing output, consistent with the objective of growth and vitality as to be delivered within the Cork County Development Plan.

The proposal will achieve medium-density residential development, being efficient use of a zoned land to provide a much-needed development with quality amenities for future occupants. Overall, it is anticipated there will be a moderate positive and permanent impact.

### 13.4.8 Economic Activity

There will be an economic benefit to local business during operation. Residents will use local facilities and services, and it is anticipated that the additional population will result in increased business for the wider Fermoy community, and will have a positive, slight, long-term impact on the services including dentist clinics, pharmacies, banks and various retail outlets.

### 13.4.9 Land Use and Amenity

The proposed development is in line with the site-specific zoning objective for medium density residential development (refer to Chapter 2 Project Description for details) and will consist principally of residential units, a creche, and open space amenities. This development will facilitate an appropriate, sustainable settlement pattern which will accommodate residential, community, leisure and recreational facilities to satisfactorily match the anticipated level of population growth and household generation.

The amenity provision within the development is described in detail in the Planning and Design Statement. The site has a natural screening boundary to the east. The existing hedgerows running east west through the site forms the framework of the design, identifying pockets of open space suitable for development. The landscaping of the development will frame the units, creating a user-friendly environment with a strong and attractive landscape setting – refer to Chapter 4 LVIA of the EIAR. This future amenity is a positive consideration to define the relationship and connectivity of the open spaces and beyond to the wider context. These are accessible within 2 min walk from most of the site.

These primary open spaces include play areas, walking and activity routes, visual amenity and opportunities for congregation.

Community facilities identified in Section 13.2 are expected to benefit from the increased population, in particular sports clubs, community centres, gyms and community services such as the post office, library, and GP services. Any potential impacts are anticipated to be long term, neutral and not significant.

### 13.4.10 Health

The baseline data for Fermoy indicates that in general the population is in good health. The proposed development will not result in any significant negative impacts to the health and wellbeing of the existing population. In particular, the design of the scheme ensures that both future and existing residents within the local environs will benefit from proposed amenities.

The operational phase of the proposed development, in terms of recreation and amenity facilities will have a long term, moderate positive impact on Human Health.

The development has been designed to incorporate the principles of Universal Design, to provide appropriate choice of accommodation to residents with diverse abilities and ages. A Universal Design Statement has been prepared by Geraldine Coughlan Architects which provides insight into the design concept, and concludes that the development can be accessed, understood and used by the widest possible extent of people, regardless of their age, size or ability. This includes the houses and apartments as well as the external spaces, pedestrian and cycle routes and roads.

Potential impacts on population and human health as a result of operational noise and vibration are assessed in Chapter 10. The assessment found that noise emissions arising within the completed site will be urban-residential in character, will not give rise to offsite impacts, and will be identical in character to emissions arising within surrounding residential zones.

### 13.4.11 Daylight and Sunlight Assessment

A sunlight, daylight and overshadowing report has been prepared and submitted with this application which concludes that the proposed residential development achieves the best practice guidelines in relation to Daylight, Sunlight and Overshadowing.

### 13.4.12 Building Life Cycle Report

A Building Life Cycle Report has been prepared by Geraldine Coughlan Architects to assess the long term running and maintenance costs of the apartment buildings associated with this proposed development. All measures have been included in the design of the proposed development to consider the reduction of potential costs in the functioning of the completed development. These measures were included within the design, layout and selection of proposed materials for the development.

### 13.4.13 Risk of Major Accidents and Disasters

The potential of major risks and disasters as a result of the proposed development has been assessed and the findings are presented in Chapter 16 of this EIAR and by other disciplines within this EIAR. No risk of major accidents and disasters has been identified. The project comprises development of a residential estate, in a greenfield area at the periphery of a suburban area. There are no sites in proximity which are subject to The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015. A desktop study of the flood history at the site was carried out in the Civil Engineering documents prepared by Walsh Design Group. The development lies outside all flood zones shown in the Local Area Plan for the Fermoy MD.

### 13.4.14 Cumulative

There are a few permitted and proposed developments in the vicinity of the EIAR study area which in combination with the proposed development may have cumulative impacts. The cumulative impacts related to the following projects have been considered where relevant, in the context of the human environment:

Table 13.13 Cumulative Impacts - List of Permitted and Proposed Developments

| No. | Planning Ref. No. | Proposal/Application | Comment |
|---|---|---|---|
| 1. | Cork County Council Part 8 Application | Part 8 Housing Scheme 11 no. residential housing units at Uplands, Fermoy | Information at: https://www.corkcoco.ie/en/Planning/Part-8-Development-Consultation/active-part-8-development-consultation |
| 2. | Planning Ref: 21/4049 | Retention for Internal works for new technology room, sanitaryrooms, 3 no. new classrooms, 1 no. new computer room at St. Colmans College, Monumental Hill, Fermoy | Permitted on 15th July |
| 3. | Planning Ref: 20/6246 | A) The Change of Use of part of an exssiting light industrial building currently used for the assembly and commissioning of stainless steel vessels to provide for an electropolishing are within the building footprint B) internal works to facilitate the change of use, including the provision of an underground containment pit and other alterations to the factory floor C) ancillary external site works to connect to the existing on-site sewer network | Permitted 07/12/2020 |
| 4. | 21/7241 | The demolition of 2 no. dwellinghouses and associated sheds/outhouse and the construction of 28 no. residential units and all ancillary site development works, including access car/bike parking, bin storage and amenity areas | Under review by Cork County Council |
| 5. | 19/6221 | To demolish existing pump canopy, shop and stores for the construction of valeting buildings, car wash, boundary fencing, and 2 no. signs together with associated works | Permitted by 11/6/2020 |

## 13.5 Mitigation Measures

No likely negative impacts have been identified for population, or land use, accordingly no mitigation measures are required.

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 open space areas, play areas and provision for walking and cycling throughout the development.

Accordingly, no further mitigation measures are required.

Potential negative impacts have been identified related to Health & Safety during the construction process, mitigation measures are proposed in section 13.5.1. No significant risks to Human Health have been identified within this discipline in relation to the operational phase of the development. Accordingly, no further mitigation measures are required.

### 13.5.1 Health and Safety Mitigation Measures

In relation to the pre-construction and construction phases, 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 preliminary CEMP, and include;

- Securing of site boundary and erecting of fencing or hoarding/signage as required
- Minimising disruption of services through adequate engagement with utility and service providers.
- Restriction of construction working hours and traffic access.
- Site access and egress;
- Preparation of an Emergency and Evacuation Plan.
- Maintenance of public roads;
- Communication with local authorities and neighbours.

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 construction stage (PSCS) will have been 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.

### 13.5.2 Construction Phase Mitigation

During the construction phase, safety will be a primary concern. A Project Supervisor for the Construction Process (PSCP) will be appointed to oversee site safety. 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 Traffic Management Plan, to be agreed with the Planning Authority prior to commencement of development.

### 13.5.3 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.

## 13.6 Residual Impacts

The proposed mitigation measures will avoid, prevent, or reduce impacts on the human environment during the construction and operational phases of the proposed development

It is anticipated that the proposed development will realise significant positive overall economic and social benefits for the local community and the wider Fermoy area. Strict adherence to the mitigation measures recommended in this EIAR will ensure that there will be no negative residual Impacts or effects on Population and Human Health from the construction and operation of the proposed scheme. Indeed, the delivery of much needed housing will realise a likely significant positive effect for the local area.

## 13.7 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 Stage(PSCS).

## 13.8 References

### 13.8.1 Documents

Fermoy Municipal District Local Area Plan 2017, Cork County Council

Cork County Development Plan 2014, Cork County Council

Cork County Draft Landscape Strategy 2007, Cork County Council

The Provision of Schools and the Planning System - A Code of Practice for Planning Authorities (2008), The Department of Education and Science, and the Department of the Environment, Heritage and Local Government

### 13.8.2 Websites

Health and Safety Authority website - http://www.hsa.ie/eng/Topics/Hazards/ (Accessed 07/02/2022).

Central Statistics Office (CSO) website www.cso.ie (Accessed 08/02/2022).

Department of Education and Sciences (DES) website www.education.ie (Accessed 24/01/2022).

Tusla website www.tusla.ie/ (Accessed 08/02/2022).

Google Earth (Google Earth) (Accessed 09/02/22)

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# CHAPTER 14

## Significant Interactions of the Foregoing

# Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

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# Chapter 14 Significant Interactions of the Foregoing

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## Tables

# 14 Significant Interactions of the Foregoing

## 14.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter describes the significant interactions of impacts identified in the previous chapters.

The potential cumulative effects of the proposed project in combination with other permitted developments in proximity has been considered in each chapter as relevant.

### 14.1.1 Author Information and Competency

This chapter was prepared by Majella O'Callaghan (MSc in Urban and Regional Planning, Dip in Project Management and BA (Hons) in Geography and Economics) of McCutcheon Halley Planning Consultancy. She holds qualifications in planning and is a Corporate Member of the Irish Planning Institute (IPI). She has worked with multi-disciplinary teams on several projects and has provided input to a variety of development projects that require both environmental and ecological assessment of potential impacts.

### 14.1.2 Assessment Methodology

### 14.1.3 Legislative Requirements

The EIAR has considered and assessed the interactive effects and cumulative impacts arising from the construction and operation of the proposed development based on best scientific knowledge. Interactive effects (or interactions), specifically refer to any direct or indirect effects caused by the interaction of environmental factors as outlined in Article 3 (1) of the amended EIA Directive;

> *"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> (a) population and human health;
> (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
> (c) land, soil, water, air and climate;
> (d) material assets, cultural heritage and the landscape;
> (e) the interaction between the factors referred to in points (a) to (d)."

Annex IV of the amended Directive states that a description of impacts should include:

*"…the direct effects and any indirect, secondary,* ***cumulative,*** *short, medium and long-term, permanent and temporary, positive and negative effects of the project"*

The relevant interactions and interdependencies between specific environmental aspects have been summarised in the matrix set out in **Table 14.1**.

## 14.2 Description of Significant Interactions

### 14.2.1 Landscape and Visual Impact

Chapter 4 assesses the likely impacts on landscape, and the visual impacts arising from the proposed development. During the construction phase, the following aspects would interact with Landscape and in the absence of mitigation may give rise to likely significant effects.

- Soils and Geology: removal and stockpiling of soils will cause a change to the existing landscaping which will have a negative impact on local receptors in particular; however the effects will be short term for the construction phase. The reuse of soils as fill material also has a potential for impacts

During operation the potential interactions are;

- Population and Human Health: The changes to the site will have the potential to positively impact population and human health through the provision of amenity areas such as green spaces, shared spaces and pedestrian and cycle paths.

The potential significant impacts of Landscape have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.2 Material Assets – Traffic and Transport

Chapter 5 assesses the likely impacts on Traffic and Transportation arising from the proposed development. During the construction phase, the following aspects would interact with Traffic and Transport and in the absence of mitigation may give rise to likely significant effects.

- 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 the site may give rise to hydrocarbon spills.

During operation the potential interactions are;

- 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 from traffic may contribute to climate change.

The potential significant impacts of Traffic and Transport have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.3 Material Assets: Services and Infrastructure

Chapter 6 assesses the likely impacts on Services and Infrastructure arising from the proposed development. During the construction phase, the following aspects would interact with Services and Infrastructure and in the absence of mitigation may give rise to likely significant effects.

- 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.
- Biodiversity: The provision of connections to services and utilities may result in the removal and loss of habitat

During operation, the potential interactions are;

- Population and human health: There may be an increased demand on services such as potable water and on the Wastewater Treatment network which might lead to issues once the development is fully occupied.
- Biodiversity: disturbance to bats arising from artificial light spillage into the environment from the associated lighting scheme.

The potential significant impacts to Services and Infrastructure have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.4 Soils and Geology

Chapter 7 assesses the likely impacts on Soils and Geology arising from the proposed development. During the construction phase, the following aspects would interact with Soils and Geology and in the absence of mitigation may give rise to likely significant effects.

- Population and human health: Site clearance has the potential to result in increased dust and particulate emissions to air;
- Water (Hydrology): Construction activities may result in discharge of contaminated run-off to surface water, or result in contamination of groundwater;
- Biodiversity: site clearance and earth works may result in the spread of invasive non-native species and removal or accidental damage to hedgerows;
- Cultural Heritage and Archaeology: There may be an impact to Cultural Heritage and Archaeology if previously undiscovered sub-surface remains are damaged or destroyed during site clearance and/or construction.

During operation, the potential interactions are;

- Water (Hydrology): The foundation piles could act as a permanent partial barrier to groundwater flow and permanently remove a portion of the aquifer.
- Population and human health: development will be constructed on potentially contaminated soils, resulting in a potential risk to residents if they come in contact with same.

Overall, the potential significant impacts to Soils and Geology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.5 Hydrology and Hydrogeology

Chapter 8 assesses the likely impacts on Hydrology and Hydrogeology arising from the proposed development. During the construction phase, the following aspects would interact with Hydrology and Hydrology and in the absence of mitigation may give rise to likely significant effects.

- Biodiversity: any negative impacts on water quality such as increased discharge of silt or sediment to surface water may result in impacts to biodiversity downstream of the site.
- Material Assets – Services, Utilities and Infrastructure: works to provide connections to utilities and services, such as foul and surface water sewer, may have a negative impact on groundwater if spills of fuels or other contaminants occur.

During operation, the potential interactions are;

- Material Assets – Services, Utilities and Infrastructure: Potential Leask from sewerage pipes and drainage infrastructure may result in impacts to groundwater. There will also be an increased demand on potable water and on the municipal drainage infrastructure.

The potential significant impacts to Water (Hydrology) have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.6 Biodiversity

Chapter 9 assesses the likely impacts on Biodiversity arising from the proposed development. During the construction phase, the following aspects would interact with Biodiversity and in the absence of mitigation may give rise to likely significant effects.

- Noise and Vibration: site activity and increase in noise and construction related vibration have the potential to cause disturbance of faunal species.

During operation, the potential interactions are;

- Noise and Vibration: Once the development has been completed and is occupied increased levels of noise may cause disturbance and displacement of faunal species;
- Air Quality: any reduction in air quality or increase of emissions has the potential to negatively impact on biodiversity.

No other potential significant interactions have been identified other than those already described. The potential significant impacts to Biodiversity have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.7 Noise and Vibration

Chapter 10 assesses the likely impacts on Noise and Vibration arising from the proposed development. During the construction phase, the following aspects would interact with Noise and Vibration and in the absence of mitigation may give rise to likely significant effects.

- Population and Human Health: increased levels of noise and vibration during construction activities may result in negative impacts to the amenity of local residents.

During operation, 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.

No other potential significant interactions have been identified other than those already described. The potential significant impacts of Noise and Vibration have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.8 Air Quality and Climate

Chapter 11 assesses the likely impacts on Air Quality and Climate arising from the proposed development. During the construction phase, the following aspects would interact with Air Quality and in the absence of mitigation may give rise to likely significant effects.

- Population and Human Health: Construction activities may result in a decrease in local air quality which has the potential to negatively impact on human health.

No potential operational interactions were identified, and no other potential significant interactions have been identified other than those already described. The potential significant impacts to Air Quality have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.9 Cultural Heritage and Archaeology

Chapter 12 assesses the likely impacts to Cultural Heritage and Archaeology arising from the proposed development. No other significant interactions have been identified, other than those discussed above. The potential significant impacts to Cultural Heritage and Archaeology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

### 14.2.10 Population and Human Health

Chapter 13 assesses the likely impacts to Population and Human Health arising from the proposed development. No other significant interactions have been identified, other than those discussed above. The potential significant impacts to Population and Human Health have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

**Table 14.1 Potential Interaction of Effects Matrix (Con = Construction, Op= Operational. If there is considered to be no potential for an effect, the box is left blank.)**

| Interaction | Landscape | | Material Assets – Traffic & Transport | | Material Assets – Infrastructure | | Land & Soils | | Water | | Biodiversity | | Noise & Vibration | | Air Quality & Climate | | Cultural Heritage | | Population & Human Health | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. | Con. | Op. |
| Landscape | | | | | | | X | | | | | | | | | | | | X | X |
| Material Assets: Traffic & Transport | | | | | | | | | | X | | | X | X | X | X | | | X | X |
| Material Assets: Infrastructure | | | | | | | | | | | X | X | | | | | | | X | X |
| Land | | | | | | | | | X | X | X | | | | | | X | | X | X |
| Water | | | | | X | X | | | | | X | X | | | | | | | | |
| Biodiversity | | | | | | | | | | | | | X | X | | X | | | | |
| Noise & Vibration | | | | | | | | | | | | | | | | | | | X | X |
| Air Quality & Climate | | | | | | | | | | | | | | | | | | | X | X |
| Cultural Heritage | | | | | | | | | | | | | | | | | | | | |
| Population & Human Health | | | | | | | | | | | | | | | | | | | | |

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# CHAPTER 15

## Schedule of Mitigation & Monitoring

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# Chapter 15 Summary of Mitigation & Monitoring

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# 15 Summary of Mitigation & Monitoring

## 15.1 Introduction

This chapter includes the full schedule of mitigation measures and monitoring where proposed. This chapter of the EIAR has been prepared by Majella O'Callaghan, McCutcheon Halley Planning Consultants and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring during the construction and operational phases of the proposed development.

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government state:

> *"While not a mandatory requirement an EIAR can very usefully include a summary table of features and/or measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the proposed development, and a timescale for the implementation of proposed mitigation measures."*

### 15.1.1 Mitigation

The draft EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2017) identifies that there are 4 established strategies for the mitigation of effects; avoidance, prevention, reduction and offsetting.

**Mitigation by Avoidance**: Avoidance usually refers to strategic issues, such as site selection, site configuration or selection of process technology. This may be the fastest, cheapest and most effective form of effect mitigation. In some cases mitigation by avoidance may also be considered as part of the "consideration of alternatives".

**Mitigation by Prevention**: This usually refers to technical measures. Where a potential exists for unacceptable significant effects to occur (such as noise or emissions) then measures are put in place to limit the source of effects to a permissible and acceptable level.

**Mitigation by Reduction**: This is a very common strategy for dealing with effects which cannot be avoided. It tends to concentrate on the emissions and effects and seeks to limit the exposure of the receptor. This is regarded as a less sustainable, though still effective, approach, implemented through reducing the effect and/or reducing exposure to the effects.

**Mitigation by Remedy/Offsetting**: This is a strategy used for dealing with adverse effects which cannot be prevented or reduced. Remedy is compensating for or counteracting adverse effects. Examples include increased planting of specific trees/shrubs to replace unavoidable loss of vegetation, or provision of a new amenity area to compensate for the unavoidable loss of access to the grounds of an old house. Examples of Offsetting include reinstating buildings, walls or features, or the introduction of tunnels to enable wildlife to access other comparable habitats.

### 15.1.2 Monitoring

Some disciplines have proposed monitoring following their assessment of impacts and implementation of proposed mitigation measures. Monitoring will take place after consent is granted in order to demonstrate that the project in practice conforms to the predictions made during the EIA process. Monitoring provides assurance that proposed systems are operating as intended. This allows adjustments of operations to be made to ensure continued compliance with consent conditions such as emission limit values, conditions of operation, performance criteria/ indicators and detection of unexpected mitigation failures.

The EPA Guidelines also state that "*It is particularly important that the developer understands their commitment to mitigation measures that are proposed in an EIS. These are enforceable undertakings that will have to be put in place and sustained when the project is implemented*".

The following mitigation and monitoring measures have been set out in Table 15.1 and have been proposed by the specialist consultants during preparation of the EIAR.

Table 15.1 Mitigation and Monitoring Table

| POTENTIAL IMPACT | CONSTRUCTION | OPERATION |
|---|---|---|
| **EIAR Topic: Chapter 2 Project Description** | | |
| **Potential impacts during construction.** | Chapter 2 describes the proposed development and includes construction stage controls and mitigation measures. These are also set out in the preliminary CEMP, and include those measures set out below. It will be a requirement that all personnel will understand and implement the CEMP.<br>Traffic management and management of vehicle movements to protect staff and residents are proposed.<br>It will be necessary for the appointed contractor to prepare and implement a construction management plan and traffic management to reduce impacts of the construction phase on local residents and ensure the local road network is not adversely affected during the course of the construction project.<br>Dust mitigation measures are proposed. These are also referred to in Chapter 11 Air Quality and Climate and in the Dust Management Plan included as Appendix 11.2. | None proposed. |
| **EIAR Topic: Chapter 3 Alternatives Considered** | | |
| **Potential impacts have been mitigated by design, as set out in Chapter 2 and Chapter 3.** | Alternatives may be described at six levels: do-nothing alternative, alternative locations, alternative layouts, alternative design, alternative processes and alternative mitigation measures. The consideration of the main alternatives in respect of the development of the subject land was undertaken by the Design Team.<br>Alternative layouts were considered to minimise impacts on natural features such as hedgerow and provide permeability to minimise car usage and therefore mitigate some of the potential impacts on human health relating to car use | All potential mitigation measures relating to alternative layout and design have been incorporated in the final agreed design of the project, and therefore there is no requirement to provide operational mitigation measures. |
| **EIAR Topic: Chapter 4 Landscape and Visual Impact** | | |
| **Potential impacts have been mitigated by design, as set out in Chapter 2 and Chapter 3.** | **Avoidance measures**:<br>Retention of external boundary vegetation as well as (one) significant boundary/treeline.<br>**Reduction Measures:** | The principal mitigation for the Proposed Development is inherent in the design of its architecture, public realm and open space, which has evolved through an iterative process of assessment and consultation.<br>There are no operational management measures required in respect of landscape and visual issues, |

| | | |
|---|---|---|
| | Taller duplex buildings are clusters around a central green area which responds to the site characteristics;<br>Wheel wash and power washers will be located inside the main entrance during the construction period in order to keep roads clean;<br>Scaffolding will be erected around the site during construction along with hoardings at ground level;<br>Mesh netting will be erected around the scaffolding during construction as a safeguard measure to minimise dust emissions from the site.<br>**Remediation Measures:**<br>Appropriate new native plant species to be used throughout the scheme;<br>Enhancement of site tree cover by additional tree planting proposed as part of the development. | however the following remediation measures are proposed;<br>▪ Landscape management and maintenance plan to be drawn up and approved by a qualified professional |
| **EIAR Topic: Chapter 5 Traffic and Transportation** | | |
| **Increased traffic during both construction and operational phases** | The CEMP includes directs for a Construction Stage Traffic Management Plan which will identify the optimum route and times for construction access to the site.<br>A construction Traffic Management Plan will be developed and implement which will identify delivery of materials, specific haulage routes, staff parking, as well as details of the site compound. Measures to mitigate any potential noise, air quality and dust from construction stage activities will be detailed. | The scheme is located in an area where local services such as retail provision, schools and church are all within walking distance. The following mitigation measures are proposed to improve pedestrian safety as well as encouraging public transport use via the existing 245-bus stop located within 10 minutes' walk of the entrance.<br>▪ Extensive upgrade works on the R639 are proposed as part of the proposed development. The proposed works will include footpath and cycle lanes to connect the proposed residential development to the existing pedestrian and cycling network located to the north of the R639 entrance junction.<br>▪ Additionally, a signalised crossing to be located just south of the development entrance is proposed to provide a safe crossing point for pedestrians and cyclists. The signalised crossing also allows cyclists to safely cross the R639 to access the northbound cycle lane heading towards Fermoy. |
| **Potential impacts relating to number of HGVs at the site** | The development will result in the re-use of excavated materials generate on site and it is anticipated this will reduce the total volume of imported material therefore reducing traffic generation. | |
| **EIAR Topic: Chapter 6: Material Assets: Services, Infrastructure and Utilities** | | |
| **Potential impacts to services** | ▪ The proposed development should comply with the provisions of the preliminary Construction Demolition | All new foul and surface water drainage pipes to be pressure tested and CCTV to identify any possible defects |

|  |  |  |
|---|---|---|
|  | Waste Management Plan with respect to construction waste.<br>▪ The proposed development will comply with the provisions of the Preliminary Construction Environmental Management Plan.<br>▪ All new services will be constructed and provided in strict accordance with the relevant codes of practice. | Water conservation measures to implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments.<br>Ensure that all Hydrocarbon interceptors are designed to limit the flow of water from the development to the greenfield run off.<br>All watermain pipes to be pressure cleaned and pressure tested in accordance with Irish Water details. |
| **Monitoring** | No specific monitoring measures are proposed, the CEMP and CDWMP also include details of proposed environmental monitoring for the duration of the construction work. | Monitoring is proposed of water usage during the construction stage. Once operational, the water usage in the development will be monitored by a build water meter and compared to anticipated usage. This will allow Irish Water to monitor any potential leaks. |
| **EIAR Topic: Chapter 7: Soils and Geology** |  |  |
| **Removal of existing unconsolidated soils** | The shallow nature of the development means than interaction with bedrock or water table is not anticipated or will be minimal. | None Proposed |
| **Construction Waste** | A site specific Construction Waste Management Plan has been prepared and will be in place for the development | None Proposed |
| **Fuel Spills** | A designated contractor compound located in an area of level ground should be established for the different phases of site development. This compound will enable the safe storage of building materials, car parking, waste skips and should include a designated re-fuelling station and concrete wash down area<br>Activity of plant equipment and machinery operating in the construction area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc<br>All fuel storage areas on the site should be sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.<br>Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.<br>Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used. | None Proposed |

| | | |
|---|---|---|
| **Dust emissions, and/or sediment Runoff** | Limiting activities to work areas and not allowing machinery or construction activity in proposed future green, open space and/or undeveloped areas will ensure that there is no dust or sediment runoff generated and limited soil compaction will occur in those areas.<br>Designated roadways and internal access/construction routes should be clearly designated and fenced off in order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Machinery traffic on bare soils is a significant generator of silt.<br>Designated stockpile areas for the temporary storage of topsoil and subsoil material required for site re-use should be established at least 10m away from any drainage feature and as far as possible for the stream on the eastern boundary. Stockpile heights should be kept low to prevent instability and silt fencing installed around stockpile areas.<br>Any finished construction and green areas should be fully landscaped and re-grassed as soon as possible after completion to limit the potential for dust and silty water generation from those areas. | None Proposed |
| **Monitoring** | During the construction all topsoil and subsoil excavation work will be observed by a banks man. Although no buried waste or foreign material is anticipated the operative will be instructed to lookout for any physical evidence, (discolouration, odour, sheen etc,), of contamination in the excavations. A soil management plan, including segregation, sampling and suitable disposal off-site will be in place for the works and this plan will be instigated if necessary.<br>The CEMP and CWMP will also include details of proposed environmental monitoring for the duration of the construction works. | None Proposed |
| **EIAR Topic: Chapter 8 Hydrology and Hydrogeology** | | |
| **Emissions of dust and sediment runoff** | The areas where the excavation of unconsolidated soil and subsoils is required within each building phase should be kept to a minimum and only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of preventing the release of dust | None Proposed |

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| | in dry weather and suspended sediments during or after wet conditions. Potential dust and suspended solids runoff impacts are therefore reduced or avoided.<br>Sediment runoff impacts can also be greatly reduced and mitigated by controlling and limiting construction and machinery activity occurring adjacent to the drainage channel and site wide during or soon after very wet weather.<br>Buffer areas with silt fences should be established between the construction works the drainage channels.<br>Limiting activities to work areas and not allowing machinery or construction activity in proposed future green, open space and/or undeveloped areas will ensure that there is sediment runoff generated and no soil compaction will occur in those areas. No heavy machinery activity allowed in areas with attenuation tanks.<br>Designated roadways and internal access/construction routes should be clearly designated and fenced off in order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Similarly existing hedge rows and site features which are to be maintained should be fenced off.<br>A designated contractor compound located in an area of level ground away from the drainage system will be established for the building phases. This compound will enable the safe storage of building materials, car parking, toilet facilities, waste skips and will include a designated refueling station and wash down area.<br>Designated stockpile areas for the temporary storage of topsoil, subsoils and rock material required for site use should be established in areas where the ground level is flat and away (>20m) from any drainage feature. If there is a need for the long term storage of soil stockpiles then they should be seeded.<br>Sand and gravel stockpiles on site should be kept to a minimum and stored away (>20m) from water courses and covered if necessary.<br>Shallow berms, silt fences and/or cut-off trenches can be established around compound, work and stockpile areas which will prevent clean surface water runoff from flowing across these areas and will also help contain any impacted runoff flowing away from these parts of the site.<br>Any sediment laden runoff should be channeled through silt traps and settlement | |

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| | ponds to allow, as far as possible, the settlement of suspended solids. The diffuse discharge of silty water over grassland areas will help to filter the fine sediments and allow percolation to ground should be applied as necessary, (this should not be done in areas of the site adjacent to the local drainage ditches or the eastern drainage channel).<br>Runoff from machine service and/or concrete mixing areas should not be allowed to enter the sites drainage system or go to watercourses. Dedicated concrete wash down bunded areas should be established.<br>Any finished construction, landscaped and green areas should be finished and re-grassed as soon as possible after completion to limit the potential for dust and surface water generation from those areas. | |
| **Spill control measures to protect soil and groundwater** | Activity of plant equipment and machinery operating in the construction area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including staff training, regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc.<br>All fuel storage areas on the site are sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.<br>Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.<br>Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used. | None Proposed |
| **General Measures** | All construction works will be completed in line with the recommendations of the Construction Industry Research and Information Association (CIRIA) *Environmental Good Practice on Site 4th Ed (C741 - 2015) & Control of Water Pollution from Construction Site* (C532 - 2001).<br>Best practice environmental guidance will be incorporated into the Construction Environmental Management Plan (CEMP) for the development | No other measures proposed as mitigation included and considered as part of project design. |

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| **Monitoring** | The potential for surface water runoff to arise from work, stockpile and compound areas will be observed by the appointed contractor during wet weather events to ensure that it is not impacting the local drainage channel or indirectly the Blackwater River. Both hydrocarbons and silt cause discolouration so are easy to visually monitor for their presence. If necessary water sampling and monitoring of the local drainage channel can be completed to test for Total Suspended Solids (TSS) and Hydrocarbon concentrations during the construction phase if required. | The surface storm water drainage system on the site will be controlled by buried storage systems which are designed to mimic the green field runoff rates. A system of interceptors and filters will ensure that the runoff is kept clean as hydrocarbons and sediment material is removed. This infrastructure will need to be maintained and serviced to ensure its long term operation is successful. A visual inspection and maintenance schedule should be implemented for this infrastructure to ensure this infrastructure operates correctly for the operational phase of the development |
| **EIAR Topic: Chapter 9 Biodiversity** | | |
| **General** | Mitigation measures will be integrated as part of the proposed development regarding environmental protection to potential construction and operational phase impacts. A Natural Impact Statement in support of th Appropriate Assessment (AA)process, has been undertaken to consider mitigation measures regarding potential significant adverse effects on a Natura 2000 site where relevant to the proposed development and this has been provided as a standalone document accompanying the planning application.<br>The CEMP accompanying this SHD application includes a range of environmental measures required during construction such as traffic, parking, the setting up of site and access. | None Proposed |
| **Damage and loss to habitats** | The final landscaping proposals will result in an overall net gain of native-dominant woody features at the site (trees, hedgerow, shrub) that will easily compensate for the loss of one tree. The successful dominant planting of native/non-native pollinator friendly trees/shrubs as part of the proposed landscaping plan will lead to a slight positive effect on semi-natural habitat and flora at the site and surrounding locality. | The existing hedgerow feature along the southern boundary will be retained with supplementary native planting where appropriate during the operation phase. |
| **Impacts to foraging bats as a result of loss of habitat** | The mature Ash tree (at the southern boundary) due for felling will be re-assessed in advance of felling by a suitably qualified/experienced Ecologist in accordance with best practice guidelines. If this tree is considered to have potential to support bat roosts at the time, it will be marked in the field to allow easy identification for all site staff and thereby ensure protection from inappropriate felling. The subsequent felling of this tree will be undertaken under the advice/supervision of a suitably qualified/experienced Ecologist in accordance with best practice guidelines and in consultation with NPWS where relevant. | |
| **Monitoring** | Ensure that a pre-felling/removal assessment of bat roosting potential/activity in relation to trees | |

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|  | due for removal is undertaken, with subsequent protection and appropriate follow-up actions where required. |  |
| **Impacts to bats as a result of lighting during construction and operation** | Construction operations during the hours of darkness will be kept to a minimum; this will minimise disturbance to species that are roosting/resting or active at night<br>The construction phase lighting scheme will be designed to minimise light spillage nuisance at retained/new woody features of the study site and adjoining areas by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories (*e.g.* shielding plates). This will benefit bats as well as other fauna active/resting at night | The operational phase lighting scheme will be designed to minimise light spillage nuisance at retained/new woody features of the study site and adjoining areas by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories |
| **Pollution to surface waters** | Measures to protect surface waters are outlined in the CEMP and works will follow best practice guidance will be implemented at all times in relations to all construction activities to avoid any accidental pollution events occurring. This will include the following:<br>• To ensure that there will be no contamination of surface water, any excess excavated material will be immediately removed;<br>• The short term storage and removal/disposal of excavated material will be planned and managed such that the risk of pollution from these activities is minimised;<br>• Silt fencing will be erected and maintained in place during the construction phase and until such time as the integrity of the re-instated ground/material has been fully established;<br>• The silt fencing will be checked twice daily during construction and once per day thereafter to ensure that it is working satisfactorily until such time as the re-instated ground/material has been fully established;<br>• Sediment traps (such as earthen berms and/or settlement ponds) and/or silt fences will be provided to prevent run-off from the site;<br>• Drainage channels beside construction roads will flow into settlement ponds or swales in series to allow primary and secondary settlement of sediment. Each swale series will have an outfall manhole directly downstream in which final settlement can take place and the outfall can be monitored. Outfall manholes will be regularly emptied of sediment during periods of heavy rainfall. These measures will prevent run-off from the site and total suspended solid levels in all discharge shall be | None proposed |

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| | in compliance with the Quality of Salmonid Water Regulations (SI 293:1988);<br>• Through all stages of the construction phase the contractor will ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution of all types;<br>• The storage of oils, hydraulic fluids etc. will be in a bunded facility with filling and take off points within the bunded area in accordance with current best practice;<br>• The pouring of concrete, sealing of joints, application of water proofing paint etc. will be completed in the dry to avoid pollution of the freshwater environment. As grout /cementitious materials are highly toxic to aquatic life all such works must be contained in complete isolation of all waters and storm water systems. | |
| **Threat of spread of invasive species** | A site assessment will be undertaken by a suitably qualified/experienced Ecologist or Invasive Plant Specialist prior to enabling/construction activities to assess the most up-to-date status of invasive plants (*e.g.* Cherry Laurel *Prunus laurocerasus,* Winter Heliotrope *Petasites fragrans*, Buddleia *Buddleia davidii*) at the site relative to the works area. Where relevant, invasive plants will be managed/eradicated and monitored in line with current guidelines where available (*e.g.* NRA 2010) under the advice/supervision of a suitably qualified/experienced Ecologist and/or Invasive Plant Specialist. The management of invasive plants will need to be incorporated into the final Construction and Environmental Management Plan for the project to inform the need to manage works accordingly | None proposed |
| **Monitoring** | Ensure that invasive plants are appropriately managed/eradicated with a field assessment to determine the most up-to-date status of invasive plants (*e.g.* Cherry Laurel, Winter Heliotrope Buddleia) relative to the works area. | |
| **Disturbance to faunal species** | The removal of woody vegetation (tree, scrub) during site clearance/construction activities will not be undertaken during the bird nesting season (currently defined as March 1st to August 31st inclusive by the Irish Wildlife Acts 1976 – 2018 as amended).<br>During site clearance, a suitably qualified/experienced Ecologist will supervise/check areas where woody vegetation removal is due to identify potential unforeseen wildlife issues (*e.g.* unknown badger sett) so that appropriate measures can be undertaken in | None Proposed |

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| | accordance with best practice guidelines and in consultation with NPWS where relevant. | |
| **Monitoring** | A suitable qualified/experienced Ecologist will be engaged in the role of Ecological Clerk of Works (ECoW)<br>Monitoring will be carried out in accordance with the CEMP.<br>Ensure that where a fauna species is found actively using the development footprint for breeding/resting (*e.g.* bird nest, bat roosting, hare, common frog) during site enabling/clearance/construction activities, relevant works are ceased immediately and that the area is cordoned off until appropriate follow-up actions are undertaken where required. | Once operational, the implementation of the landscape plan, compensatory habitat and additional planting should be inspected. |
| **EIAR Topic: Chapter 10 Noise and Vibration** | | |
| **Impacts to receptors from noise during construction** | Plant used onsite during the construction phase will be maintained in a satisfactory condition and in accordance with manufacturer recommendations.<br>Machinery not in active use will be shut down.<br>A designated environmental liaised officer will be appointed to site during construction works.<br>Where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.<br>Generators or compressors will be fitted with manufacturers' acoustic enclosures, or alternatively will be screened by a local acoustic screen.<br>Guidance set out in British Standard BS 5228-1:2009+A1:2014 with respect to noise control will be applied throughout the construction phase. | |
| **Vibration** | None Proposed | None Proposed |
| **Monitoring** | Where required, construction monitoring will be undertaken at periodic samples periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion. | None Proposed |
| **EIAR Topic: Chapter 11 Air Quality and Climate** | | |
| **Emissions of dust and particulate matter** | A detailed dust management plan associated with a high level risk of dust impacts has been prepared and is outlined in Appendix 11.3. This plan draws on best practice mitigation measures | Any impacts to air quality are predicted to be imperceptible therefore no mitigation is proposed. |

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|  | from Ireland, the UK and the USA in order to ensure the highest level of mitigation possible.<br>Measures will include:<br>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.<br>Any road that has the potential to give rise to dust nuisance will be regularly watered, as appropriate, during dry and/or windy conditions.<br>Vehicles exiting the main site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.<br>Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.<br>Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.<br>Regular watering of stockpiles be used as required if particularly dusty activities are necessary during dry or windy periods. Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.<br>During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.<br>Hoarding or screens shall be erected around works areas to reduce visual impact. This will also have an added benefit of preventing larger particles of dust from travelling off-site and impacting receptors.<br>At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. |  |
| **Monitoring** | Due to the close proximity of the site to a number of sensitive receptors, monitoring of construction dust deposition along the site boundary during the construction phase of the proposed development is recommended. This is to ensure the proposed mitigation measures are working satisfactorily.<br>Monitoring can be carried out using the Bergerhoff method in accordance with the requirements of | None Proposed |

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| | the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2 m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 - 32 days.<br>Monitoring measures are set out in the Dust Management Plan included as Appendix 11.2; At all times, the procedures put in place will be strictly monitored and assessed.<br>• The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;<br>• During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;<br>• 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;<br>• It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;<br>• 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;<br>• It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein. | |
| **EIAR Topic: Chapter 12 Cultural Heritage and Archaeology** | | |
| **Damage to unknown subsurface archaeological deposits** | A programme of archaeological investigations to comprise of a geophysical survey followed by test trenching will be undertaken prior to the commencement of the construction phase.<br>A drainage channel extending along the eastern boundary of the proposed development site forms the townland boundary between Coolcarron and Fermoy for a distance before continuing in the townland of Fermoy and being culverted. The drainage channel will be investigated as part of the archaeological mitigation measures | None Proposed |
| **Monitoring** | Method statements detailing the proposed strategy for all pre-construction site investigations will submitted for approval to the National | None Proposed |

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| | Monuments Service as part of the licence applications.<br>A report will be compiled on all site investigations which will clearly present the results in written, drawn and photographic formats. Copies of these reports will be submitted to the National Monuments Service, Cork County Council and the National Museum of Ireland. | |
| **EIAR Topic: Chapter 13 Population and Human Health** | | |
| **None identified** | No significant effects have been identified. Mitigation measures to reduce potential environmental impacts during construction are proposed in the CEMP which accompanies the application.<br>Measures to ensure health and safety of residents include management of construction traffic and site access;<br>• Securing of site boundary and erecting of fencing or hoarding/signage as required;<br>• Minimising disruption of services through adequate engagement with utility and service providers.<br>• Restriction of construction working hours and traffic access.<br>• Site access and egress;<br>• Preparation of an Emergency and Evacuation Plan.<br>• Maintenance of public roads;<br>• Communication with local authorities and neighbours<br>Measures to protect population and human health are inherent in the design of the project, as outlined in Chapter 2 Project Description and Chapter 3 Alternatives Considered. Mitigation measures are also proposed in Chapter 10 Noise and Vibration and Chapter 11 Air Quality.<br>A Project Supervisor for the Construction Phase (PSCP), will be appointed to oversee site and public safety. | 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. |
| **Monitoring** | No specific monitoring is proposed. The Project Supervisor for the Construction Phase (PSCP), will be appointed to oversee site safety and will monitor compliance with health and safety requirements. | None proposed. |

**Cumnor Construction Ltd**

Proposed Strategic Housing Development at
Coolcarron (townland), Fermoy, Co. Cork

# CHAPTER 16

## Risk of Major Accidents or Disasters

## Volume II

Environmental Impact Assessment Report

CUMNOR
Building & Civil Engineering Contractors

April 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

# Chapter 16 Risks of Major Accidents and Disasters

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# 16 Risks of Major Accidents and Disasters

## 16.1 Introduction

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 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 taken into account with respect to land use planning. This is achieved through the provision of technical advice to planning authorities.

The HSA does not currently consider the proposed development to be a COMAH facility.

However, in order to ensure a comprehensive assessment of potential environmental effects due to risks of major accidents and/or disasters as relevant to the development, this chapter presents an additional review of the characteristics of the proposed development and of the project location to consider potential for accident scenarios that do not fall under COMAH reporting requirements.

In assessing likely potential and predicted impacts, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

Section 8 of Annex IV of the EIA Directive specifies that the EIAR must include;

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

A major accident can be defined as an acute or chronic accident or disaster, of human or natural origin, which occurs either as a consequence of, or which interacts with, the construction or operation of the proposed Scheme, and which has substantial consequences for people or the environment.

### 16.1.1 Methodology

The assessment has been carried out generally in accordance with the following guidelines:

- EPA Draft 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017),
- EPA 'Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2015),
- National Roads Authority (NRA) 'Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes' (2009).

In the EIA assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The principal attributes (and impacts) to be assessed include the following:.

- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any).
- Loss of containment of drug substance material

### 16.1.2 Sources of Information

The collection of baseline regional data was undertaken by reviewing the following sources:

- Office of Public Works (OPW) flood mapping data (www.floodinfo.ie).
- Site specific data was derived from the following sources:
- Civil Engineering Report prepared by Walsh Design Group (March 2022) - Proposed Residential Development, Coolcarron, Fermoy, Co. Cork.
- Various site plans and drawings

The layout and extent of the proposed development site is shown in the Chapter 2 (Project Description) of this EIAR.

## 16.2 The Proposed Development

The description of the proposed development is presented in detail in Chapter 2 – Project Description..

The subject site is located south of Fermoy town, within the development boundary of the town, in the townland of Coolcarron. The total site area is 11.56 hectares with a net developable area of 11.22 hectares.

The development will consist of:

- 336 no. residential units, comprising 242 no. dwelling houses and 94 no. duplex and simplex apartments as follows:
- 39 no. 1 bed apartments,
- 55 no. 2 bed apartments,
- 10 no. 2 bed dwelling houses,
- 182 no. 3 bed dwelling houses,
- 46 no. 4 bed dwelling houses,
- 4 no. 5 bed dwelling houses.
- Car parking spaces and bicycle storage for each duplex & simplex building.

## 16.3 Description of the Existing Environment

### 16.3.1 Site Description

The site is currently a green field site, with parts of the site being overgrown. It is bounded on the west by the main road to Fermoy town, as well as private dwellings, commercial properties and an ESB facility. There is also an existing lay-by and weigh station on the western boundary, adjacent to the proposed entrance. There is a planted woodland and drainage ditch to the east of the site. The south of the site is bounded by agricultural land. St. Colman’s College Sports Campus is to the north. There are two existing field boundaries within the site, one a stone wall, and one of mature alder trees. There is an existing field boundary of native hedgerows. There is an ESB line that currently cross the development site from just south of the southern boundary to the ESB substation.

The site is free from structures on the Record of Protected Structures and is not located within an Architectural Conservation Area (ACA). There are no sites on the Record of Monuments and Places (RMP) within the development area. The site is also not within a Special Area of Conservation (SAC) or a Special Protection Area (SPA). It should also be noted that there is one structure located within the proposed development site which comprises the roofless ruin of a building, the rear wall of which includes the boundary wall to the tennis courts off Devlin Street. The work proposed for the creation of a new surface-water drainage-pipe along the northern spur of the proposed development site will involve the loss of this structure. These walls are considered to be of low cultural heritage value and their loss will be of negligible effect (refer to Chapter 12 - Heritage: Cultural Heritage and Archaeology for further details).

### 16.3.2 Topography

The site generally slopes gently downwards from west to east and there is an existing open drainage channel along the eastern boundary. Where the proposed entrance road to the development meets the R639 the ground level is 57.57mAOD but within the site the high point is 56.99m in the southwest corner and this falls to a low point of 51.11mAOD in the northeast corner.

### 16.3.3 Flood Risk

A desktop study of the flood history at the site was carried out by Walsh Design Group (2022) and forms part of this SHD application. There are no records of any flooding in this area of Fermoy in the OPW's floodinfo.ie database of maps and the development lies outside all flood zones shown in the Local Area Plan (2017) for the Fermoy Municipal District.

An extract from the floodinfo.ie map is shown in Figure 16.1 below which shows the extent of flooding in Fermoy Town.

The projected flood extents are localised in the lower lying areas Fermoy Town near the river and do not extend southwards to the proposed site which is on higher ground. The past flood events layer is also shown in the map, indicated with the hazard signs. These events are in Fermoy Town and there is no indication that there has been a flood event in the Coolcarron area.

It has been concluded that the site of the new works lies within Flood Zone C (i.e., where the probability of flooding is less than 0.1% AEP or 1 in 1000 year for river flooding) as defined by the guideline document to Planning Authorities in relation to Flood Risk Management

Figure 16.1 Flooding Map (Source: www.floodinfo.ie)

### 16.3.4 Seismic Activity

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 result.

In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

There are no active volcanoes in Ireland.

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 (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland including IWEX on Carrickbyrne Hill, Co. Wexford, running from 01/01/2011 and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events (refer to Figure 16.2 below).

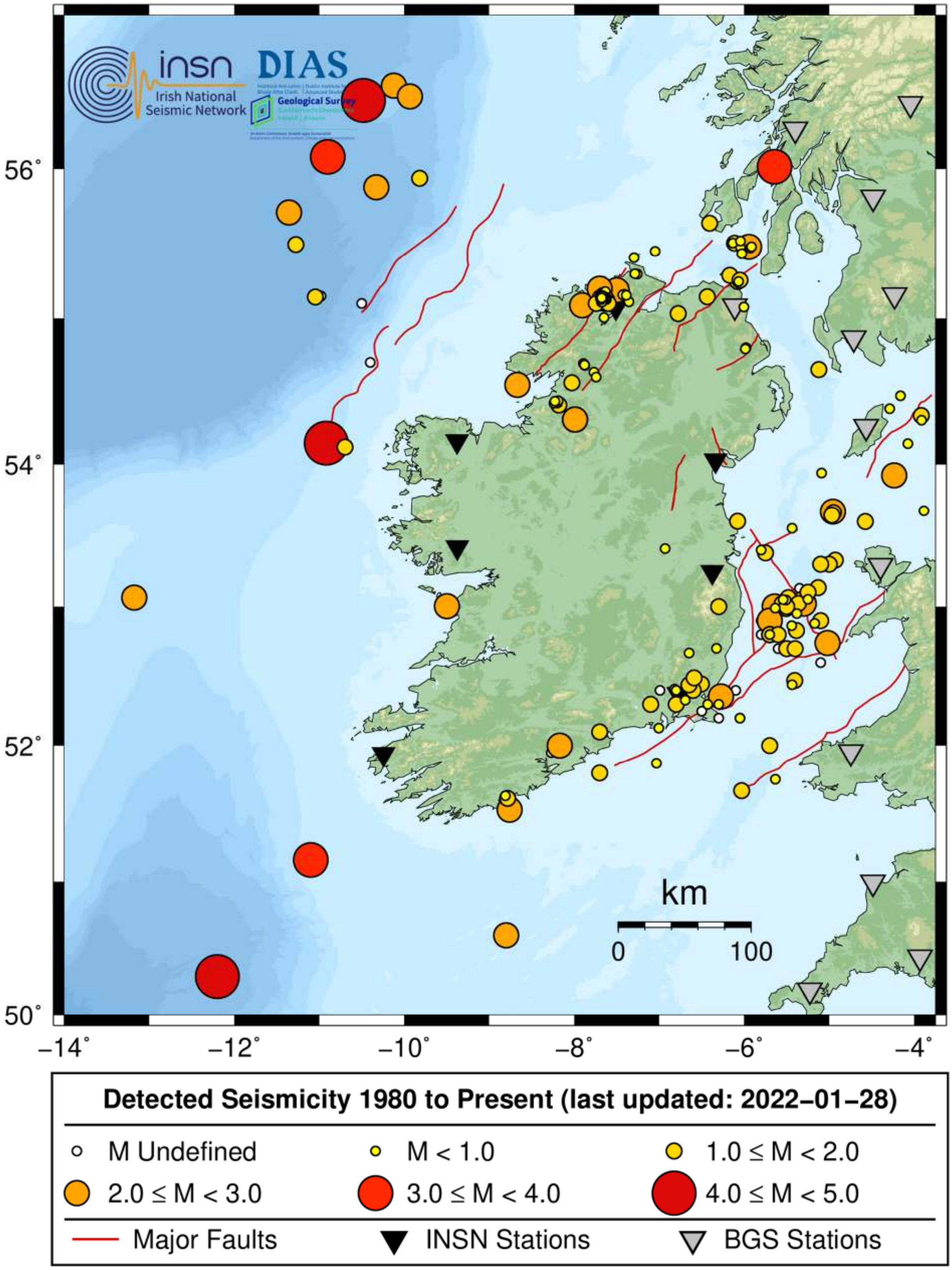

Figure 16.2 Seismic Movements (Source: Irish National Seismic Network)

As can be seen in Figure 16.2 above, the principal events have occurred along/ beyond the east, south-east and south of Ireland with seismic movements generally up to 2.9 Magnitude recorded on land with no seismic events recorded in the immediate vicinity of the Fermoy site.

## 16.4 Predicted Impacts

The potential impacts of the construction and operational phases of the Proposed Development are outlined below.

### 16.4.1 Construction Phase

No scenarios of concern have been identified during the construction phase. As such the predicted impact is considered to be short term, imperceptible and neutral.

### 16.4.2 Operational Phase

The proposed development is not located in an area prone to flooding or an area prone to seismic events. As such, these accident scenarios are not of concern.

Therefore, the impact is considered to be long term, imperceptible and neutral.

## 16.5 Mitigation Measures

No specific measures are proposed

## 16.6 Monitoring

No monitoring is proposed.

The residual impact is considered to be imperceptible and neutral.

## 16.7 Cumulative Impact Assessment

Cumulative impacts are considered imperceptible and neutral

## 16.8 References

EPA Draft 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017).

EPA 'Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2015).

National Roads Authority (NRA) 'Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes' (2009).

Office of Public Works (OPW, www.floodinfo.ie).

Irish National Seismic Network (INSN, www.insn.ie)