

EIAR

Volume 2 – EIA Report

Proposed Residential Development

**Lands at Tinakilly,
Rathnew,
County Wicklow**

On behalf of

Keldrum Limited

August 2023

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Planning & Development

Consultants

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Dun Laoghaire

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1. INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) is submitted in conjunction with and in addition to a planning application, prepared by Brock McClure Consultants, 63 York Road, Dun Laoghaire, Co. Dublin for a seven-year permission for the development of lands, primarily for residential development, in the town lands of Tinakilly, Rathnew, County Wicklow as described below:

Development at this site of c. 16.8ha. The application site is bounded to the north by an existing stream and agricultural lands, to the east by Tinakilly County House Hotel (which is a protected structure RPS No. 25-15) to the immediate west by agricultural lands and residential development and to the south by Tinakilly Avenue and a site currently under development as granted by Wicklow County Council Reg Ref. 17/219 (ABP Ref.310261-18) as amended by WCC Reg Refs. 20/1000, 21/411 and 22/837.

The site masterplan layout is shown on figure 1.1 below:



Figure 1.1: Site Masterplan Layout

The development will consist of a residential development, public park and road infrastructure comprising the following:

- b) Construction of 352 no. residential units as follows:
 - I. 220 no. 1-2.5 storey houses comprising 31 no. 2 bed houses, 114 no. 3 bed houses, 72 no. 4 bed houses and 3 no. 5 bed houses, ranging in size from c.82.33 sq.m to c.212.39 sq.m. Each house will have an associated rear/ side private garden.
 - II. 132 no. apartment/ duplex/ maisonette units comprising the following: 56 no. 1 bed apartments and 48 no. 2 bed apartments in 3 no. 4 storey apartment block buildings. 8 no. 1 bed maisonette units in 2 no. 2 storey semi detached blocks. 14 no. 2 bed duplex ground floor apartment units and 14 no. 3 bed upper floors duplex apartment units arranged across 3 no. 3 storey terraced blocks, ranging in size from c.48.4 sq.m to c.109 sq.m. All apartment/ duplex/ maisonette units will be provided with private open space areas in the form of balconies/ terraces.

- III. Communal open space associated with the proposed apartment units will be provided in the form of landscaped areas located in the vicinity of the apartment units (totalling 0.1788 ha).
- IV. All internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- V. Provision of 592 no. car parking spaces across the development site and 168 no. bicycle parking spaces for residents of the proposed 56 no. 1 bed and 48 no. 2 bed apartment units. 66 no. visitor bicycle parking spaces are provided throughout the development site. All terraced houses and duplex 2 and 3 bed apartments will be provided with associated secure in curtilage bicycle lock ups.
- VI. Proposed pedestrian connections and landscaping to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.
- b) The proposed development will connect to the Tinakilly Park residential development and Rathnew Village via a new section of the Rathnew Inner Relief Road. The proposed road will join the constructed/under construction elements permitted under WCC Ref. 17/219/ ABP Ref. PL27.301261 and amended under WCC Ref. 22/837 to the south with a section of the link road to the northwest of the site at the R761 roundabout in Rathnew granted under WCC Ref. 21/1333. This includes all associated vehicular and pedestrian accesses, carriageways, paths and junctions.
- b) No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15) save for works to close the western portion of Tinakilly Avenue to vehicular traffic and the provision of a new vehicular entrance and gates along the eastern portion of Tinakilly Avenue off the Rathnew Inner Relief Road to facilitate access to Tinakilly House and other properties to the east of the site accessed from Tinakilly Avenue.
- b) All associated site development works, services provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.
- b) The planning application is accompanied by an Environmental Impact Assessment Report and Natura Impact Statement.
- b) The planning application is available for public viewing at the following website: www.tinakillydemesnelrd.ie

1.2 Scoping of the EIAR

The purpose of scoping is to identify the information to be contained within the EIAR and the methodology to be used in gathering and assessing the information.

The current application has been subject to formal pre planning application consultation meetings with Wicklow County Council consisting of a section 247 pre planning meeting and a LRD meeting in accordance with section 32B of the Planning and Development (Large Scale Residential Developments) Act 2021.

The application reflects and responds to the points of discussion during the course of the pre application consultations with Wicklow County Council. It has been further informed by advice received from the specialist team engaged to prepare the EIAR.

1.3 Consultation

A dedicated website for the proposed development is established and the EIAR is available at: www.tinakillydemesnelrd.ie

Prior to the lodgement of this application, the full complete Environmental Impact Assessment Report has been uploaded to the Department of Housing, Planning and Local Governments EIA Portal. The EIA portal is easily accessible by members of the public and provides a link and map of all planning applications that have been lodged with an accompanying EIAR.

1.4 Requirement for Environmental Impact Assessment

The requirement for an EIA for certain types and scales of development is listed in Annex I and Annex II of the of the EU Directive 2014/52/EU amended directive 2011/92/EU and is transposed into Section 5 (Part 1 and 2) of the *Planning and Development Regulations 2001* as amended.

The EU Directive on EIA lists projects for which an EIA is mandatory (Annex I) and projects for which an EIA may be required (Annex II) EU member states can select to apply thresholds for Annex II projects or examine projects on a case-by-case basis to assess when an EIA is required. In Ireland a combination of both has been applied. Annex I and II of the EU Directive on EIA have been transposed to schedule 5 of the *Planning and Development Regulations 2001* as amended.

The subject development does not fall within any of the classes of development as listed within Part 1 of Schedule 5.

The proposed development does fall within the development classes as set out in Part 2 of schedule 5 as follows:

10. Infrastructure Projects (b)(iv):

‘Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of built-up areas and 20 hectares elsewhere’.

Accordingly, as the subject site area is 16.8ha and phase 1 of the development to the south of the site is 25.83ha, the total landholding of the applicant at Tinakilly across phase 1 and 2 is 42.63ha. Although the subject site alone does not cross the 20ha threshold for an EIAR, it is considered best practice to provide an EIAR the development site, given its proximity to phase 1 of the development to the south, and the total quantity of land within the applicants landholding included within the redline of both phase 1 and 2 of the development at Tinakilly.

Accordingly, as the subject site has an overall site area of c. 25ha this EIAR has been prepared in accordance with Part 10 provisions of the Act.

This EIAR describes the findings of the EIA process to the Planning Authority to help determine a decision on the proposed development. It also informs the relevant statutory consultees, interested parties and the public about the likely effects that the proposed development will have on the environment.

1.5 Content of the Environmental Impact Assessment Report

This EIA report has been prepared in accordance with the most relevant guidance including but not limited to:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).
- Guidance on preparation of the Environmental Impact Assessment Report (European Union, 2017)

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

Pursuant to EIA Directive, (Article (5) 1 of Directive 2014/52/EU), this EIAR specifically contains:

- A description of the project comprising information on the site, design, size and other relevant features of the project;
- A description of the likely significant effects of the project on the environment;
- A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and if possible, offset likely significant adverse effects on the environment;
- A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.
- A description of the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be effected or the use of natural resources;
- A non-technical summary of the information referred to in points (a) to (d); and
- Any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project.

Impacts arising from the existence of the proposed development, the use of natural resources, the emission of pollutants, the creation of nuisances and the elimination of waste are described as direct, indirect, secondary, cumulative, short and long term, permanent and temporary, positive and negative, as appropriate.

1.6 Competency

An Environmental Impact Assessment Report must be prepared by competent experts. The applicant, Keldrum Limited, approached Brock McClure Planning and Development Consultants to direct and co-ordinate the preparation of the EIAR. A team of qualified experts has prepared each individual chapter of the report, as listed in table 1.1 below.

1.7 Format and Structure of the EIAR

This EIAR has been prepared in the ‘Grouped Format’ structure, which examines each aspects of the environment as a separate chapter referring to the existing environment, the proposed development, likely impacts and mitigation measures.

The EIAR is presented in 3 no. volumes as follows:

- Volume 1 – Non-Technical Summary
- Volume 2 – Environmental Impact Assessment Report
- Volume 3 – Appendices to Environmental Impact Assessment Report

Preparation of the EIAR has been co-ordinated by Brock McClure, Planning and Development Consultants with inputs from specialist consultants. Table 1.1 below provides a summary and overview of how this EIAR is structured together with an acknowledgment of specialist consultant’s input in the preparation of same.

Pursuant to Schedule 6, Part 1 and Part 2 of the 2001 Regulations, the following environmental elements have been grouped and assessed within this EIAR:

CHAPTER	ASPECT	CONSULTANT	LEAD CONSULTANT
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0	Non-Technical Summary	Contribution from all EIAR project team members	Not Applicable
1	Introduction	Brock McClure	Majella Quinn
2	Description of the Proposed Development	Brock McClure	Majella Quinn
3	Planning and Development Context	Brock McClure	Majella Quinn
4	Alternatives	Brock McClure	Majella Quinn
5	Population and Human Health	Brock McClure	Majella Quinn
6	Land, Soils, Geology and Hydrogeology	CS Consulting	Owen Sullivan
7	Hydrology	CS Consulting	Owen Sullivan
8	Biodiversity	Scott Cawley	Emmi Virkki
9	Air Quality and Climate	AWN Consulting	Ciara Nolan
10	Noise and Vibration	AWN Consulting	Jennifer Harmon
11	Landscape and Visual Impact	Macroworks	Richard Butler
12	Archaeological, Architectural and Cultural Heritage	IAC Archaeology	Faith Bailey
13	Traffic and Transportation	CS Consulting	Owen Sullivan
14	Waste Management	CS Consulting	Owen Sullivan
15	Material Assets	Brock McClure	Majella Quinn
16	Cumulative Impacts	Brock McClure	Majella Quinn
17	Interactions Interrelationship between the aspects	Brock McClure	Majella Quinn

Table 1.1: Structure of Volume 1

1.8 EIAR Project Team



Scott Tallon Walker Architects is a fully registered architectural practice established in 1931 as Scott and Good becoming Michael Scott Architect in 1938, and Michael Scott and Partners in 1957 before changing to the current Scott Tallon Walker in 1975. Scott Tallon Walker and its earlier incarnations developed a reputation for modernism.

Scott Tallon Walker has been responsible for many influential buildings in Ireland, notably Dublin Central Bus Station and collaborating on the design of the Aviva Stadium. Scott Tallon Walker also have a wealth of experience in designing residential schemes, and are the project architects on a number of large residential schemes including Marmalade Lane Dublin, Lee Point Student Accommodation Cork, Clonkeen SHD Dublin, Spencer Dock Apartments Dublin, Belle Bank Dublin, Maynooth University Student Housing Kildare and Crodaun SHD Kildare, all available to view as case studies of Scott Tallon Walker designed residential schemes on the firms website.



CS Consulting Group is a Group of civil and structural engineers based in Dublin, Limerick and London. The group was founded in 2012 by current directors Pearse Sutton, Cora Sutton Smith and Owen Sullivan. CS Consulting group have directed a multitude of significant development projects in several territories, ranging from commercial and retail to residential and mixed-use developments.

CS Consulting group have been involved in a variety of residential projects for large scale residential schemes including Waterfront South Central Dublin, Bay View at the Coast Baldoyle Dublin, Blackhall Plaza Dublin, Glenart Avenue Dublin, Wembley One West London and the Taper Building London, all available to view as case studies of CS Consulting Groups work on the firms website.



Brock McClure Consultants is a town planning consultancy established in 2012 and partnered by Laura Brock and Suzanne McClure. Laura Brock and Suzanne McClure have 20 years of experience in all aspects of planning consultancy in both the public and private

sector and a proven track record in the industry with a wide range of projects spanning across both statutory and strategic planning fields.

A high-calibre team of urban planners has extensive experience in a broad range of project types including residential, mixed use, industrial and commercial developments. Brock McClure Planning Consultants provides specific advice on development proposals, exempted development provisions and aspects of planning law but has also experience in all other aspects of planning (retail assessment, site characterisation assessment, monitoring, planning appraisals, environmental assessment and among many more).



Murphy & Sheanon provide a bespoke design service for all types of landscape projects. They specialise in residential landscape design from private gardens and estates to larger multi-unit projects. Murphy & Sheanon provide a complete design service, taking projects through from design conception to construction stage.



Since the establishment of the practice in 1998, IAC Archaeology has grown into the country's largest archaeological consultancy employing a core team of 20 archaeologists, built heritage specialists, surveyors and project managers who are experienced in executing major projects in both urban and greenfield environments. They are a corporate member of the Institute of Archaeologists of Ireland.

IAC Archeology has extensive experience in the management of archaeological and conservation issues from the pre-planning stage through to planning applications and subsequent archaeological investigations, excavations and monitoring. This work has been carried out on infrastructural projects; extraction schemes; renewable energy projects; commercial and residential developments.



Scott Cawley Ltd is one of Ireland's longest established, largest and most successful ecological consultancies, providing ecological survey, impact assessment and management services to planning and development related sectors. Scott Cawley has been at the heart of some of the most important infrastructure, energy and policy developments in Ireland in the last 15 years. Major developments such as Aviva Stadium, Dublin Docklands, Luas, St James's Gate Brewery, Adamstown, Clonburris and Cherrywood SDZs have all been part of their portfolio of development related work. Major transport links such as the M11, N7 Newlands Cross, N5, N15, N61, M6 and even the motorway service stations in Kildare, Louth and Fingal have all benefitted from their involvement. Recent developments including [Centre Parcs \(Longford\)](#), the [National Children's Hospital](#), National Maternity Hospital and the [N6 Galway City Transport Project](#) are part of Scott Cawley's project profiles.



AWN Consulting is a multidisciplinary consultancy offering specialist design advice, expert witness and litigation support in respect of a wide range of engineering and environmental disciplines. It is an Irish owned company with its Head Office in Dublin and a Regional Office in Cork. The company was formed in 2000 by four principals, who have overseen the growth of the company to its current level; they continue to direct its activities with a firm emphasis on technical excellence and quality of services.



Established in 1999, Macro Works provide a full suite of LVIA related tools and skills for a broad spectrum of energy, infrastructure and commercial developments. Our clients emanate from both the public and private sectors, in Ireland and abroad. Macro Works' expertise primarily covers the stages of development, from initial feasibility studies through to the completion of the planning process.

Macro Works operates to a strict code of quality assurance, as well as adhering to the latest, international best practise standards and guidelines for LVIA and photomontage. We are professionally affiliated to the Irish Landscape Institute, which is a registered member of both EFLA (European Foundation for Landscape Architecture) and IFLA (International Federation of Landscape Architects).

Not content to simply follow best practice, Macro Works constantly endeavour to establish it through constant R&D and innovation that takes advantage of the latest technologies. This push for constant advancement has ensured that Macro Works have remained at the forefront of LVIA services in Ireland for the past 20 years and will continue

to do so into the future. We excel at challenging projects where our combination of experience and innovation can be brought to bear to give any development its greatest chance of success.

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1.9 Description of Effects

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

The identified quality, significance and duration of the effects for each aspect is based on terminology set out in the EPA’s Guidance on the Information to be contained in Environmental Impact Assessment Reports 2022 table 3.4, presented on table 1.2 below:

Quality of Effects	Positive – A change which improves the quality of the environment
	Neutral - No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative – A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible – An effect capable of measurement but without significant consequences.
	Not Significant – An effect which causes notable changes in the character of the environment but without significant consequences
	Slight Effects – An effect which causes notable changes in the character of the environment but without significant consequences
	Moderate Effects – An effect that alters the character of the environment without affecting its sensitivities
	Significant Effects – An effect which, by character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
	Profound Effects – An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent – Describe the size of the area, the number of sites and the proportion of a population affected by an effect
	Context – Describe whether the extent, duration or frequency will conform or

	contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects – The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented
	Unlikely Effects – The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented
Describing the Duration and Frequency of Effects	Momentary Effects – Effects lasting from seconds to minutes
	Brief Effects – Effects lasting less than a day
	Temporary Effects – Effects lasting less than a year
	Short Term Effects – Effects lasting one to seven years
	Medium Term Effects – Effects lasting from 7 to 15 years
	Long Term Effects – Effects lasting from 15 to 60 years
	Reversible Effects – Effects that can be undone, for example through remediation or restoration
	Frequency of Effects – Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly, - or hourly, daily, weekly, monthly, annually).
	Indirect Effects (a.k.a Secondary or Off Site Effects) – Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
	Cumulative Effects – The addition of many minor or insignificant effects on other projects, to create larger, more significant effects

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Describing the Types of Effects	'Do Nothing Effects' – The environment as it would be in the future should the subject project not be carried out
	'Worst Case' Effects – The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable Effects – When the full consequences of a change in the environment cannot be described
	Irreversible Effects – When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual Effects – The degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic Effects – Where the resultant effect is greater significance than the sum of its constituents (e.g combination of SOx and NOx to produce smog).

Table 1.2 – Description of Effects

1.10 Site Selection and Consideration of Alternatives

The subject site was chosen for development on the basis of its current zoning and Plan led strategic context. The site is located within the Clermont/Tinakilly Action Area Plan, and has been zoned for Residential and Open Space uses.

The design and layout of the proposed scheme has undergone several iterations to ensure that the proposal is fully site responsive and all environmental factors, including archaeology, architecture and cultural heritage, have been taken into account.

Initially, the design team reviewed the original zoning maps in detail following site survey conditions, ecology and contour surveys. Based upon our findings, it was deemed more appropriate to propose a re-alignment of the zoning boundary lines for environmental reasons. This rationale was discussed with Wicklow County Council and agreed that revisions to zoning boundaries could proceed. A revised Action Area Plan was prepared by the design team and submitted to Wicklow County Council.

Three alternative design and layouts for the site were considered and assessed with regard to environmental effects prior to the finalisation of the site layout plan and design of the proposed development by the design team in consultation with the Planning Authority. Chapter 4 of this report examines these three layout options in detail, and provides analysis of the design evolution as it relates to each individual EIAR topic.

A 'do-nothing' scenario was considered an inappropriate and unsustainable approach that would result in the inefficient use of a strategically located and serviced land bank of zoned residential and open space lands. A 'do nothing' scenario would also frustrate the delivery of the strategic planning objectives for the area and the region.

It is noted that this application represents phase 2 of an overall development on the subject lands by the applicant. Phase 1 to the south of Tinakilly Avenue has been previously granted under Reg. Ref 17/219 (ABP Ref. 301261-18) for 271 units, as amended by permission granted under Reg. Ref 20/1000 and Reg Ref 21/411, to include for amendments to the layout, changes to house designs/types and 94 additional residential units (of which 84 no. units were refused under Reg. Ref 17/219 / ABP Ref 301261-18) The total number of units will consist of 365 no. units comprising 98 no. units permitted under Reg. ref 17/219 (ABP Ref 301261-18) as amended by permission granted under Reg. Ref 20/1000 and 21/411 (currently under construction) and 267 no. units under Reg Ref. 22/837.

1.11 Forecasting Methods and Difficulties in Compiling the Specified Information

Forecasting methods and evidence used to identify and assess the significant effects of the environment for each environmental aspect are set out in each chapter.

There were no significant difficulties encountered in compiling the specified information in this EIAR. Any issues that were encountered during the assessment of individual factors are noted within the relevant chapters.

2. DESCRIPTION OF DEVELOPMENT

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2.1 Introduction

This chapter provides a description of the subject site, receiving environment and a description of the proposed development.

A systematic approach in accordance with the Draft Guidelines on the Information to be contained in EIARs (2017), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and other EIA Guidance documents were used to ensure that all relevant aspects of the development are accurately and fully described. The objective is to provide a description of the proposed development in sufficient detail, which when taken together with the description of the receiving environment provided, will allow an independent reader without acquired technical environmental knowledge, to understand the significant impacts likely to arise from the proposed development.

The description of the proposed development is described in this chapter in terms of these environmental topics that will form the basis of the impact assessment process and the characteristics of the proposed development which could potentially affect human beings, soil, water, climate, air, flora, fauna, landscape, archaeology, and cultural heritage. Chapter 14 specifically addresses interactions between all environmental factors in this regard.

The EIA directive also requires that the description of the site, design, size or scale of the development considers all relevant phases of the existence of the project from its construction through its existence and operation (and where applicable its restoration or decommissioning).

This EIAR document fully reflects the key environmental factors of the proposed development which were recognised from the scoping carried out by the design team. The level of detail required will vary considerably according to the sensitivity of the existing environment and the potential of the project for significant effects.

2.2 Subject Site Characteristics

The subject site is identified in Figure 2.1 below.



Figure 2.1 – Application Site Area

Keldrum Limited intend to apply to Wicklow County Council for a for a Large- Scale Residential Development at this site of c. 16.8ha. The application site is bounded to the north by an existing stream and agricultural lands, to the east by Tinakilly County House Hotel (which is a protected structure RPS No. 25-15) to the immediate west by agricultural lands and residential development and to the south by Tinakilly Avenue and a site currently under development as granted by Wicklow County Council Reg Ref. 17/219 (ABP Ref.310261-18) and amended by WCC Reg Refs. 20/1000, 21/411 and 22/837.

The subject site is on the northern periphery of Wicklow Town, with Wicklow town main street approximately 2 km to the south. This location is suited for a large residential development, outside of the town centre but proximate to services and facilities. Wicklow Town offers nearby amenities such as local schools, large supermarkets, schools a library and restaurants.

Aside from availing of the many amenities that Wicklow Town has to offer, the development site is located adjacent to Rathnew, a small village, approximately 350 metres to the west of the subject site and features a small main street, providing local shops that are located a short walk from the development site.

While the site is within comfortable walking distance of Wicklow town centre it also benefits from a variety of nearby transport links. The site is well served by a variety of frequent bus services offering connections to the IFSC and Gardiner Street in Dublin and Glendalough and Bray in Wicklow. The closest bus stop to the development is located adjacent to the sites southwest corner, approximately 175 metres from the proposed site entrance. The site is located approximately a 20-minute walk to Wicklow Rail Station to the south which offers a frequent commuter train service to Dublin and Waterford.

No previous applications have been proposed for residential development on this greenfield site. The subject proposal will represent a continuation of the development to the immediate south of the site as permitted under WCC Reg Ref. Reg Ref. 17/219 (ABP Ref.310261-18) as amended by WCC Reg Refs. 20/1000, 21/411 and 22/837. The subject proposal includes for the continuation of the distributor road through the central portion of the lands, connecting to the section of the road granted to the south of the site.

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The site is located approximately 46km south of Dublin City Centre and 71 km from Dublin International Airport. The lands are proximate to the M11, which link Dublin with Wexford and Rosslare Harbour.

Description of Surrounding Development

The eastern boundary of the site runs for approximately 400 metres. This comprises of the boundary in the northeast running adjacent to agricultural lands for approximately 160 metres and the remainder of this boundary adjacent to the Tinakilly Country House Hotel Lands (Protected Structure RPS 25-15). The entire length of this boundary is characterised by an existing medium density hedgerow and some tree cover, separating the subject lands from the lands to the east of the site. There is currently an entrance point to the site along this boundary for vehicular/ pedestrian access/egress.

The sites northern boundary runs for approximately 320 metres. It is noted that the redline boundary of this section of the site extends northwest to include a section of the proposed distributor road linking to the existing constructed roundabout on the R761. The ‘Rathnew Stream’ runs the entire length of this site boundary. This site boundary is categorised by a dense tree row running along the length of the stream. There is currently no access or egress point along this boundary.

The sites western boundary runs for approximately 300 metres. The lands to the immediate west of the development site are currently unused greenfield lands. There is residential development within Rathnew Village located approximately 120 metres to the west of the site boundary at this location. The length of the sites western boundary is characterised by dense mature hedgerow and a dense tree row running the length of the boundary. There is currently no access or egress point along this boundary.

The sites southern boundary runs for approximately 470 metres. The site bounds the existing Tinakilly Avenue at this location, a single lane stretches of tarmacadamed road giving access to the Tinakilly County House and Hotel from the R750. The site boundary is characterised by a dense hedgerow and a row of existing mature trees running the length of the avenue. There is currently no site access point along this boundary. It is proposed to close the western portion of Tinakilly Avenue off to vehicular traffic as part of the subject application, with vehicular access to be maintained to Tinakilly House from the western portion of the Avenue, which will be accessed from the Rathnew Inner Relief Road. A new gate associated with Tinakilly House will be provided along the western portion of the Avenue. We confirm that the subject proposal will not inhibit the development potential of the surrounding lands.



Figure 2.2: Site Access Point along Eastern Boundary



Figure 2.3: Site Southern Boundary looking north east along Tinakilly Avenue

2.3 Description of Proposed Development

Keldrum Limited intend to apply to Wicklow County Council for a for a Large- Scale Residential Development at this site of c. 16.8ha. The application site is bounded to the north by an existing stream and agricultural lands, to the east by Tinakilly County House Hotel (which is a protected structure RPS No. 25-15) to the immediate west by agricultural lands and residential development and to the south by Tinakilly Avenue and a site currently under development as granted by Wicklow County Council Reg Ref. 17/219 (ABP Ref.310261-18) as amended by WCC Reg Refs. 20/1000, 21/411 and 22/837. The site masterplan layout is shown on figure 2.4 below:



Figure 2.4 – Site Masterplan Layout

The development will consist of a residential development, public park and road infrastructure comprising the following:

Construction of 352 no. residential units as follows:

220 no. 1-2.5 storey houses comprising 31 no. 2 bed houses, 114 no. 3 bed houses, 72 no. 4 bed houses and 3 no. 5 bed houses, ranging in size from c.82.33 sq.m to c.212.39 sq.m. Each house will have an associated rear/ side private garden.

132 no. apartment/ duplex/ maisonette units comprising the following: 56 no. 1 bed apartments and 48 no. 2 bed apartments in 3 no. 4 storey apartment block buildings. 8 no. 1 bed maisonette units in 2 no. 2 storey semi detached blocks. 14 no. 2 bed duplex ground floor apartment units and 14 no. 3 bed upper floors duplex apartment units arranged across 3 no. 3 storey terraced blocks, ranging in size from c.48.4 sq.m to c.109 sq.m. All apartment/ duplex/ maisonette units will be provided with private open space areas in the form of balconies/ terraces.

Communal open space associated with the proposed apartment units will be provided in the form of landscaped areas located in the vicinity of the apartment units (totalling 0.1788 ha).

All internal residential access roads and cyclist/pedestrian paths serving the proposed development.

Provision of 592 no. car parking spaces across the development site and 168 no. bicycle parking spaces for residents of the proposed 56 no. 1 bed and 48 no. 2 bed apartment units. 66 no. visitor bicycle parking spaces are provided throughout the development site. All terraced houses and duplex 2 and 3 bed apartments will be provided with associated secure in curtilage bicycle lock ups.

Proposed pedestrian connections and landscaping to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

The proposed development will connect to the Tinakilly Park residential development and Rathnew Village via a new section of the Rathnew Inner Relief Road. The proposed road will join the constructed/under construction elements permitted under WCC Ref. 17/219/ ABP Ref. PL27.301261 and amended under WCC Ref. 22/837 to the south with a section of the link road to the northwest of the site at the R761 roundabout in Rathnew granted under WCC Ref. 21/1333. This includes all associated vehicular and pedestrian accesses, carriageways, paths and junctions.

No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15) save for works to close the western portion of Tinakilly Avenue to vehicular traffic and the provision of a new vehicular entrance and gates along the eastern portion of Tinakilly Avenue off the Rathnew Inner Relief Road to facilitate access to Tinakilly House and other properties to the east of the site accessed from Tinakilly Avenue.

All associated site development works, services provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

The planning application is accompanied by an Environmental Impact Assessment Report and Natura Impact Statement.

The planning application is available for public viewing at the following website: www.tinakillydemesnelrd.ie

Detailed Description

Residential Element

The proposed development offers a wide range of unity types across the site, with the residential scheme comprising 352 no. new dwelling units (220 no. houses, 28 no. duplex/apartment units and 104 no. apartment units). The unit mix will cater for a wide demographic, with 2,3,4 and 5 bed houses, 2 and 3 bed duplex/apartment units and 1 and 2 bed apartment units provided throughout the site. The general unit mix is provided below:

Houses:

- 31 no. 2 bedroom houses
- 114 no. 3 bedroom houses
- 72 no. 4 bedroom houses
- 3 no. 5 bedroom houses

Apartments:

- 56 no. 1 bed apartment units
- 48 no. 2 bed apartment units
- 14 no. 2 bed apartment units (duplex ground floor)
- 14 no. 3 bed apartments (duplex upper floors)

A detailed breakdown of the units provided is provided on the Site Statistics sheet prepared by Scott Tallon Walker submitted as part of this planning application.

The subject development presents phase 2 of development on the applicant's landholding at Tinakilly. Phase 1 is currently under construction to the south of the development site and consists of houses and duplex apartment units. The now proposed phase 2 of the overall development introduces new unit types to the wider development, with 3 no. 4 storey apartment blocks being provided on the western portion of the lands adjacent to the proposed section of the Rathnew Inner Relief Road, and in the southwestern corner of the development site. 8 no. maisonette apartment units are also provided. The new unit types provided create a diverse streetscape and avoid a monolithic development type across Phase 1 and 2 of the overall development at Tinakilly.

The proposed apartment units have been provided to allow the development to achieve Wicklow County Councils density objectives for the subject lands of 35 – 50 units per hectare.

The height and location of the proposed apartment units has been carefully considered by the project team. 2 no. of the provided apartment blocks are located fronting the proposed section of distributor road through the central section of the site and provide excellent passive surveillance over this area of the site. These apartments are 4 no. storeys in height and create a distinct urban edge between the western character areas of the site, the Rathnew Inner Relief Road and the character areas presented on the sites eastern portion of the lands.

The northernmost apartment building located along this section of the distributor road provides passive surveillance over the area of passive open space provided in the northwest of the site, as it is the northernmost element of residential development provided on the western side of the site.

The 3rd apartment building provided as part of the proposed development is also provided on the western portion of the subject lands, in the southwest corner of the development site. This apartment building also presents as 4 storeys in height and provides passive surveillance over the area of passive open space provided in the southwest corner of the development site, and Tinakilly Avenue to the south of the development site.

8 no. maisonette 1 bed apartment units are provided on the eastern portion of the development site. These units are presented in a one up one down format, across 4 buildings in 2 no. semi detached blocks. These units provide a number of smaller units on the development site, and will allow for the development, when constructed, to cater for a wider demographic of future residents.

Building Form

There are 32 no. differing types of houses and apartment units across the site, each considered in terms of form, material composition, texture, colour and adjacent treatments to create distinct character areas within the overall neighbourhood. A summary of the variety of units provided across the site is as follows:

- Unit Type M1 – 3 Bed Semi Detached
- Unit Type N1 – 3 Bed Semi Detached
- Unit Type N2a – 3 Bed Semi Detached End Row
- Unit Type O1 – 4 Bed Semi Detached
- Unit Type O1b – 4 Bed Semi Detached End Row
- Unit Type O2a – 4 Bed Detached – Front Entry
- Unit Type O2b – 4 Bed Detached End Row
- Unit Type P2a – 4 bed Detached/ Side Entry End Row
- Unit Type Q2c – 2 Bed Mid Terrace
- Unit Type Q2d – 2 Bed End of Terrace
- Unit Type R2a – 3 Bed End of Row
- Unit Type R2d – 3 Bed End of Terrace
- Unit Type W2a – 2 Bed Detached
- Unit Type W1b – 4 Bed Detached
- Unit Type Z1 – 5 Bed Semi Detached/ Front Entry
- Unit Type Z2b – 5 Bed Detached/ Front Entry End Row
- Unit Type V21a – 2 Bed Duplex End of Row
- Unit Type V21a – 3 Bed Duplex End of Row
- Unit Type V21c – 2 Bed Duplex Mid Terrace
- Unit Type V21c – 3 Bed Duplex Mid Terrace
- Unit Type V21d – 2 Bed Duplex End of Terrace
- Unit Type V21d – 3 Bed Duplex End of Terrace
- Unit Type V21e – 2 Bed Duplex at Tinakilly Avenue
- Unit Type V21e – 3 Bed Duplex at Tinakilly Avenue
- Unit Type Dxa – 1 Bed Maisonette GF Unit
- Unit Type Dxa – 1 Bed Maisonette FF Unit
- Unit Type Dxd – 1 Bed Maisonette GF Unit
- Unit Type Dxd – 1 Bed Maisonette FF Unit
- Unit Type AP1a – 1 Bed Apartment Type a
- Unit Type AP1b – 1 Bed Apartment Type b
- Unit Type AP2a -2 Bed Apartment Type a
- Unit Type AP2b – 2 Bed Apartment Type b

Traditional pitched roofs and 2 storey houses provided create a sense of familiarity throughout the scheme and surrounding context and tie in with the existing domestic scale of the development to the south of the subject site.

Windows have been provided where possible adjacent to front door areas to enhance the light level received in entrance hall areas. Ground floor window sills have been provided closer to ground levels to create brighter living spaces to the front of the houses at ground floor level. At first floor level, window sills have been raised to allow more flexibility of internal space usage for occupants of bedrooms. First floor bathroom windows have been

provided above toilets where possible to provide natural lighting to bathroom areas where possible.

Double glazed doors and separate windows to the rear elevations have been provided to allow more usable wall space for kitchen planning and an openable window to the kitchen for ventilation.

A number of specially designed homes have been provided as a variant to standard house types to address corner sites and end of row situations bringing emphasis and articulation to the corners of new neighbourhoods.

Character Areas

The site has been divided into 6 no. specific character areas by the project architect Scott Tallon Walker.

Character area 1 is located in the southeast of the subject lands to the north of Tinakilly Avenue. Homes located in this character area have been designed to take cues from the colour palette and materials of Tinakilly House and the development to the south of the site. Houses in this character area will feature a grey brick and white/ grey render finish with black slate roof tiles.

Character area 2 is located along the central eastern portion of the subject site. These homes extend north of character area 1 and have been provided with a subtle change in material. The houses located in this character area will feature a red brick and white/ grey render finish with black slate roof tiles.

Character area 3 is located along the northernmost section of residential development on the eastern portion of the subject lands. Houses in this character area will be finished in red brick and grey/ white render with black slate roof tiles.

Character area 4 is located on the western portion of the site and runs parallel to the proposed Rathnew Inner Relief Road. This character area features three storey duplex units and four storey apartment blocks that will be finished in red brick and grey/ white render with black slate roof tiles.

Character area 5 is located on the west side of the subject site and comprises of rows of terrace units, providing smaller family homes. Houses in this character area will be finished in red brick and grey/ white render with black slate roof tiles.

Character area 6 is a 4-storey apartment building located on the western portion of the subject lands, with views over Rathnew to the west of the site and the surrounding landscape. The apartments provided in this character area will be finished in red brick and grey/ white render with black slate roof tiles.

CGIs depicting how the proposed development will appear when constructed have been prepared by 3D Design Bureau, and are shown below for the benefit of the planning authority:



CGI 2.1 – Proposed Bungalows



CGI 2.2 – Proposed Duplex Units and apartments.

Privacy

As per the Wicklow – Rathnew Development Plan 2013-2019, the development has been designed by the project architect to provide maximum privacy and a high standard of residential amenity to all future residents.

Windows have been positioned so that direct overlooking into private living areas of other units or from the public realm is avoided.

Back-to-back separation distances between units of 22 metres is maintained at 1st floor level.

All walls between private gardens and public open spaces are at least 2m in height and all walls between private gardens are at least 1.8m in height.

All site boundaries will be of a solid construction with no accessible gaps. Walls bounding public areas will be of solid block, stone clad, and concrete capped to the outside.

Where timber is used along boundaries, they will be bounded and supported by concrete posts. Concrete post and plank walls will not be used for any boundary visible from the public domain.

Residential Density

The applicant notes that Wicklow County Council included the following statement within the LRD Opinion issued in relation to the subject development regarding density levels:

'The proposed development should demonstrate how it is in accordance with table 6.1 Density Standards and CPO 6.13 of the County Development Plan 2022-2028 noting that the site is considered to be an Outer Suburban/ Greenfield Site in the settlement of Wicklow- Rathnew where a density of 35-50 dph is sought. Density calculations shall be clearly set out in the planning application. The site area used for the purposes of calculating the residential density of the development should be clearly indicated'.

On this basis it is considered that the Wicklow County Development Plan 2022-2028 supersedes the specific site objectives regarding density as included within the Wicklow-Rathnew Development Plan 2013-2019. The applicant has progressed with the design of the scheme on this basis and has aimed to achieve a site wide density of 35-50 units per hectare for this Outer Suburban/ Greenfield site as required by the Wicklow County Development Plan 2022-2028.

The subject lands total 16.8 hectares, with a nett developable area of 10.03 hectares (R1 and R2 zoned lands). The subject proposal provides 352 no. units across the site on residential zoned lands within the site application boundary. This totals an average residential density of 35 units per hectare on R1 and R2 zoned lands (352 units on 10.03 ha of residential zoned lands).

It is submitted by the applicant and design team that this level of density is wholly appropriate for the subject lands and accords with the required density of 35-50 units per hectare for Outer Suburban/ Greenfield sites as listed in the Wicklow County Development Plan 2022-2028.

Dual Aspect

All 220 no. houses and 28 no. apartment/ duplex units will enjoy the benefit of being dual aspect.

Of the 104 no. apartment units provided, 56 no. will have the benefit of dual aspect, totalling 54 percent of the provided apartment units.

Traffic and Transport

A Traffic and Transport Assessment has been prepared as part of this application pack by CS Consulting.

The proposal will not have a significant impact on the operation of the surrounding road network. The internal road network is fit for purpose and in compliance with the Design Manual for Urban Roads and Streets.

A DMURS Compliance Statement has been prepared for the proposed development by the project engineer CS Consulting. This document provides an overview of the developments compliance with the Design Manual for Urban Roads and Streets (DMURS). This document concludes that the proposed development road widths, corner radii, pedestrian and cyclist facilities, kerbs, boundary treatments and landscaping have all been designed in compliance with the requirements of DMURS.

We refer to the TTA and DMURS Compliance Statement prepared by CS Consulting submitted as part of this planning pack for a detailed analysis.

Construction

An Outline Construction and Environmental Management Plan has been prepared by CS Consulting, providing an outline framework of the construction process, site management arrangements and environmental protection measures that will be implemented during the construction process.

Once appointed, the lead contractor will prepare a detailed Construction Management Plan to be agreed upon with Wicklow County Council prior to the commencement of works.

Resource and Waste Management

A Resource and Waste Management Plan has been prepared by CS Consulting to ensure that waste generated during the construction phase of the development will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 to 2013 and the Eastern Midlands Region (EMR) Waste Management Plan 2015-2021 are complied with. It shall also ensure that optimum levels of waste reduction, reuse and recycling are achieved by the proposed development.

Flood Risk

The development site has no historically recorded flood events. The proposed residential development is outside the 1% AEP and 0.1% AEP flood extent and is within Flood Zone C. The proposed section of distributor road extends to the west of the site where it intersects with Flood Zone A/B.

The resulting flood maps confirm that the proposed residential development is not impacted by either the 1% AEP and 0.1% AEP flood events from the Rathnew and Broomhall watercourses. However, the proposed bypass road is within Flood Zone A/B.

Climate change and residual risks have also been assessed for their impact on the development. For the residual risk assessment, a blockage assessment (67%) has been undertaken on the proposed single span bridge. The results confirm that the site will not be impacted from the identified residual risks.

Regarding pluvial flood risk, review of the available information and site topography does not indicate that the site is at risk of pluvial flooding. Surface water within the site will be managed through the provision of a stormwater system. The system will restrict discharge from the site to its greenfield equivalent and attenuation will be provided as per the development plan guidelines, which requires that stormwater discharge to be limited to the site's greenfield equivalent and that attenuation storage be provided. The stormwater system has been designed in accordance with the Wicklow County Development Plan and GDSDS guidance documents.

Part V Provision

36 no. units across the development site will be provided as part V units. The breakdown of Part V typology is as follows:

- Unit type Dxa – 1 bed maisonette GF Unit – 4 no. units
- Unit type Dxa – 1 bed maisonette FF Unit – 4 no. units
- Unit type V21a – 2 bed duplex end of row – 3 no. units
- Unit type V21c – 2 bed duplex mid terrace – 8 no. units
- Unit type V21d – 2 bed duplex end of terrace – 2 no. units
- Unit type V21e- 2 bed duplex at Tinakilly Avenue – 1 no. unit
- Unit type V21a – 3 bed duplex end of row – 3 no. units
- Unit type V21c – 3 bed duplex mid terrace – 8 no. units

- Unit type V21d - 3 bed duplex end of terrace – 2 no. units
- Unit type V21e – 3 bed duplex at Tinakilly Avenue – 1 no. unit

This presents an overall mix of 22% 1 bed, 39% 2 bed and 39% 3 bed units being provided as Part V units.

Car and Bicycle Parking

An adequate level of parking is delivered across the site with 592 no. car parking spaces provided for the 352 no. proposed units. A breakdown of the proposed car parking spaces per type of unit is provided below for the benefit of the planning authority:

- In Curtilage House Parking – 411 spaces
- On Street House Parking – 7 spaces
- On Street Maisonette/ Duplex Parking – 55 spaces
- On Street Apartment Parking – 114 spaces
- Visitor Parking – 5 spaces

Of the provided 592 no. spaces 9 no. of these are provided as dedicated accessible parking spaces. 20 no. of these are provided as on street EV charging spaces. All car parking spaces provided will be ducted for the future installation of an EV charging point.

144 no. bicycle parking spaces will be provided for the apartment units with a further 42 no. visitor bicycle parking spaces also provided. Ample space shall be provided within the curtilage of the proposed housing units for the storage of residents and visitors bicycles.

Access

The development site will be accessed via the section of the distributor road through the Tinakilly lands permitted under WCC Reg Ref. 17/219 (ABP. 301261/18) as amended by WCC Reg Refs. 20/1000, 21/411 and 22/837. This constructed section of the road to the south will connect to the now proposed extension of the distributor road which will extend through the development site and connect to the existing roundabout at the R761 to the northwest of the development site. This connection to the northwest will also provide an access point for vehicular/ pedestrian and cycle traffic to the site.

It is submitted that the proposed section of distributor road crossing Tinakilly Avenue will allow for the western portion of Tinakilly Avenue to be closed off to vehicular traffic when the development is constructed. A new entrance point to the Tinakilly House Hotel will be provided from the new section of distributor road, connecting to the east side of Tinakilly Avenue, which will give access to the Hotel and dwellings currently accessed via the Avenue. This new entrance to the eastern portion of Tinakilly Avenue from the proposed Rathnew Inner Relief Road is detailed on the projects roads drawings prepared by CS Consulting. This section of the distributor road will be provided as part of the initial development phase.

A portion of the west side of Tinakilly Avenue will be closed off to public as part of the subject application. This area will feature an appropriate boundary treatment as detailed on the submitted Landscape Architecture drawings prepared by Murphy & Sheanon. The section of the Avenue that will be closed off is outside of the ownership of the applicant, and the site owner has expressed to the applicant that they intend to develop this site in the future. The section of the west side of Tinakilly Avenue in the ownership of the applicant and included as part of this application pack will be landscaped into a park area for pedestrians only, connecting the subject proposal to phase 1 of the development to the south of the site by pedestrian links. This park area provides excellent pedestrian permeability and a recreation area for residents of both phases of the development. The area of park provided along Tinakilly Avenue has the benefit of excellent passive surveillance from the proposed apartment and duplex units lining the avenue, and houses

to the south of the site, permitted as part of phase 1 of the development to the south of Tinakilly Avenue.

Childcare Provision

We refer the Planning Authority to application Reg. Ref. 19/853 for a mixed-use development including a creche and offices located at Broomhall Business and Enterprise Park, Merrymeeting Co. Wicklow. The creche facility provided as part of this development will be 576 sq.m and is a purpose built – dedicated facility that will provide childcare services for future occupants of the overall subject development. This permitted creche facility is located approximately 300 metres from the site entrance to the west, suitably located to cater for the childcare needs of future residents of development on the Clermont – Tinakilly Action Area lands.

It is noted that since the granting of this permission Keldrum Limited lodged a subsequent application with Wicklow County Council under WCC Reg Ref. 19/853, which proposed alterations to the permitted creche facility to increase the size of the childcare facility from 135 no. childcare spaces to 190 no. full-time childcare spaces. This application was granted by Wicklow County Council and the creche will be constructed on the basis that it will cater for 190 no. childcare spaces, dealing with any demand for childcare that arises from development on the Clermont – Tinakilly Action Area lands. The end user anticipates that the facility can accommodate c.250 children accounting for full-time, part-time and sessional requirements.

It is noted that the applicant has contacted the operator of the Broomhall creche, Little Harvard, to confirm the operational capacity of the creche facility. The creche operator has confirmed that the creche maximum capacity at any one time will be c. 219 children, and over the course of a day the facility could cater for well in excess of 250 children, as children requiring ECCE care and after school care will attend the facility at different times throughout the day.

This correspondence with the creche operator has been circulated to the Wicklow County Childcare Committee, who have provided confirmation that this approach to the provision of childcare for the development is acceptable. A copy of this confirmation of acceptability from the Wicklow County Childcare Committee is submitted to the Planning Authority as part of this application pack.

Irish Water Connection

A pre connection enquiry was made to Irish Water for a Water & Wastewater connection for a development of 350 units on the subject lands. The pre-connection enquiry reference assigned was CDS20007402. Irish Water confirmed that the subject development could connect to the existing water network without upgrades. A Wastewater connection for the development was considered Feasible subject to upgrades. Irish Water noted that they:

‘plan to carry out upgrades to the Bollarney pumping station and there is also an LNRP for the network downstream of Bollarney PS which will be sized and designed to accommodate additional load from this development’. Some local network upgrades and extensions may be required depending on the connection point, these will be determined at connection stage. This may be subject to change’.

The applicant has also received a Statement of Design Acceptance from Irish Water. This was issued to the project engineer CS Consulting on the 28th of June 2023 under Connection Reference No. CDS20007402. The statement of Design Acceptance is included within the submitted Engineering Services Report as Appendix B.

Open Space

There are multiple areas of residential and public open space identified for passive recreation throughout the development site, totalling 9075 sq.m These areas of open space

within the residential R1 and R2 zoned sections of the development site are identified on figure 2.5 below in yellow, blue and red as included within the Landscape Design Statement prepared by the project Landscape Architects, Murphy & Sheanon:

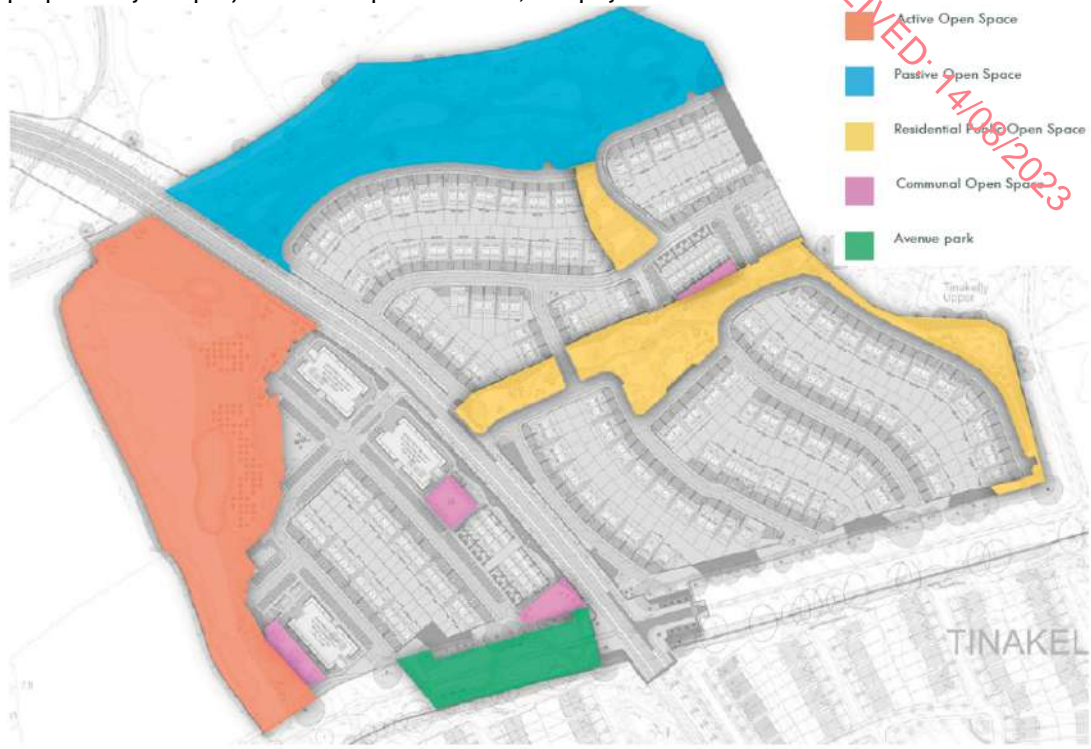


Figure 2.5 – Residential Open Space identified in yellow

In addition to this there is approximately 2.40 hectares of land zoned as active open space across the development site. It is noted that the applicant has agreed with the Planning Authority that this area of zoned ‘active open space’ will be provided as ‘passive open space’. 1.94 ha of the overall development site is zoned for passive open space and will be provided as such.

The Landscape Masterplan prepared by Murphy & Sheanon depicted in Figure 2.6 below details the open space areas to be provided across the development site.

4.1. LANDSCAPE PLAN



Figure 2.6 – Landscape Masterplan

Tree Cover

An Arboricultural Impact Assessment prepared by The Tree File has been submitted as part of this application pack. The report concludes that the proposal will have minimal impact on the existing tree cover on the site. Compensatory and additional tree planting will mitigate and loss of existing trees on the site. This will ultimately provide more trees than those that currently exist on site.

Applicant Agreement with Wicklow County Council for Provision of Active and Passive Open Space

The Applicant, Keldrum Limited have an agreement as part of the deliverance of Active and Passive Open Space as outlined in the Agreed Tinakilly Area Action Plan on the Clermont/ Tinakilly Lands with Wicklow County Council. A meeting to agree on the strategy for open space delivery was held on the 3rd of May 2022 between the applicants' representatives and Michael Nicholson and Deirdre Whitfield of Wicklow County Council. It was agreed that the Active Open Space Delivery on the Action Area lands would be delivered as part of the first phase of development, now granted under WCC Ref. 22/837 under development known as Tinakilly 1, south of Tinakilly Avenue.

It is submitted to Wicklow County Council that the Active Open Space being delivered for the subject development as part of Tinakilly phase 1 to the south of the development site is currently under construction, with the first phase of Active Open Space having recently been delivered.

The passage of this agreement for the provision of open spaces across the action plan lands noting that: *'All designs and specifications will be fully vetted and agreed with WCC prior to commencement. Additional items such as outdoor gym equipment will be incorporated into the specification if requested by WCC'* is particularly relevant to the subject application in this case. The applicant has agreed with Wicklow County Council that the area within the subject site boundary zoned for the provision of 'Active Open Space' will instead be provided as 'Passive Open Space'.

Energy

Each dwelling will achieve a minimum energy performance standard as outlined by the SEAI, including NZEB standards for all dwellings. Please refer to the accompanying Utilities and Energy Sustainability Report prepared by PMEP for further details regarding the proposed energy strategy for the scheme.

Adaptability

Units have been designed with future adaptability in mind . Homeowners have the option for future internal reconfiguring or future expansion to the rear. These alterations and adaptations can be carried out without affecting the character of the houses or the neighbourhood.

Universal Design

All house types follow, where possible, the Technical Guidance Document M – Access and Use (2010) in compliance with building regulations.

The principals of Universal Design have been adopted designing to meet the changing needs of people over time. Access and use is possible regardless of age, size, ability, or disability. These homes are designed to Universal Design Homes 4 key principals - be integrated into the neighbourhood, easy to approach, enter and move about in. easy to understand, use and manage and flexible, safe, cost effective and adaptable over time.

Details of the universal design approach to the site are outlined in the Design Statement prepared by Scott Tallon Walker submitted as part of this application pack.

Project Phasing

The proposed development represents the second phase of an overall development on the Tinakilly -Clermont Action Area lands. The first phase of the overall development for 365 no. units total was granted on a site to the south of the development site under WCC Refs. 17/219 as amended by Refs. 20/1000, 21/411 and 22/837.

The subject development now provides 352 no. units on a site to the north of the already granted phase 1 of development. A phasing plan for this stage of the development has been prepared by Scott Tallon Walker Architects and is included within the submitted architectural drawing pack. For the convenience of the Planning Authority, the phasing diagram is also shown on figure 2.7 below:

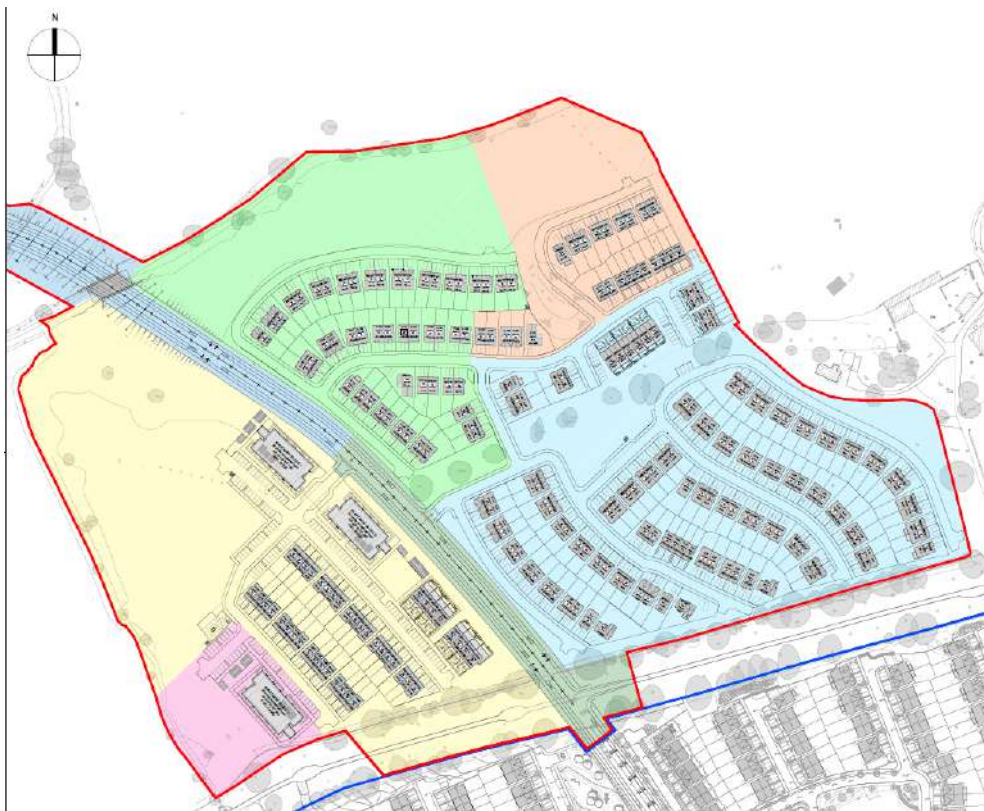


Figure 2.7: Phasing Diagram

The breakdown of the delivery of units on the lands as per the permitted and subject applications is as follows:

It is noted by the applicant and design team that the phasing of the proposed development formed a key section of the prepared Wicklow County Council LRD opinion report issued regarding the subject application. WCC requested that phasing was addressed as follows in a full application pack:

'A detailed phasing proposal, accompanied by a robust planning report, should be submitted with any application, which details how all necessary infrastructure, in particular roads, passive and active open space, services, childcare provision, etc, would be provided in tandem with the occupation of houses. Any phasing plan should ensure that the proposed development is sustainable and would generally accord with the phasing requirements of the approved Action Area Plan for the area'.

In response to this it is submitted that the following phasing of development is proposed for the proposed scheme:

- Childcare Provision

The childcare needs for the proposed development will be catered for by a permitted creche currently under construction at Broomhall Business and Enterprise Park, Merrymeeting Co. Wicklow. It is noted that the creche facility was granted permission under WCC Reg Ref. 19/853 and subsequently granted permission for a revised facility to increase the size of the childcare facility from 135 no. childcare spaces to 190 no. full-time childcare spaces. This application was granted by Wicklow County Council and the creche will be constructed on the basis that it will cater for 190 no. childcare spaces, dealing with any demand for childcare that arises from development on the Clermont – Tinakilly Action Area lands. The end user anticipates that the facility can accommodate c.250 children accounting for full-time, part-time and sessional requirements.

It is noted that the applicant has contacted the operator of the Broomhall creche, Little Harvard, to confirm the operational capacity of the creche facility. The creche operator has confirmed that the creche maximum capacity at any one time will be c. 219 children, and over the course of a day the facility could cater for well in excess of 250 children, as children requiring ECCE care and after school care will attend the facility at different times throughout the day.

This correspondence with the creche operator has been circulated to the Wicklow County Childcare Committee, who have provided confirmation that this approach to the provision of childcare for the development is acceptable. A copy of this confirmation of acceptability from the Wicklow County Childcare Committee is submitted to the Planning Authority as part of this application pack.

It is submitted that this creche facility will be completed and operational prior to the occupation of any units proposed as part of the subject development.

- Relief Road Section 1 (Dark Green) - To be completed prior to the occupation of any housing units proposed as part of this scheme.

The enabling works phase for the provision of the development includes the provision of a section of the Rathnew Inner Relief Road extending north from the existing section constructed to the south of the development site. As part of this phase a new entrance will be provided to Tinakilly House extending east from the proposed section of relief road through Tinakilly Avenue. The provision of this section of the Rathnew Inner Relief Road will open up access to the subject lands and provide the entrances to the Western and Eastern neighbourhoods to be constructed as part of a later phase of the development.

Relief Road Section 2 (Dark Blue) - The full Rathnew Inner Relief Road will be delivered prior to the occupation of 107 no. units proposed as part of this scheme.

The Rathnew Inner Relief Road will be completed prior to the occupation of 107 no. houses provided as part of the subject development. This is in accordance with the agreed Area Action Plan which states that:

'Delivery of the Rathnew Inner Relief Road may be on a phased basis, but no more than 40 percent of the residential development in the area will be permitted in advance of the full completion of the road'.

The overall development capacity on residential zoned lands within the AAP area is as follows:

Development site inside AAP area	Unit Quantum
Tinakilly 1	365 no. units permitted
Tinakilly 2	352 no. units proposed
R2 zoned lands to the northwest of the development site outside of the applicants ownership	3.87 no. hectares – Potential to provide 155 no. units at a density of 35-50 units per hectare as per the WCC Development Plan 2022-2028. A median density of 40 units per hectare has been applied for this capacity study.
R2 zoned lands to the southeast of the development site outside of the applicants ownership	3.45 no. hectares – Potential to provide 138 no. units at a density of 35-50 units per hectare as per the WCC Development Plan 2022-2028. A median density of 40 units per hectare has been applied for this capacity study.
RE zoned lands within the AAP boundary	4.25 ha as listed in the Wicklow County Development Plan 2022-2028 (Section 12.2). – potential to provide 170 no. units at a density of 35-50 units per hectare as per the WCC Development Plan 2022-2028. A median density of 40 units per hectare has been applied for this capacity study.
Total Development Capacity on AAP Lands:	1180 no. units on residential zoned AAP lands

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It is therefore submitted that 472 no. units represents 40% of the total development capacity on the AAP lands, including permitted, proposed and future development to be provided in accordance with the Wicklow County Development Plan 2022-2028 density standard of 35-50 units per hectare. For the purpose of this assessment a median density of 40 uph has been applied to all undeveloped residential zoned lands within the AAP area.

The applicant can therefore deliver 107 no. units as part of the proposed Tinakilly 2 development prior to the completion of the Rathnew Inner Relief Road, on top of the 365 no. units permitted as part of Tinakilly Phase 1 to the south of the development site. This will total 40% of development on the AAP lands (472 of 1180 units total).

- Phase 1 – 115 no. units (Yellow)
Phase 1 of the residential element of the development will involve the delivery of 115 no. residential units on the western portion of the subject lands. As part of this development phase a large portion of the overall open space area to be provided for the development will be delivered, as a large passive open space area across the

north west of the development site. The area of parkland proposed along the section of Tinakilly Avenue within the ownership of the applicant will also be provided as part of this phase of the proposed development, allowing increased pedestrian connectivity between the proposed development and the permitted phase 1 to the south of the site, and creating a landscaped passively surveilled area of parkland for use by all residents of the overall development at Tinakilly and the public.

- Phase 2 - 129 no. units (Light Blue)
129 no. units will be provided on the south eastern portion of the subject lands as part of phase 2 of the subject development. A large portion of residential open space associated with the Tinakilly 2 development will be provided through the centre of the eastern portion of the development site as part of this phase of the subject application. This will present as a tree lined avenue and will provide excellent pedestrian legibility and permeability through the eastern residential portion of the lands through to the central Rathnew Inner Relief Road.
- Phase 3 - 32 no. units (Pink)
32 no. apartment units will be provided in the south west of the development site as part of phase 3 of the subject development. These apartments will provide passive surveillance over the park area provided on lands within the applicants ownership on Tinakilly Avenue, and the area of passive open space provided within the north western portion of the lands. The delivery of passive open space within Phase 3 will complete the delivery of the entirety of passive open space on the western portion of the development lands.
- Phase 4 – 24 no. units (Orange)
24 no. units will be provided in the north east of the development site as part of phase 3 of the subject development. As part of this phase of development the central plaza shared space area will also be provided, alongside a section of the proposed riverwalk area across the northern portion of the lands. The delivery of these open space areas will add to the variety of open space areas available throughout the development lands for use by future residents.
- Phase 5 – 52 no. units (Green)
52 no. units will be provided in the central to northern portion of the eastern portion of the site as part of phase 5. The remainder of the residential open space through the central portion of the east site and public open space river walk across the central section of the site will also be provided as part of the 5th phase of development, completing all open space provision for the overall development site in tandem with the completion of the final 52 no. units.

2.4 Development Inputs

Water Supply

It is proposed to continue the 225mm diameter and 160mm diameter watermains along the eastern and western sides of the Rathnew Inner Relief Road which are currently under construction (as permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), and to supply the proposed development with potable water via new 150mm diameter and 100mm diameter connections to these.

The proposed watermain network system has been designed in accordance with the specifications and requirements of Irish Water.

Irish Water Connection

A Confirmation of Feasibility (CoF) has been issued by Irish Water in respect of the proposed development's potable water supply and foul drainage arrangements (Ref. CDS20007402). As part of the LRD application process, CS Consulting subsequently issued the proposed drainage arrangement and proposed watermain layout to Irish Water for approval, following which Irish Water issued a Statement of Design Acceptance (SoDA).

Power Supply

ESB Networks have been contacted and an existing ESB network map for the area surrounding the proposed development has been obtained. A system of modular unit substations will be installed to provide power to the development.

Electricity Services will be brought from the existing MV network via underground ducting to the unit substation to be located on the site.

3No. Modular unit substations will connect the residential houses and link road to the electricity network. Allowances of 2No. modular substations would be allocated for the residential development on the east side of the link road and 1No modular substation will be dedicated to the residential area to the west of the link road.

Broadband/ Telco Providers

There are existing Telco Networks infrastructure in the vicinity of the site. A formal application cannot be made at this stage but will be made should planning permission be granted.

Each of the TELCO, being EIR and Virgin Media, providers have been contacted and existing services maps for the area surrounding the proposed development has been obtained.

The Site Infrastructure will allow for multiple broadband providers. It is envisaged Telco services will connect into the development from the existing Malahide Road adjacent to Kinsealy development.

Provision for 2 No 110mm communication ducts will be made to provide the telecom services to the new development along the Malahide Road and will be distributed within the proposed development as indicated. A 50mm EIR and Virgin Media (VM) duct shall be provided from the nearest chamber to the home (a maximum of 12No houses per chambers). EIR and VM Services shall terminate within the EIR and VM ETU box positioned on the external walls of each house.

2.5 Development Outputs

Surface Water

The restriction of post development run-off to greenfield discharge rates is to be achieved primarily through the provision of onsite attenuation storage, which shall retain excess runoff during extreme rainfall events and allow this to be discharged at a controlled rate. In order to comply with Wicklow County Council's requirements, the subject site must retain stormwater generated on site during a 1-in-100-year storm event (increased by 20% for predicted climate change effects) and limit stormwater discharge from the site to the greenfield discharge rate. Surface water drainage from the development will be designed in accordance with the requirements of Wicklow County Council. The greenfield runoff rate at the development site has been established as 6.56 l/s/ha. A total attenuation storage volume of 3,369m³ is required for the development site, and a total attenuation storage volume of 3,445m³ is provided.

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Foul Water

The proposed development will require a new separate foul drainage network to collect and convey foul effluent. The drainage network for the proposed development has been designed in accordance with:

- EN BS 752:2008 Drain & Sewer Systems Outside Buildings
- The Irish Water Code of Practice for Wastewater Infrastructure

Given the topography of the site, the development's gravity foul drainage network shall comprise two distinct parts:

- A northern section, which shall fall to the south and outfall into a new
- foul pumping station located at the site's southern boundary; and

A southern section, which shall fall to the south and outfall into a foul manhole located at the site's southern boundary in the Rathnew Inner Relief Road.

The proposed pumping station shall pump the collected foul effluent via 80mm and 160mm diameter rising mains to an approved standoff manhole in the new section of the Rathnew Inner Relief Road to be built as part of this development, close to the development's southern boundary. From this point, the effluent shall discharge to a 225mm diameter foul sewer to be laid in this new section of the relief road; this in turn shall connect to the new 225mm diameter foul sewer currently under construction within the southernmost section of the Rathnew Inner Relief Road. The proposed pumping station will be located within a secure compound, with 2.4m high paladin fencing and a 5m wide access gate. The pump chamber will contain duty and assist pump sets and 24-hour storage will be provided in the form of a concrete tank with a high-level overflow and low-level return. The control panel will be fitted with a high-level alarm and text/web alert system to ensure prompt response in the event of an emergency. The proposed foul drainage infrastructure has been designed using the WinDes Micro Drainage Program

Waste Management

A detailed Construction Waste Management Plan accompanies this EIAR and ensures that best practice is followed in the management of waste from the proposed development.

Waste generated during the construction period on a site typical of the subject site generally includes the following:

- Concrete
- Wood
- Glass
- Plastics
- Bituminous mixtures, coal tar, and tarred products
- Metals (inclusive of their alloys)
- Soil and Stones
- Insulation Materials (possibility for asbestos containing materials)
- Gypsum based construction material
- Materials containing mercury
- PCB containing materials (sealants, resin-based floorings, capacitors).
- Waste electrical and electronic equipment
- Oil Wastes and Waste of liquid fuels
- Batteries and accumulators
- Packaging (paper/cardboard, plastic, wood, metal, glass, textile, etc.).

The following measures are proposed to ensure effective management of construction waste at the development site, to maximise recycling and to minimise the impact of construction waste:

- On site segregation of all waste materials into appropriate categories
- All waste material to be stored in skips or other suitable receptacles in a designated waste storage area on site
- Left over materials shall be reused on or off site
- Uncontaminated excavated material will be reused on site in preference to the importation of clean fill
- All waste leaving the site shall be transported to a suitably licensed/ permitted facility for disposal
- All waste leaving the site should be recorded and copies of relevant documentation retained.

2.6 Characteristics of the Construction and Operation Phases

Site Preparation Works and Establishment of construction Services

Preparation of the site requires limited works with minimal site clearance, establishing entranceways and haul roads for vehicles, surveying and setting out, setting up the construction site with fencing, site compounds etc. It is noted that much of the haul roads and entranceways to the site have been established to cater for the existing surrounding developments which are currently under construction.

The site will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. The construction compound will be fenced off for health and safety reasons so that access is restricted to authorized personnel only. All areas under construction will be fenced for security and safety purposes and temporary lighting supplied as necessary.

Pursuant to Section 2(a)(i) of S.I No 600 of 2001, a description of the physical characteristics of the proposed development and land use requirements during the construction and operation phases is provided below.

Construction Phase

It is intended for works to begin on site in Q1 2024. The proposed development is anticipated to be constructed over a 48-month period.

The development will be constructed on the following basis:

- Set up of site perimeter hoarding, maintaining existing pedestrian and traffic routes to the site
- Site Clearance
- Reduced Level excavations
- Site services installations (drainage, power, water)
- Construct Building Frame and Envelope
- Finish Interior and Exterior Landscaping

Construction Hours

Construction hours will be subject to planning permission and associated conditions. However it is noted that it may be necessary for construction to take place outside of normal construction hours in the case of services diversions and connections, concrete finishing and fit out works.

Deliveries to site will generally be between the hours of 07:00 to 19:00 Monday to Friday and 08:00 to 14:00 on Saturdays. There may be occasions where it is necessary to make deliveries outside of these times, for example when large loads are limited to road usage outside of peak times.

Any deliveries or construction works that need to take place outside of the agreed working hours will be completed with the advance agreement of WCC.

Construction Staff

It is estimated that there will be 125 no. construction staff on site at peak construction stage of the 24 month predicted construction programme.

On site facilities for construction staff will consist of:

- Materials Storage Area
- Site Office and Meeting Room
- Staff welfare facilities including but not limited to toilets, drying room, canteen.

Vehicular Access to Site during Construction

During the construction of the proposed development, access for construction vehicles will initially be from the existing Tinakilly Avenue off the Rathnew Road. As construction progresses and the proposed Rathnew Inner Relief Road crosses Tinakilly Avenue and enters the proposal site, construction traffic will utilise this route and access the site from the constructed portion of the Rathnew Inner Relief Road to the south of the site.

A pedestrian only access point to the site will be installed to separate vehicular and pedestrian movements when accessing and egressing the site.

Security personnel will be present at the site entrance to ensure all traffic is entering/exiting the site in a safe manner.

A wheel wash will be installed at the site entrance to prevent dirt from the site being carried out onto the public road.

Site Parking during Construction

There will be sufficient on-site parking provided for staff and visitors during the construction period of the development. Construction Staff will be encouraged to use public transport in accordance with the guidance provided by the Health Service Executive and local transportation services.

Operational Phase

Once operational, the geology on site will be protected from the elements. Subsoil will either have a surface road dressing, building footprint or topsoil covering. Topsoil will be grassed to prevent erosion or surfaced with permeable paving. Planting and landscape of active and passive recreational areas will protect against erosion of soil.

The proposed development will increase the area of hard standing on the existing site, through the inclusion of new houses and paved areas. Unmitigated, this will lead to an increase in the volume of rainfall runoff generated on the site and a reduction in percolation to the groundwater table.

A drainage strategy has been developed for the site, which will reduce post-development runoff rates to greenfield rates, through the incorporation of Sustainable Drainage Systems (SuDS), including permeable paving and underground attenuation tanks.

The impacts of the operational phase of the proposed development are further addressed as appropriate in the relevant chapters of this EIAR.

2.7 Monitoring

Construction Noise

All construction activities will be carried out in compliance with the recommendations of BS 5228 Noise Control on Construction and Open sites Part 1 and comply with BS 6187 Code of Practice for Demolition.

Potential Sources of Noise include construction activities on site which may involve the use of heavy machinery.

A site representative responsible for all matters involving noise and vibration will be appointed prior to construction on the site. This individual will be responsible for engagement with local residents to give advance notice of any noisy activities due to take place and to keep a register of complaints.

A noise and vibration monitoring expert will be appointed to carry out independent monitoring of noise and vibration at critical periods and at sensitive locations.

Air Quality and Dust Monitoring

The contractor will monitor dust levels in the vicinity of the site in accordance with any attached planning conditions and records shall be kept for review by the Planning Authority.

There are currently no national or European Union standards of air quality with which levels of dust deposition can be compared. The minimum criteria to be maintained shall be in accordance with the German Standard Method for determination of dust deposition rate, VDI 2129, which is a maximum deposition of 350mg/m²/day as measured using Bergerhoff type dust deposit gauges.

Vibration

The contractor will be required to carry out works such that the effect of vibration on adjacent buildings and the surrounding area is minimised and that no damage to these occurs because of construction activity on the site.

Potential sources of vibrations include construction activities on site which may involve the use of heavy machinery. The contractor will be required to comply with the requirements of the planning permission for any vibration limits on the for the works.

2.8 Sustainability

The proposed development will meet the requirements for Conservation of Fuel and Energy in Dwellings (Part L Building Regulations 2011), and as such will meet the requirements for compliance with Nearly Zero Energy Building Standards.

2.9 Cumulative Impacts

There are potential short-term nuisances such as dust and noise arising from the construction phase of the subject development. In advance of works starting on site the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the contractor.

2.10 Decommissioning

Given the nature of the proposed development, residential use, road development and active open space, it is not envisaged that the proposed development will require closure or decommissioning in the future.

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3 PLANNING AND DEVELOPMENT CONTEXT

The development lands are subject to national, regional, sub regional and county/ local planning policy.

This chapter considers the strategic and local level statutory planning context governing development on the application site, inclusive of a review of the relevant national and regional policy context and local statutory planning context for Wicklow County and the application site, with an aim to promote the proper planning and sustainable development of the subject site.

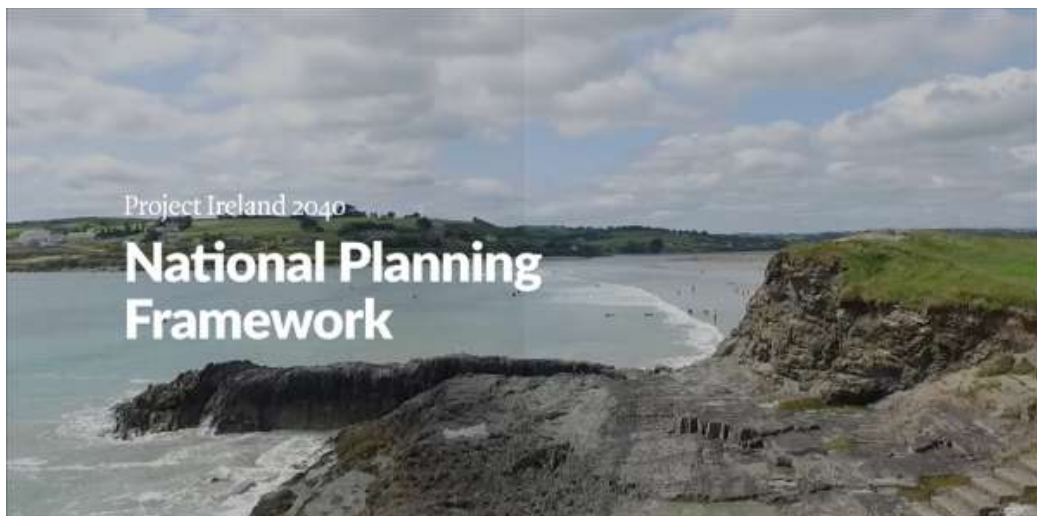
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3.1 Planning Policy Documents

It is our considered opinion that the key policy documents for consideration as part of this Statement of Consistency are identified as follows:

- National Planning Framework – Project Ireland 2040
- Rebuilding Ireland: Action Plan for Housing and Homelessness
- Regional Spatial & Economic Strategy for the Eastern and Midland Region 2019-2031
- Regional Planning Guidelines for the Greater Dublin Area 2010–2022
- Design Manual for Urban Roads and Streets 2019
- Smarter Travel – A New Transport Policy for Ireland 2009-2020
- Transport Strategy for the Greater Dublin Area 2016-2035
- Sustainable Residential Development in Urban Areas (2009)
- a. Urban Design Manual - Best Practice Guidelines
 - Delivering Homes, Sustaining Communities (2008)
- a. Best Practice Guidelines - Quality Housing for Sustainable Communities
 - Guidelines for Planning Authorities on Childcare Facilities (2001)
 - The Planning System and Flood Risk Management (2009)
 - Sustainable Urban Housing - Design Standards for New Apartments (2018)
 - Urban Development and Building Height Guidelines (2018)
 - Housing for All – A New Housing Plan for Ireland (2021)

3.1.1 National Planning Framework – Project Ireland 2040



The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of our country out to the year 2040. It caters for:

- The extra one million people that will be living in Ireland by 2040;
- The additional two thirds of a million people working in Ireland by 2040; and
- The half a million extra homes needed in Ireland by 2040.

The Framework focuses on:

- Growing our regions, their cities, towns and villages and rural fabric.
- Building more accessible urban centres of scale.
- Better outcomes for communities and the environment, through more effective and coordinated planning, investment, and delivery.

As a strategic development framework, this Plan sets out the long-term context for the Country's physical development and associated progress in economic, social, and environmental terms and in an island, European and global context. Ireland 2040 will be followed and underpinned by supporting policies and actions at sectoral, regional, and local levels.

The key high - level objectives of the Plan are:

- To continue a path of economic, environmental, and social progress that will improve our prosperity, sustainability and well - being.
- To ensure that Irelands many unique assets can be built upon, with an emphasis on improving economic output and stability as well as quality of life, environmental performances and the livability of Dublin, our cities, towns, and rural areas.
- To set out likely future change in Ireland and the spatial pattern required for effective and coordinated investment in a range of sectors to best accommodates and support that change.
- To put in place a strategy for the sustainable development of places in Ireland and how that can be achieved through planning, investment, and implementation.

The NPF sets out that the Eastern and Midlands region will, by 2040, be a Region of around 2.85 million people, at least half a million more than today. It is identified that progressing the sustainable development of new greenfield sites for housing and particularly those close to public transport corridors is key to enabling growth.

It is worth highlighting that the projected level of population and jobs growth in the Eastern and Midland Regional Assembly area respectively represents 475,000 - 500,000 additional people and 330,000 additional jobs by 2040.

The national planning framework promotes the creation of mixed tenure communities by stating *"More affordable homes must be provided in our urban areas as part of the creation of mixed-tenure communities."*

The NPF recommends the following in relation to compact urban development *"At a metropolitan scale, this will require focus on a number of large regeneration and redevelopment projects, particularly with regard to underutilised land within the canals and the M50 ring and a more compact urban form, facilitated through well designed higher density development."*

It is also apparent from the NPF that low-density housing development, and underused sites, have been a feature of Ireland's housing landscape in cities, towns and the open countryside. To avoid urban sprawl and the pressure that it puts on both the environment and infrastructure demands, increased residential densities are required in the urban areas.

The sites zoning allows for residential development and is considered appropriately serviced with appropriate infrastructure to deliver on a sustainable form of development.

It is submitted that the current proposal for 352 new residential units will deliver on the above objectives of the NPF. We note specifically that the addition of a wide range of unit typologies is appropriate at this highly accessible site, catering to a wide demographic of potential future residents.

The following policies are considered key in the context of this site:

National Policy Objective 1 -

Planning for a population in the Eastern and Midland Region of 490,000 - 540,000 additional people i.e., a population of around 2.85 million;

National Policy Objective 3a -

Deliver at least 40% of all new homes nationally, within the built-up footprint of existing settlements.

National Policy Objective 6 -

Regenerate and rejuvenate cities, towns and villages of all types and scale as environmental assets, that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area.

National Policy Objective 11 -

In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns, and villages, subject to development meeting appropriate planning standards and achieving targeted growth.

National Policy Objective 13 -

In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high-quality outcomes in order to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected.

National Policy Objective 31 -

Prioritise the alignment of targeted and planned population and employment growth with investment in the provision of childcare facilities and new and refurbished schools on well located sites within or close to existing built-up areas that meet the diverse needs of local populations.

National Policy Objective 32 -

To target the delivery of 550,000 additional households to 2040.

National Policy Objective 33 -

Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location.

National Policy Objective 34 -

Support the provision of lifetime adaptable homes that can accommodate the changing needs of a household over time.

National Policy Objective 35 -

Increase residential density in settlements, through a range of measures including reductions in vacancy, re-use of existing buildings, infill development schemes, area or site-based regeneration and increased building heights.

National Policy Objective 74 -

Secure the alignment of the National Planning Framework and the National Development Plan through delivery of the National Strategic Outcomes.

The proposal for a high density residential development at this highly accessible location is consistent with the National Planning Framework for 2040.

3.1.2 Rebuilding Ireland: Action Plan for Housing and Homelessness



The action plan for housing and homelessness recognises that a significant increase in new homes is required. The action plan outlines a 5 pillar approach as follows:

- Pillar 1 - Address Homelessness
- Pillar 2 - Accelerate Social Housing
- Pillar 3 - Build More Homes
- Pillar 4 - Improve the Rental Sector
- Pillar 5 - Utilise Existing Housing

The plan outlines that *“Accelerating delivery of housing for the private, social and rented sectors is a key priority for the Government. Ensuring sufficient stable and sustained provision of housing that is affordable, in the right locations, meets peoples different needs and is of lasting quality is one of the greatest challenges facing the country at present.”*

The plan repeatedly states the need for housing to be in appropriate locations, *“In addition to the scale of housing provision, the delivery of housing in the right place is also central to enabling a good standard of living and improving quality of life. Locating housing in the right place provides the opportunity for wider family and social networks to thrive, maximises access to employment opportunities and to services such as education, public transport, health and amenities, while also delivering on sustainability objectives related to efficiency in service delivery and investment provision.”*

The proposed development supports Pillar 3 of the plan specifically by way of the delivery of 352 new residential units at a key location adjacent to services and amenities. The site has the benefit of accessibility to public transport services and is considered a significant

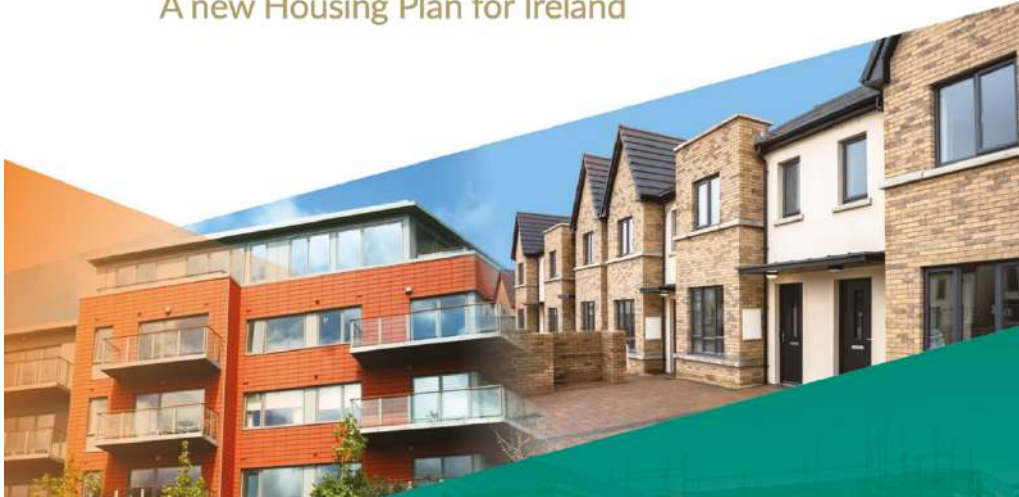
opportunity site for the delivery of residential units, contributing to the overall development of the Action Area lands.

The proposal is consistent with the Area Action Plan for Housing and Homelessness.

3.1.3 Housing for All – A New Housing Plan for Ireland

Housing for All

A new Housing Plan for Ireland



The Housing for All (HFA) plan has been introduced by the Government in order to achieve a more sustainable housing system with a planning system that is fit for purpose and that will create long-term vibrant communities with the necessary supporting infrastructure. It caters for:

- Preventing homelessness
- Protecting tenants
- Supporting social inclusion

The plan focuses on:

- Introducing incentives and measures to bring vacant and derelict properties back into residential use.
- Supporting homeownership and increasing affordability.
- Preventing homelessness, protecting tenants and supporting social inclusion and increasing social housing delivery.
- Increase the levels of new housing stock with the goal of ending homelessness by 2030.
- Achieve a more sustainable housing system with a planning system that is fit for purpose and that will create long-term vibrant communities with the necessary supporting infrastructure.
- Increasing the capacity and efficiency of delivery in both public and private sectors.
- Over 300,000 new homes to be built by 2020, including a projected 54,000 affordable homes for purchase or rent and over 90,000 social homes.
- Setting out a pathway to economic, societal and environmental sustainability in the delivery of housing.

The HFA is to be the largest State led building programme in our history and is financed by the biggest State funding commitment ever. The HFA also has the largest ever housing budget in the history of the State to transform our housing system, with an excess of €20 bn in funding through the Exchequer, the Land Development Agency (LDA) and the Housing Finance Agency over the next five years.

It is also apparent from the HFA plan that high-density housing is to be supported. Within the plan, a new fund the Croí Cónaithe (Cities) Fund has been introduced to further the implementation of planning permissions for apartments. Housing policy objective 15, no. 15.1 states that the HFA plan will *“Introduce the Croí Cónaithe (Cities) Fund to ensure that planning permissions for apartments in high density areas already secured by 2021 are activated by the end of 2025 for build to sell.”*

In addition to this, the new fund will focus on *“activating housing supply through enhanced viability measures targeted at developing properties for individual household purchasers, including first-time buyers and right-sizers.”* The fund will *“stimulate activation of existing planning permissions for build-to-sell apartment developments of four floors or more, above a certain density threshold, and this will be complemented by the sanction of a tax to activate vacant lands for residential purposes.”*

Moreover, housing policy objective 11, no. 11.2 supports high-density housing: *“Develop section 28 Guidelines for Planning Authorities on Sustainable and Compact Settlement Guidance (SCSG), including guidance on housing typologies to facilitate innovative approaches to medium and higher densities.”*

Additionally, housing policy objective 12, no 12.2 is to deliver a new approach to active land management: *“Develop proposals for new Urban Development Zones, to DHLGH deliver a coordinated and transparent approach to the delivery of residential and urban development, particularly on brownfield sites, meeting the compact growth objectives of the National Planning Framework.”*

Furthermore, the HFA plan will drive economic sustainability and reduce constructions costs. Objective 23, 23.11 states that the HFA plan will *“Reduce C&D waste and associated costs by working with the construction industry on demonstration projects to show how best practice (specifically in relation to urban high-rise apartment developments) waste segregation and other waste management measures, can reduce overall C&D disposal costs.”*

The subject proposal provides 352 new residential units which will contribute towards the government’s target deliverance of 33,000 new residential units per year between 2021 and 2030.

The proposal is consistent with Housing for All – A New Housing Plan for Ireland.

3.1.4 Regional Spatial & Economic Strategy for the Eastern and Midland Region 2019-2031



The *Regional Spatial and Economic Strategy for Eastern and Midland Regional Assembly* (RSES) has recently been published and adopted.

The RSES provides a:

- **Spatial Strategy** – to manage future growth and ensure the creation of healthy and attractive places to live, work, study, visit and invest in.
- **Economic Strategy** – that builds on our strengths to sustain a strong economy and support the creation of quality jobs that ensure a good living standard for all.
- **Metropolitan Plan** – to ensure a supply of strategic development areas for the sustainable growth and continued success and competitiveness of the Dublin metropolitan area.
- **Investment Framework** – to prioritise the delivery of key enabling infrastructure and services by government and state agencies.
- **Climate Action Strategy** – to accelerate climate action, ensure a clean and healthy environment and to promote sustainable transport and strategic green infrastructure.

The following regional policy objectives relate specifically to Wicklow/ Rathnew which is listed in the Regional Spatial and Economic Strategy as a Key Town and are relevant to the subject application:

RPO 4.54: *Support an enhanced role and function of Wicklow-Rathnew as the County Town, particularly as a hub for employment, training and education.*

The proposed development supports this objective by providing a new residential development that will provide housing for workers as the town grows and becomes a hub for employment, training and education.

In relation to residential development in Wicklow/ Rathnew specifically, the plan states that:

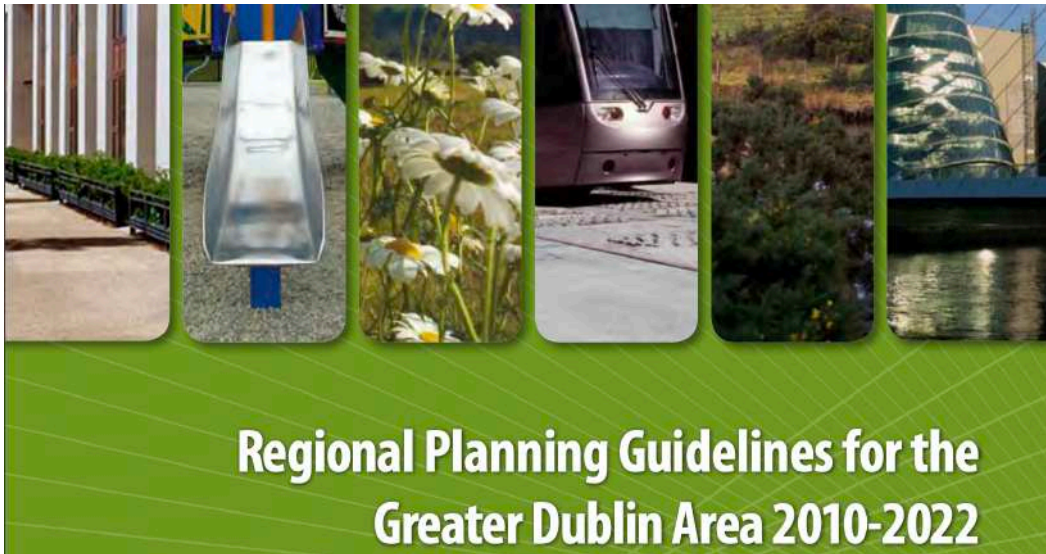
‘Wicklow Town/ Rathnew enjoys rail and road access to Dublin City and the wider region, and an abundance of recreational amenities close by including the coast, the

harbour and the Wicklow Mountains; as a result there is a high demand for housing in this settlement. Redevelopment and opportunity sites within the core areas of Wicklow-Rathnew will be promoted in the first instance for new residential development, with sites close to transport infrastructure, recreational and education amenities and employment being prioritised thereafter’.

The proposed development addresses the high demand for housing in this area and offers a high quality residential offering, providing 352 new residential units on the periphery of Wicklow town to the north, close to existing services and amenities.

The proposal is consistent with the Regional Spatial and Economic Strategy for the Eastern and Midland Region.

3.1.5 Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022



The Regional Planning Guidelines (RPGs) 2010-2022 is a policy document, which aims to direct the future growth of the GDA and works towards the implementation of the relevant strategic planning framework.

We note specifically that the Guidelines provide an overall strategic context for the Development Plans of each local authority in the GDA including population and housing targets, and they also provide a framework for future investment in environmental services, transportation, and other infrastructure.

It is our view that the current proposal delivers on the above objectives of the RPGs for the following reasons:

- The site zoning allows for residential development and is appropriately serviced, located along a high quality new regional road with access to public transport and services.
- The proposal delivers on excellent local connections to Wicklow town and beyond.

The RPGs set out the future population and housing targets for each County and City Development Plan, in line with NSS spatial policy. By 2022, Wicklow has a projected population target of 176,800 people and housing allocation of 82,012.

The following tables are extracted from page 83 and 84 of the RPGs as follows:

Table 5: Population Target for Local Authorities

Council	2006 Census	2016	2022
Dublin City	506,211	563,512	606,110
Dun Laoghaire Rathdown	194,038	222,800	240,338
Fingal	239,992	287,547	309,285
South Dublin	246,935	287,341	308,467
Kildare	186,335	234,422	252,640
Meath	162,831	195,898	210,260
Wicklow	126,194	164,280	176,800
GDA Total	1,662,536	1,955,800	2,103,900

Figure 3.1 - Population Targets for Local Authorities

Table 6: Housing Allocation for Local Authorities

Council	2006 Census	2016	2022
Dublin City	223,898	265,519	319,903
Dun Laoghaire Rathdown	77,508	98,023	117,893
Fingal	89,909	118,646	142,144
South Dublin	87,484	115,373	137,948
Kildare	68,840	93,748	112,477
Meath	61,257	79,729	95,458
Wicklow	49,088	68,351	82,012
GDA Total	657,184	839,389	1,007,835

Figure 3.2 - Housing Allocations for Local Authorities

As stated above, the proposed development will represent an opportunity for the redevelopment of an under-utilised site and will contribute towards the achievement of targets (population and housing) set out by the RPGs, which should be delivered between the period 2016-2022.

We also wish to highlight that the strategic guidance on density is that appropriate sites proximate to town centres and public transport links must be brought forward for development at appropriate densities and it is our view that the current site and proposal which will deliver a density of 35 dwellings per hectare on the residential zoned R1 and R2 zoned lands is therefore appropriate in the context of the above.

The proposal for a new residential development at this highly accessible location is consistent with the Regional Planning Guidelines for the Greater Dublin Area 2010 -2022.

3.1.6 Smarter Travel – A New Transport Policy for Ireland 2009-2020



The Government has committed in 'Smarter Travel - A Sustainable Transport Future: A New Transport Policy for Ireland 2009 - 2020' to reducing the total share of car commuting from 65% to 45%, a rise in non-car trips by 55% and that the total vehicle miles travelled by the car fleet will not increase.

The key goals of the Guidelines are as follows:

- Future population employment growths will predominantly take place in sustainable compact forms which reduces the need to travel for employment and services.
- 500,000 more people will take alternative means to commute to work to the extent that the total share of car commuting will drop from 65% to 45%.
- Alternatives such as walking, cycling and public transport will be supported and provided to the extent that these will rise to 55% of total commuter journeys to work.
- The total kilometres travelled by the car fleet in 2020 will not increase significantly from current levels.
- A reduction will be achieved on the 2005 figure for Greenhouse gas emissions from the transport sector.

Achieving sustainable transport will require a suite of actions that will have complementary impacts in terms of travel demand and emissions. These are as follows:

- Actions to reduce the distance travelled by private car and encourage smarter travel.
- Actions aimed at ensuring that alternatives to the car are more widely available.
- Actions aimed at improving the fuel efficiency of motorized transport.
- Actions aimed at strengthening institutional arrangements to deliver the targets.

Smarter Travel acknowledges that good progress is being made in meeting the above targets and actions by providing better guidance on planning and development through the delivery of Planning Guidelines.

It is submitted that as far as possible, the impacts of traffic are reduced and minimised where practical through the scheme roads design, while providing several environmental and economic advantages.

The proposal for new residential development at this highly accessible location is supportive of the objectives outlined in Smarter Travel – A New Transport Policy for Ireland 2009-2020.

3.1.7 Transport Strategy for the Greater Dublin Area 2015-2035



The National Transport Authority has prepared the Transport Strategy for the Greater Dublin Area 2016 - 2035. The Vision of this strategy is for the Greater Dublin Area to be a competitive, sustainable city-region with a good quality of life for all by 2030.

The Strategy includes five overarching objectives to achieve the vision, which are as follows:

- Build and strengthen communities
- Improve economic competitiveness
- Improve the built environment
- Respect and sustain the natural environment
- Reduce personal stress

The Strategy sets out measures to achieve the vision and objectives for the GDA. These include better integration of land use planning and transportation, consolidating growth in identified centres, providing more intensive development in designated town and district centres, and controlling parking supply.

The Strategic Infrastructure proposals are presented by mode of transport and relate to heavy rail infrastructure, light rail infrastructure, bus infrastructure, cycling infrastructure, walking and road network. Whilst the key objectives of the Transport Strategy relate to the main town centre area, we wish to highlight that the current proposal for residential development is located proximate to services and amenities in Rathnew and Wicklow town, a short walk from the development site. The nature of the development as houses and duplex apartment units means that car parking is provided for each unit, however the location of the development 175 metres from a bus stop and 2km from Wicklow train station promotes the use of public transport for commuter journeys into Dublin City and towards Wexford town.

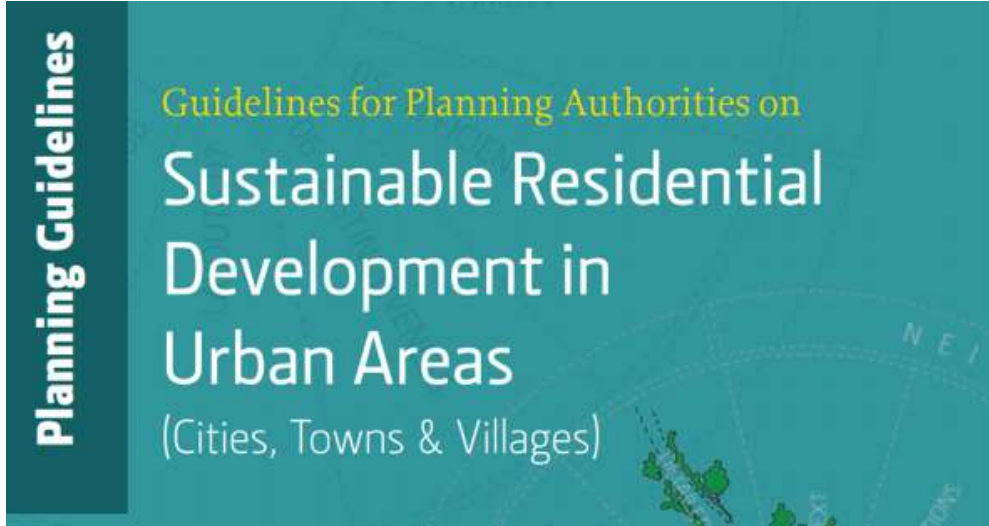
The proposal for new residential development at this accessible location is supportive of the objectives of the Transport Strategy for the Greater Dublin Area 2016-2035.

Each of the relevant strategic policy documents are now considered below and their relevance to the subject site and the developments compliance with same, is assessed in detail.

3.2 Section 28 Ministerial Guidelines

Each of the relevant strategic policy documents are now considered below and their relevance to the subject site and the developments compliance with same, is assessed in detail.

3.2.1 Sustainable Residential Development in Urban Areas (2009) / Urban Design Manual (2009) Guidelines



The role of these guidelines is to ensure the sustainable delivery of new development throughout the country. The Guidelines provide guidance on the core principles of urban design when creating places of high quality and distinct identity. High quality design is recommended in the development management process. The Guidelines are accompanied by an Urban Design Manual, which demonstrates how key principles can be applied in the design and layout of new residential development.

The development site can be best described as Outer Suburban/ Greenfield outlined in section 5.11 (f) of this document:

'These may be defined as open lands on the periphery of cities or larger towns whose development will require the provision of new infrastructure, roads, sewers and ancillary social and commercial facilities, schools, shops, employment and community facilities'.

The document goes on to state that:

'Studies have indicated that whilst the land take of the ancillary facilities remains relatively constant, the greatest efficiency in land usage on such lands will be achieved by providing net residential densities in the general range of 35-50 dwellings per hectare and such densities (involving a variety of housing types where possible) should be encouraged generally. Development at net densities less than 30 dwellings per hectare should generally be discouraged in the interests of land efficiency, particularly on sites in excess of 0.5 hectares'.

The density of the proposed development on the 10.3 hectares of residential zoned lands within the application boundary is 35 units per hectare across the site (352 units on 10.3 hectares of residential zoned land). This level of density is considered to be appropriate having regard to the Sustainable Residential Development in Urban Areas (2009) / Urban Design Manual (2009) Guidelines which promote an increase in residential density.

It is noted that this proposed density has arisen from a specific request from Wicklow County Council included within the issued LRD Opinion document associated with the proposed development as follows:

'The proposed development should demonstrate how it is in accordance with table 6.1 Density Standards and CPO 6.13 of the County Development Plan 2022-2028 noting that the site is considered to be an Outer Suburban/ Greenfield Site in the settlement of Wicklow- Rathnew where a density of 35-50 dph is sought.

Density calculations shall be clearly set out in the planning application. The site area used for the purposes of calculating the residential density of the development should be clearly indicated'.

The development provides a variety of unit types and sizes which are capable of catering for a wide range of demographics in the Wicklow/ Rathnew area, and will appropriately deal with demand for varying unit typologies as population in the area increases.

The building height on the site of maximum 4 storeys is considered appropriate to deliver a sustainable residential density suitable to the nature of the site and its surroundings and maximise the development potential of the site whilst providing high quality units with access to large areas of open space that do not visually injure the area. The proposal is appropriately located close to Rathnew and Wicklow town.

It is submitted that there are no existing dwellings to the north, west or east of the site in proximity of the proposed development that would suffer from unduly overlooking or overshadowing. Tinakilly Park, which represents phase 1 of the overall development on the Tinakilly lands, is located to the south of the development site across Tinakilly Avenue. It is submitted that the distance of the proposed development to the Tinakilly Park development to the south of the site means that overlooking or overshadowing does not present as an issue at this location.

The development is located on the northern periphery of Wicklow Town (population over 5000) which puts the development in the category of 'Larger Towns' as outlined in the guidelines. We examine the contents of the Guidelines below as they relate to Larger Towns.

Design

The key elements of design in the context of larger towns are as follows:

- Acceptable Building Heights
- Avoidance of Overlooking/Overshadowing
- Provision of adequate public and private open space
- Internal Space in Apartments
- Suitable parking provision
- Provision of ancillary facilities

The current proposal has been designed in the context of the above and we note the following in this regard:

- Appropriate building heights are proposed in accordance with performance criteria under the Building Height Guidelines.

- Overshadowing is not considered an issue in this case; the proposed development is maximum 4 storeys in height and is located an appropriate distance from any surrounding residential development, primarily Tinakilly Park which is currently under construction to the south of the development site, across Tinakilly Avenue.
- An adequate level of parking is delivered across the site with 592 no. car parking spaces provided for the 352 no. proposed units. A breakdown of the proposed car parking spaces per type of unit is provided below for the benefit of the planning authority:
 - In Curtilage House Parking – 411 spaces
 - On Street House Parking – 7 spaces
 - On Street Maisonette/ Duplex Parking – 55 spaces
 - On Street Apartment Parking – 114 spaces
 - Visitor Parking – 5 spaces
- Multiple safe communal open spaces are provided throughout the development site overlooked by dwellings and equipped with children’s play spaces and landscaped areas for residents.
- A coherent and permeable network of open spaces is proposed.
- Pedestrian access and permeability are key across the site and specific attention has been given to accessibility and the connectivity of the site with surrounding street interfaces.
- Residential amenity facilities are delivered within the scheme.

Density

The proposed development aims to deliver an appropriate density and form of residential development to accommodate the growing population of Wicklow town and Rathnew on this site located to the northern periphery of Wicklow town.

The subject development provides a density of 35 units per hectare, providing 352 no. units on 10.3 hectares of residential zoned lands within an overall site boundary of 16.8 hectares.

The proposed density of 35 units per hectare on the residential zoned lands within the site red line boundary is considered an appropriate approach to development having regard for the site location in proximity to Wicklow town and Rathnew, the prominence of the site and the surrounding infrastructure and access to transport, services and amenities. The proposal has been carefully considered to offer the most sustainable form of development on the site whilst still providing a high level of residential density and amenity.

The proposed development density is consistent with table 6.1 Density Standards and CPO 6.13 of the Wicklow County Development Plan 2022-2028. The site is considered to be an ‘Outer Suburban/ Greenfield site’ as per the Wicklow County Development Plan. On ‘Outer Suburban/ Greenfield’ sites a residential density of 35-50 units per hectare is sought.

Appropriate levels of density have been carefully considered by the project team, who have designed the scheme to provide an average of 35 units per hectare on the R1 and R2 zoned lands within the site redline boundary.

The proposed density has arisen from the LRD pre planning process where Wicklow County Council requested in the LRD opinion issued in respect of the proposed development, that the proposal should demonstrate its compliance with the density standards outlined in Table 6.1 and CPO 6.13 of the Wicklow County Development Plan 2022-2028. The site is considered to be a 'Outer Suburban/ Greenfield' site as per the Wicklow County Development Plan 2022-2028 and so a density of 35-50 units is sought for this site.

It is submitted that the proposed development provides an appropriate intensification of residential use on the site as per the relevant zoning objective and density requirements, and provides a variety of new unit types in the area. 2, 3, 4 and 5 bedroom houses are proposed, alongside 1 and 2 bed apartment units and 3 bed duplex units. This is consistent with the character of development that has been established on the Tinakilly lands through the provision of new units at Tinakilly Park to the immediate south of the lands, and further expands on the unit types provided as part of this granted permission currently under construction.

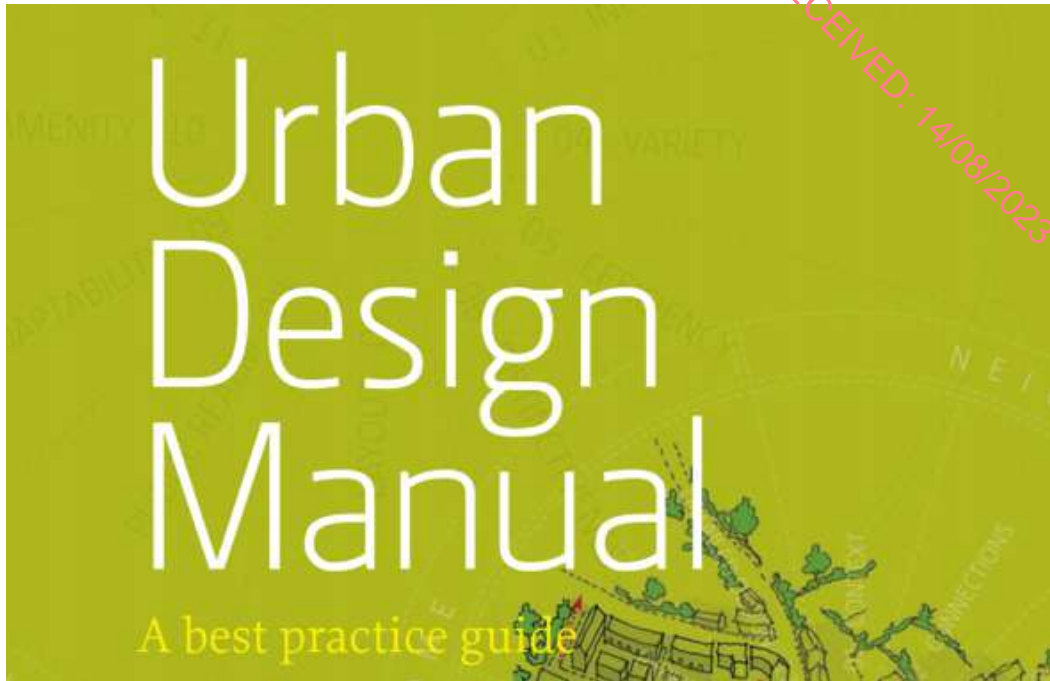
The overall density of 35 units per hectare on the residential zoned lands within the application site boundary is consistent with relevant national policy. A Circular Letter NRUP 02/21 issued by the Department of Housing, Local Government in April 2021 relating to Residential Density in Towns and Villages, as set out in the Guidelines for Planning authorities on Sustainable Residential Development in Urban Areas 2009 states that the density of development for Outer Suburban/ Greenfield sites within cities and larger towns should be:

'In the general range of 35- 50 units per hectare'

The overall density of development on the residential zoned land within the application site is 35 units per hectare which is in line with the national vision for densities on greenfield sites on the edge of larger towns, which accurately describes the subject site, which is greenfield lands on the periphery of Wicklow Town.

The density proposed arose from the initial pre planning meeting with WCC planners where it was stated that an increase in density and a variety of unit types were required to maximise the development potential of the site and cater for the immediate needs of the Rathnew area.

Urban Design Manual



Aside from the above, we draw attention to the compliance of the scheme with the ‘sister’ document for these guidelines, the ‘Urban Design Manual’. This planning application is accompanied by a Design Statement, prepared by Scott Tallon Walker Architects, which demonstrates how the proposed development has regard to and has been developed in accordance with best practice in respect to urban design.

The Design Statement should be read in conjunction with this Planning Report and with the plans and particulars accompanying this planning application.

For the purposes of this report, compliance with the key requirements of the Urban Design Manual are noted below:

CRITERIA	RESPONSE
<p>CONTEXT How does the development respond to its surroundings?</p>	<p>The proposal seeks to provide a development that is self-sufficient in terms of privacy, access to open space, and parking. Appropriate access points are provided to the development – both pedestrian and vehicular.</p> <p>The development location and design has been chosen to protect the amenity of the surrounding area. The development is maximum 4 no. storeys which respects the existing landscape of the area and caters to the needs of the growing population in Wicklow appropriately. The scale, layout and design of the development poses no impact in terms of overlooking or overshadowing to Tinakilly House located to the east of the site or the Tinakilly Park development located adjacent to the application site to the south across Tinakilly Avenue.</p> <p>The building height on site varies from 1 no. storey houses to 3 no. storey duplex units and 4 no. storey apartment blocks.</p>

	<p>The variation in height on the development site has been carefully considered by the design team and provided at appropriate locations which contribute positively to the development streetscape and layout and delivers a high level of residential amenity to all future residents.</p> <p>The development will cater for improved connections to surrounding future developments through the provision of a new link road through the central portion of the site.</p>
<p>CONNECTIONS How well is the new neighbourhood/site connected?</p>	<p>The proposal delivers on the following in terms of connections: Appropriate access points are provided to the development.</p> <p>The site's proximity to Wicklow town and public transport links ensures a safe and easy access from the site to amenities and facilities in the area. There is adequate parking for the development to allow all future residents to own a private car.</p>
<p>INCLUSIVITY How easily can people use and access the development?</p>	<p>We note the following in terms of usability and access to and within the scheme:</p> <p>Pedestrian access and linkages to the site are in existence and with distances to nearby public transport and amenities are convenient and set out above.</p> <p>Pedestrian access is further enhanced within the development with 'pedestrian priority' given in the eastern portion of the site, where no internal roads are proposed, and a large area of open space is provided.</p> <p>The proposed development will provide a range of accommodation types.</p> <p>The units are designed to allow for full Part M accessibility where possible.</p>
<p>VARIETY How does the development promote a good mix of activities?</p>	<p>Variety in the development is provided through a range of design proposals in both the built environment and in the landscaping layout.</p> <p>In the built environment, there are a different unit typology which allows for accommodation for a variety of users.</p> <p>The landscaped elements are divided between several areas throughout the site which gives residents a variety of area avail of.</p> <p>Passive security is designed to provide total surveillance.</p> <p>Communal facilities are provided within the scheme which can allow for a range of activities to be provided to future residents.</p>
<p>EFFICIENCY How does the development make appropriate use of resources including land?</p>	<p>The scheme proposes a high-density development on a currently underutilised site in in a highly accessible location adjacent to the R750 regional road and to the north of Wicklow town.</p>

	<p>The massing of the buildings on site was carefully considered by the project team throughout the design process. It is considered that 1-2 no. storey houses, 3 no. storey duplex units and 4 no. storey apartment buildings are the most appropriate form of development for the site given its size, location, demand for unit typology in the area, provision of a high level of residential amenity and Wicklow County Council density requirements for these lands.</p>
<p>DISTINCTIVENESS How do the proposals create a sense of place?</p>	<p>The scheme promotes the principles of DMURS - Design Manual for Urban Roads and Streets. This balance of road planning, public space and site layout will provide an inviting and enticing setting for a new community.</p> <p>The proposal features landscaping unique to the subject site which will create an immersive open space area for residents synonymous with the proposed development. The proposal features appropriate boundary treatments to provide a level of privacy for residents of the proposed development.</p>
<p>LAYOUT How does the proposal create people-friendly streets and spaces?</p>	<p>As can be seen from the layout, pedestrian priority is maintained within the scheme, which the entire northern and western portion of the lands included within the red line boundary being provided as a new landscaped park area.</p> <p>There are also communal areas of open space provided for residents of the apartment units provided as part of the proposed development, and various landscaped pocket park residential open space areas provided plotted throughout the proposed development for future residents to avail of.</p> <p>The variety and extent of open space areas provided across the development site creates people friendly spaces for residents to meet and gather.</p> <p>Pedestrian safety has been prioritised within the roads design of the proposed development, all proposed roads have been designed to comply with the Design Manual for Urban Roads and Streets.</p>
<p>PUBLIC REALM How safe, secure and enjoyable are the public areas?</p>	<p>All open spaces within the scheme are easily accessible from all provided units. The layout of open spaces has been arranged to ensure that these spaces are safe, secure, passively surveilled and well-lit where appropriate.</p>
<p>ADAPTABILITY How will the buildings cope with change?</p>	<p>The development offers a range of unit types and sizes. Homeowners have the option for future internal reconfiguring or future expansion to the rear. These alterations and adaptations can be carried out without affecting the character of the houses or the neighbourhood.</p>
<p>PRIVACY AND AMENITY How do the buildings provide a</p>	<p>Appropriate set back distances are maintained.</p> <p>Private open space is in line with all required development standards.</p>

<p>high amenity? quality</p>	<p>All houses and duplex units provided feature own door access.</p> <p>All units have access to high quality landscaped communal amenity areas.</p>
<p>PARKING How will parking be secure and attractive?</p>	<p>Parking areas are private for the houses provided as part of the development and all parking areas within the development site benefit from passive surveillance from several units.</p>
<p>DETAILED DESIGN How well thought through is the building and landscape design?</p>	<p>Murphy & Sheanon worked closely with Scott Tallon Walker Architects to devise a scheme that complements and respects the original design concept. The landscaping proposal enhances the development and ensures that the individual amenity of the units and wider residential amenity of the scheme is of high quality.</p>

Table 3.1 - Compliance with Urban Design Manual

The above table clearly outlines how the development proposal is envisaged to deliver on the key provisions of the Urban Design Manual. We submit that the current proposal is supportive of the objectives of the Sustainable Residential Development in Urban Areas (2009) / Urban Design Manual.

3.2.2 Delivering Homes Sustaining Communities (2007)



The Department’s policy on housing provides the overarching policy framework for an integrated approach to housing and planning and notes that demographic factors will continue to underpin strong demand for housing. This in turn presents challenges for the physical planning of new housing and associated services. The quality of the housing environment is central to creating a sustainable community.

The *Delivering Homes Sustaining Communities* policy statement is accompanied by Best Practice Guidelines entitled ‘Quality Housing for Sustainable Communities’ and these are the focal point in terms of the consistency of the current proposal.

Quality Homes for Sustainable Communities (2007)

The purpose of these Guidelines is to promote high standards in design and construction and in the provision of residential development and services in new housing schemes. It is our considered view that the proposal for the site has delivered on the key principles of this document by delivering the following:

- The proposed development will provide a quality living environment in 2- and 3-bedroom duplex apartments and 3- and 4-bedroom houses designed to meet or exceeds standards and ample amenities and open space provided.
- Pedestrian Access is prioritized within the scheme. The proposed layout facilitates connection to the adjoining sites which are earmarked for future development. The entirety of the site along the southern and eastern boundary is provided as open space areas with no vehicular access to these areas.
- All open spaces are safe and benefit from passive surveillance from the proposed dwelling buildings on site.
- The chosen materials have been selected for their aesthetic and durable qualities over the life cycle of the scheme.

A Housing Quality Assessment has been prepared by Scott Tallon Walker Architects and submitted with this planning application. We direct to this assessment for full details on the extent of proposals. We submit to the Board that the current proposal is supportive

of the objectives of the Delivering Homes Sustaining Communities (2007) and the associated Best Practice Guide 'Quality Housing for Sustainable Communities'.

3.2.3 Guidelines for Planning Authorities on Childcare Facilities (2001)

Childcare Facilities

Guidelines for Planning Authorities

The Childcare Guidelines provide a framework to guide local authorities in preparing development plans and assessing applications for planning permission, and developers and childcare providers in formulating development proposals. The Guidelines are intended to ensure a consistent approach throughout the country to the treatment of applications for planning permission for childcare facilities.

The Guidelines state: *“Access to quality childcare services contribute to the social, emotional and educational development of children. There are clear economic benefits from the provision of childcare. The lack of accessible, affordable and appropriate childcare facilities makes it difficult for many parents/guardians to access employment and employment related opportunities.”*

The Guidelines identify several appropriate locations for childcare facilities, which include the following:

- New Communities/Large Housing Developments
- The vicinity and concentrations of workplaces, such as industrial estates, business parks and any other locations where there are significant numbers working
- In the vicinity of schools
- Neighbourhood, District and Town Centres
- Adjacent to public transport corridors, park and ride facilities, pedestrian routes, and dedicated cycle ways

Notwithstanding the locations identified above, the Guidelines state that proposals should have regard to the following:

- Child Care (Pre-School Services) Regulations, 1996.
- Suitability of the site for the type and size of facility proposed.
- Availability of outdoor play area and details of management of same.
- Convenient to public transport nodes.
- Safe access and convenient parking for customers and staff.
- Local traffic conditions.
- Number of such facilities in the area; and
- Intended hours of operation.
-

The subject proposal does not include the provision of a creche facility.

We refer the Planning Authority to application Reg. Ref. 19/853 for a mixed-use development including a creche and offices located at Broomhall Business and Enterprise Park, Merrymeeting Co. Wicklow. The creche facility provided as part of this development will be 576 sq.m and is a purpose built – dedicated facility that will provide childcare

services for future occupants of the overall subject development. This permitted creche facility is located approximately 300 metres from the site entrance to the west, suitably located to cater for the childcare needs of future residents of development on the Clermont – Tinakilly Action Area lands.

It is noted that since the granting of this permission Keldrum Limited lodged a subsequent application with Wicklow County Council under WCC Reg Ref. 19/853, which proposed alterations to the permitted creche facility to increase the size of the childcare facility from 135 no. childcare spaces to 190 no. childcare spaces. This application was granted by Wicklow County Council and the creche will be constructed on the basis that it will cater for 190 no. childcare spaces, dealing with any demand for childcare that arises from development on the Clermont – Tinakilly Action Area lands. The overall number of childcare spaces is likely to be significantly higher at 250 no. spaces to account for full-time, part-time and sessional requirements.

The applicant has agreed this strategy with the Wicklow County Childcare Committee who provided confirmation that this approach to the provision of childcare for the development is acceptable.

3.2.4 The Planning System and Flood Risk Management (2009)



The Planning System and Flood Risk Management Guidelines were published by the Minister for the Environment, Heritage & Local Government in November 2009 under Section 28 of the Planning & Development Act 2000 (as amended).

The purpose of the Guidelines is that Planning Authorities must implement the Guidelines in ensuring that where relevant, flood risk is a key consideration in the assessment of planning applications.

We refer to the enclosed Site-Specific Flood Risk Assessment prepared by JBA Consulting for full details on the assessment carried out in line with the above guidelines. The key conclusions of this document are as follows:

The development site has no historically recorded flood events. The proposed residential development is outside the 1% AEP and 0.1% AEP flood extent and is within Flood Zone C.

The proposed section of distributor road extends to the west of the site where it intersects with Flood Zone A/B.

3.2.5 Sustainable Urban Housing: Design Standards for New Apartments 2020 (as amended)



‘Sustainable Urban Housing: Design Standards for New Apartments 2020’ are intended to promote sustainable housing, by ensuring that the design and layout of new apartments provide satisfactory accommodation for a variety of household types and sizes, including families with children over the medium to long term. The 2020 Apartment Guidelines replace the 2018 version and are updated to reflect the conclusions from the review of co-living and shared accommodation.

The Design Standards for new Apartment’s detail 3 no. locations where apartment developments are generally suitable. The development is classed as being in an ‘Intermediate Urban Location’ within the guidelines which are defined as the following in section 4.21:

‘suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard’.

The relevant guidance relating to the location of apartments in intermediate urban areas as outlined in the Design Standards for new Apartments document are outlined below:

- Sites within or close to i.e. within reasonable walking distance (i.e. up to 10 minutes or 800-1,000m), of principal town or suburban centres or employment locations, that may include hospitals and third level institutions;
- Sites within walking distance (i.e. between 10-15 minutes or 1,000- 1,500m) of high capacity urban public transport stops (such as DART, commuter rail or Luas) or within reasonable walking distance (i.e. between 5-10 minutes or up to 1,000m) of high frequency (i.e. min 10 minute peak hour frequency) urban bus services or where such services can be provided

- Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) of reasonably frequent (min 15 minute peak hour frequency) urban bus services.”

We submit that the apartment element of this development is appropriate at this location given its location in proximity to Wicklow town to the south, Wicklow train station to the south and reasonably frequent urban bus services departing from a bus stop located immediately adjacent to the site to the west.

The current proposal provides for 352 no. new residential units and the following section of this report sets out the compliance of the proposal with the key policy requirements and standards as they relate to the 28 no. 2 and 3-bed duplex apartment units and 104 no. apartment units as provided as part of the scheme.

Specific Planning Policy Requirement 1

Apartment developments may include up to 50% one-bedroom or studio type units (with no more than 20-25% of the total proposed development as studios) and there shall be no minimum requirement for apartments with three or more bedrooms. Statutory development plans may specify a mix for apartment and other housing developments, but only further to an evidence-based Housing Need and Demand Assessment (HNDA), that has been agreed on an area, county, city or metropolitan area basis and incorporated into the relevant development plan(s).

Applicant Response to SPPR1

The proposed development mix is as follows:

- 56 no. 1 bed apartment units
- 48 no. 2 bed apartment units
- 14 no. 2 bed apartment units (duplex ground floor)
- 14 no. 3 bed apartments (duplex upper floors)

We submit that there are no studio units proposed as part of the scheme, following an in-depth review of the local housing market. The development provides 56 no. 1 bed units of the 132-no. apartment/ duplex units provided and therefore will not exceed the maximum allowable provision of 1 bed units of 50% as set out in SPPR1 of the Design Standards for New Apartments document.

Specific Planning Policy Requirement 3

Minimum Apartment Floor Areas:

- **Studio apartment (1 person) 37 sq.m**
- **1-bedroom apartment (2 persons) 45 sq.m**
- **2-bedroom apartment (4 persons) 73 sq.m**
- **3-bedroom apartment (5 persons) 90 sq.m**

Applicant Response to SPPR3

The subject proposal complies with the minimum apartment floor areas as follows:

- 1 bed apartment units – **Minimum 48.4 sq.m**
- 2 bed apartment units – **Minimum 79.2 sq.m**
- 2 bed apartment units (duplex ground floor) - **Minimum 79.58 sq.m**
- 3 bed apartments (duplex upper floors) – **Minimum 105.57 sq.m**

It is noted that all provided apartment and duplex apartment units exceed the minimum floor area requirements for apartment units. Please refer to the Housing Quality Assessment prepared by Scott Tallon Walker for more information regarding floor areas across all units.

Specific Planning Policy Requirement 4

In relation to the minimum number of dual aspect apartments that may be provided in any single apartment scheme, the following shall apply:

- (iii) A minimum of 33% of dual aspect units will be required in more central and accessible urban locations, where it is necessary to achieve a quality design in response to the subject site characteristics and ensure good street frontage where appropriate.*
- (ii) In suburban or intermediate locations, it is an objective that there shall generally be a minimum of 50% dual aspect apartments in a single scheme.*
- (iii) For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, planning authorities may exercise further discretion to consider dual aspect unit provision at a level lower than the 33% minimum outlined above on a case-by-case basis, but subject to the achievement of overall high design quality in other aspects.*

Applicant Response to SPPR4

The site can be classified as a suburban or intermediate location in this regard given its location on the northern periphery of Wicklow town.

All 28 no. duplex apartment units provided will have the benefit of dual aspect.

Of the 104 remaining apartment units provided 56 no. will have the benefit of dual aspect.

It is therefore submitted that of the 132 no. duplex apartments and apartment units provided, 84 no. will be dual aspect, or 64%. Given this, we submit the proposal complies with the dual aspect ratio requirements of the Apartment Guidelines.

Specific Planning Policy Requirement 5

Ground level apartment floor to ceiling heights shall be a minimum of 2.7m and shall be increased in certain circumstances, particularly where necessary to facilitate a future change of use to a commercial use. For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, planning authorities may exercise discretion on a case-by-case basis, subject to overall design quality.

Applicant Response to SPPR5

The proposed floor to ceiling height of all floors of the buildings will be at least 2.4 metres.

We note the Guidelines state the following:

*“Building Regulations Technical Document F deals with Ventilation. It provides guidance on ceiling height in habitable rooms. The suggested minimum floor to ceiling height, consistent with good room design, the use of standard materials and good building practice is **generally 2.4m.**”*

Given this, we submit the proposal complies with the floor to ceiling height requirements of the Apartment Guidelines.

Specific Planning Policy Requirement 6

A maximum of 12 apartments per floor per core may be provided in apartment schemes. This maximum provision may be increased for building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, subject to overall design quality and compliance with building regulations

Applicant Response to SPPR6

The 28-no. apartment units that are arranged as duplexes will have own door access onto the street. The ground floor 2 bed apartment units do not feature a stairwell and have access directly onto street level. The duplex units above all feature an external stairwell. We refer to the floorplans prepared by Scott Tallon Walker Architects submitted as part of this application pack for details regarding this.

96 no. apartment units are arranged across 3 no. apartment block buildings, each floor will feature no more than 8 no. units per floor.

The remaining 8 no. units are arranged in maisonette style buildings, with the ground floor unit featuring direct access onto the street and the upper floor unit being provided with access via a private internal stairwell.

Internal Storage

All apartment and duplex units provided meet and exceed the requirements for minimum storage areas as outlined in the guidelines.

No. of bedrooms	Minimum storage requirements	Proposed
1 bedroom	3 sqm	Minimum 3 sq.m
2 bedroom	5 sqm (3 person)	N/A
	6 sqm (4 person)	Minimum 6.1 sq.m
2-bedroom duplex GF	5 sqm (3 person)	N/A
	6 sqm (4 person)	Minimum 6.1 sq.m
3-bedroom duplex	9 sqm	Minimum 11.46 sq.m

Please refer to the Housing Quality Assessment prepared by Scott Tallon Walker Architects for further details on internal storage.

Private Amenity Space

We submit that compliance with the minimum required areas for private amenity space is achieved for all units. We submit this is consistent with the design standards and is acceptable in this instance given the overall design quality put forward.

No. of bedrooms	Minimum floor areas for private amenity space	Proposed
1 bedroom	5 sqm	Minimum 9 sq.m
2 bedroom	6 sqm (3 person)	N/A
	7 sqm (4 person)	Minimum 17 sq.m
2-bedroom duplex GF	6 sqm (3 person)	N/A
	7 sqm (4 person)	Minimum 20.78 sq.m terrace
3-bedroom duplex	9 sqm	Minimum 17.3 sq.m terrace

Refuse Storage

The Apartment Guidelines requires that the storage and collection of waste materials be provided in apartment schemes. The Guidelines also state that “Refuse facilities shall be accessible to each apartment stair/lift core and designed with regard to the projected level of waste generation and types and quantities of receptacles required. Within apartments, there should be adequate provision for the temporary storage of segregated materials prior to deposition in communal waste storage and in-sink macerators are discouraged as they place a burden on drainage systems.”

The waste storage areas shown in the architectural drawings have been strategically located and are sufficiently sized. There will be sufficient space to allow for the segregation of waste into appropriately sized receptacles within minimal collection frequencies. As part of any forthcoming application, the applicant will prepare a full Operational Waste Management Plan, which will provide further detail on how waste will be managed during the operation of the site.

Communal Amenity Space

The below calculation shows the required communal space areas that should be provided for the apartment element of the development:

No. of bedrooms	Minimum floor areas for communal amenity space	Required
1 bedroom	5 sqm (56 x 5sq.m = 280 sq.m)	280 sq.m
2 bedroom	7 sq.m (48 x 7 sq.m = 336 sq.m)	336 sq.m
2-bedroom duplex GF	7 sq.m (14 x 7sq.m =98 sq.m)	98 sq.m
3 bedroom duplex	9 sqm (14 x 9sq.m = 126 sq.m)	126 sq.m
	Total required	840 sq.m total
	Total provided	1788 sq.m total

There is a requirement for 840 sq.m to be provided as communal amenity open space for the proposed development. The proposal far exceeds this requirement, providing 1788 sq.m as communal amenity open space for residents of the apartment units and duplexes provided. These areas are provided as landscaped areas close to the provided apartment units for use by residents of the apartments. We refer the Planning Authority to the Landscape Planning Pack prepared by Murphy & Sheanon Landscape Architects for more information.

In addition to the communal amenity open space provided, it is noted that all apartment and duplex units have been located adjacent to large areas of public open space within the development site usable for residents of the entire development and wider community.

Bicycle Parking and Storage

The Apartment Guidelines require that “planning authorities must ensure that new development proposals in central urban and public transport accessible locations and which otherwise feature appropriate reductions in car parking provision are at the same time

comprehensively equipped with high quality cycle parking and storage facilities for residents and visitors.”

We submit that the proposed quantum of cycle parking has been directly informed by the Wicklow- Rathnew Development Plan 2013 – 2019 which offers specific guidance relating to the required quantity of cycle parking spaces for developments in the Rathnew area. The development plan states that for apartment units the requirement for cycle parking spaces should be 1 cycle space per unit.

The proposed development offers 1 no. cycle parking space per unit for the duplex apartments in a secure in curtilage lock box.

Over 1 no. cycle parking space per unit for the apartment units is provided in secure lock up areas adjacent to the apartment block buildings, totalling 144 no. spaces for the 98 no. apartments provided in the proposed blocks.

The 8 no. maisonette apartment units proposed will be provided with 1 no. cycle parking space per unit in a secure in curtilage lock box.

42 no. visitor bicycle parking spaces are also provided throughout the scheme as Sheffield stands.

Car Parking

The Apartment Guidelines generally encourage reduced standards of car parking. The document defines accessible locations as falling into 3 categories:

- Central and/or Accessible Urban Locations
- Intermediate Urban Locations
- Peripheral and/or Less Accessible Urban Locations

Our review of these 3 categories identified that the site can be categorised as being located in a Peripheral and/or Less Accessible Urban Location.

Regarding car parking, the Apartment Guidelines set out the following requirements for Peripheral and/ or Less Accessible Urban Areas:

‘As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required’.

The site is approximately a 20-minute walk from Wicklow town Main Street and Wicklow Rail Station.

An adequate level of parking is delivered across the site with 592 no. car parking spaces provided for the 352 no. proposed units. A breakdown of the proposed car parking spaces per type of unit is provided below for the benefit of the planning authority:

- In Curtilage House Parking – 411 spaces
- On Street House Parking – 7 spaces
- On Street Maisonette/ Duplex Parking – 55 spaces
- On Street Apartment Parking – 114 spaces
- Visitor Parking – 5 spaces

Of the provided 592 no. spaces 9 no. of these are provided as dedicated accessible parking spaces. 20 no. of these are provided as on street EV charging spaces. All car parking spaces provided will be ducted for the future installation of an EV charging point.

We submit the parking ratio proposed for the apartment element of this development is acceptable for the site given the nature of the development and its location.

The proposal is consistent with the overall principles of the Sustainable Urban Housing: Design Standards for New Apartments (2020).

3.2.6 Design Manual for Urban Roads and Streets 2019



The Design Manual for Urban Roads and Streets (DMURS), 2019, sets out design guidance and standards for constructing new and reconfiguring existing urban roads and streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas. DMURS places a focus on pedestrians, cyclists and public transport users and sets out guidance and standards for constructing new and reconfiguring existing urban roads and streets in Ireland.

Consideration of DMURS and its contents has been a key objective for this project. The four key design principles have been incorporated as follows:

- **Connected networks:** To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and more sustainable forms of transport.

The development is adjacent to a permitted application for a new relief road (WCC reg Ref. 17/219 which will form the new site entrance from the r750. This relief road extends through the centre of the application site and will provide an additional new site access and egress point along the northern boundary. A large portion of the eastern and southern area of the site does not feature any roadways and priority is given to pedestrians by providing landscaped open space areas. Cul de sacs are proposed throughout the development site to encourage lower speeds and lower traffic flow throughout the site, creating a safer environment for pedestrians. A portion of the permitted inner relief road will be provided as part of this application.

- **Multi-functions streets:** The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment.

There is limited scope for encouraging multi-functional streets within the development site given the singular nature of the proposal as a residential development. However, the proposal promotes multi-functional use for pedestrians and cyclists who can access the site via the permitted relief road to access the housing units or to access the large landscaped communal open space areas provided.

- **Pedestrian focus:** The quality of the street is measured by the quality of the pedestrian environment.

Pedestrians are considered throughout the development with improved connectivity throughout the site and along the site perimeter. Additionally, internal roads have been omitted from much of the eastern and southern

portion of the development encouraging increased pedestrian activity and ensuring pedestrians have priority over vehicles.

The restriction of vehicular access around the sites eastern and southern perimeter allows a large area of pedestrian focused space to be provided which is safe and removed from traffic traversing the site.

- Multidisciplinary approach: Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

The multi-disciplinary approach is reflected in the chosen design which arose from a series of meetings with the design team. This has ensured a holistic and considered approach to designing the development has been maintained.

All internal roads within the development site have been designed for a vehicular speed of between 10km/h and 30km/h, which allows the movement of vulnerable road users to be prioritised. Kerb Radii at junctions has been restricted to a maximum of 4.5 m to prevent vehicles travelling through the development site at high speeds.

The proposal for an appropriate density, mixed tenure development at this highly accessible location is supportive of the objectives of the Design Manual for Urban Roads and Streets (2013).

3.2.7 Urban Development and Building Height Guidelines (2018)



The publication of the '**Urban Development and Building Heights, Guidelines for Planning Authorities (2018)**' is intended to set out national planning policy guidelines on building heights in relation to urban areas. These guidelines are the most recent form of guidance from the Minister on the matter of building height and were formally adopted in December of 2018. We note that section 1.14 of the document sets out the following:

“Accordingly, where SPPRs are stated in this document, **they take precedence over any conflicting, policies and objectives of development plans, local area plans and strategic development zone planning schemes.** Where such conflicts arise, such plans, schemes need to be amended by the relevant planning authority to reflect the content and requirements of these guidelines and properly inform the public of the relevant SPPR requirements.

The Urban Development and Building Height Guidelines are the predominant context for assessment of height in this case.

From the outset, it is noted that the Building Height Guidelines (2018) expressly seek to increase building heights at appropriate urban locations and adjacent to key public transport corridors.

“In relation to the assessment of individual planning applications and appeals, it is Government policy that building heights must be generally increased in appropriate urban locations. There is therefore a presumption in favour of buildings of increased height in our town/city cores and in other urban locations with good public transport accessibility.”

The development is considered to be located in a ‘suburban/edge location (City and Town). Section 3.4 of the guideline’s states that:

*‘Newer housing developments outside city and town centres and inner suburbs, i.e. the suburban edges of towns and cities, **typically now include town-houses (2-3 storeys), duplexes (3-4 storeys) and apartments (4 storeys upwards).** Such developments deliver medium densities, in the range of 35-50 dwellings per hectare net. Such developments also address the need for more 1 and 2 bedroom units in line with wider demographic and household formation trends, while at the same time providing for the larger 3, 4 or more bedroom homes across a variety of building typology and tenure options, enabling households to meet changing accommodation requirements over longer periods of time without necessitating relocation. These forms of developments set out above also benefit from using traditional construction methods, which can enhance viability as compared to larger apartment-only type projects’.*

Section 3.6 of the guidelines regarding building heights in suburban/ edge locations states that:

‘Development should include an effective mix of 2,3 and 4 – storey development which integrates well into existing and historical neighbourhoods and 4 storeys or more can be accommodated alongside existing larger buildings, trees and parkland, river/sea frontage or along wider streets’.

The development provides 220 no. 2-5 bedroom houses, 104 no. 1-2 bedroom apartments and 28 no. 2-3 bedroom duplexes with a ground floor 2 bed apartment and 3 bed apartment at the upper floors on 10.3 hectares of residential zoned lands within the site boundary. The proposed development ranges in height from 1 to 4 storeys and provides a density of 35 units per hectare on the residential zoned lands within the site application red line boundary. It is considered that the proposed development presents the most appropriate form of development for the site, given the site size, location, nearby development context, demand for these proposed unit types, and density objectives for the site.

SPPR 4 of the Urban Development and Building height guidelines relates directly to the subject development and states that:

‘It is a specific planning policy requirement that in planning the future development of greenfield or edge of city/town locations for housing purposes, planning authorities must secure:

- 1. the minimum densities for such locations set out in the Guidelines issued by the Minister under Section 28 of the Planning and Development Act 2000 (as amended), titled “Sustainable Residential Development in Urban Areas (2007)” or any amending or replacement Guidelines;*
- 2. a greater mix of building heights and typologies in planning for the future development of suburban locations; and*
- 3. avoid mono-type building typologies (e.g. two storey or own-door houses only), particularly, but not exclusively so in any one development of 100 units or more’.*

The proposed development provides 220 no. 2-5 bedroom houses, 104 no. 1-2 bedroom apartments and 28 no. 2-3 bedroom duplexes with a ground floor 2 bed apartment and 3 bed apartment at the upper floors. This provides a density of 35 units per hectare on residential zoned lands within the site redline boundary, and a development height of 1-4 storey across the site. It is considered that this form of development offers unit typology that matches demand in the area and delivers appropriate density on the site in line with the requirements of the Wicklow County Development Plan 2022-2028. The proposed development therefore delivers an appropriate density on the site whilst maintaining a high level of residential amenity.

Specific Planning Policy Requirements

The following Specific Planning Policy Requirements are considered particularly relevant to the current site context and the compliance of the scheme with these SPPRs is set out below.

SPPR 3 (A)

“It is a specific planning policy requirement that where:

- (14) 1. An applicant for planning permission sets out how a development proposal complies with the criteria above; and 2. The assessment of the planning authority concurs, taking account of the wider strategic and national policy parameters set out in the National Planning Framework and these guidelines; then the planning authority may approve such development, even where specific objectives of the relevant development plan or local area plan may indicate otherwise.”***

Applicant Response to SPPR 3A

The performance of the proposal vis a vis the building height criteria is further assessed below in sub-section ‘Development Management Criteria’.

Development Management Criteria

The Guidelines clearly set out that in the event of making a planning application, the applicant shall demonstrate to the satisfaction of the Planning Authority that the proposed development satisfies criteria. The relevant criteria, followed by an applicant response is set out below to clearly set out for the Planning Authority to demonstrate that the current proposal respects the outlined Development Management Criteria.

At the scale of the relevant city / town	
Assessment Criteria	Response
<p><i>“The site is well served by public transport with high capacity, frequent service and good links to other modes of public transport.</i></p>	<p>The site is well served by a variety of reasonably frequent bus services offering connections to the IFSC and Gardiner Street in Dublin and Glendalough and Bray in Wicklow. The closest bus stop to the development is located adjacent to the sites northwest corner, approximately 175 metres from the proposed site entrance. The site is located approximately 2km or a 20-minute walk to Wicklow Rail Station to the south which offers a frequent commuter train service towards Dublin and Waterford.</p>
<p>Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views. Such development proposals shall undertake a landscape and visual assessment, by a suitably qualified practitioner such as a chartered landscape architect.</p>	<p>The proposal is not located within an architecturally sensitive area. However, careful consideration has been given to the successful integration of the scheme into the existing character and topography of the site and area. The Architectural Design Statement and Landscape Design Statement prepared by Scott Tallon Walker and Murphy & Sheanon respectively outlines the rationale for the development and respectively confirms the proposal, while substantial, would result in a positive contribution to the character and urban fabric of this area in terms of landscape character and quality due to both the low sensitivity, quality and nature of the existing site and the proposed revitalisation and new architectural character.</p>
<p>On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.”</p>	<p>The proposed development will not impact the visual amenity of the surrounding area. Careful consideration has been given to the existing Tinakilly House to the east of the development site and appropriate set back distances have been maintained to not reduce the level of amenity experienced by surrounding buildings.</p> <p>A variety of unit types and heights are provided across the development site offering a variety in scale and form while also providing an appropriate density for the site given its location and scale.</p>

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At the scale of district/ neighbourhood/ street	
<p>The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape.</p>	<p>The proposal responds to the natural and built environment in an appropriate manner. Careful consideration has been given to the proposal regarding how it addresses the surrounding area with particular attention given to the streetscape and similar surrounding development. The high-quality design submitted provides an appropriate development which will provide a precedent for development on nearby similar sites. The development aims to deliver a new high quality residential development catering to the demand for new units as outlined in national policy documents on a currently underutilised site.</p>
<p>The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.</p>	<p>Careful consideration has been given to ensure that a monolithic appearance is avoided. Different materials, and fenestration as well as changes in massing between the proposed houses, duplex units and apartment buildings across the site will break up the uniform appearance of the site and create visual interest.</p> <p>The changes in height from 1 to 4 storeys on the site creates a unique townscape, avoiding the feel of a monolithic one-dimensional estate.</p> <p>We refer to the Architectural Design Statement prepared by Scott Tallon Walker Architects enclosed herewith for further details.</p>
<p>The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” (2009).</p>	<p>A stream runs along the sites northern boundary. A full site-specific flood risk assessment has been prepared by JBA Consulting addressing the potential for Flood Risk on the lands.</p>
<p>The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is</p>	<p>The high-quality design proposed will ensure that the development will be legible and attractive when viewed from the wider area. Internally, the site</p>

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<p>situated and integrates in a cohesive manner.</p>	<p>provides pedestrian and cyclist linkages which integrates the development.</p>
<p>The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.”</p>	<p>The appropriate mix of unit types and sizes has been incorporated into the proposed development to contribute to a currently limited market for this type of housing close to Wicklow.</p>
<p>At the scale of the site/building</p>	
<p>The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.</p>	<p>A detailed design rationale for the form, massing and height of the proposed development is set out in the enclosed Architectural Design Statement by Scott Tallon Walker Architects. The scheme design, particularly the orientation of the housing units was carefully considered to minimise the potential for overlooking and overshadowing of each other.</p>
<p>Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment’s ‘Site Layout Planning for Daylight and Sunlight’ (2nd edition) or BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’.</p> <p>Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution</p>	<p>We confirm that a Daylight and Sunlight Assessment has been completed by 3D Design Bureau and is submitted as part of this LRD Application Pack.</p>
<p>Site Specific Assessment</p>	
<p>Specific impact assessment of the micro-climatic effects such as down-draft. Such assessments shall include measures to avoid/ mitigate such micro-climatic effects and, where appropriate, shall include an assessment of the cumulative</p>	<p>A microclimate assessment is not deemed necessary in the case of the proposed development given the relatively low build height proposed of 1 to 4 storey.</p>

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<p>micro-climatic effects where taller buildings are clustered.</p>	
<p>In development locations in proximity to sensitive bird and / or bat areas, proposed developments need to consider the potential interaction of the building location, building materials and artificial lighting to impact flight lines and / or collision.</p>	<p>The proposed development site has been subject to a full Environmental Impact Assessment Report. An Appropriate Assessment Screening Report and Natura Impact Statement have also been prepared in respect of the proposed development by the project ecologist, Scott Cawley.</p>
<p>An assessment that the proposal allows for the retention of important telecommunication channels, such as microwave links</p>	<p>As the subject buildings are not considered to be of significant height this assessment is not required in this instance.</p>
<p>An assessment that the proposal maintains safe air navigation.</p>	<p>Given the development is removed from any airports or air strips this report is not required.</p>
<p>An urban design statement including, as appropriate, impact on the historic built environment</p>	<p>An Architectural Design Statement has been prepared by Scott Tallon Walker and is enclosed as part of the submitted application documentation.</p> <p>The development proposes no potential impact on any nearby protected structures, the closest being Tinakilly House located to the east of the development site. We refer to the LVIA accompanying the application presented within the project EIAR for more information.</p>
<p>Relevant environmental assessment requirements, including SEA, EIA, AA and Ecological Impact Assessment, as appropriate.</p>	<p>We submit that all relevant environmental assessments have been conducted and are submitted as part of this application pack, including an Appropriate Assessment Screening Report, Natura Impact Statement and Environmental Impact Assessment Report.</p>

Table 2 – Development Management Criteria

Considering the above, the subject proposal for 220 no. houses, 104 no. apartments and 28 no. duplex/ apartment units should be positively considered by the Planning Authority on this site. Specifically, the proposal has addressed the specific development criteria requirements of the Guidelines and is in compliance with the key SPPRs. Most notably the site’s location is considered to address the very spirit and intent of the Guidelines that being one proximate to public transport and a variety of services.

It is submitted that the proposal is consistent with the Urban Development and Building Height Guidelines for Planning Authorities (2018).

3.3 Wicklow County Development Plan 2022-2028

The Wicklow County Development Plan 2022-2028 is the relevant statutory planning policy document in place for Wicklow. The County Development Plans housing strategy policies as relevant to the subject development are outlined as follows:

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3.3.1 Housing

Population and Housing Trends

Wicklow-Rathnew is designated as Level 2 Key Town in the County Settlement Strategy as outlined in the Wicklow County Development Plan 2022-2028. It is worth highlighting that the population of Wicklow- Rathnew is targeted to increase from 14,114 in 2016 to 18,515 by Q2 2028.

It is noted in chapter 3 Core Strategy that:

“Key towns are identified for growth rates of c. 35% having regard for their identification in the RSES as towns suitable for higher levels of growth”.

The following Housing Supply Growth Targets are listed within Chapter 3 Core Strategy for Wicklow/ Rathnew:

- Housing Growth Q3 2022 – Q2 2028 – **1,267 no. units**
- Housing Growth Q2 2028-2031 – **275 no. units**

It is noted that the subject proposal for 352 no. units directly aids towards the achievement of providing 1,267 no. units by 2028 and will contribute towards the overall unit requirements for the Wicklow Rathnew area by 2031.

Location of New Residential Development

The County Development Plan outlines the following under section 6.3.2 relating to the appropriate location for new residential development:

‘In accordance with the NPF, RSES and the Core / Settlement strategies set out in Chapters 3 and 4 of this plan, new housing development shall be generally required to locate on suitably zoned / designated land in towns and villages.

The priority for new residential development shall be in the designated town / village / neighbourhood centres, in the ‘primary zone’ or in the historic centre of large and small villages, through densification of the existing built-up area, re-use of derelict or brownfield sites, infill and backland development. In doing so, particular cognisance must be taken of the need to respect the existing built fabric and residential amenities enjoyed by existing residents and maintaining existing parks and other open areas within settlements.

Where insufficient land is available in the centres of settlements, new housing development shall also be permitted on greenfield lands that are zoned / designated for housing’.

The zoning / designation of greenfield land for new housing shall adhere to the following principles:

- Application of the ‘sequential approach’ whereby zoning extends outwards from centres, contiguous to the existing built-up part of the settlement.
- Application of compact growth targets.
- Creation of ‘walkable’ neighbourhoods, whereby undeveloped lands within 10 minutes walking distance of the settlement centre and 5 minutes walking distance of any neighbourhood / village centres are prioritized.

- Promotion of a sustainable land use and transportation pattern, whereby undeveloped lands that are accessible to public transport routes are considered most suitable for development. In this regard, undeveloped land within 1 km of any rail or light rail stop or 500m of bus routes will be prioritized.
- Application of the tiered zoning approach in accordance with NPO 72 whereby land that is fully serviced is differentiated from land that can be serviced within the lifetime of the plan.
- Lands already or easily serviced by a gravity fed water supply system and wastewater collection system will be prioritized.
- Cognisance will be taken of the need to provide upmost protection to the environment and heritage, particularly of designated sites, features, and buildings.
- Prioritisation of environmental and sustainability considerations for meeting sustainable development targets and climate action commitments in accordance with the National Adaptation Framework – examine environmental constraints including but not limited to biodiversity, flooding, and landscape.
- The need to maintain the rural greenbelt between towns.

The Planning Authority will note that the current proposal for a residential development is well founded in principle under the provisions of the above Plan. This is especially the case given the forecast housing and population increases and the required quantum of residential development for the Rathnew areas.

We also remind the Planning Authority of the significant requirements for housing supply nationally and the provisions of Rebuilding Ireland – An Action Plan for Housing and Homelessness, the National Planning Framework: Ireland 2040 Our Plan and Housing For All – A New Housing Plan for Ireland.

3.3.2 Development and Design Standards

It is submitted that the applicant and design team have carefully considered all relevant Development and Design Standards as included in Volume 3 Appendix 1 of the Wicklow County Development Plan 2022-2028. The development is in compliance with the following listed standards:

Density

Section 3.1.1 of Volume 3 Appendix 1 of the Wicklow County Development Plan 2022-2028 notes that:

‘Higher densities are encouraged to achieve an efficient use of land and create compact, vibrant and attractive settlements.’

It further goes on to state that:

‘New development should incorporate a mix of dwelling types and heights to achieve minimum densities and create interesting and attractive settlements.’

Table 3.1 of Appendix one outlines the required density standards for new development within Wicklow County based on location and site type. The subject development is

located on the outskirts of Wicklow- Rathnew and is considered a outer suburban/ greenfield site.

For outer suburban/ greenfield sites in Wicklow – Rathnew, the following density standards apply as per table 3.1:

‘Minimum density of 35 - 50 dwellings per hectare.’

It is submitted that the proposed development achieves the outlined standard as included in the Wicklow County Development Plan 2022-2028 and provides a site wide density of 35 units per hectare.

The development also provides a compact vibrant and attractive settlement, a range of finishes and materials are proposed throughout the development sites 6 no. defined character areas.

Dwelling Mix

Section 3.2.8 ‘Building Design’ of Volume 3 Appendix 1 as included in the Wicklow County Development Plan notes that:

‘All medium to large scale housing developments shall include a range of house types and sizes, including detached houses, semi – detached, terraces, townhouses, duplexes and bungalows, unless otherwise specified by the Planning Authority’

It then further states that:

‘Mono-type building typologies (e.g. two storey or own-door houses only) will not be considered, particularly, but not exclusively so in any one development of 100 units or more’

And that:

‘New apartment developments¹⁴ will be required to include a range of unit sizes to cater for different housing needs which shall accord with SPPR1 and SPPR 3 of the ‘Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities’ (DHPLG 2018)’.

The applicant and design team have considered the above as included in the Wicklow County Development Plan 2022-2028 and have proposed a scheme that consists of:

- A total of 220 no. 2 bedroom houses, 114 no. 3 bedroom houses, 72 no. 4 bed houses and 3 no. 5 bedroom houses are provided across the development site, ranging in height from 1-2.5 storeys.
- A total of 96 no. 1 and 2-bedroom apartment units in 3 no. 4 storey apartment blocks located on the western portion of the development site.
- 8 no. maisonette apartment units are provided, presented as one up one down 1 bed apartment units.
- 28 no. duplex apartment units are provided, featuring 14 no. 2 bed apartments at ground floor level and 14 no. 3 storey apartment units on the upper floors.

It is evident from the above that the residential mix proposed is appropriate for the site and provides for an extensive mix of unit types and sizes, in line with the requirements as outlined in the Wicklow County Development Plan 2022-2028.

Car parking / EV Parking

Section 3.1.5 of Volume 3 Appendix 1 included in the Wicklow County Development Plan 2022-2028 states that 2 off street, car parking spaces shall normally be required for all dwelling units over 2 bedrooms. For every 5 residential units provided with only 1 space, 1 visitor space shall be provided.

An adequate level of parking is delivered across the site with 592 no. car parking spaces provided for the 352 no. proposed units. A breakdown of the proposed car parking spaces per type of unit is provided below for the benefit of the planning authority:

- In Curtilage House Parking – 411 spaces
- On Street House Parking – 7 spaces
- On Street Maisonette/ Duplex Parking – 55 spaces
- On Street Apartment Parking – 114 spaces
- Visitor Parking – 5 spaces

Of the provided 592 no. spaces 9 no. of these are provided as dedicated accessible parking spaces. 20 no. of these are provided as on street EV charging spaces. All car parking spaces provided will be ducted for the future installation of an EV charging point.

Section 1.2 ‘Climate Action’ of Volume 3 Appendix 1 of the Wicklow County Development Plan 2022-2028 notes that EV charging points should be provided as follows:

Installation of 1 recharging point for every 10 dwellings (with a minimum 1 for development under 10 dwellings) which is available to all residents. Installation of ducting infrastructure for every parking space within development.

It is submitted that the proposed development complies with these standards as outlined in the Wicklow County Development Plan 2022-2028. All provided parking spaces will be ducted for the provision of EV charging points. A total of 20 no. on street EV charging spaces are provided for the development of the total 181 no. on street parking spaces provided, totalling 11% of all on street parking spaces.

Bicycle Parking

Table 2.4 of Volume 3 Appendix 1 as included in the Wicklow County Development Plan 2022-2028 outlines the requirements for bicycle parking by type of development. For residential units the following standard is required:

‘1 space per bedroom + 1 visitor space per 5 units.’

168 no. bicycle parking spaces will be provided for the apartment units with a further 66 no. visitor bicycle parking spaces also provided. Ample space shall be provided within the curtilage of the proposed housing units for the storage of residents and visitors bicycles.

All terraced houses, maisonettes and duplex apartment units will have private covered bicycle storage units in curtilage.

Height

Section 3.1.2 ‘Building Height’ of Volume 3 Appendix 1 of the Wicklow County Development Plan 2022-2028 notes that:

‘Building height can make a positive contribution to the identity and character of an area. In general terms, building height shall be assessed having regard to the building’s function, location, setting and whether it can be successfully integrated into the existing streetscape without being unduly overbearing, obtrusive or impacting adversely on existing amenities.’

It is submitted that the applicant and design team have given extensive consideration to the building heights on the subject site. The proposal includes buildings ranging in height from 1 to 4 storeys. The building height on the site of maximum 4 storeys is considered appropriate to deliver a sustainable residential density suitable to the nature of the site and its surroundings and maximise the development potential of the site whilst providing high quality units with access to large areas of open space that do not visually injure the area. The proposal is appropriately located close to Rathnew and Wicklow town.

3.4 Wicklow Rathnew Development Plan 2013-2019

The Wicklow – Rathnew Development Plan 2013-2019 is the relevant statutory planning context for the subject site. The Development Plan was prepared in 2013 and is the statutory plan for the site and its environs. The plan was due to be replaced in 2019 however no draft replacement plan has been published as of December 2021, and so the plan remains the most recent relevant statutory context in place for Wicklow and Rathnew.

The key provisions of the Plan and the compliance of the proposed development with same are now detailed herein.

3.4.1 Area Action Plan

We note that an Area Action Plan for lands included in the Tinakilly Action Area was submitted by the applicant to Wicklow County Council and approved on the 20 September 2021.

The agreed Area Action Plan provides additional detail regarding how the wider lands in the Clermont – Tinakilly area can be developed. The approved plan does not contradict or preclude development occurring as outlined in the current Development Plan and allows for the subject lands to be developed in a phased and integrated manner.

The adjustments approved by Wicklow County Council contained within the submitted Area Action Plan are minor and provided for by the Development Plan. These changes relate to the zoning objectives governing the site, which have been slightly amended as part of the approved Area Action Plan for the lands, to improve connectivity and permeability of Open space areas.

The driving rationale behind the submission of the Area Action Plan was topography and other minor constraints on the site. The minor amendments to zoning make development more deliverable on the subject lands.

While changes have been made to the zoning objectives, the individual quantum of residential and open space zoned areas remains unchanged.

Any future development of the lands included in the approved Area Action Plan will implement the key development objectives and phasing outlined by the AAP.

3.4.2 Zoning

The subject site has several zonings, as identified in Figure 3.3 below.

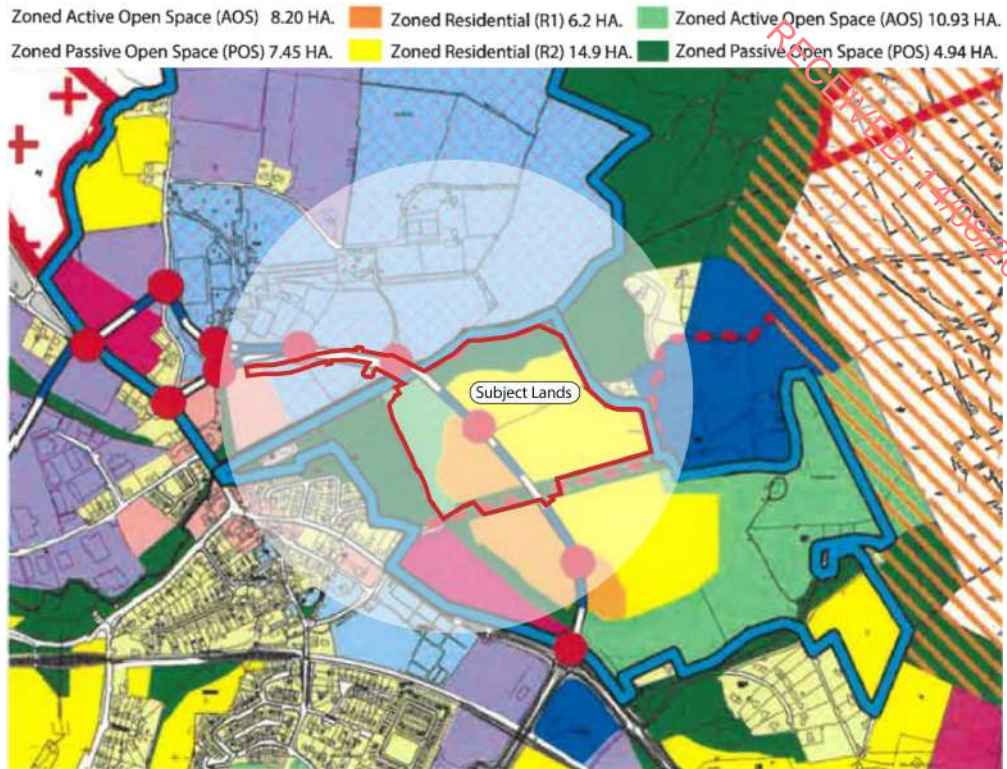


Figure 3.3 - Town and Environs Plan Zoning

The relevant zonings are identified as follows:

- **Clermont - Tinakelly Action Area - Light Blue Line**
- **Residential (R1) - Orange**
- **Residential (R2) - Dark Yellow**
- **Active Open Space (AOS) - Light Green**
- **Passive Open Space (POS) - Dark Green**
- **Future Road Alignment - Blue/White/Red Line**
- **Indicative Pedestrian Walkway - Dashed Red**

The following matrix summarises the various zonings.

	Residential - Infill (RE)		Community/Education/Institutional (CE)		Conservation Zone (CZ)
	Residential (R1)		Clermont Campus (CC)		Port (PT)
	Residential (R2)		Enterprise & Employment (E1)		Active Open Space (AOS)
	Residential (R3)		E & E - Warehousing (E2)		Passive Open Space (POS)
	Residential (R4)		E & E - Retail Warehousing (E3)		Neighbourhood Shops and Services (NS)
	Town Centre (TC)		Village Centre (VC)		Tourism (T)

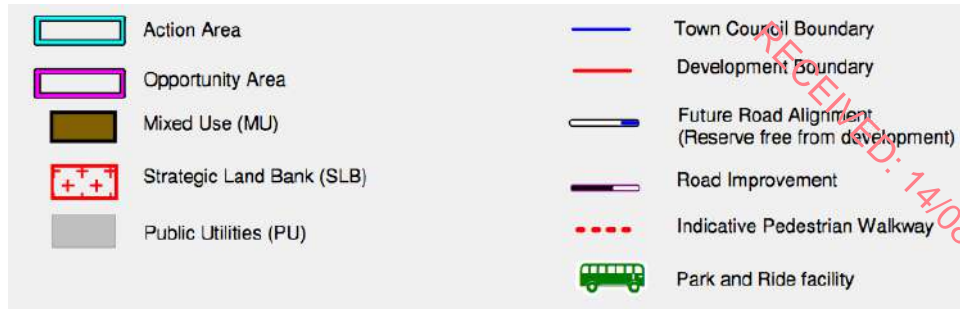


Figure 3.4 - Zoning Matrix

The mix of zonings provide for a number of different uses and development objectives as follows:

- **Residential (R1) / Residential (R2)**

Uses permitted include:

“New dwellings, Education, Home Based Commercial Activities, Religious Building, Crèche or Nursery School, Community Facility, Open Space, Playground, Residential Institution, Skate park.”

It is worth highlighting that there are different densities laid out in the plan for the R1 and R2 zoning and we note the following of relevance in this regard:

- (a) R1 – High Density (up to 40 units per ha)
- (b) R2 – Medium Density (up to 28 units per ha)

The description for the above zonings as outlined in the Plan is detailed as follows:

“To allow for the provision of high quality new residential developments at increased densities with good layout and design, with adequate public transport and cycle links and within walking distance of community facilities. Provide an appropriate mix of house sizes, types and tenures in order to meet household needs and to promote balanced communities”.

The applicant notes that Wicklow County Council included the following statement within the LRD Opinion issued in relation to the subject development regarding density levels:

‘The proposed development should demonstrate how it is in accordance with table 6.1 Density Standards and CPO 6.13 of the County Development Plan 2022-2028 noting that the site is considered to be an Outer Suburban/ Greenfield Site in the settlement of Wicklow- Rathnew where a density of 35-50 dph is sought.

Density calculations shall be clearly set out in the planning application. The site area used for the purposes of calculating the residential density of the development should be clearly indicated’.

On this basis it is considered that the Wicklow County Development Plan 2022-2028 supersedes the specific site objectives regarding density as included within the Wicklow- Rathnew Development Plan 2013-2019. The applicant has progressed with the design of the scheme on this basis and has aimed to achieve a site wide density of 35-50 units per hectare for this Outer Suburban/ Greenfield site as required by the Wicklow County Development Plan 2022-2028.

- **Active Open Space**

Uses permitted in principle include:

“Community Facility, Open Space, Playground, Recreational Building/Facility/Sports Club, Skate Park.”

The objective of this zoning is to preserve, improve and provide for recreational public and private open space.

The Development Plan states the following description for this zoning:

“To facilitate the further development and improvement of existing sports areas / clubs and to facilitate opportunities for the development of new high quality active sports and recreational areas”.

The Applicant, Keldrum Limited have an agreement as part of the deliverance of Active and Passive Open Space as outlined in the Agreed Tinakilly Area Action Plan on the Clermont/ Tinakilly Lands with Wicklow County Council. A meeting to agree on the strategy for open space delivery was held on the 3rd of May 2022 between the applicants’ representatives and Michael Nicholson and Deirdre Whitfield of Wicklow County Council. It was agreed that the Active Open Space Delivery on the Action Area lands would be delivered as part of the first phase of development, now granted under WCC Ref. 22/837 under development known as Tinakilly 1, south of Tinakilly Avenue.

It is submitted to Wicklow County Council that the Active Open Space being delivered for the subject development as part of Tinakilly phase 1 to the south of the development site is currently under construction, with the first phase of Active Open Space having recently been delivered.

The passage of this agreement for the provision of open spaces across the action plan lands noting that: *‘All designs and specifications will be fully vetted and agreed with WCC prior to commencement. Additional items such as outdoor gym equipment will be incorporated into the specification if requested by WCC’* is particularly relevant to the subject application in this case. The applicant has agreed with Wicklow County Council that the area within the subject site boundary zoned for the provision of ‘Active Open Space’ will instead be provided as ‘Passive Open Space’.

- **Passive Open Space**

Uses permitted in principle include:

“Community Facility, Open Space, Playground, Recreational Building/Facility/Sports Club, Skate Park.”

The objective of this zoning is to preserve, improve and provide for parks, recreational public and private open space, green corridors and ecological buffer zones.

The Development Plan states the following description for this zoning:

“To facilitate the further development and improvement of existing parks and other passive / amenity open areas and to facilitate opportunities for the development of new parks, recreational spaces, green corridors and ecological buffers.”

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3.4.3 Indicative Zonings

The Wicklow – Rathnew Development Plan 2013-2019 states the following on page 164:

“The position, location and size of the land use zonings shown on the land-use zoning map associated with this plan are indicative only and may be altered in light of eventual road and service layouts, detailed design and topography, subject to compliance with the criteria set out for the Action Areas below.”

Having considered the above provision, we note that at the design stage of this process, changes were made to the original zoning on the subject site to provide a more viable route for the inner relief road through the Clermont Tinakilly Action Area lands, along with minor changes to the Residential and Open Space zonings that allow for the development potential on the lands to be maximised. The minor changes to the relief road route and zoning on the site was driven by the site topography and other minor constraints. It is noted that the overall quantum of residential and open space zoned lands on the site has not changed from that included in the Wicklow-Rathnew Local Area Plan 2013-2019.

The southern portion of the inner relief road has been permitted under WCC Refs. 17/219 (ABP. 301261-18) as amended by WCC Refs. 20/1000, 21/411 and 22/837. The section of the road now proposed in the subject application will connect to the constructed section of the road to the south and complete the delivery of the envisaged road, which will traverse the lands from the Merrymeeting junction on the R750 to the south of the site and the R761 to the northwest, connecting to a section of the relief road currently under construction as part of the granted application WCC ref. 21/1333.

The Area Action Plan submitted was approved by Wicklow County Council on the 20th of September 2021.

The previous zoning of the site and zoning changes submitted in the Area Action Plan approved by Wicklow County Council are shown below:

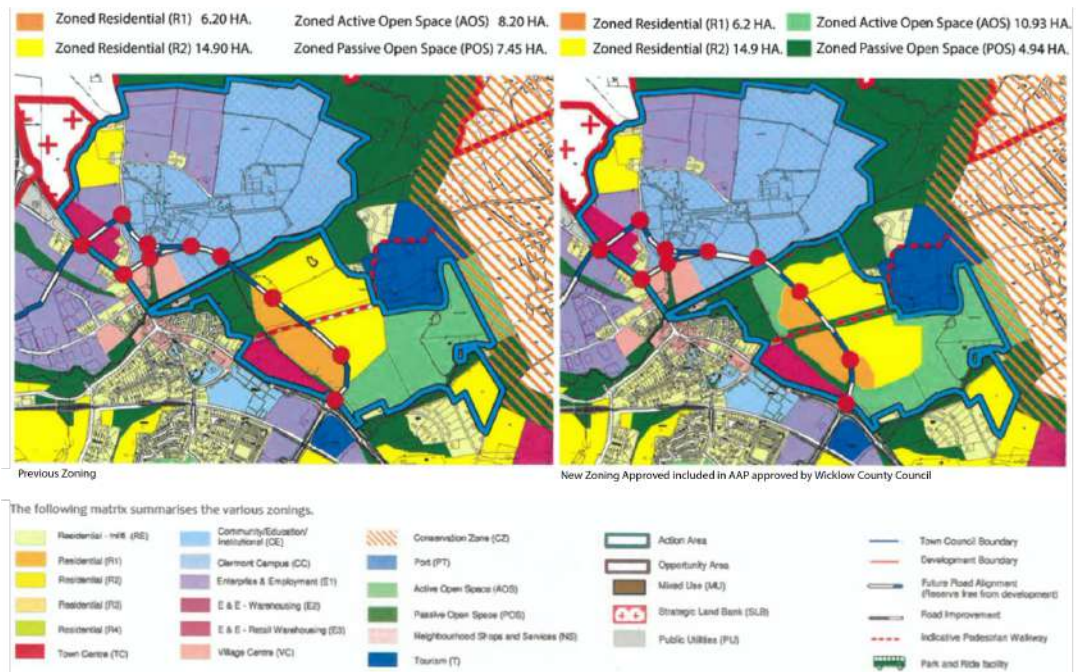


Figure 3.5 – Amendments to Land Use Zoning as approved by WCC

3.4.4 Clermont – Tinakilly Action Area

As noted above, the site is also included within the Clermont - Tinakilly Action Area lands, which comprise approximately 137 ha of lands and are identified in Figure 3.6 below for the purpose of this application, with zoning amendments shown as per the agreed Area Action Plan:

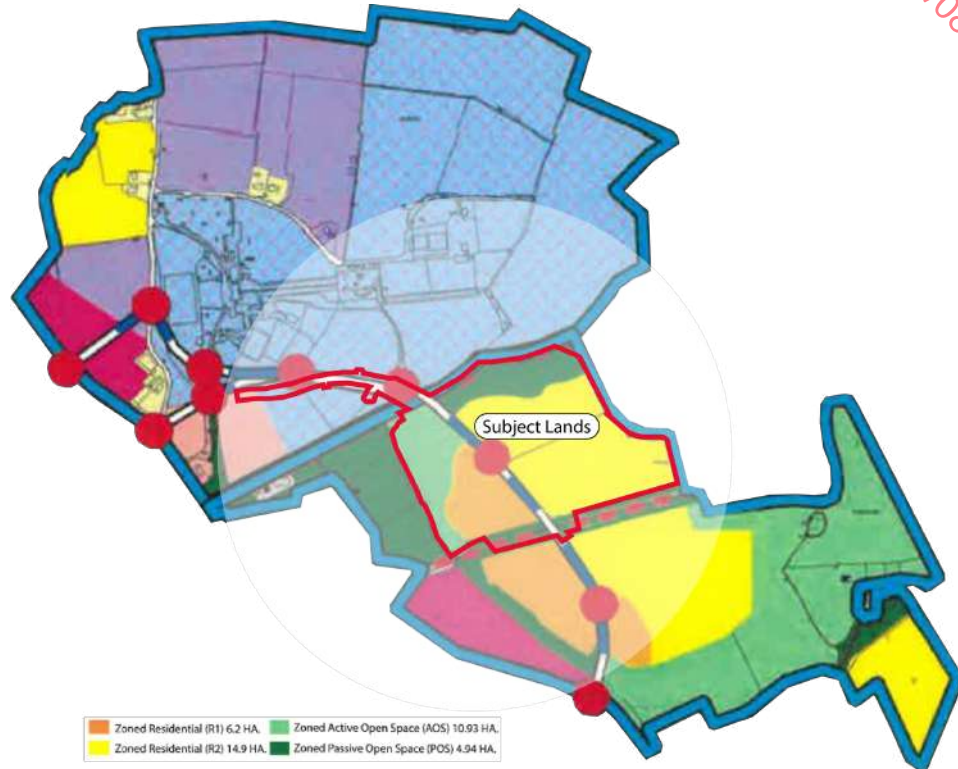


Figure 3.6- Clermont / Tinakilly Action Area

The majority of lands included within the subject application site boundary are zoned R1 and R2 Residential, with areas of zoned Active and Passive open space also included within the site redline boundary located adjacent to the eastern and northern site boundaries.

We note from the outset of this report that the applicant is amenable to delivery of the residential units at this location in tandem with the delivery of open space and the inner relief road and we note that we are committed to delivering a scheme that fully complies with the requirements of the Development Plan.

We note the following provisions of this action area, which now require consideration as part of this planning application:

- Any plan prepared or development proposed for these lands, while respecting all relevant development control standards and plan objectives must provide for **phased and integrated development**. Any plan shall comply with the following objectives:
 - Provision of a new inner relief road for Rathnew to facilitate access to new developments from the existing road network, to prevent congestion in Rathnew village centre due to the development of Clermont – Tinakilly Action Area and to achieve good traffic circulation in the area. The delivery of the Rathnew inner relief road may be on a phased basis, **but no more than 40% of the residential development will be permitted in advance of the full completion of the road.**

- A minimum area of 28ha shall be developed as public open space in accordance with the following criteria: **Lands designated Passive Open Space (POS) shall be developed as a formal landscaped park, including an amenity walkway along both sides of the river, generally as indicated on the map.** The plan shall include suitable proposals to ensure that walkway areas are maintained as safe, usable areas, free from anti-social behaviour.
Lands designated Active Open Space (AOS) shall be laid out and developed as a public sports ground, to be devoted to the use of the general public and not reserved for a single club or activity, in a format and with such facilities / infrastructure to be determined following consultation with the Community Development Section of the Council. The delivery of the Open Space may be on a phased basis, **but no more than 70% of the residential development will be permitted in advance of the full completion of the Active Open Space and the riverine park.**
- Land designated VC in Rathnew village centre shall be developed as an extension to the village centre, including new streets and squares, that provide a new streetscape along the main street and a pedestrianised walkway up to Clermont College.

The Plan outlines that overall, there is capacity for 280 units on R1 lands and 557 units on the entirety of R2 zoned lands within the overall Action Area. Our client is in a position to deliver a substantial portion of these units by virtue of the current proposal of 352 residential units as part of this phase 2 proposal. Notwithstanding this, we note that as part of this application, the applicant is endeavouring to deliver the following in line with the Action Area Requirements:

- Delivery of the remaining section of the Rathnew Inner Relief Road, which will connect with the section of the road built and constructed to the south of the development site under WCC Ref. 17/219 (ABP. 301261-18) as amended by application WCC Refs. 20/1000, 21/411 and 22/837.
- Areas of passive public open space areas within the development

We trust that the Planning Authority will have due regard to the applicants' intentions to deliver development at this site in line with Development Plan requirements.

We refer the Planning Authority to the proposals submitted herewith for further details on the extent of development proposed. We note specifically the proposed masterplan drawing submitted by Scott Tallon Walker Architects, which outlines the full extent of the proposals at a scale of 1:1250.

Applicant Agreement with Wicklow County Council for Provision of Active and Passive Open Space

The Applicant, Keldrum Limited, have agreed the following as part of the deliverance of Active and Passive Open Space as outlined in the Agreed Tinakilly Area Action Plan on the Clermont/ Tinakilly Lands:

'All designs and specifications will be fully vetted and agreed with WCC prior to commencement. Additional items such as outdoor gym equipment will be incorporated into the specification if requested by WCC'. The applicant has agreed with Wicklow County Council that the area within the subject site boundary zoned for the provision of 'Active Open Space' will instead be provided as 'Passive Open Space'. Correspondence between the applicant and Wicklow County Council supporting this is now submitted as part of this LRD meeting pack.

A meeting to agree on the strategy for open space delivery was held on the 3rd of May 2022 between the applicants' representatives and Michael Nicholson and

Deirdre Whitfield of Wicklow County Council. It was agreed that the Active Open Space Delivery on the Action Area lands would be delivered as part of the first phase of development, now granted under WCC Ref. 22/837.

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3.4.5 Core Strategy

It is worth highlighting that the core strategy for the Wicklow – Rathnew Development Plan 2013-2019 has identified the subject site as being designated for significant development in Phases 1 (2013-2019) and Phase 2 (post 2019) of the Plan. The subject site is identified on the map below for context purposes.

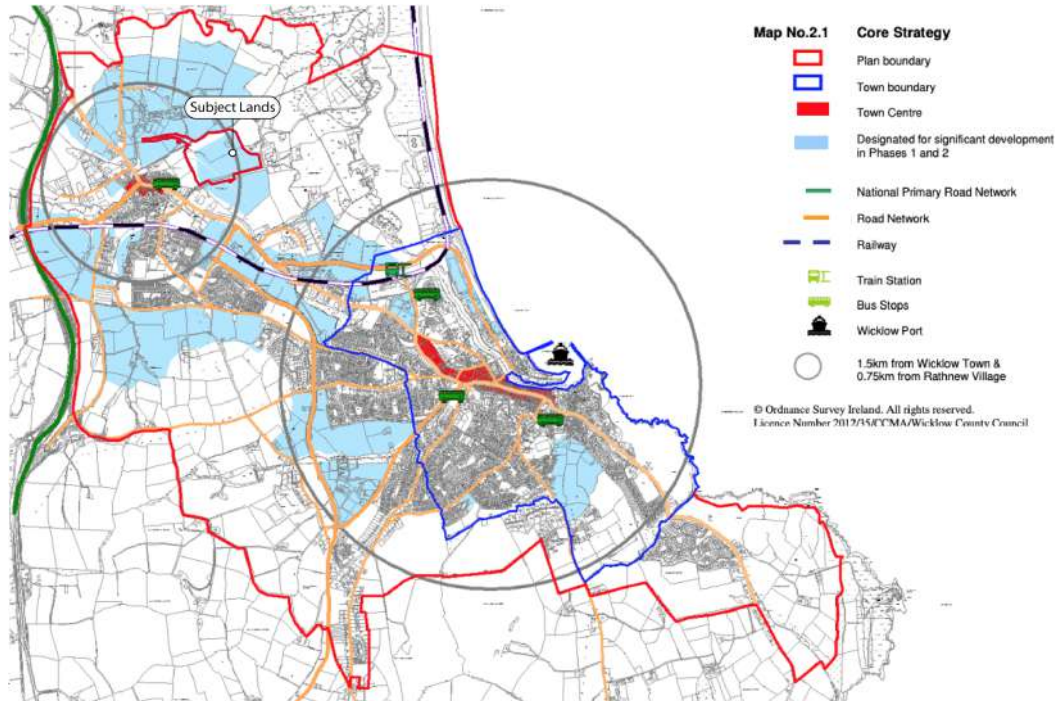


Figure 3.7 - Core Strategy Map

The Plan states the following regarding phasing:

“It is the development strategy of this plan that lands closest to the core of Wicklow Town and Rathnew Village shall be considered first for development.”

We are of the opinion that the said lands are in close proximity to the town centre, and we note specifically that the majority of the residentially zoned lands within the site redline boundary are defined as generally located within 0.75 km of the centre of Rathnew Town, which are lands inside the grey circle shown on the Core Strategy map around Rathnew.

It is evident from the above that the subject site is well founded on planning grounds as a development site with potential for significant residential development over the course of the current plan and beyond.

3.4.6 Residential Development

Within the Development Plan, Chapter 3 focuses on residential development and is specific in its vision for residential ‘R1’ zoned lands.

The following policies are of relevance to the subject site and future development should consider same:

Policy NH1 of the Plan notes the following:

“All new residential developments shall comply with the development standards set out in this plan, unless otherwise agreed by the Planning Authority.”

Policy NH2 of the Plan requires the following:

*“Zoned residential lands located within the identified Opportunity Area or Action Area shall be **developed as comprehensive (not piecemeal) integrated scheme** that allow for the sustainable phased and managed development of each area during the plan period.”*

Policy NH3 of the Plan has the following requirement:

*“Unless otherwise specified by the Planning Authority, **any development in excess of 200 residential units, or smaller developments that will accumulate to be part of larger future developments, will be required to carry out a social infrastructure audit**, to determine if social and community facilities in the area are sufficient to provide for the needs of the future residents. Where deficiencies are identified, proposals will be required to either rectify the deficiency, or suitably restrict or phase the development in accordance with the capacity of existing or planned services.”*

As a response to the above, we note the following:

- The scheme has been designed to fully comply with the development standards contained in the Plan. The remainder of this section examines the proposal vis-à-vis the standards in question.
- The applicant submitted an Action Area Plan for the entirety of the lands in question, which was approved by Wicklow County Council to ensure that there is a comprehensive and integrated approach to development of the area. Phase 1 of the overall development was granted by Wicklow County Council to the south of the subject site under WCC Ref. 17/219 (ABP. 301261-18) as amended under Reg Ref. 20/1000, 21/411 and 22/837.
- A Social Infrastructure Statement has been prepared and included as part of this LRD application pack.

3.4.7 Residential Standards

This section details the relevant quantitative standards that apply to any development proposal progressed for the site going forward.

The Plan states that in large – scale expansion areas (200 units or more or smaller developments that will accumulate to be part of larger future developments) such as action areas of this plan, the following shall apply:

- *“At the outset, **a vision for the area shall be established and agreed with the Planning Authority**. This shall set out the ‘type’ of place that is envisaged, the design ethos and the influences on form and design emerging.*
- *An evaluation of the existing surroundings of the site, as well as future proposals/zoning for lands in proximity, shall be carried out to determine how the new development **will integrate with the area and allow for maximum connectivity and permeability**.*
- *The development shall include **distinctive and/or landmark type buildings and a series of new spaces that allow for the development of a sense of place and identity**.*
- *New roads/street shall be laid out in a **legible hierarchy from distributor to local roads**.”*

We ask the Planning Authority to have due regard to the approved Action Area Plan and Design statement prepared by Scott Tallon Walker Architects submitted herewith.

The Planning Authority will note specifically that the action area plan clearly sets out a vision for development for the wider area. In addition, there are details included in both documents on permeability and connectivity within the lands. There is a series of new spaces created within the proposal, which will give a sense of place and a sense of identity to future residents. Lastly, the Planning Authority will note that there are clear proposals for a hierarchy of local roads.

3.4.8 Dwelling Mix and Sizes

The Wicklow Town– Rathnew Development Plan 2013-2019 states that residential zoned lands ‘R1’ and ‘R2’ “shall have an appropriate mix of house sizes, types and tenures in order to meet household needs and to promote balanced communities.”

Greenfield sites are required to include a range of unit types including apartments, duplexes, townhouses, semi-detached and detached houses, including single storey dwellings. We note the following breakdown in mix now proposed:

- A total of 220 no. 2 bedroom houses, 114 no. 3 bedroom houses, 72 no. 4 bed houses and 3 no. 5 bedroom houses are provided across the development site, ranging in height from 1-2.5 storeys.
- A total of 96 no. 1 and 2-bedroom apartment units in 3 no. 4 storey apartment blocks located on the western portion of the development site.
- 8 no. maisonette apartment units are provided, presented as one up one down 1 bed apartment units.

The overall breakdown in residential mix is as follows:

Houses:

- 31 no. 2 bedroom houses
- 114 no. 3 bedroom houses
- 72 no. 4 bedroom houses
- 3 no. 5 bedroom houses

Duplexes:

- 14 no. 2 bedroom ground floor apartments
- 14 no. 3 bedroom duplex apartments

Apartments:

- 8 no. 1 bedroom maisonette apartments
- 52 no. 1 bedroom apartments
- 44 no. 2 bedroom apartments

It is evident from the above that the residential mix proposed is appropriate to the site and provides for an extensive mix of unit types.

3.4.9 Privacy

The Plan is clear in stating that maximum privacy should be achieved within any form of residential development. Windows and Balconies shall be positioned and designed such that direct intrusion into private living areas from other dwelling units or from the public realm is avoided. Separation distances of 22m should be attained at first floor level and above. There is flexibility within this option in that the detailed design and positioning of windows can prevent invasion privacy.

The following standards apply to side-by-side and back-to-back housing:

- All walls bounding the private (usually rear) garden shall be 2 m in height.
- Side boundaries between houses shall be provided at a height of 2m and shall extend from the front façade of the house to the rear wall of the house.
- All boundaries shall be of a solid construction i.e., they form a complete screen barrier with no gaps.
- Walls bounding any public areas shall be of solid block construction rendered and capped on the outside.
- If timber boundaries are utilized, they must be bonded and supported by concrete posts. Concrete post and wall planks will not be permitted for any boundary visible from the public domain.

We refer the Planning Authority to boundary treatment drawings prepared by Murphy & Sheanon Landscape Architects submitted as part of this application pack, which clearly details that all proposals for boundary treatment are in compliance with the above requirements.

3.4.10 Residential Open Space

Public and Private Open Space requirements are detailed below.

Private Open Space

The Development Plan states that dwellings shall be provided with private open space at a rate of 0.64 sq m per 1 sq m house floor area for the first 150 sq m, with the minimum garden size allowable being 48 sq m.

Each of the dwellings is afforded with an area of private open space in the form of a rear / side garden for house type units and a balcony or terrace area for duplex and studio apartments.

We note that all garden spaces are above 48 sq m and all balconies serving duplex and apartment units are in line with government guidelines for apartment units entitled 'Sustainable Urban Housing – Design Standards for Apartments – Guidelines for Planning Authorities 2015'.

Public Open Space

Public Open Space is required at a rate of 15% of the site area. Areas within the site that are not suitable for development or for recreational use must be excluded before the calculation is made.

Spaces less than 10 m in width or 200 sq m in area will not be counted as useable public open space in this regard. There should also be a hierarchy of open spaces that shall be provide for the different play needs of different age groups.

We note that several open space areas are provided within the overall site area of 16.42 ha, as listed below:

- **Active open space zoned lands – 2.40 ha.** – It is noted that the applicant has agreed with Wicklow County Council to provide this space as passive open space.
- **Passive open space zoned lands – 1.94 ha**
- **Residential open space – 0.91 ha.**

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3.4.11 Car Parking

Regarding car parking, the Plan states that 2 off street, car parking spaces shall normally be required for all dwelling units over 2 bedrooms. For every 5 residential units provided with only 1 space, 1 visitor space shall be provided. The following standards shall apply to development in this regard:

- Communal parking shall be conveniently located and suitably lit at nighttime.
- Adequate provision shall be made for visitor and disabled car parking.

An adequate level of parking is delivered across the site with 592 no. car parking spaces provided for the 352 no. proposed units. A breakdown of the proposed car parking spaces per type of unit is provided below for the benefit of the planning authority:

- In Curtilage House Parking – 411 spaces
- On Street House Parking – 7 spaces
- On Street Maisonette/ Duplex Parking – 55 spaces
- On Street Apartment Parking – 114 spaces
- Visitor Parking – 5 spaces

Of the provided 592 no. spaces 9 no. of these are provided as dedicated accessible parking spaces. 20 no. of these are provided as on street EV charging spaces. All car parking spaces provided will be ducted for the future installation of an EV charging point.

3.4.12 Roads

There are several roads' objectives contained within the Development Plan, which should again be considered as part of the assessment of the development potential of the site. We note the following policy specifically in this regard:

“RP2 – To facilitate the development of a new inner relief road to the east of Rathnew Village (as shown on Map 12.1), which would facilitate access to new developments from the existing road network, would prevent congestion at the Rathnew mini roundabout due to the development of AA1 and achieve good traffic circulation in the area.”

It is also an objective under the Rathnew Village Centre Strategy to facilitate the above relief road. We note Objective Rathnew 9 in this regard as follows:

“To facilitate the delivery of the Rathnew Inner Relief Road.”

We note at this point that the applicant is delivering a section of the Inner Relief Road through the Clermont Tinakilly Action Area lands, connecting to the section of the road granted on lands to the immediate south of the development site permitted under application Reg Ref. 17/219 as amended by Reg Refs. 20/1000, 21/411 and 22/837 as part of this application. The section of road delivered as part of this application will complete the delivery of the inner relief road.

3.5 Part V Requirements

It is noted that the 10% requirement for Part V units applies in the case of the subject site as the land was purchased between 1 September 2015 and 31 July 2021.

Part V Provision

36 no. units across the development site will be provided as part V units. The breakdown of Part V typology is as follows:

- Unit type Dxa – 1 bed maisonette GF Unit – 4 no. units
- Unit type Dxa – 1 bed maisonette FF Unit – 4 no. units
- Unit type V21a – 2 bed duplex end of row – 3 no. units
- Unit type V21c – 2 bed duplex mid terrace – 8 no. units
- Unit type V21d – 2 bed duplex end of terrace – 2 no. units
- Unit type V21e- 2 bed duplex at Tinakilly Avenue – 1 no. unit
- Unit type V21a – 3 bed duplex end of row – 3 no. units
- Unit type V21c – 3 bed duplex mid terrace – 8 no. units
- Unit type V21d - 3 bed duplex end of terrace – 2 no. units
- Unit type V21e – 3 bed duplex at Tinakilly Avenue – 1 no. unit

This presents an overall mix of 22% 1 bed; 39% 2 bed and 39% 3 bed units being provided as Part V units.

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4 CONSIDERATION OF ALTERNATIVES

The requirement to consider alternatives within an Environmental Impact Assessment Report is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended, which states:

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

The Schedule 6(2)(b) of the Regulations implement this requirement by requiring the following information:

(b) “a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;”

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The Regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) – states:

“The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.”

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

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

This chapter 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 and providing a comparison on the environmental effects.

This chapter assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale, project design and technology of the Proposed Development. This section provides a full justification for the proposed development and provides a comparison of the environmental effects of each alternative option.

The main alternatives examined throughout the design process are set out as follows:

- Alternative Locations
- Alternative Designs and Layouts
- Alternative Processes

The design of the proposed development was subject to a number of design alterations. Every effort was made, during the design evolution, to ensure that the development was sympathetic to the site conditions and contours, ecology and receiving environment.

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4.1 Alternative Locations

As noted in Section 4.13 of the 2018 Guidelines “some projects may be site specific so the consideration of alternative sites may not be relevant”.

We refer to the guidelines on Information to be contained in Environmental Impact Assessment Reports (EPA 2022), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

It is noted that the subject site is zoned for the provision of residential units and open space areas and is located within the Tinakilly Action Area. An Area Action Plan was submitted to Wicklow County Council regarding the future residential development of the Action Area lands and approved on the 20th of September 2021.

The agreed Area Action Plan provides detail greater than that provided within the current Wicklow County Development Plan 2022-2028 regarding how the wider lands at Clermont – Tinakilly can be developed.

The approved plan does not contradict or preclude development occurring as outlined in the current Development Plan and allows for residential development on the subject lands to be developed in a phased and integrated manner.

The adjustments approved by Wicklow County Council contained within the submitted Area Action Plan are minor and provided for by the Development Plan. These changes relate to the zoning objectives governing the site, which have been slightly amended as part of the approved Area Action Plan for the lands, to improve connectivity and permeability of Passive and Active Open space areas.

The driving rationale behind the submission of the Area Action Plan was topography and other minor constraints on the site. The minor amendments to zoning make development more deliverable on the subject lands. While changes have been made to the zoning objectives, the individual quantum of each zoned area remains unchanged.

The applicant, Keldrum Limited, is currently developing phase 1 of development on the overall applicant landholding at Tinakilly, to the south of the development site. The applicant has extensive construction experience in Wicklow and is involved in a number of schemes in the surrounding area including schemes at Mariners Point and Burkeen Hall in Wicklow Town to the south of the site.

Given the sites appropriate zoning for residential development and the applicants previous experience with developing successful residential schemes in the county, the subject site was considered an ideal location by the applicant for the development of a new residential scheme.

Having regard to the nature and design of the development, it is considered that the proposed development is an effective and appropriate use of the subject site.

It is noted that extensive preliminary studies were conducted on the site prior to the preparation of a full planning application pack to ensure the site suitability for residential development as part of the due diligence process. This included the following assessments:

- Topographical Surveys
- Preliminary Ecological Assessments
- Soil Sampling
- Preliminary Flood Risk Assessments
- Archaeological and Geophysical Surveys
- Test fits of early design iterations of the scheme

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Given the sites appropriate zoning for residential development, the applicants previous experience with developing successful residential schemes in the county and the physical site suitability, the subject site was considered an ideal location by the applicant for the development of a new residential scheme. In addition to this, the subject development is the second phase of development on the applicants landholding at Tinakilly, and will complete the development of the area as a new residential neighbourhood and provide for the completion of the Rathnew Inner Relief Road through the Clermont – Tinakilly Action Area lands, which will facilitate a reduction in through traffic traversing Rathnew Village.

For these reasons, the subject application will directly complement the permission granted, that is being constructed under WCC Reg Ref. 17/219 (ABP. 301261/18) as amended by WCC Reg Refs. 20/1000, 21/411 and 22/837 (Phase 1).

The development of the Tinakilly lands will provide much needed residential accommodation in Wicklow and as such, no alternative locations for the proposed development were considered.

4.2 Alternative Designs

Several Alternative Designs were undertaken by Scott Tallon Walker Architects throughout the design process before arriving at the final project design as submitted with this planning application.

The final design of the scheme has evolved as part of a multi-disciplinary process with input from all EIAR team members, the project design team, applicant, and primarily advice received as part of the extensive pre planning process with Wicklow County Council, which consisted of an initial section 247 pre planning meeting followed by an LRD meeting. An opinion on the scheme proposed to Wicklow County Council at each of the pre planning phases was circulated following the pre planning meetings, which in turn informed design changes to the scheme which have been incorporated into the final development proposal.

The 2 no. scheme designs that were presented to Wicklow County Council as they evolved through preplanning are described below.

Option 1

A section 247 meeting was held with Wicklow County Council on the 29th of April 2022 presenting an initial conceptual scheme for comment. The initially proposed scheme consisted of the following:

- 300 no. units in 3 phases of c.100 units, divided into 3 distinct neighbourhoods within the subject lands (northern, western and southern).
- The development would provide a section of the Rathnew Relief Road traversing the subject site from south to northwest allowing the creation of distinctive neighbourhoods within the scheme.
- The proposed relief road would extend outwards to the northwest past the residential element of the development and will connect to the constructed roundabout to the northwest of the site at the R761.
- Areas of open space on appropriately zoned lands would be provided as part of the subject proposal, delivered alongside the development of the associated neighbourhood.

- There would be no passive or active open space provided for the development in the southern neighbourhood, which will avail of the open space areas provided in separate construction phases, with open space areas already under construction at Tinakilly Park.

The site layout plan as submitted for the s. 247 meeting with Wicklow County Council is presented below.



Figure 4.1 – Site Layout Plan submitted to Wicklow County Council for s.247 Pre Planning Meeting

Concerns raised by Wicklow County Councils Planners with the scheme proposed at the initial s. 247 meeting are summarised as follows:

- **Phasing**
 - The phasing of the road delivery was queried.
 - Delivery of the road should be considered entirely in relation to the proper planning of the area and will not give consideration to the financial viability for the applicant.
- **Density**
 - The the density of the proposal should be reflective of the 28 to 40 uph noted on R1/R2 zoned lands. – **(Note: The Wicklow County Development Plan 2022-2028 density standards are now considered to supersede those listed in the Wicklow – Rathnew Development Plan 2013-2019 by Wicklow County Council).**
- **Layout/Safety**
 - The pathways are challenging in relation to levels along the Riverwalk. Work is needed to make this Riverwalk accessible and usable by all.
 - Universal access is required.
 - The creation of a ‘rat run’ should be avoided along Tinakilly Avenue – This can be addressed by making the western portion of the avenue accessible to residents of the existing dwellings located along the avenue only.
 - The provision of “Cross Roads” is not desirable on the Avenue/Inner Relief Road. Plans to close part of this avenue to vehicular traffic were queried.

- **Open space**
 - Open space areas should feature appropriate provision of street furniture.
 - Provision for seating areas.
 - There should be a clear link from the Tinakilly South Neighbourhood to the areas of Active/ Passive Open Space included in the Tinakilly 1 application.
- **Design**
 - The steps up to duplex units should be designed as per comments on Tinakilly 1.
- **Parking**
 - There should be an appropriate provision of EV chargers in place, parking spaces should not be separated by a footpath.
 - Parking for those with a disability should be incorporated into the proposed development where applicable.
 - Parking provision should be located close to the destination points (i.e. some proposed housing is not located close to the parking).
 - Universal access is required.
- **Engineering**
 - The location of detention basins was queried - how these areas appear when flooded should be carefully considered.
 - All open space areas should remain accessible when the detention basin areas are flooded.
- **Environmental**
 - The western boundary flood zone should be appropriately protected.
 - The construction of the development should not cause this flood zone to migrate to another area.
 - All site access routes must remain accessible in the case of a flood event.
- **Part V**
 - There should be no en-suite or built in wardrobes as they are not funded.
 - Provide evidence of when the land was purchased to ascertain if 10% or 20% applies and this should be discussed with the Housing Section.
 - The preference of the Housing Department was for a mix of housing unit types and that these should be pepper potted throughout the scheme.
 - Details of current demand for Part V units in Rathnew:
 - 217 no. 1 bed units
 - 237 no. 2 bed units
 - 126 no. 3 bed units
- **Costings**
 - In relation to section 34 - any application should specifically identify the works considered over and above the remit of the applicant. Costings for these works should also be included and an agreement with Roads should be in place prior to the lodgement of any application.

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- **Creche Provision**
 - Creche provision queried. This issue needs to be agreed with WCC Childcare committee prior to the lodgement of any application.

Comments from the Wicklow County Council Planners present at the section 247 meeting were considered and the design proposal was updated accordingly. A revised proposal to incorporate the comments received at the s.247 pre planning meeting was submitted to Wicklow County Council as part of the LRD meeting request pack as outlined below:

Option 2

An LRD meeting was held with Wicklow County Council on the 26th of January 2023 following on from the initial s. 247 pre planning meeting. A revised proposal was submitted to Wicklow County Council, incorporating the comments received regarding the proposal submitted for the initial s. 247 meeting. The revised 'Option 2' development consisted of the following:

- a) Construction of 292 no. residential units as follows:
 - 232 no. 1-3 storey houses comprising 32 no. 2 bed houses, 120 no. 3 bed houses, 77 no. 4 bed houses and 3 no. 5 bed houses ranging in size from 86sqm to 214sqm gross floor area each with rear/side private gardens.
 - 60 no. apartments/duplexes arranged across 8 no. 3 storey buildings comprising 30 no. 2 bed apartments c.79.58sqm each and 30 no. 3 bed duplexes c.106sqm each.
 - Provision of private open space serving apartments/duplexes in the form of east and west facing balconies/terraces.
 - Residential open space in the form of various landscaped areas located throughout the development site (totalling c.0.8ha).
 - Provision of 541 no. car parking across the development site and 60 no. bicycle parking spaces associated with the duplex units.
- b) Provision of landscaped public open space areas on appropriately zoned open space lands. This will consist of the provision of c.4.14ha of passive open space featuring looped walkways and planted areas.
- c) Provision of a section of the Rathnew Inner Relief Road connecting with the Tinakilly Park residential development to the south (permitted under WCC Ref. 22/837) and the link road at Rathnew to the north west (permitted under WCC Ref. 21/1333).
- d) All associated vehicular and pedestrian accesses from the proposed section of the Rathnew Inner Relief Road including carriageways, paths and junctions and all internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- e) No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15) save for new vehicular entrance and gates on Tinakilly Avenue.
- f) All associated site development works, services provision, infrastructural and drainage works, provision of 3 no. substation cabinets, bin stores, public lighting, landscaping, open space, and boundary treatment works.
- g) No changes to permitted applications WCC Refs. 22/837 and 21/1333 save for associated works to the proposed link road.

The site layout plan as submitted for the LRD meeting with Wicklow County Council is presented below:



Figure 4.2 – Site Layout Plan submitted to Wicklow County Council for LRD Meeting

The scheme was updated to reflect comments received from Wicklow County Council after the initial s. 247 pre planning meeting. The scheme lodged to Wicklow County Council at LRD Meeting stage presented a comprehensive suite of material for the assessment of the relevant Wicklow County Council departments.

Following the lodgement of the LRD Meeting pack to Wicklow County Council, and meeting between the Council and the application design team on the 26th of January 2023, Wicklow County Council then issued an LRD Opinion document on the 26th of February 2023. The issued LRD Opinion document contained the following comments from Wicklow County Council to be addressed within the future full LRD application pack:

- **Phasing**
 - The applicant should draft a condition to be attached to a grant of planning permission that controls the phased delivery of the proposed section of distributor Road.
 - The phasing of Tinakilly 1 should tie into Tinakilly 2. Infrastructure associated with the granted Tinakilly 1 permission should be complete before the delivery of Tinakilly 2.
 - Clarity on the quantum of applications that would designate the Broomhall creche as their dedicated childcare facility.
 - Any proposed environmental management strategies should be carefully implemented in tandem with the agreed phasing.
 - A comprehensive phasing plan should be submitted with a full planning pack. This should include an overlay of services/ buildings phasing.
 - A material contravention of agreed phasing is not recommended. Any deviation from agreed phasing should be accompanied by a strong rationale for same.
- **Density**
 - The site was considered to be ‘Outer Suburban Greenfield’ as per the WCC Development Plan 2022-2028. Density levels should accord with that outlined in this plan, 35-50 units per hectare should be provided.

- Rationale needed for being at the lower end of the 35-50 unit density requirements.
- More terraced units should be provided on site to increase density.
 - **Layout/Safety**
 - A strong rationale needs to be provided for closing Tinakilly Avenue off to vehicular traffic.
 - Tree row area through the eastern portion of the site needs to be addressed – Is there potential for units to be rotated at this location to provide frontages onto the tree rows? Boundary treatments for units at this location to be explored.
 - The green strip along the site eastern boundary needs to be appropriately planted and a rationale for such provided – This has potential to become a hotspot for anti-social behaviour.
 - Zig Zag path through the linear park should be designed to match pedestrian desire lines, current design encourages pedestrians to take short cuts off the paved area.
 - **Engineering**
 - Hydraulic Calculations for culverted areas should be provided as part of the full planning application pack.
 - The proposed bridge should be fully detailed in any lodged planning application.
 - The submitted TTA uses traffic data from 2007 and underestimates traffic flows. An updated TTA should be included with any full planning application pack.
 - Any visitor parking that is not associated with specific units should be removed.
 - 10% EV Charging spaces should be provided and all spaces should be ducted.
 - Check allowances for urban creep in WCC Development Plan. All SuDS measures should comply with allowances in WCC Plan.
 - Site Lighting Plan at application stage should be provided in larger format.
 - **Environmental**
 - Watercourse protection measures should be included in any lodged planning application.
 - Management of topsoil removal should be detailed in any lodged planning application.

Comments from the Wicklow County Council Planners present at the LRD meeting were considered and the proposal was updated accordingly, giving rise to the proposal that is currently submitted to the planning authority for consideration, 'Option 3 – Chosen Option'.

Option 3 'Chosen Option'

Option 3 represents the 'Chosen Option' now submitted to the planning authority for consideration. The project design team has endeavoured to incorporate all comments received from Wicklow County Council into the final design proposal. The proposal now put forward before the county council for consideration is summarised as follows:

Construction of 352 no. residential units as follows

220 no. 1-2.5 storey houses comprising 31 no. 2 bed houses, 114 no. 3 bed houses, 72 no. 4 bed houses and 3 no. 5 bed houses, ranging in size from c.82.33 sq.m to c.212.39 sq.m. Each house will have an associated rear/ side private garden.

132 no. apartment/ duplex/ maisonette units comprising the following: 56 no. 1 bed apartments and 48 no. 2 bed apartments in 3 no. 4 storey apartment block buildings. 8 no. 1 bed maisonette units in 2 no. 2 storey semi detached blocks. 14 no. 2 bed duplex ground floor apartment units and 14 no. 3 bed upper floors duplex apartment units arranged across 3 no. 3 storey terraced blocks, ranging in size from c.48.4 sq.m to c.109 sq.m. All apartment/ duplex/ maisonette units will be provided with private open space areas in the form of balconies/ terraces.

Communal open space associated with the proposed apartment units will be provided in the form of landscaped areas located in the vicinity of the apartment units (totalling 0.1788 ha).

All internal residential access roads and cyclist/pedestrian paths serving the proposed development.

Provision of 592 no. car parking spaces across the development site and 168 no. bicycle parking spaces for residents of the proposed 56 no. 1 bed and 48 no. 2 bed apartment units. 66 no. visitor bicycle parking spaces are provided throughout the development site. All terraced houses and duplex 2 and 3 bed apartments will be provided with associated secure in curtilage bicycle lock ups.

Proposed pedestrian connections and landscaping to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

The proposed development will connect to the Tinakilly Park residential development and Rathnew Village via a new section of the Rathnew Inner Relief Road. The proposed road will join the constructed/under construction elements permitted under WCC Ref. 17/219/ ABP Ref. PL27.301261 and amended under WCC Ref. 22/837 to the south with a section of the link road to the northwest of the site at the R761 roundabout in Rathnew granted under WCC Ref. 21/1333. This includes all associated vehicular and pedestrian accesses, carriageways, paths and junctions.

No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15) save for works to close the western portion of Tinakilly Avenue to vehicular traffic and the provision of a new vehicular entrance and gates along the eastern portion of Tinakilly Avenue off the Rathnew Inner Relief Road to facilitate access to Tinakilly House and other properties to the east of the site accessed from Tinakilly Avenue.

All associated site development works, services provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

The planning application is accompanied by an Environmental Impact Assessment Report and Natura Impact Statement.

The planning application is available for public viewing at the following website: www.tinakillydemesnelrd.ie

The site layout plan of the chosen Option 3 is outlined below for the benefit of the planning authority:



Figure 4.3 – Site Layout Plan submitted now submitted to Wicklow County Council for consideration.

It is submitted that the scheme now submitted in this full LRD application pack has implemented a number of changes from the iteration of the scheme presented to Wicklow County Council at LRD meeting stage to respond to the comments of Wicklow County Council as included in the issued LRD Opinion document. The key changes to the scheme as now submitted are summarised as follows:

- The quantity of units has increased from 292 no. units as submitted with the LRD Meeting Pack to 352 no. units as now included within this full LRD application pack. This increase in the number of units provided has been implemented into the scheme design to directly respond to Wicklow County Councils request that the density of the proposed scheme be increased to comply with density requirements as outlined in the Wicklow County Development Plan 2022-2028.
- The site redline has been expanded to include a section of the western portion of Tinakilly Avenue. This section of the avenue has been included to provide a pedestrian parkland area along the southern boundary of the development site. The provided park in this location will be appropriately landscaped and passively surveilled by units provided as part of the proposed scheme, and as part of the permitted, under construction, Tinakilly 1 scheme to the south of the development site. This park area will provide a pedestrian connection between both Tinakilly schemes and improve permeability for pedestrians in the area.
- 104 no. 1 and 2 bed apartment/ maisonette units have been provided as part of the final submitted scheme. These units represent a new typology in the Tinakilly area and have been provided to ensure that the development is in compliance with density standards included within the Wicklow County Development Plan 2022-2028, as noted by the Wicklow County Council Planners in their issued LRD Opinion.
- A new vehicular and pedestrian entranceway is provided to Tinakilly House and Hotel as part of the proposed development. This new entrance way will be provided along the eastern portion of Tinakilly Avenue, from the new Rathnew

Inner Relief Road. As part of the provision of this new entranceway, a new entrance gate is proposed at this location. A bespoke entrance gate has been chosen for the Hotel by the hotelier and drawings detailing these gates have been included within the subject planning application pack for the consideration of the Planning Authority.

The applicant and design team have given extensive consideration to the comments of Wicklow County Council presented at initial pre planning stage and LRD meeting stage and are confident that the now submitted scheme has adequately and appropriately addressed all concerns of Wicklow County Council. A direct response to each of the items raised by Wicklow County Council in their issued LRD opinion has been included within the submitted Response to Wicklow County Council LRD Opinion document, enclosed within the application Planning Report lodged as part of this application pack.

4.3 Do Nothing Alternative

The site is zoned for residential development and is within the 'Tinakilly Action Area' which has an approved Area Action Plan in place to govern the future residential development on the lands. As there have been no alternative locations considered for the development as per the reasons outlined in section 4.1 above, it is considered that the 'Do Nothing' Alternative of leaving the development site as greenfield lands would be contrary to Wicklow County Councils development objectives for the subject site.

4.4 Alternative Processes

Alternative processes are not considered relevant to this Environmental Impact Assessment Report given the nature of the proposed development.

4.5 Environmental Impacts of Design Evolution

It is considered that the above evolution of the scheme from option 1 through to option 2 and the chosen option 3 were not driven by environmental factors but rather by comments received from the Wicklow County Council Planning Department. The design team has endeavoured to ensure that the proposal presents the most sustainable design option for the site from the initial outset of the design of the scheme. An Appropriate Assessment Screening Report was prepared for the subject site which concluded that the possibility of for significant effects on the following European sites, in the absence of mitigation either arising from the project alone or in combination with other plans and projects, as a result habitat loss/ fragmentation, habitat degradation as a result of hydrological impacts, habitat degradation as a result of introducing/spreading non-native invasive species, and disturbance/ displacement impacts: Wicklow Mountains SAC, The Murrough Wetlands SAC and the Murrough SPA. It was therefore concluded that a Stage 2 Appropriate Assessment was required in respect of the listed European Sites, and a Natura Impact Statement was prepared in this regard.

The project ecologist Scott Cawley has prepared a Natura Impact Statement to further assess the potential impacts of the scheme on surrounding listed European sites. The prepared Natura Impact Statement concluded that with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' Qualifying Interest habitats and species and Special Conservation Interest species and whether the predicted impacts would adversely affect the integrity of The Murrough Wetlands SAC, Wicklow Mountains SAC and The Murrough SPA. There are no other European sites at risk of effects from the proposed development. Avoidance, design

requirements and mitigation measures are set out within the prepared Natura Impact Assessment and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction and operational Phases of the proposed development such that there will be no adverse effects on any European sites.

It has been objectively concluded by the project ecologists Scott Cawley following an examination, analysis, and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development, and the effective implementation of the mitigation measures prescribed that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

Soil & Geology:

The design layout has attempted to take account of the topography of the site. There will be no large piling requirements on the site excavation for basement construction will not be required, the road and housing construction will largely mirror the existing topography and will not materially change the local slopes and topography.

The final design ensures that the vast majority of excavated material from surface stripping, road grading and foundation excavation will consist of naturally occurring topsoil and subsoil and will be largely reusable. The final design will have minimal impact on local geology, where possible, excavated material will be reused on site.

Water & Hydrology:

The point of connection for potable water It is proposed to continue the 225mm diameter and 160mm diameter watermains along the eastern and western sides of the Rathnew Inner Relief Road, which are currently under construction (as permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), and to supply the proposed development with potable water via new 150mm diameter and 100mm diameter connections to these.

Therefore, while the scheme layout has evolved through the various versions stated above, the point of connection along the existing road has remained fixed. As the layout has evolved, the realignment of existing drainage channels has been examined and will be maintained where possible with any sediment load being diverted through silt traps and attenuation structures.

Air & Climate:

Operational traffic emissions associated with the proposed development are predicted to have an imperceptible impact on air quality. The operational phase impact to air quality is long-term, localised, neutral and imperceptible.

Noise & Vibration:

The design evolution has at all times taken account of the potential impact on adjoining landowners and properties. While the internal layout has changed through the various designs, the separation distance has remained the same and therefor any potential impact has not changed through the design evolution.

Landscape & Visual Impact

As outlined above, the design evolution has taken key ecological factors into account in preparation of the proposed final scheme. It is acknowledged that due to the existing agricultural nature of the site, and the emerging urban form, initially the development may create some negative visual impacts for residents. However, the extent of these impacts to human beings, and most importantly to the existing ecology, water and

hydrology of the area have been minimised through the design and layout proposed herein.

Transport & Access:

The design evolution of the proposed development site provides a benefit to potential future vehicle users of the site. Designing the internal road network to form clusters rather than long expanses of road both internally and around the development, will create a safer environment for a residential area which will encourage slower vehicle speeds and heighten safety awareness for residents.

Material Assets:

As the overall quantum of development has not changed the potential impact on Tinakilly House and overall tourism is the main issue that was addressed. The final project design has introduced a parkland area along the western portion of Tinakilly Avenue, and a new entrance way and gates to the Tinakilly House Hotel on the eastern section of Tinakilly Avenue off a section of the Rathnew Inner Relief Road crossing the avenue. The final project design is considered to have a positive impact on the hotel, providing an upgraded access route and new entrance way and associated gates.

Archaeology, Architecture & Cultural Heritage

Each iteration of the design and layout for this proposed development has fundamentally been influenced by the presence of Tinakilly House, a protected structure. The layout of the final proposal maintains adequate separation distance between the proposed development and Tinakilly House. In order to protect the privacy of Tinakilly House, it is proposed herein to allow trees along the southern boundary of Tinakilly House to grow higher to mitigate against any adverse visual impacts.

5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter has been produced to assess the likely impacts associated with Human Health for the proposed development. In Accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022), Draft Advice Notes for Preparing Environmental Impact Statements (EPA 2015) and European Commission Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU 2017). This chapter considers the “existence, activities and health of people”, with respect to “topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions”.

Human beings and their well-being are a central consideration in assessing the environment. Any likely change in environmental conditions, which will impact the quality of life for human beings, must therefore be comprehensively addressed.

Impacts upon humans may derive from any number of the environmental parameters discussed throughout this EIAR. Ultimately, all development impacts upon the environment to some extent and upon human beings and their quality of life. Direct effects relate to matters such as water and air quality, noise, and landscape change. Indirect effects relate to matters such as flora and fauna.

This section of the Environmental Impact Assessment Report focuses upon the human environment proximate to the proposed development in terms of population profile; employment; land use and social patterns; human health and traffic congestion.

Impact on humans arising from other issues such as natural hazards, soils, geology and hydrogeology, water, air quality, noise, vibration traffic and landscape are assessed in the following EIAR chapters:

- Chapter 6 – Land, Soils, Geology and Hydrogeology
- Chapter 7- Hydrology
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape Visual Impact Assessment
- Chapter 13 – Traffic and Transport

5.2 Methodology

In accordance with the EPA Guidelines (EPA 2022) this chapter has considered that:

“In an EIAR, the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g under the environmental factors of air, water, soil, etc. The Advice Notes provide further discussion of how this can be addressed”.

A per Article 3 of the Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU:

1. The environmental impact 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:
 - i. Population and Human Health**
 - ii. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC
 - iii. Land, soil, water, air and climate
 - iv. Material assets, cultural heritage, and the landscape
 - v. The interactions referred to in the factors referred to in points (i) to iv)

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

The 2017 publication by the European Commission (EC), *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*, considered that:

Human Health is a very broad factor that would be highly Project dependant. The notion of human health should be considered in the context of 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 and 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’.

This chapter follows these EC guidelines and will examine the health effects relevant to the proposed development as they relate to a relevant, defined study area. The effects of the proposed development on the population and human health are analysed in compliance with the requirements of the EPA guidelines.

It is noted that at the time of preparing this Environmental Impact Assessment Report, the Central Statistics Office have begun releasing data from Census 2022, which will supersede Census 2016. The Census 2022 data will be released throughout 2023, with the full census being available after the final profile publication on the 19th of December 2023. The Census 2022 publication schedule is included below to outline the availability of Census 2022 information:

Release name	Date
Census 2022 - Summary Results	Tuesday, May 30th 2023
Census 2022 Profile 1 - Population Distribution and Movement	Thursday, June 29th 2023
Census 2022 Profile 2 - Housing in Ireland	Thursday, July 27th 2023
Census 2022 Profile 3 - Households, Families and Childcare	Thursday, August 31st 2023
Census 2022 - Small Area Population Statistics (SAPS)	Thursday, September 21st 2023
Census 2022 Profile 4 - Disability, Health and Carers	Thursday, September 28th 2023
Census 2022 - Place of Work, School, College - Census of Anonymised Records (POWSCAR)	Thursday, October 19th 2023
Census 2022 Profile 5 - Diversity, Migration, Ethnicity, Irish Travellers & Religion	Thursday, October 26th 2023
Census 2022 Profile 6 - Homelessness	Thursday, November 16th 2023
Census 2022 Profile 7 - Employment, Occupations and Commuting	Thursday, November 30th 2023
Census 2022 Profile 8 - The Irish Language and Education	Tuesday, December 19th 2023

Figure 5.1 – Census Publication Schedule

At the time of Issue of this Environmental Impact Assessment Report the following census profiles have been published and are available for review:

- Census 2022 Summary Results – **Published Tuesday 30th May 2023**
- Census 2022 profile 1 – Population Distribution and Movement – **Published June 29th 2023**

It is noted that the applicant has considered the published 2022 Census results in the context of the wider County Wicklow, as no small area population maps for the electoral divisions surrounding the development site are currently available. These are due to be published on September 21st, 2023.

The population in Wicklow County has changed as follows from Census 2016 to Census 2022:

	Census 2016	Census 2022
Wicklow Population Total:	142425	155851

Table 5.1 - Population evolution in Wicklow County 2016-2022

From Census 2016 to Census 2022 the population of Wicklow County increased by 13426 total. This represents a 9% total population increase throughout the County in the period from 2016-2022.

This Population and Human Health chapter assesses the Wicklow Urban and Wicklow Rural Electoral Divisions. As no Census 2022 data has yet been published relating to these specific electoral divisions, it is assumed that the 9% population increase throughout the wider Wicklow County could be applied to the Wicklow Urban and Wicklow Rural Electoral Divisions to get an outline of population change in these areas from 2016 – 2022.

5.3 Assessment of Significance & Sensitivity

The assessment of significance is a professional appraisal based on the sensitivity of the receptor and the magnitude of impact of any potential effect. The sensitivity of individuals in an area will vary on a case-by-case basis and must be assessed accordingly. It would be unrepresentative to classify an entire population as ‘low sensitivity’ so for this assessment it is assumed that the receiving population is of a consistent high sensitivity to effectively properly assess the impact of the development on human health and population, using a precautionary principle.

5.3 Population

5.3.1 Receiving Environment

This section describes the receiving environment in terms of existing context, character, significance, and sensitivity which forms the baseline for further assessment.

Population Trends for the Local Area

The Central Statistics Office (CSO) provides data on population and socio-economic aspects of the population at a State, County and local Electoral District level. The subject site falls within the ‘Wicklow Rural’ Electoral District (ED) and within the administrative area of Wicklow County Council. The most recent census of population was undertaken by the CSO in 2016.

CSO population statistics relevant to the subject area are summarised below. The most recent population figures for the Wicklow Urban and Wicklow Rural areas are noted as 6,762 and 8,163 respectively, which are highlighted in Table 5.2 below.

DED	2011	2016	Actual Change	% Change
Wicklow Urban	6761	6762	1	0.0%
Wicklow Rural	7429	8163	734	9.9%
<p>Note: a 9% increase in population can be applied to 2016 figures to reflect overall population change in Wicklow County as published in Census 2022</p>				

Table 5.2 - Population evolution in both Electoral District Areas (Source: CSO 2016)

The official census data for 2016 indicates a 9.9% (734 persons) increase in the Electoral Division (ED) of ‘Wicklow Rural’ and a 0.0% (1 person) increased in population in ‘Wicklow Urban’.

With a consistently rising demand for housing in Wicklow County, population figures are envisaged to increase across most DEDs within the county in the next decade.

The Wicklow County Development Plan 2022-2028 outlines that an increase in population of the settlement in **Wicklow-Rathnew Town** (Level 2) to 19,471 is predicted by the year 2031.

Furthermore, although the 2016 Census of Population shows that the State population has only experienced a growth rate of 3.7 per cent from 2011 to 2016, these results are indicative of the past global financial crisis and the resulting trend towards migration.

As the economy recovers, a reversal in this trend is anticipated. There remains strong population growth and housing demand throughout the country but particularly within the Greater Dublin Area. The Wicklow Rural Electoral District has consistently shown population growth and housing demand.

This trend has been confirmed within published Census 2022 data which states that the population of Wicklow County has increased from 142425 in 2016 to 155851 in 2022, an increase in population of c. 9%.

Age Profile

A review of the Wicklow Urban and Wicklow Rural age profile confirmed that communities in the surrounding areas have an age profile weighted generally towards an older population group with an above average concentration of individuals over 65 years and a below average proportion under 19 years of age in the Wicklow Urban Area. The Wicklow Rural area predominant age cohort is by people in the working age group (35 to 39 years). This can be assessed following a reviewed of figures below:

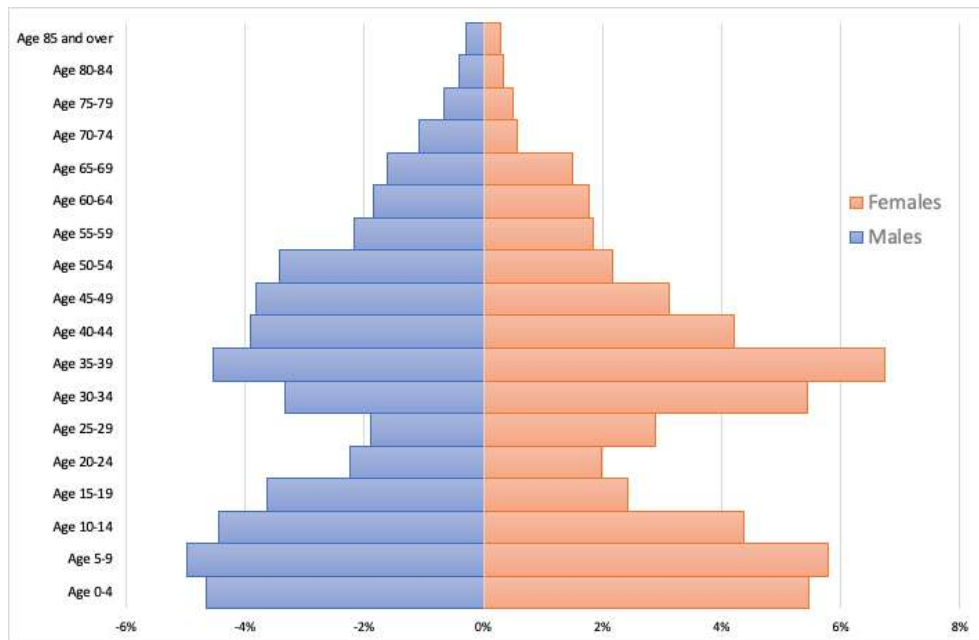


Figure 5.1 Population Profile by sex & age group in Wicklow Rural Electoral Division (Source: CSO 2016)

Note: a 9% increase in population can be applied to 2016 figures to reflect overall population change in Wicklow County as published in Census 2022

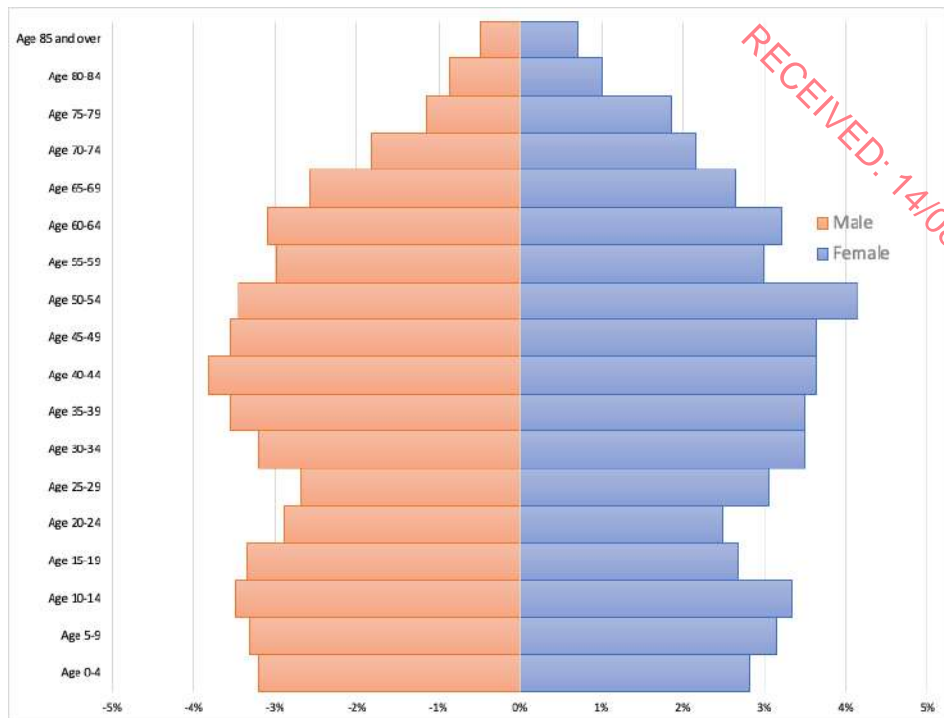


Figure 5.2 - Population Profile by sex & age group in Wicklow Urban Electoral Division (Source: CSO 2016)

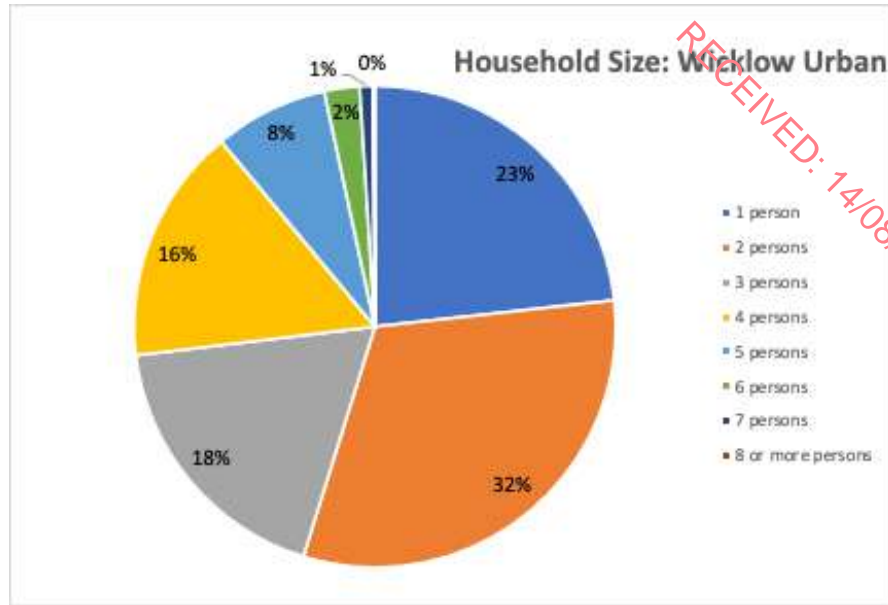
Note: a 9% increase in population can be applied to 2016 figures to reflect overall population change in Wicklow County as published in Census 2022

Accommodation – Household Size

From calculating the average household size in Wicklow (CSO 2016 data for Total Household Population/ No. Occupied Households) it is noted that the household size in the Wicklow County area is 2.86 which increased from 2.79 in the year 2011. The trend towards larger household sizes is expected to continue over the next decade.

The predominant household size in the ‘Wicklow Urban’ Electoral Division area is 2 people (CSO 2016) as is indicated in the Figures below. This equates to 32% or 813 of a total of 2,560 households.

In the ‘Wicklow Rural’ area it is evident that 4 person households present the most common household size at 25% of total households, as highlighted on the charts below. It is also worth highlighting that the number of 2 person households is high in the ‘Wicklow Rural’ Electoral Division, accounting for 24% or 645 of the total 2,632 households.



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Figure 5.3 - Percentages of the different household sizes in the 'Wicklow Urban' ED (Source: CSO 2016)

Note: a 9% increase in population can be applied to 2016 figures to reflect overall population change in Wicklow County as published in Census 2022

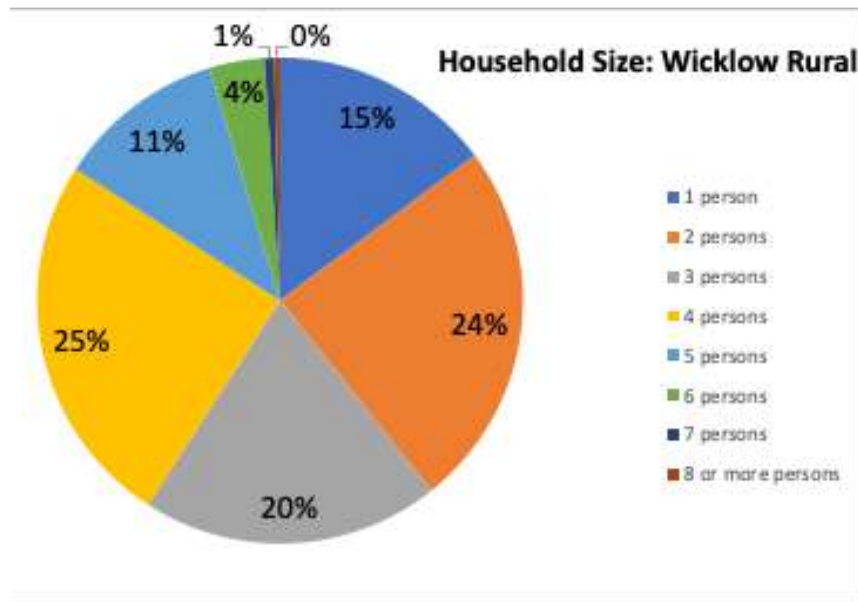


Figure 5.4 – household Percentages of the different household sizes in the 'Wicklow Rural' ED (Source: CSO 2016)

Note: a 9% increase in population can be applied to 2016 figures to reflect overall population change in Wicklow County as published in Census 2022

Whilst we acknowledge the above figures, which clearly state that nearly one third of the surrounding area comprises 2 or 4 person units, we will apply the 2.86 county average within this report as an average household size projected for the proposal.

This said, the overall proposal (352 no. dwelling units) is expected to generate a population of c. 1008 no. persons (352 x 2.86).

The key points to note are as follows:

- The total number of persons in Wicklow Urban and Wicklow Rural EDs is 6,762 and 8,163, respectively.
- The average household size in Wicklow County is 2.86 persons.

- Nearly a third of the local community comprises 2 - person households.
- The proposal (352 no. residential units) will generate a total population of c. 1008 persons.

We confirm that the above statistics area applied throughout this chapter to allow for conclusions be drawn.

5.3.2 Characteristics of the Proposal

The proposed development will consist of the following:

Construction of 352 no. residential units comprising 220 no. 2-4 bedroom houses and 132 no. 1-3 bedroom apartments.

Provision of private, communal and public open space. Provision of a new park to the north and west of the site (c.4.34ha).

All internal residential access roads and cyclist/pedestrian paths serving the proposed development.

Provision of car and bicycle parking.

Proposed pedestrian connections and landscape revisions to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

All vehicular and pedestrian connections between Tinakilly Park and Rathnew Village via a new section of the Rathnew Inner Relief Road.

All associated site development works, services provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

No further changes to development permitted under WCC Refs. 17/219/ ABP Ref. PL27.301261, 20/1000, 21/411, 22/837 or 21/1333.

5.3.3 Potential Impact of the Proposal

Construction Phase

The construction phase has no potential impact on the existing population of the area, given that it will be a finite process and it is expected that the workforce will travel from its existing place of residence rather than staying in temporary accommodation in the area. The impact on the local community is considered elsewhere in Section 5.5 of this Environmental Impact Assessment Report under 'Land Use and Social Patterns'.

Operational Phase

The development will add to the existing population of the area by c. 1008 persons and will increase and improve the housing stock. It is expected that the development will have a permanent positive impact on the demography and economic future of the area, and its ability to support related infrastructure and services.

Do-Nothing Impact

It is anticipated that the 'do-nothing' approach would result in the stagnation of development in the area. The subject site features several zonings, including Residential (R1); Residential (R2); Active Open Space (AOS) and Passive Open Space (POS).

Objectives outlined in the Wicklow-Rathnew Development Plan and the Clermont-Tinakilly Action Area Plan note that planned development of residential dwellings and open space is of paramount importance, thus, to adopt the 'do-nothing' approach would adversely affect these objectives.

5.3.4 Remedial and Reductive Measures

Construction Phase

The construction phase of the proposed development is unlikely to generate any significant adverse impact on the demography of the area and is more likely to have a positive economic impact. As such, no remedial or reductive measures are considered necessary. Any impacts on the community in the area are considered elsewhere in Section 5.5 of this Environmental Impact Assessment Report.

Operational Phase

No remedial or reductive measures are considered necessary during the operational phase. The proposed development will provide additional housing in a sustainable manner.

5.3.5 Predicted Impact of the Proposal

Construction Phase

It is not envisaged that any increase in population will occur during the construction phase. The proposed development is likely to generate additional income for existing shops and services.

Operational Phase

As outlined previously, should the subject development proposal proceed, it would result in an increase in population of c. 764 persons. This represents a beneficial impact for the area within the Wicklow Urban and Wicklow Rural ED areas and is entirely compatible with the residential policies and objectives of Wicklow County Council as outlined in the Wicklow Rathnew Development Plan (2013-2019).

Worst Case Impact

The failure of the proposed development to proceed will not lead to any adverse impacts on the existing population of the area. However, it would impede the planned growth in the area per the relevant statutory national and local planning documents.

5.4 Employment and Land Use

5.4.1 Receiving Environment

Employment

Based on standard International Labour Organisation (ILO) criteria, an estimated 2,554,600 persons were in employment in Q2 2022, up 8.7% (+205,500) from 2,349,100 in Q2 2021.

The increase of 205,500 (+8.7%) in employment is composed of increases of 97,000 (+7.7%) for males and 108,500 (+10.0%) for females in the year to Q2 2022.

The number of people who were in employment but were absent from work during the reference week (i.e. temporarily absent from work for reasons such as holidays, sick leave or family leave) was 187,200 or 7.3% of those employed, compared to 220,900 or 9.4% of those employed in Q2 2021.

This resulted in an increase of 9.4% or 7.1 million hours worked per week from 75.9 million hours in Q2 2021 to 83.0 million hours in Q2 2022.

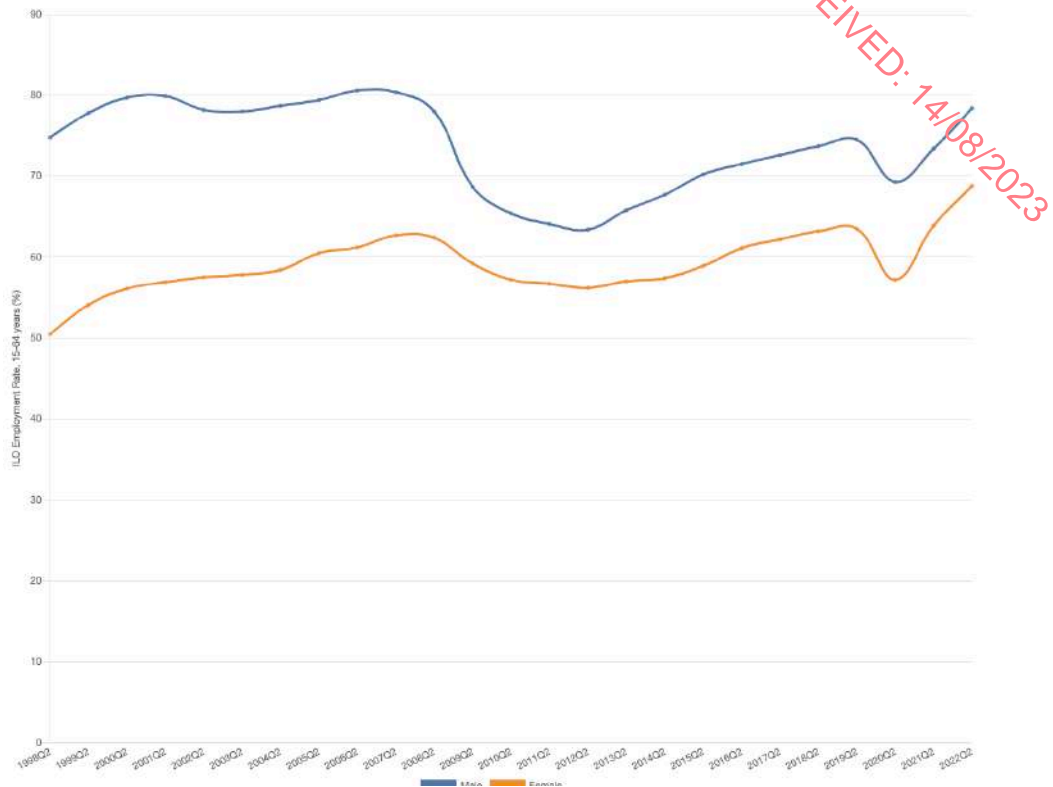


Figure 5.5: Employment Rate in Ireland 1998 (Q2) – 2022 (Q2)

Employment Status

The number of employees increased by 171,200 (+8.5%) in the year to Q2 2022 to 2,192,000, while the number of self-employed increased by 34,400 (+11.2%) to 341,000.

Employment increased by 205,500 in the year to Q2 2022, with 138,000 (+7.4%) more persons in full-time employment and 67,500 (+14.2%) more persons in part-time employment.

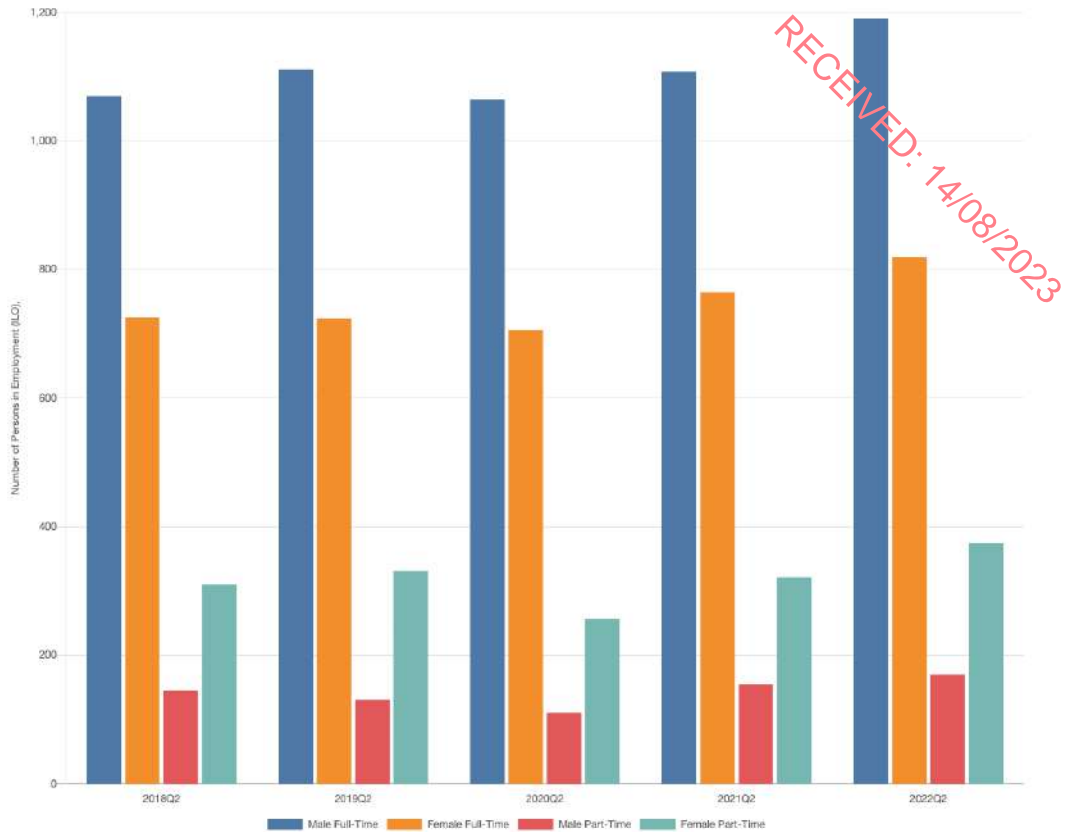


Figure 5.6: Persons aged 15 - 89 years in employment classified by sex and full-time/part-time status, Q2 2018 – Q2 2022

Overall, Employment increased by 205,500 in the year to Q2 2022, with 138,000 (+7.4%) more persons in full-time employment and 67,500 (+14.2%) more persons in part-time employment.

Unemployment

To establish a more balanced picture of the employment situation it is necessary to also examine trends in unemployment in Ireland over a comparable timeframe. The most pertinent figures in relation to unemployment are the Live Register figures, which are published on a national and local level. It should be noted however, that the live register lists those persons who are available for work but not currently employed. In addition, it includes part-time workers; casual workers and those in receipt of unemployment benefit or assistance. As such, it is not a true indicator of unemployment, but a useful tool by which to measure fluctuations in the local and national employment circumstances.

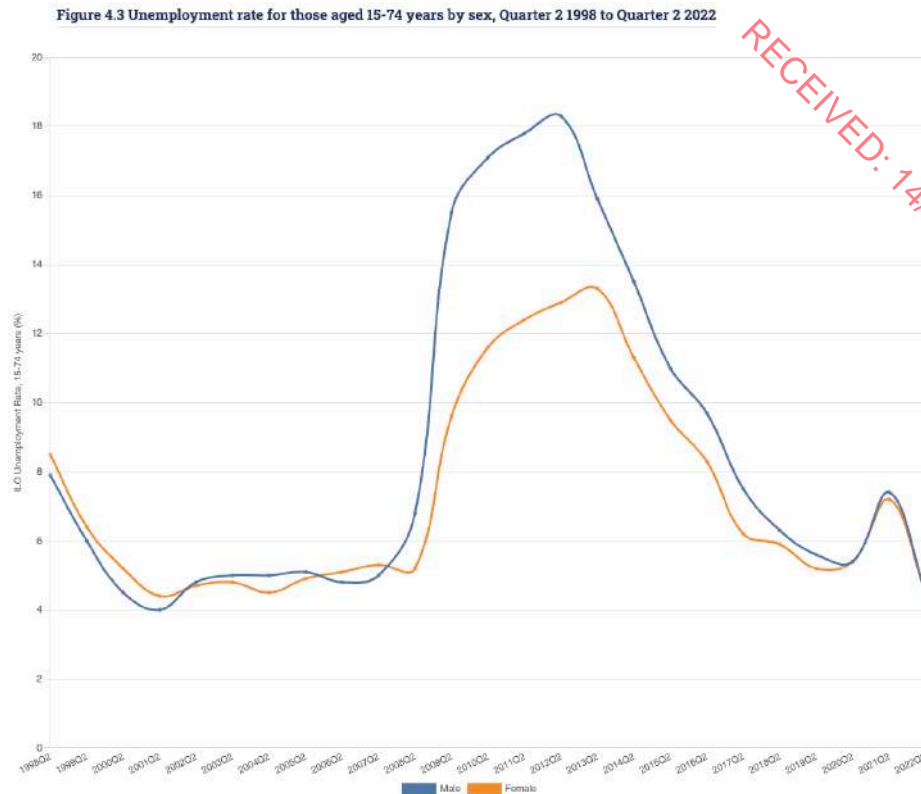


Figure 5.7: No. of Unemployed Persons aged 15-74 years classified by sex, Q2 1998 – Q2 2022

The number of persons aged 15-74 years who were unemployed decreased by 64,200 (-34.9%) to 119,900 in the year to Q2 2022, using standard International Labour Organisation (ILO) criteria. The unadjusted unemployment rate for persons aged 15-74 years decreased from 7.3% to 4.5% over the year to Q2 2022.

Unemployment decreased by 36,300 (-36.5%) for males to 63,200 in the year to Q2 2022 compared with a fall of 27,900 (-33.0%) to 56,700 for females over the same period. The unemployment rate for males was 4.5% in Q2 2022 down from 7.4% a year earlier while the corresponding rates for females were 4.5% and 7.2% respectively.

The unemployment rate for those aged 15-24 years, known as the Youth Unemployment Rate, stood at 11.4% in Q2 2022 down from 21.1% in Q2 2021.

On an annual basis, unemployment decreased in all eight NUTS 3 regions with the largest decrease occurring in the Dublin region (-18,900) followed by the South-West region (-9,500).

Just under seven in ten (69.1%) of unemployed people in Q2 2022 were in short-term unemployment (less than one year). Over the year to Q2 2022, short-term unemployment fell by 42,500 (-33.9%) to 82,800 while there was a fall of 17,700 (-35.8%) in the numbers of long-term unemployed to 31,800.

The long-term unemployment rate decreased from 2.0% in Q2 2021 to 1.2% in Q2 2022. Just over a quarter (26.5%) of unemployed persons were in long-term unemployment in Q2 2022 which is down from 26.9% a year earlier.

Employment - Conclusion

In accordance with Development Plan policy, there is an identified need to accommodate future generations within the Wicklow and the Greater Dublin Area through the proper planning and development of new neighbourhoods. It envisages that a certain level of local employment will arise from the increase in population and the associated increase in employment opportunities. It is considered that the proposed development will have an increasingly positive effect on employment in the local community.

Land Use - Existing Retail Provision

A review of the area surrounding the subject site confirms that there is an ALDI supermarket located to the northwest of the subject site in Rathnew. In addition to this there are a number of supermarket facilities within Wicklow Town to the southeast of the development site as follows:

- Lidl - Rathnew Road, Wicklow
- Tesco - Whitegates, Wicklow
- SuperValu - Wenworth Place, Wicklow

In addition to the above, local retail facilities are noted as follows:

- Centra - Mount Usher Court, Ashford
- Centra, Merrymeeting Shopping Centre

The Aldi to the northwest of the development site located along the R750 road, Lidl on Rathnew Road, Tesco at Whitegates, SuperValu at Wenworth Place and Centra at Merrymeeting Shopping Centre would be the main shopping facilities utilised by residents of the area.

Retail Provision – Conclusion

It is concluded that there are sufficient retail facilities in the area to cater for the proposed scheme. There is an array of supermarket and local shops in the vicinity of the proposed development that the future residents of the development will avail of.

5.4.2 Characteristics of the Proposal

The new resident population will provide an increased market for the local shops and services and may result in the creation of employment opportunities to cater for this increased demand for goods and services.

5.4.3 Potential Impact of the Proposal

Construction Phase

As previously noted, the site is zoned for residential and open space uses, thus the proposal is deemed to be an acceptable form of development. Direct and indirect employment will be generated as a result of the development during the construction phase.

Operational Phase

The increase in population that will result from this proposal (c. 1008 persons), has the potential to bring increased job security to existing jobs in the vicinity and will also help to stimulate the local economy by creating an increased demand for services which will lead to job creation.

Do-Nothing Impact

In this instance a ‘do-nothing’ impact would result in the loss of considerable direct and indirect economic and social benefits.

5.4.4 Remedial and Reductive Measures

The proposed development will be entirely beneficial in employment terms, and no remedial or reductive measures are considered necessary.

5.4.5 Predicted Impact of the Proposal

Construction Phase

The proposed development will provide important construction and related employment. In addition to the direct financial and employment benefits of the construction programme itself, it is anticipated that builders' suppliers and other related services would benefit significantly during the construction period.

Overall, the construction programme of the proposed development will be of significant benefit to the local and wider economy, due to the income and increased expenditure that will result.

Operational Phase

When the residential dwellings of the subject development scheme are inhabited, there will be considerable scope for the contracting and purchasing of local goods, supplies and services in the area. This multiplier effect can be expected to generate and support additional employment and expenditure in the local economy to the benefit of local businesses.

Worst Case Impact

As the proposal would have no profound or irreversible adverse consequences in relation to employment, a 'worst case' impact is not applicable in this instance.

5.5 Land Use and Social Patterns

5.5.1 Receiving Environment - Land Use

As previously outlined, a detailed analysis of all existing community facilities within the Wicklow/Rathnew area is included within the supporting Community Infrastructure Statement (enclosed), which should be read in conjunction with this EIAR.

Educational Facilities Summary

Based on an initial review of capacity available in the various primary and post primary school facilities within the area, our initial review confirms that there is sufficient capacity to cater for the 126 no. primary pupils and 82 post primary pupils arising from the proposal.

[Calculated using Wicklow County population in for primary level (% Age 5 -12 years * 1008) &. Post-Primary level (%Age 13 – 18 years * 1008).

Taking the above into account, it is submitted that there exists sufficient capacity to cater for the primary and post - primary school needs arising from the proposed development of 352 no. units.

All in all, it is submitted that, there is no current requirement for the provision of an additional educational facility to address the demand arising from the subject proposal.

Childcare Facilities

We refer the Planning Authority to application Reg. Ref. 19/853 for a mixed-use development including a creche and offices located at Broomhall Business and Enterprise Park, Merrymeeting Co. Wicklow. The creche facility provided as part of this development will be 576 sq.m and is a purpose built – dedicated facility that will provide childcare services for future occupants of the overall subject development. This permitted creche facility is located approximately 300 metres from the site entrance to the west, suitably

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located to cater for the childcare needs of future residents of development on the Clermont – Tinakilly Action Area lands.

It is noted that since the granting of this permission Keldrum Limited lodged a subsequent application with Wicklow County Council under WCC Reg Ref. 22/590, which proposed alterations to the permitted creche facility to increase the size of the childcare facility from 135 no. childcare spaces to 190 no. full-time childcare spaces. This application was granted by Wicklow County Council and the creche will be constructed on the basis that it will cater for 190 no. childcare spaces, dealing with any demand for childcare that arises from development on the Clermont – Tinakilly Action Area lands. The end user anticipates that the facility can accommodate c.250 children accounting for full-time, part-time and sessional requirements.

It is noted that the applicant has contacted the operator of the Broomhall creche, Little Harvard, to confirm the operational capacity of the creche facility. The creche operator has confirmed that the creche maximum capacity at any one time will be c. 219 children, and over the course of a day the facility could cater for well in excess of 250 children, as children requiring ECCE care and after school care will attend the facility at different times throughout the day.

Community and Social Facilities

An initial review of the surrounding area has confirmed the following provision of facilities:

Libraries

There is 1 Wicklow Council branch library located within the wider area, located within a 3km radius.

A mobile library is set up in Rathnew by Wicklow County Council on Thursdays every fortnight.

Healthcare

The wider surrounding area includes a primary health care centre (Wicklow Primary Healthcare Centre) within 1km serving the local communities and another one within 3km. It is also noted that there are 6 HSE registered General Practitioners serving the area (within 3km).

Religious Facilities

The surrounding communities are served by several churches. We note specifically that the St. Joseph's Church is the closest to the subject site. There are also a number of alternative churches in the wider area such as the Wicklow Parish Church, Saint Patrick's Church, the Church Of The Most Holy Rosary RC or Pentecostals of Dublin.

Local Groups

The surrounding communities of Rathnew and Wicklow have a number of organisations and community groups that support its residents. Notable examples include the Croi Rath Naoi, Wicklow Regatta, Wicklow School of Music and Drama, Wicklow Men's Shed.

Community and Social Facilities Summary

It is apparent from our review of community and social facilities, that there is an appropriate provision within the surrounding area to serve the development now proposed. It is our considered view that there is no requirement arising from the current proposal for the provision of additional facilities within the immediate context.

We trust that this will be satisfactory to the Planning Authority.

Open Space

A review of the area confirmed the presence of the following passive amenity and open space areas:

- Broad Lough
- Vartry Reservoir
- The Vartry River
- Black Castle
- Wicklow Town Beach

A major feature, Broad Lough is just a stone's throw away from the subject site, although it is underutilized in places as an active amenity space.

It is submitted that the future residents of the proposed development will primarily utilise the expansive public parkland areas that are proposed as part of the subject application.

Recreation

With regards to sports and recreation, we submit that notable facilities are located proximate to the proposed development, which is compliant with the objective contained in the County Wicklow Sports and Recreation Policy.

For instance, we note the following - Rathnew G.A.A., Wicklow & Arklow Hillwalkers Association, Wicklow and District Football League, Wicklow County Cricket Club, Wicklow GAA, Wicklow Tai Chi and Kenpo Karate, Wicklow Tennis Club, Wicklow Town Football Club or Wolfe Tone and District Youth Club.

Sporting activities such as soccer, rugby, Gaelic games and pitch and putt are all supported yet there is a lack of support infrastructure such as changing rooms and clubhouses. There is also evidence to suggest that sporting clubs experience considerable difficulty in finding suitable grounds to base themselves and that there are insufficient indoor facilities.

Open Space and Recreational Facilities Summary

It is apparent from our review of open space and recreation within the surrounding area, that there exists a sufficient provision to cater for the proposed development.

We note however that the applicant is delivering a significant quantity of new public open space as part of the current proposal. This proposal is a significant planning gain and a key benefit of the current application.

On review of proposals submitted, it is apparent there are several appropriate plans for the delivery of a well-designed open space area. Notably, the area of open space provided will incorporate a section of Tinakilly Avenue along the southern boundary of the site and create a park in this location that will connect Tinakilly Park to the south of the site to the subject proposal for pedestrians. A riverine walk is provided in the area of open space provided in the northern portion of the subject lands.

This area of active open space has the potential to serve a variety of potential end users, be it strollers from Rathnew Village, future inhabitants of the proposed development or visitors wishing to use the new public park elements provided. All considered, it is submitted that the area of open space shall deliver new activity to this area, which is a welcome addition in terms of open space and recreation requirements.

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5.5.2 Potential Impact of the Proposal

Construction Phase

The scale of the development will inevitably lead to noticeable impacts during the construction phase. These can largely be summarized as:

- Temporary increase in vehicular traffic
- Temporary increase in noise; dirt; and dust generation
- Temporary increase in employment opportunities

It is expected that short-term adverse impacts will be experienced mainly by the resident and working populations and to a lesser extent by any visiting/tourist community. The adverse impacts being considered here would generally be of a short-term nuisance nature and as such would not affect quality of life for existing residents in the long term.

Operational Phase

A proposal of this nature at the subject site would have the following potential impacts during its operational phase:

- Increase the population of the area.
- Increase demand for local resources.
- Increase support and demand for local businesses and services.
- Increase level of local traffic.
- Change the character and appearance of the subject site.
- Increase critical mass capable of supporting increased public transport options.

The resident community would experience these impacts in several ways. The growth in population of the neighbourhood may exert pressure on existing residential facilities ranging from public service facilities, community and commercial uses and schools. The existing local business community would be expected to receive increased patronage.

The community may experience a change in mobility consequent to increased congestion of the road network or actual physical development.

An alteration to the actual physical environment of the neighbourhood may affect the spatial perceptions of the community living in this area. However, it should also be noted that the increased population resultant from the proposed development will help underpin the viability of existing community, social, recreational, and school facilities as the existing receiving community ages. The proposed development will provide new community, thus adding to the vitality of the existing community.

An increase in the residential and working population would ultimately increase the critical mass of the area and therefore provide a significant support base for the introduction of public transport systems over the longer term.

Do-Nothing Impact

A do-nothing scenario in this case would result in the perceptions of the community remaining unchanged.

5.5.3 Remedial and Reductive Measures

Construction Phase

Possible adverse impacts arising from the construction phase will be mitigated by various strategies. Dust and dirt will be minimised by wheel washing of heavy vehicles and dust will be managed by spraying stockpiles when conditions are dry. It is usual to restrict construction-working hours, including construction traffic, to minimise the impact on nearby noise sensitive locations. The community will be unavoidably aware of the

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construction phase while it is in progress, but it is expected that any inconvenience will be minimised by the standard building controls.

Operational Phase

The population increase arising from the subject proposal accords with the zoning of the site, the objectives of the Wicklow County Development Plan 2022-2028, the agreed Clermont/Tinakilly AAP and the relevant local and nation statutory planning and guideline documents. Furthermore, it will add to the sustainability of local businesses and services. As such, no remedial measures are required.

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5.5.4 Predicted Impact of the Proposal

Construction Phase

It is likely that any impacts during the construction phase of the subject development proposal will be temporary, mainly affecting the residential community and to a lesser extent, the working and visiting communities of the area. However, with due regard for the remedial and reductive measures proposed during the construction period, the impact of the proposed development on communities in the area will not be significant and any impact will only be temporary.

Operational Phase

An increase in demand for local goods and services is likely to occur as a result of the development of residential dwellings. It is expected that the character of the local area would change, resulting in the creation a new vibrant neighbourhood, contributing to the Rathnew Town living environment.

Worst Case Impact

The subject proposal will not produce any unacceptable or irreversible changes in the local community. A worst-case scenario is thus not applicable in this instance.

5.6 Health and Safety

Construction Phase

Dust generated during the construction phase of the project will potentially impact the air quality within the immediate surrounds of the subject site. The most significant impacts are associated with excavation and construction traffic, both of which are dependent upon weather conditions.

A project-specific ‘Construction and Environmental Management Plan’ (CEMP) will be established and maintained by the contractor. The CEMP will also include a Waste Management Plan, prepared in accordance with the Department of Environment, Community and Local Government guidelines.

No lasting impacts are expected, and temporary impacts will be effectively managed through mitigation measures, in accordance with the CEMP, which will include a specific Dust Minimisation Plan.

Operational Phase

As the proposed development includes part construction of the Rathnew Inner Relief Road, a significant human asset, upon completion there will be significant improvements to traffic and access conditions for Rathnew residents. In addition to the above, the proposal will provide additional material assets, including SuDS water infrastructure.

5.7 Traffic Congestion

Construction Phase

The residual impacts of the construction phase are a negative temporary impact upon the road network. It is envisaged that a construction management plan be put in place between the contractor and the Wicklow County Council prior to work commencing.

This will assist with ensuring construction vehicles do not impact on the morning and evening peak periods on the local road network. The residual impacts of the operational phase on traffic will result in a negligible impact upon the surrounding road network. The development flows will not have a material impact upon the operation of the nearby junctions.

Operational Phase

New pedestrian and cycle infrastructure is proposed within the development to promote sustainable travel to and from the site.

5.8 Interactions

A comprehensive analysis of all identified inter-related potential likely and significant impacts are addressed in specific, subject-based chapters within this EIAR. Overall, the comprehensive environmental assessments undertaken show that the proposed development will not result in any significant adverse effects upon the environment. Mitigation measures are proposed to avoid, remedy, or reduce identified impacts where necessary.

5.8 Monitoring

Measures to avoid negative impacts on population and human health are largely integrated into the overall design of the proposed development. Compliance with the design and layout of the proposal applied for will be a condition of the development if granted. Monitoring will be managed via the Building Regulations certification process and by the specific conditions outlined in any grant of permission. Monitoring for compliance with health and safety requirements will be undertaken by the project supervisor for the construction process.

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6 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

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6.1 Introduction

This chapter describes the existing land, soils, and groundwater aspects of the proposed development site. An assessment is made of the proposed development's likely impact on these elements during the construction, and operational phases.

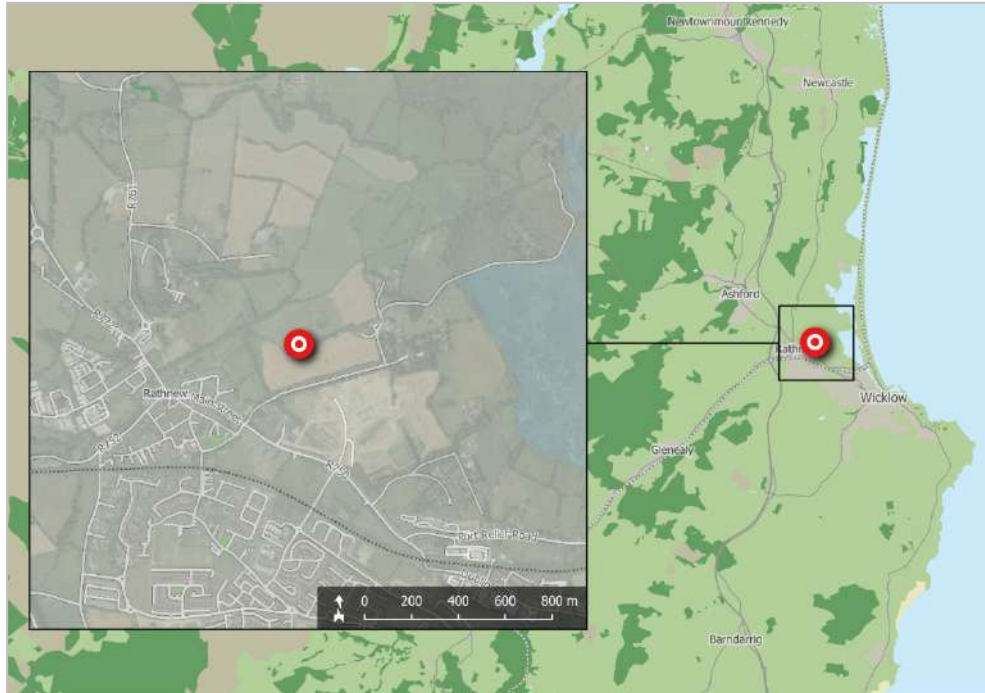


Figure 6.1 – Development Site Location (sources: EPA, NTA, OSM Contributors, Google)



Figure 6.2 – Site Extents and Environs (sources: NTA, OSM Contributors, Google)

This chapter has been prepared by Robert Fitzmaurice and Gordon Finn of CS Consulting. Robert is a Chartered Engineer (CEng) with Engineers Ireland and has been practicing as a Civil/Environmental consultant for over 20 years. Robert holds an undergraduate degree in Civil & Environmental Engineering and a master's degree in Industrial Engineering, with Postgraduate Diplomas in Environmental Engineering and Planning & Environmental Law. Gordon holds BA/BAI and MAI degrees in Civil, Structural, and Environmental Engineering from the University of Dublin, and is a member of the Institute of Engineers of Ireland. His relevant professional experience includes the preparation of Environmental Impact Assessment Report chapters for a broad range of residential, commercial, and institutional developments.

This chapter presents an assessment of the impacts of the Proposed Project on land, soils, and hydrogeology (groundwater). It defines the study area, the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to land, soils, and groundwater, and presents the findings of the impact assessment. This assessment is based on a desktop study of the site, including publicly available information, and a site investigation report carried out by Ground Investigations Ireland in November 2022 (report no. 11957-06-22, attached as **Appendix 6A**).

6.2 Subject Site and Characteristics of the Proposed Development

6.2.1 Subject Site Characteristics

The site of the proposed development is located at Tinakilly, Rathnew, Co. Wicklow, in the operational area of Wicklow County Council. The area enclosed by the planning application boundary extends to approximately 16.8ha.

The subject site is on the northern periphery of Wicklow Town, with Wicklow town main street approximately 2 km to the south. The site is located approximately 46km south of Dublin City Centre and 71 km from Dublin International Airport. The lands are proximate to the M11, which link Dublin with Wexford and Rosslare Harbour.

To the south, the site is bound by an access road, which leads to Tinakilly House. Tinakilly House is located immediately to the east of the site and currently operates as a country house hotel. The subject site is bounded on all other sides by agricultural land (predominantly arable).

6.2.2 Development Description

A full description of the proposed development is provided in the statutory notices and in Chapter 2 of the EIAR. Briefly summarised, the proposed development comprises the construction of 352no. residential units:

- 220no. 2-4 bedroom houses
- 132no. 1-3 bedroom apartments

The proposed development includes the completion of the Rathnew Inner Relief Road (RIRR), connecting the R750 and R761 regional roads, and the provision of 3no. new junctions on this road.

6.3 Assessment Methodology

6.3.1 Legislation and Guidance

The following relevant policy, legislation, and guidance has informed the impact assessment:

- EPA guidance document ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2022’ (EPA, 2022).
- The Institute of Geologists of Ireland guidance document ‘Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements’ (IGI, 2013).
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, Draft’ (EPA, 2015).
- European Union Water Framework Directive (WFD) (2000/60/EC). The following legislation in Ireland governs the shape of the WFD characterisation, monitoring and status assessment programmes in terms of monitoring different water categories, determining the quality elements and undertaking characterisation and classification assessments:
 - European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003)
 - European Communities Environmental Objectives (Surface Water) Regulations, 2009 (‘S.I. No. 272 of 2009 as amended’), as amended in 2012 (by S.I. No. 327/2012), 2015 (by S.I. No. 386/2015) and 2019 (by S.I. No. 77/2019)
 - European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010)
 - European Communities Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016)
 - EC, Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (2017)
 - EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland (2003), containing Draft IGVs for the Protection of Groundwater
 - Groundwater Directives (80/68/EEC and 2006/118/EC)
 - Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA, 2013)

6.3.2 Impact Assessment Methodology

The analysis of the predicted impacts of the proposed development on soils, geology and groundwater during construction and operation is presented in the following sections. The assessment considered geological and hydrogeological features identified within the proposed development site and the surrounding vicinity in accordance with the methodology outlined below, to determine the significance of the effect. Where likely significant effects are highlighted, mitigation is proposed, and any residual effects assessed.

This impact assessment has been undertaken in accordance with The EPA Guidelines on the Preparation of an EIAR (EPA, 2022), Guidelines on the Information to be contained in Environmental Impact Assessment Reports, along with the IGI guidance (Institute of Geologists of Ireland, 2013. Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environmental Impact Statements.) which outlines a 13-step methodology that is divided across four distinct elements:

Initial Assessment (Steps 1 to 5)

Direct and Indirect Site Investigation and Studies (Steps 6 to 9)

Mitigation Measures, Residual Impacts and Final Impact Assessment (Steps 10 to 12)

Completion of the Soils, Geological & Hydrogeological sections of the EIAR (Step 13)

6.3.3 Initial Assessment (Steps 1 to 5)

A review of available relevant information relating to the site, with a focus on associated site investigations undertaken, as summarised in Table 6.2.

The site specific detailed intrusive site investigations and environmental monitoring in the development site area provide a status on the current condition of the site. This information provides the current baseline conditions for the site to allow an initial assessment of how the development might impact on the existing subsurface environment are outlined in Section 6.3.

An Initial Assessment and Impact Determination Step 5 of the IGI 2013 Guidance document shows that Earthworks associated with stockpiles and site investigation will be the only activities below that will take place at the development site:

- Earthworks
- Storage / Transmission of leachable or hazardous materials
- Lowering of groundwater levels by pumping or drainage
- Discharges to ground
- Excavations of materials above the water table
- Excavations of materials below the water table
- Landspreading
- Abstraction / Discharge of energy (heat) from/to the ground

6.3.4 Direct and Indirect Site Investigations and Studies (Steps 6 to 9)

A detailed site investigation has been undertaken on the full site. A detailed intrusive site investigation was undertaken in July and August 2022, as detailed in Section 6.3.

6.3.5 Mitigation Measures, Residual Impacts and Final Impact Assessment (Steps 10-12)

Sections 6.6 and 6.7 identify the likely significant impacts during the construction and operation of the proposed development. The effect of these impacts is assessed and where necessary mitigation measures are presented, and residual impacts are highlighted.

6.3.6 Completion of the Soils, Geological & Hydrogeological Sections of the EIAR (Step 13)

The findings of the intrusive site investigation are outlined in Section 6.4.

According to the IGI 2013 guidance, the assessment requires a description of the development including location, physical characteristics, main characteristic of operation phase of the development and estimation of the type and quantity of expected residues and emissions. A baseline study of the environment is required to illustrate the current conditions and potential natural changes to the environment.

The methodology requires also listing all the potential effects which could be caused to the environment by the development. This must be followed by provision of mitigation measures which would allow avoiding, preventing, reducing and, where possible, offsetting any identified significant adverse effects.

The classification of importance of the site features, magnitude and significance of impacts was conducted according to the guidance developed by National Road Authority (NRA) and presented in IGI document “Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements”.

In order to assess the potential impact of proposed development to the soils geology and groundwater attributes they are classified in accordance with the importance of relevant attributes and quantified the likely magnitude of any impact on these attributes. The rating criteria from the IGI 2013 EIS Guideline was used for assessing the importance of geological and hydrogeological features within the study area. The impact ratings are in accordance with impact assessment criteria provided in the EPA publication Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

6.4 Receiving Environment

This section outlines the site history in relation to potential contamination of soils, geology and hydrogeology and is based on a review of the publicly available data and historical environmental reports. Available desk study maps (6. A1 to 6. A10) from the sources below have been developed for the site, which are presented in **Appendix 6B**.

As part of the desk study that was undertaken to establish the baseline conditions (i.e. soils, geological and groundwater environment), the following sources of information were reviewed:

- Ordnance Survey topographic base mapping, historical mapping and aerial photography;
- Designated Sites, including Geological Heritage Sites, County Geological Sites (as available), Natura 2000 Sites and proposed and candidate Special Areas of Conservation (SACs), Special Protection Areas (SPA) and National Heritage Areas (NHAs);
- Geological Survey of Ireland (GSI) (2021) data viewer for maps on Bedrock Geology, including all known outcrops, karst features, quarries and identified faults and formation boundaries;
- Overburden Geology, thicknesses and overburden types with depositional descriptions such as glacial, fluvial, marine etc. where this information is available;
- Soils, both natural and man-made;
- Groundwater Bodies and Surface Water Bodies, including current qualitative and quantitative status and related objectives and measures;
- Aquifers, showing groundwater abstractions and any related protection zones and discharges to groundwater;
- Groundwater Vulnerability;
- Environmental Protection Agency (EPA) maps (2021). Surface Water Drainage, including areas at risk of flooding (OPW);
- Sites with waste licenses and permits, both current and historical;
- Sites where illegal dumping has been recorded/reported;
- Water Framework Directive mapping on Groundwater and River Waterbodies.
- Sites with recorded/reported contaminated land;
- Sites with recognised aggregate potential and/or which contain economic minerals.
- Previous site investigation reports, including desk-based studies, intrusive investigation reports and groundwater monitoring (see Table 6.2)

6.4.1 Site History

Several sources have been reviewed in establishing the historical context of the site. Primary sources of information include the following:

- Available extracts from Ordnance Survey of Ireland (OSI) historical maps and Aerial Photographs
- Site Investigation Report

Early edition OS maps (6-inch and 25-inch) confirm that the site was undeveloped and used for agricultural purposes.

6.4.2 Surrounding Land Uses

Table 6.1 – Summary of Surrounding Land Uses

Boundary	Land Use
North	The site is bounded by the Rathnew Stream, beyond which is agricultural land.
South	The site is bounded by Tinakilly Avenue, beyond which is the site of a residential development currently under construction.
East	The site is bounded by agricultural land and buy the grounds of the Tinakilly Country House hotel
West	The site is bounded by the Rossana Lower stream, beyond which is agricultural land.

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6.4.3 Site Investigations and Assessments

As part of the investigation for this proposed development an intrusive site investigation was commissioned. Ground Investigations Ireland carried out the works in July and August 2022, with their final report (ref: 11957-06-22), issued in November 2022. A summary of the key site investigations assessment, is provided in Table 6.2.

Table 6.2 – Summary of Relevant Site Investigations

Year	Title	Investigation Scope	Summary
2022	Ground Investigations Ireland: Report 11957-06-22 (A034 Tinakilly Co. Wicklow Ground Investigation Report)	<ul style="list-style-type: none"> ○ 25no. trial pits to max. depth of 4.00m BGL ○ 6no. soakaways to BRE Digest 365 ○ 25no. dynamic probes ○ 6no. cable percussion boreholes to max. depth of 10.00m BGL ○ 16no. plate bearing tests ○ 6no. groundwater monitoring wells 	<ul style="list-style-type: none"> ○ Only natural material uncovered during trial pit investigations. ○ Topsoil to max. depth of 0.40m BGL, underlain by cohesive and granular deposits. ○ Good infiltration rates recorded to north of site; poor infiltration rates to south.

6.4.4 Regional Soils and Geology

6.4.4.1 Topography

The topography of the surrounding region dips toward the sea to the east. Across the site the ground level at its highest point is approximately 29.65mOD falling away to the north-west to approximately 8.0mOD.

6.4.4.2 Soils

The Teagasc database shows that the majority of soil in the area of the site is classified as ‘urban’.

6.4.4.3 Geology

According to the GSI database the bedrock underlying the site is the Maulin Formation. The formation comprises dark blue-grey slate, phyllite & Schist.

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6.4.5 Regional Hydrogeology

6.4.5.1 Aquifer Classification

The bedrock beneath the site is classified as a bedrock aquifer by the GSI. The area surrounding the site is classified as Locally Important (LI) Aquifer which is moderately productive only in local zones. The regional groundwater flow is likely to be to the east discharging to the Irish Sea.

6.4.5.2 Aquifer Vulnerability

Groundwater vulnerability is a measure of the ease with which ground water could be contaminated by human activity. Groundwater vulnerability is also used as an indication of the depth to bedrock in the area as it is a function of the thickness and permeability of the overlying subsoils. According to the GSI database the vulnerability of the aquifer surrounding the site is classed as moderate.

6.4.5.3 Groundwater Recharge Calculations

Recharge is the amount of rainfall that replenishes the bedrock aquifer. Based on the GSI database the recharge in areas on made ground surrounding the site is 71mm/yr.

6.4.5.4 Groundwater Wells and Springs

A review of the GSI databases shows that there are no wells on or within 1km of the site.

6.4.5.5 Surface Water Bodies

The Rathnew Stream forms the northern boundary of the development site proper. The Rossana Lower stream forms the western boundary of the development site. The Rossana Lower stream is a tributary of the Rathnew Stream, their confluence being located at the north-west corner of the development site proper. The Rathnew Stream in turn flows into the Broadlough Estuary approximately 1.2km east-north-east of the development site; this transitional waterbody (TWB) joins the Irish Sea at Wicklow Harbour, approximately 2.6km south-east of the development site.

6.4.6 Protected Features

6.4.6.1 Geological Heritage Areas

There are no known geological heritage areas within the boundaries of the development or the wider surrounding area.

6.4.6.2 Sensitive Features

To the east of the subject lands, approximately 450m away are two environmentally sensitive areas, the Murrough Wetlands SAC & Murrough SPA.

6.4.7 Regional Potential for Contaminated Land

6.4.7.1 Waste Licenses and Permits

No waste permits have been identified for the subject lands.

6.4.7.2 Integrated Pollution and Prevention Control and Industrial Emission Licenses

No IPPC or emission licences were identified for the subject lands.

6.4.7.3 Potential Historic Contamination

The historical background of the sites former land use does not indicate any previous historic land use which would indicate the potential for historic contamination to be present.

6.4.8 Site Soils and Geology

6.4.8.1 Made Ground

The site investigation completed in August 2022 did not indicate the presence of made ground on the site.

6.4.8.2 Natural Soils

Natural soils to an average depth of 400mm were encountered on site.

Cohesive Deposits

COHESIVE DEPOSITS: Two Cohesive deposits were encountered. The upper deposits were encountered beneath the Topsoil and were described typically as brown sandy gravelly CLAY with occasional cobbles and boulders. The lower Cohesive deposits were encountered beneath the granular deposits and were described typically as brown sandy or very sandy gravelly CLAY with occasional cobbles and boulders. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the cohesive matrix. These deposits had some, occasional or frequent cobble and boulder content were noted on the exploratory hole logs.

Granular Deposits

GRANULAR DEPOSITS: Two granular deposits were encountered. The granular deposits were encountered within or at the base of the cohesive deposits and were typically described as brown gravelly silty fine to coarse SAND with occasional cobbles and rare boulders or a grey/black slightly sandy clayey sub-rounded fine to coarse GRAVEL with clay and silt lenses.

The secondary gravel and silt/clay constituents varied across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs.

It should be noted that many of the trial pits where granular deposits or groundwater were encountered, experienced instability. This was described either as side wall spalling or as side wall collapse in the remarks section at the base of the trial pit logs. A significant groundwater strike was noted in the boreholes on encountering the granular deposits and the driller noted blowing sands or gravels during drilling.

6.4.8.3 Bedrock

Bedrock was not encountered during the site investigation works on site. According to the available geological information the bedrock beneath the site comprises the Maulin Formation, which consist of Dark Blue-grey slate, phyllite & Schist.

6.4.8.4 Soil Contamination

The is no historic evidence of pervious site uses which may have led to soil contamination and no made materials were encountered during the site investigation.

6.4.8.5 Tidal Influence

The subject site is located too far from the sea to be influenced by tidal factors.

6.5 **Potential Impact of the Proposed Development**

The potential impacts to soils, geology and hydrogeology from the proposed development is assessed in this section.

6.5.1 **Construction Phase**

The earthworks aspects of the development will include the following:

- Importation (approximately 34,000m³) of suitable material on the site.
- Small cut and fill type earthworks may be required for some civil infrastructure associated with basement slab build ups, pile caps and lift pits.
- Temporary storage of fuel may be required on site for construction machinery.
- Typical site drainage measures such as sump pits and drainage trenches.

6.5.2 **Excavation of Subsoil Layers**

There will be a requirement to excavate subsoil to allow for the reprofiling of the site and for the installation of services.

6.5.2.1 Foundation and Concrete Usage

The proposed foundations and general site construction works will require the use of cement & concrete products. Cement within concrete is highly alkaline and any spillage/injection to piles which migrates through sub-soils would be harmful to groundwater quality. The overall effect on the groundwater in the gravel is considered to be Imperceptible /Not Significant.

6.5.2.2 Construction Traffic, Accidental Spills and Leaks

The site is located within an area of moderate vulnerability which is providing a thick natural protection layer to the underlying bedrock aquifer from potential near surface contaminants. However, there is potential that any fuels or chemicals used during construction, if inappropriately handled or stored or lost through spillages (including fuel leaks from construction machinery), could have a degree of impact on both soil quality and groundwater quality in the area. Accordingly, the potential effects are considered to be temporary, Moderate/Slight-Negative.

6.5.2.3 Geological and Hydrogeological Environment

The site is underlain a by an aquifer but the groundwater in it is separated from it by layer of stiff clay under the site which provided a natural barrier to groundwater contamination migration. The effects from the proposed development during the construction stage is considered to be Imperceptible/ Not Significant.

6.5.3 **Operational Phase**

The operational phase of the proposed development is unlikely to have any significant impacts on the local geological/hydrogeological environment, due to the environmental design considerations that have be incorporated in the detailed design of the proposed development.

Following construction of the development there will be additional hardstanding areas that will increase the amount of stormwater runoff from the area which currently recharges the ground. The proposed development design is such that all surface water is to be designed to the highest level of sustainable drainage system (SuDS) design and is to be collected and attenuated prior to discharge. This will result in a long term positive effect to the SPA.

In relation to the operational phase, the potential impact on the soils, geology and hydrogeology is considered to be long term, Imperceptible/Not significant.

6.5.4 'Do Nothing' Scenario

In this scenario the existing site will remain as is, with no detrimental effects on the environment.

6.6 Ameliorative, Remedial or Reductive Measures

6.6.1 Measures to Address Temporary Stockpiles

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted.
- Selection of plant with low inherent potential for generation of noise where practicable.
- Placing of noisy plant as far away from any noise sensitive receptors where possible.
- Where noise control at source is insufficient, erection of sound-absorbing barriers/hoardings (particularly during site stripping works undertaken close to noise sensitive receptors).
- Haul roads will be well maintained avoiding steep gradients.
- Plant such as pumps and generators which are required to work outside of normal working hours will be enclosed with acoustic enclosures.
- Avoid unnecessary revving of engines and switch off equipment when not required.
- All plant and equipment should be regularly maintained (increases in plant noise are often indicative of future mechanical failure).
- Establishing channels of communication between the contractor/developer and local community that are potentially impacted.

Mitigation measures that aim to control vibration from construction works will include the following:

- The plant and activities chosen to carry out the construction work should be chosen to cause as little vibration as possible while achieving the required purpose.
- All plant and equipment should be regularly maintained to reduce unnecessary vibration.
- Activities causing significant vibration should be located away from sensitive areas and/or isolated using resilient mountings where practicable.

Dust Management; adhere to contractor dust management plan, a primary aim of which will be to avoid dust becoming airborne at the source through best practise and if required, by adopting effective control strategies. Where potential exists for general dust emissions, the following mitigation measures will be implemented:

- Site roads to be regularly cleaned and maintained as appropriate. Local Roads outside the site will be regularly inspected (at least on a daily basis) and cleaned as necessary.

- Any site road that has potential to give rise to fugitive dust will be regularly watered and swept, as appropriate, during extended dry and/or windy conditions.
- Control of vehicle speed within the site.
- Vehicles delivering materials with dust potential will be enclosed with tarpaulin or similar covers to restrict the escape of dust. Vehicles collecting material from the site for off-site disposal will be similarly covered.
- Wheel wash facility close to exit from the site.

Pending assessment for potential re-use, existing stockpiled material will be moved to a designated area of the site for temporary storage. The requirement for stock piling of stripped or imported soil material will be minimised on-site and the Contractor will be required to develop and maintain a detailed stockpile management plan. Where soil or other building materials require stockpiling, the location and moisture content of these stockpiles are important factors which will determine their potential for dust emissions.

In the case of stockpiling, the following mitigation measures will be adopted:

- All stockpiles will be located at least 50m from any watercourse or drainage channels occurring within the site.
- Temporary storage of soil or other materials will be managed (in terms of height, stability and location) to prevent release of windblown dust.
- Regular watering of stockpiles will take place to ensure the moisture content is high enough to increase the stability of the soil/materials and thus suppress dust.
- Soil material will be protected from exposure to wind by covering the material on-site if so required.

6.6.2 Excavation of Subsoil Layers

Precautions will be taken to minimise an impact of construction noise and dust impacting site operators and residents of nearby houses as outlined in the OCEMP report, together with soil and ground gases impacting site workers. The mitigation measures will also apply to this section on the excavation of subsoil layers.

Additional control measures will be implemented by the Contractor over areas suspected to contain trace asbestos. The Contractor will be required to put in place an air monitoring programme to be implemented by an independent specialist to ensure that control measures do not release airborne asbestos fibres from the waste.

As a consequence of these mitigation measures, the potential effects arising from a risk of exposure to site users, construction worker and residents in the nearby houses are considered to be Brief and Imperceptible.

Any shallow excavation required for civil works in the made ground will be monitored by an appropriately qualified person to ensure that should a hotspot of contamination be encountered from physical observations that it is identified, segregated and disposed of appropriately as soon as possible. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Any contaminated soil will need to be disposed of a suitable licenced facility.

If excavated material is to be stockpiled on-site, appropriate environmental protection will be deployed in order to control suspended solids run-off from entering site or off drainage systems. Excavated soils with physical evidence of contamination will be stored on plastic to prevent potential leaching to ground.

6.6.3 Construction Traffic, Accidental Spills and Leaks

The level of construction traffic directly associated with the development will vary over the course of the construction project but during peak works, traffic will be generated from the following activities:

- The removal of excavated material
- The delivery of construction materials
- Staff trips; and
- Site visitors and unscheduled deliveries.

Mitigation measures to prevent leaks and spillage to ground and underlying aquifer units include:

- Designated refuelling in a bunded area on-site if being undertaken on-site.
- Spill kit facilities to be provided on-site. Construction personnel should be trained in spill response.
- Drip trays to be provided when using mobile fuel bowsers.
- Secure bunded area to be used for storage of any chemical on-site.
- Storage of the equipment and potentially polluting materials (fuel, engine oils, and hydraulic fuels) should be organised in a way to prevent potential spill and fuel tanks need to be bunded.
- Overnight parking and refuelling of the plant, should take place on hardstanding fitted with drainage system suitable to collect spills.

Construction traffic impact will be mitigated through the implementation of the construction traffic management plan to be prepared by the Contractor and submitted for approval prior to the commencement of the works. All mitigation measures relating to construction activities are outlined in the OCEMP Report Section on the Construction Traffic Safety prepared for the site development.

6.6.4 Geological and Hydrogeological Environment

Soil and water pollution will be minimised by the implementation of good construction practices. The Construction Industry Research and Information Association (CIRIA) provides guidance on the control and management of water pollution from construction sites (Masters – Williams et al, 2001).

6.6.5 Operational Phase

There are no mitigation measures required for the operational phase.

6.6.6 'Do Nothing' Scenario

Without the above mitigation measures during the construction phase of works there is a potential risk to the environment and human health of works and public. Without ground gas mitigation measures there is a potential human health risk to residents and users of the proposed development.

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6.7 Predicted Impact of the Proposed Development

6.7.1 Construction Phase

As part of the piling works there is a potential to expose minimal contaminated soils to the surface with the following potential effects:

Contamination, such as asbestos, becoming airborne and affecting the human health of workers in the vicinity of the piling works and residents of nearby houses.

The risk of contaminated dust becoming airborne and affecting construction workers is at its highest when the soils are dry. Typically, soil moisture is sufficient to prevent contaminants such as asbestos becoming airborne (Nathanail et al, 2014), however where soil becomes dry there is a likely temporary Negative/Adverse effect, with an overall Profound significance occurring in respect of site workers and members of the public in the immediate vicinity of the works. Use of appropriate mitigation measures as per HSA guidance, risk assessment and air monitoring and protocols in the CEMP will reduce the potential effects to Imperceptible.

Potential risks to construction workers / maintenance workers from soil, shallow groundwater, and dust contamination will be minimised with use of appropriate working methods and use of personal protective equipment (PPE), hygiene procedures and compliance with the CEMP.

The magnitude of this impact is considered to be negligible as it does not affect either the use or integrity or any of the important features. As a result, its significance is considered to be Imperceptible for soil, geology and groundwater with appropriate mitigation measures being implemented.

6.7.2 Operational Phase

During the operational phase of the proposed residential development the contamination in the subsurface made ground and subsoils beneath the site will be present, but protected from becoming in contact with site users by the development infrastructure and hardstanding. Consequently, the proposed development will have a positive effect on the contaminated soil and reduce its effect on potential site users to a permanent Moderate Positive effect.

The development hardstanding areas will reduce the amount of rainfall recharge in this area of the site, which will be redirected through the stormwater drainage system. This will have permanent, moderate, positive effect on groundwater quality and as it will permanently reduce the volume of contaminated recharge draining to the perched groundwater in the made ground and underlying groundwater in the gravel subsoils in the development area.

6.7.3 'Do Nothing' Scenario

Under a 'Do-Nothing' scenario, it is assumed that the subject site shall remain in its current greenfield state. There will therefore be no environmental impact in respect of the soils, subsoils, or groundwater at this site.

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6.8 Monitoring

During removal of any soils from the site during site clearance and construction works, the soils will be examined during excavation to ensure that the soils being moved are consistent with the descriptions and classifications according to the waste acceptance criteria testing carried out as part of the recent site investigations.

During construction the details of the OCEMP will be followed and adhered to.

It is a mandatory requirement by the HSA (HSA 2103) to implement an air monitoring program by an independent analyst for the removal of the asbestos in soil if required for any shallow excavation works in the made ground. The contractor who carries this out will be required to ensure that the control measures do not release airborne asbestos fibres.

6.9 Reinstatement

Reinstatement of site compounds, construction access roads and associated works area will be made to a similar finish to existing or improved conditions.

In general, the main site will be occupied by the proposed new building structures and infrastructure.

6.10 Interactions and Potential Cumulative Impacts

6.10.1 Interactions

This section provides a description of the impact interactions together with potential cumulative impacts.

6.10.2 Traffic and Transportation

The excavation and removal of stockpile soils from the site during the construction phase of the project will have an impact on the traffic levels around the site. During the construction phase, vehicles to and from the site will contribute to an additional traffic impact, in particular for truck movements.

6.10.3 Water and Hydrology

Placement of the development over the area creates a reduction in recharge from the diversion of stormwater from hardstanding areas. Details on the use of a temporary attenuation pond for stormwater from this site development are detailed in Chapter 8.

6.10.4 Waste Management

Details of the waste management are given in the 'Waste Management' chapter. See Chapter 14.

6.10.5 Noise and Vibration

During construction, there will be a number of stockpile removal and construction related activities such as foundation piling which will lead to noise and vibration. Similarly, there will be noise and vibrations associated with the truck movements involved in the removal of the stockpiled soils off site and installation of foundation piles. Details of the noise and vibration are provided in Chapter 10.

6.10.6 Air Quality

The installation of foundation piles will lead to the generation of dust and odours from contaminants present in the subsoils. Details of the air quality mitigation measures are provided in Chapter 9.

6.10.7 Flora and Fauna

The current site surface left after remediation works consists of a 0.3m layer of hardcore. This site has been overgrown in recent years. Details on the site flora and fauna are detailed on Chapter 6.

6.11 Cumulative Impacts

As the site development is being constructed on the existing ground level, excavations are limited to shallow excavations into the made ground under the site. There are no significant potential cumulative impacts from these external developments to the site on the land, soils and groundwater.

6.12 Difficulties Encountered

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

6.13 References

- Geological Survey of Ireland, Online geological and groundwater databases
- Environmental Protection Agency, Online Envision Map databases
- National Parks & Wildlife, Online Envision Map databases
- National Monument Services, Online Historic Environment Map databases
- Institute of Geologists of Ireland, 2013. Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- EPA, 2022. Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

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7 HYDROLOGY

7.1 Introduction

This chapter considers matters pertaining to hydrology and water services that may potentially affect a proposed 352-unit Large-scale Residential Development (LRD) at Tinakilly, Rathnew, Co. Wicklow. In addition, this chapter looks at the potential for the proposed development to influence off-site flooding events. This chapter should be read in conjunction with the Engineering Services Report and the Construction Surface Water Management Plan prepared by CS Consulting, and the Flood Risk Assessment prepared by JBA Consulting, all three of which are submitted separately with this application.

7.2 Methodology

In preparing this chapter, CS Consulting has conducted a desktop study of the development site, informed in particular by the following:

- Site-specific Flood Risk Assessment prepared by JBA Consulting
- Wicklow County Development Plan 2022–2028 Strategic Flood Risk Assessment
- Greater Dublin Regional Code of Practice for Drainage Works
- Environmental Protection Agency mapping
- Office of Public Works flood risk mapping and historical flooding records
- Department of the Environment Flooding Guidelines
- Geological Survey of Ireland mapping
- Local Authority and Irish Water drainage and water supply records

7.3 Baseline Environment

7.3.1 Site Location

The site of the proposed development is located at Tinakilly, Rathnew, Co. Wicklow, in the operational area of Wicklow County Council. The area enclosed by the planning application boundary extends to approximately 16.8ha.

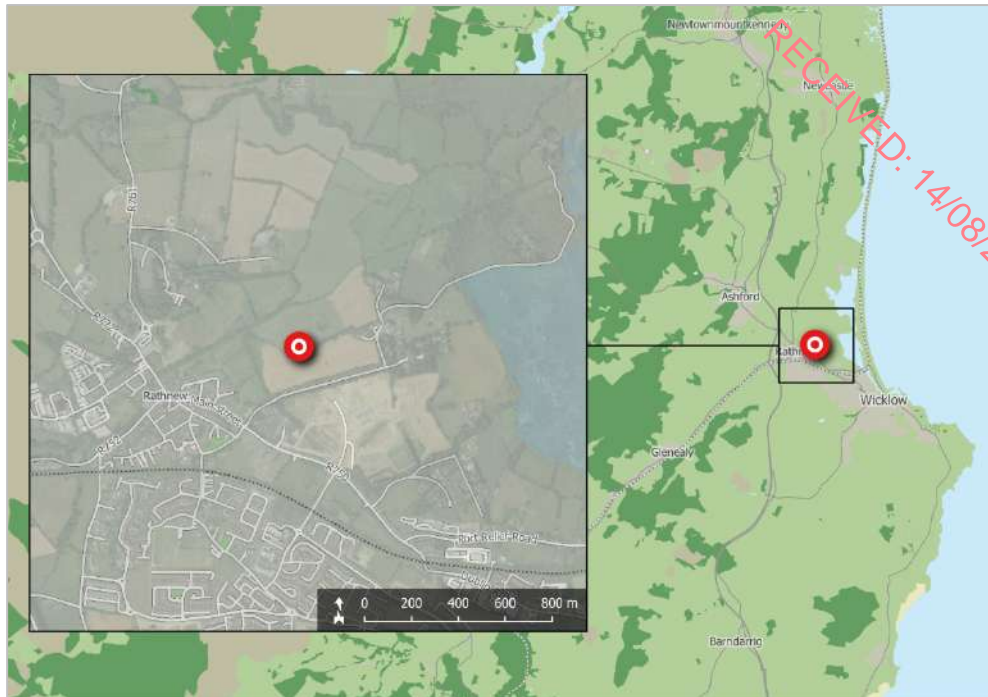


Figure 7.1 – Development Site Location (sources: EPA, OSM Contributors, Google)



Figure 7.2 – Site Extents and Environs (sources: NTA, OSM Contributors, Google)

7.3.2 Surface Water Drainage

The development site topography is generally characterised by a consistent fall to the north and to the west. All stormwater runoff from the main body of the site currently drains to the following 2no. existing watercourses that run along the northern boundary and the western boundary of the proposed development site (see **Figure 7.4**):

- The Rathnew Stream, which forms the northern boundary of the development site proper.
- The Rossana Lower stream, which forms the western boundary of the development site.

7.3.3 Foul Water Drainage

No existing public foul drainage infrastructure is present within or adjacent to the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), a new 225mm diameter foul sewer is however under construction within the permitted southern section of the Rathnew Inner Relief Road. This shall commence in proximity to the development site's southern boundary and shall outfall to the foul drain at the junction of the new Relief Road and the R750.

All effluent generated in Rathnew is conveyed to the Regional Wastewater Treatment Plant (Wicklow Wastewater Treatment Plant - EPA Licence Number D0012-01). This currently has a reserve organic capacity of approx. 15,000 PE (population equivalent).

7.3.4 Potable Water Supply

An existing 315mm diameter public watermain is located along the northern side of the R750, approx. 300m to the south of the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), new watermains connecting to this are under construction within the permitted southern section of the Rathnew Inner Relief Road (RIRR):

- a 225mm diameter watermain along the eastern side of the RIRR.
- a 160mm diameter watermain along the western side of the RIRR.

An existing 2" (51mm approx.) diameter watermain is also in place in Tinakilly Avenue, running along the development site's southern boundary.

7.4 Characteristics of the Proposed Development

A full description of the proposed development is provided in the statutory notices and in Chapter 2 of the EIAR. Briefly summarised, the proposed development comprises the construction of 352no. residential units:

- 220no. 2-4 bedroom houses
- 132no. 1-3 bedroom apartments and duplex units

The proposed development includes the completion of the Rathnew Inner Relief Road (RIRR), connecting the R750 and R761 regional roads, and the provision of 3no. new junctions on this road.

7.4.1 Proposed Storm Water Arrangements

The restriction of post development run-off to greenfield discharge rates is to be achieved primarily through the provision of onsite attenuation storage, which shall retain excess runoff during extreme rainfall events and allow this to be discharged at a controlled rate. In order to comply with Wicklow County Council's requirements, the subject site must retain stormwater generated on site during a 1-in-100-year storm event (increased by 20% for predicted climate change effects) and limit stormwater discharge from the site to the greenfield discharge rate.

The greenfield runoff rate at the development site has been established as 6.56 l/s/ha. A total attenuation storage volume of 3,369m³ is required for the development site, and a total attenuation storage volume of 3,453m³ is provided. Refer to the stormwater attenuation calculations attached as **Appendix 7A**.

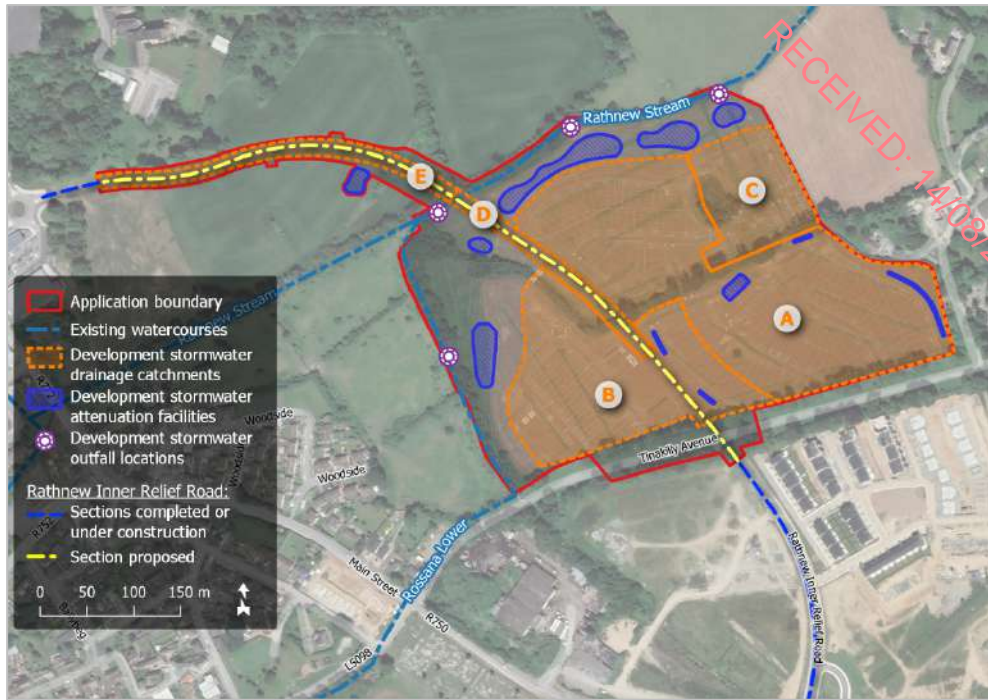


Figure 7.3 – Stormwater Drainage Catchments (sources: OSM Contributors, Google)

The proposed development comprises five distinct catchments for the collection and disposal of stormwater runoff (see Figure 7.4):

- Catchment A has an area of 5.93ha and comprises the majority of the site to the east of the proposed Rathnew Inner Relief Road (RIRR) alignment.
- Catchment B has an area of 3.16ha and comprises the southernmost section of the RIRR within the development boundary, as well as areas to the west and east of this.
- Catchment C has an area of 1.30ha and comprises the north-east corner of the development site.
- Catchment D has an area of 0.44ha and comprises the central section of the RIRR within the development boundary.
- Catchment E has an area of 0.62ha and comprises the northern section of the RIRR within the development boundary.

Areas outside these defined catchments shall not be significantly developed and shall maintain their current natural drainage patterns.

The proposed new storm water drainage arrangements have been designed and will be constructed in accordance with:

- The Greater Dublin Strategic Drainage Study (GSDSDS), Volume 2
- The Greater Dublin Regional Code of Practice for Drainage Works
- British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
- Part H of the Building Regulations (Building Drainage)

7.4.2 Proposed Foul Drainage Arrangements

The proposed development will require a new separate foul drainage network to collect and convey the effluent generated by the proposed development. The drainage network for the proposed development has been designed in accordance with: British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings) the Irish Water Code of Practice for Wastewater Infrastructure

Given the topography of the site, the development's gravity foul drainage network shall comprise two distinct parts:

- a northern section, which shall fall to the south and outfall into a new foul pumping station located at the site's southern boundary; and
- a southern section, which shall fall to the south and outfall into a foul manhole located at the site's southern boundary in the Rathnew Inner Relief Road (RIRR).

The proposed pumping station shall pump the collected foul effluent via 80mm and 150mm diameter rising mains to an approved standoff manhole in the new section of the RIRR to be built as part of this development, close to the development's southern boundary. From this point, the effluent shall discharge to a 225mm diameter foul sewer to be laid in this new section of the relief road; this in turn shall connect to the new 225mm diameter foul sewer currently under construction within the southernmost section of the RIRR (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118).

The proposed pumping station will be located within a secure compound, with 2.4m high paladin fencing and a 5m wide access gate. The pump chamber will contain duty and assist pump sets and 24-hour storage will be provided in the form of a concrete tank with a high level overflow and low level return. The control panel will be fitted with a high level alarm and text/web alert system to ensure prompt response in the event of an emergency.

7.4.3 Proposed Potable Water System

It is proposed to continue the 225mm diameter and 160mm diameter watermains along the eastern and western sides of the RIRR, which are currently under construction (as permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), and to supply the proposed development with potable water via new 150mm diameter and 100mm diameter connections to these.

The development's proposed water supply network has been designed in accordance with the specifications and requirements of Irish Water, as well as with the Department of the Environment's 'Recommendation for Site Development Works' and the requirements of Wicklow County Council. In particular:

Hydrants are positioned within 46m of all parts of the dwelling units.

Air valves are located at the high points of loops.

Scour valves are located at the low point of loops.

The proposed residential 100mm watermains have been designed as ring mains.

Each residential building has an individual service connection, with a water meter located within the footpath.

Bulk water meters are provided at the development's 2no. proposed connections to the public watermains along the eastern and western sides of the RIRR.

The proposed watermain network system has been designed in accordance with the specifications and requirements of Irish Water.

7.5 Existing Flood Risk

The flooding guidelines categorise the risks associated with flooding into three areas: Zones A, B, and C. This categorisation is indicated below.

Zone A – High Probability of Flooding

Where the average probability of flooding from rivers and sea is highest (risk greater than 1% annually for river flooding or 0.5% annually for coastal flooding).

Zone B – Moderate Probability of Flooding

Where the average probability of flooding from rivers and sea is moderate (risk between 0.1% and 1% annually for river flooding, and between 0.1% and 0.5% annually for coastal flooding).

Zone C – Low Probability of Flooding

Where the probability of flooding from rivers and sea is low (risk is less than 0.1% annually for both river and coastal flooding).

In accordance with the Flood Risk Management Guidelines, dwellings are classified as 'highly vulnerable developments'. These should generally not be located in Flood Zones A or B. Review of Eastern Catchment Flood Risk Assessment and Management Study (CFRAM) mapping confirms that the residential part of the site is in Flood Zone C. However, the proposed Rathnew Inner Relief Road alignment extends to the west of the site, where it passes over the Rathnew Stream that discharges into Broadlough Estuary. The CFRAM mapping indicates a significant floodplain extent that must be crossed.

7.5.1 Fluvial Flooding

The proposed residential development is outside the 1% AEP and 0.1% AEP flood extent areas and is within Flood Zone C. The proposed Rathnew Inner Relief Road alignment extends to the west of the site, where it intersects with Flood Zone A/B. The risk of fluvial flooding impacting upon the residential properties within the subject development is therefore negligible, even during a 1-in-1000-year flooding event.

A review of the Office of Public Works flood maps database (www.floodmaps.ie) for the area does not indicate historical flooding at the site. See the OPW Past Flood Event Local Area Summary Report provided as **Appendix 7B**. Please also refer to **Appendix 7C** for the relevant CFRAM Fluvial Flooding Extents maps.

7.5.2 Tidal Flooding

Although in close proximity to the Irish Sea, the site was not deemed to be at risk from tidal flooding. Please refer to **Appendix 7C** for the relevant CFRAM Coastal Flooding Extents maps.

7.5.3 Pluvial Flooding

Pluvial flooding is the result of rainfall-generated overland flows that arise before run-off can enter a watercourse or sewer. It is particularly sensitive to increases in hardstanding ground and is usually associated with rainfall events of high intensity. According to the GSI, the site was not impacted by the Winter 2015/2016 Surface Water Flooding event. Refer also to the OPW Past Flood Event Local Area Summary Report provided as **Appendix 7B**.

The site is greenfield and there will consequently be loss of permeable area as a result of the development. Nonetheless, opportunities for improvements in management of surface water should be incorporated into the drainage design. Specific mitigation measures are proposed in **Section 7.7**.

7.5.4 Existing Off Site Public Drainage Network Performance

It is the understanding of CS Consulting that at present there are no issues with the local drainage arrangements. The subject development will not discharge any surface water to the public drainage system.

7.5.5 Groundwater Flooding

Groundwater flooding results from high sub-surface water levels that impact upper levels of the soil strata and overland areas that are usually dry. The groundwater vulnerability has been classified as 'High' by the Geological Survey of Ireland (GSI) groundwater vulnerability maps. Review of the GSI web portal confirms that there are no known karst features in the area. See **Appendix 7D** for GSI mapping showing background groundwater and geology data for the subject lands.

In summary, there is no known risk of groundwater flooding in this area. Having reviewed the GSI data, groundwater flooding will not be considered and has been screened out at this stage.

7.6 Potential Impacts of the Proposed Development

7.6.1 Potential Construction Phase Impacts

In relation to the construction phase, the stripping of the existing ground surface and construction activities could potentially lead to increased sedimentation within nearby surface waters. Operation of machinery and use of chemicals and concrete during the construction phase has the potential to pollute the nearby public surface water network and receiving watercourse. However, the implementation of mitigation measures highlighted in this report will significantly reduce the likelihood and magnitude of the potential impacts on the surface water environment occurring during the construction phase. The potential impact is therefore considered to be low with a short duration and therefore considered to be not significant.

Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities. This has the potential to result in increased silt and pollutant levels into existing nearby watercourses. In the absence of mitigation, it is likely that this activity would have a slight, temporary adverse impact on the watercourses.

Heavy rainfall or a high level of ground water could produce ponding in open trenches. Discharge of this rainfall pumped from excavations to existing watercourses could compromise their capacity and thereby cause flooding. This may be characterised as a potential moderate, temporary adverse impact.

Discharge of wash water from concrete trucks and discharge of vehicle washdown water may contaminate the groundwater. In the absence of mitigation, it is likely that such activities would have a short-term temporary, moderate adverse impact on groundwater and local watercourses within the area.

During construction of the development, there is a risk of localised accidental pollution incidences from the following sources:

- Spillage or leakage of oils or fuels stored on site.
- Spillage or leakage of oils and fuels from construction machinery or site vehicles.
- The use of concrete and cement during foundation construction.

7.6.2 Operational Phase Water and Wastewater Demand

The proposed development will give rise to increased demand for both waste water services (circa 8.163 l/sec peak flow) and for potable water (circa 8.245 l/sec peak demand). The subject lands have been zoned for the proposed usage and as such the current zoning would have taken into consideration the predicted effluent volumes to be

generated on site by residential development, as well as the predicted increase in potable water demand.

There is a risk of surface water ingress into the foul water drainage system due to poor workmanship by the potential contractor. This would increase the loading in the estimated foul flow on the downstream network. There is also a possibility of leakage from the sewers and drains again due to poor workmanship. Any foul leakage could potentially result in local contamination of groundwater in the area.

7.6.3 Potential for Increased Risk of Onsite Flooding

The development will result in an increase in impermeable (hardstanding) areas within the subject site. In the absence of mitigation measures, the development therefore has the potential to increase the risk of pluvial flooding within the site.

7.6.4 Potential for Proposed Development to Contribute to Off- Site Flooding

The development will result in an increase in impermeable (hardstanding) areas within the subject site. In the absence of mitigation measures, the development therefore has the potential to increase surface water runoff to the existing watercourses at the site's western and northern boundaries. This could in turn increase the risk of fluvial flooding at locations further downstream.

In addition, the proposed development has the potential to alter surface water flows where the proposed Rathnew Inner Relief Road (RIRR) crosses the Rathnew Stream. Were these flows within the stream or across its associated flood plain to be obstructed, this could result in upstream flooding following severe rainfall events.

7.7 Mitigation Measures

7.7.1 Construction Phase Mitigation Measures

Full detail of mitigation measures to be implemented in the development's construction phase are given in the Construction Surface Water Management Plan prepared by CS Consulting, which is submitted separately with this application.

Temporary surface water collection and sediment control measures will be required during construction to collect runoff and direct it to the permanent ponds and detention basins; these will be implemented and reconfigured as required during construction. Run-off from the working site or any areas of exposed soil should be channelled and intercepted at regular intervals for discharge to temporary silt traps or lagoons, thence to the permanent stormwater attenuation facilities. Any overflows should be directed to land rather than to a watercourse. The necessary temporary surface water drainage and sediment control measures shall be in place before earthworks commence.

As construction progresses, elements of the development's internal stormwater collection network may be incorporated into the construction phase surface water disposal arrangements. The Main Contractor shall be responsible for ensuring that all elements of the development's permanent stormwater drainage network and attenuation facilities are free from waste materials generated during construction, including the initial site clearance and excavation. Routine visual inspections by the contractor shall reduce any risk of excess construction materials causing blockages in the surface water network and any potential flooding occurring. A maintenance schedule and operational schedule should be established by the contractor for silt and pollution control measures during the construction period. This should be undertaken in consultation with the relevant statutory authorities.

Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential.

Oil storage tank(s) and the associated filling area and distribution pipe work should be at least 50m distant from surface watercourses. Storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005).

A Site-Specific Construction and Environmental Management Plan shall be developed and implemented during the construction phase. Site inductions shall include reference to the procedures and best practice as outlined in this Plan.

Weather conditions and seasonal weather variations shall also be taken account of when planning stripping of topsoil and excavations, with an objective of minimising soil erosion.

Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater. Spill kits should be kept in designated areas for re-fuelling of construction machinery. Dewatering measures should only be employed where necessary.

The potable water and foul drainage systems have been designed to Irish Water standards and prior to any construction work commencing on site the proposed water main design shall be required to be vetted and approved by Irish Water. This requirement shall ensure that any adverse effects which maybe experienced during or following completion can be mitigated.

In addition to the above general procedures, the following specific mitigation measures shall be adopted for the protection of surface watercourses:

- There is to be no direct (untreated) discharge of site runoff to surface water features.
- Passage for fish upstream and downstream must not be impeded by the proposed works.
- Prior to any machinery working on site for any purpose, the working area is to be marked out with wooden stakes and, where deemed necessary, hazard tape shall be erected to identify the working limits.
- Working limits are to be checked at the end of every day by the Site Manager.
- Measures are to be implemented to prevent the release of sediment during the construction work; these shall be installed prior to any site clearance. In respect to works adjacent to the Rathnew Stream and the Rossana Lower stream, these measures may include but not be limited to the use of silt fences, sedimentation mats, etc.
- Exclusion zones and barriers (sediment fences) are to be provided between earthworks, stockpiles, and temporary surfaces to prevent sediment washing into the receiving water environment.
- Temporary construction surface drainage and sediment control measures are to be in place before earthworks commence.
- If pouring of cementitious materials is required for the works adjacent to a pond, surface water drainage feature, or drainage features connected to same, this is to be carried out in the dry.
- Discharge water generated during placement of concrete is to be removed off site for treatment and disposal.
- Where stockpiling is required, temporary stockpiles are to be located >50 metres from any surface water feature. Three sides shall be surrounded with silt fences, with

access from the fourth (uphill) side. Sides shall be smoothed and collection of run-off considered (i.e. discharging to a settlement pond, etc.).

- Concrete pumping is to be monitored to ensure no accidental discharge. Mixer washings and excess concrete shall not be discharged to surface water features. Concrete washout areas shall be located remote from any surface water drainage features, to avoid accidental discharge to watercourses.
- No hydrocarbons or any polluting chemicals are to be stored within 50m of the surface water network. Fuel storage tanks shall be bunded to a capacity at least 110% of the volume of the storage tank (plus an allowance of 30mm for rainwater ingress). Refuelling of construction plant shall not occur within 50m of the surface water network and shall be carried out only in bunded refuelling areas.
- Emergency procedures and spillage kits are to be available and construction staff are to be familiar with emergency procedures.
- Measures are to be implemented to minimise waste and to ensure the correct handling, storage, and disposal of waste.
- If any heavily contaminated land is encountered during construction, it is to be removed off-site and be disposed of at a licenced waste facility.
- Contaminated groundwater, if encountered on site, could result in contaminated waters being discharged from the construction site. Any such contaminated waters is to be treated using best practice and appropriate measures/controls, dependent on the nature of the contamination, prior to discharge.
- If dewatering is required, water is to be treated prior to discharge to any sewer or watercourse. This shall include treatment via petrol interceptor and treatment for silt removal, either via silt trap, settlement tanks, or ponds.
- There is to be no direct pumping of contaminated water from the works to the surface water drainage/stream network at any time.
- Foul drainage from site offices and compounds, where not directed to the existing wastewater network, is to be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses.
- An Emergency Response Plan is to be prepared, detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident.
- It is to be ensured that site staff are trained in the implementation of the Emergency Response Plan and the use of any spill control equipment as necessary.

7.7.2 Operational Phase Mitigation Measures (Waste and Wastewater)

As the proposed development is completed monitoring of the development site shall be the responsibility of the developer (or an appointed management company) to carry out any maintenance works required. Until such time as the development is taken in charge by the Local Authority, the developer (or an appointed management company) shall be responsible for monitoring and maintaining the development site and the respective drainage networks.

All sewers and drains will be tested and surveyed prior to completion of the works, to minimise the risk of uncontrolled groundwater penetration to the networks and leakage of foul water to ground water on site during the development's operational phase.

Water meters will be installed at key locations in agreement with Irish Water and these meters will be linked to the Irish Water monitoring telemetry system. These meters will facilitate the early detection of unusual water usage in the network and identify potential leaks in the system.

7.7.3 Mitigation of Onsite and Offsite Flood Risk

As previously described, the subject development site is at negligible risk of flooding from fluvial or tidal sources, and OPW records do not indicate any past occurrences of flooding on the site. With the exception of the proposed Rathnew Inner Relief Road (RIRR) crossing of the Rathnew Stream, the proposed development shall not alter the site's topography to an extent capable of increasing these risk factors; as such, no specific measures are required to mitigate onsite fluvial or tidal flood risk.

As previously noted, the development does have the potential to alter surface water flows where the proposed RIRR crosses the Rathnew Stream. The bridge and culvert arrangement proposed at this location have been sized to ensure that flows within the stream and across its associated flood plain shall not be obstructed to a degree that would significantly increase the risk of upstream flooding following severe rainfall events. The proposed design meets the hydraulic design standards specified under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010 and Section 50 of The Arterial Drainage Act, 1945. These are as follows:

- A bridge or culvert must be capable of passing a fluvial flood flow with a 1% annual exceedance probability (AEP) or 1 in 100-year flow without significantly changing the hydraulic characteristics of the watercourse.
- A culvert must be capable of operating under the above design conditions while causing a hydraulic loss of no more than 300 mm (excluding the culvert gradient).
- If the land potentially affected includes dwellings and infrastructure, it must be demonstrated that those dwellings and/or infrastructure are not adversely affected by constructing the bridge or culvert.
- A culvert diameter, height and width must not be less than 900 mm to facilitate maintenance access and reduce the likelihood of debris blockage.

The proposed development shall increase the proportion of impermeable area within the subject site, which in turn has the potential to increase the risk of on site and offsite flooding due to surface water runoff during high-intensity rainfall events. This risk shall be mitigated by the provision of attenuation storage systems as part of the development's surface water drainage system, as well as through the implementation of additional Sustainable Drainage Systems (SuDS) measures.

Stormwater Attenuation Storage

The proposed development will include attenuation storage facilities that will release stormwater from high-intensity rainfall events in a controlled manner. By restricting the flow, the risk of the proposed development adversely affecting existing surface watercourses or contributing to onsite or offsite flooding is mitigated.

A total attenuation storage volume of 3,369m³ is required to ensure that stormwater runoff from the development does not exceed the greenfield runoff rate for the site, and a total attenuation storage volume of 3,453m³ is provided. Attenuation storage facilities have been designed to cater for the 1-in-100-year critical storm event plus a 20% allowance for climate change. The relevant calculations, as well as a more detailed description of the proposed attenuation system, are given in the accompanying Engineering Services Report.

The proposed development comprises five distinct catchments for the collection and disposal of stormwater runoff (see **Figure 7.4**):

- Catchment A has an area of 5.93ha. The greenfield runoff rate has been established as 38.9 l/s and the attenuation storage requirement is 1,708m³. Total attenuation storage of 1,708m³ (1,328m³ + 380m³) is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 38.9 l/s.
- Catchment B has an area of 3.16ha. The greenfield runoff rate has been established as 20.7 l/s and the attenuation storage requirement is 972m³. Total attenuation

storage of 975m³ is provided for this catchment. Stormwater from this catchment shall discharge to the Rossana Lower stream via a flow restrictor device, at a maximum rate of 20.7 l/s.

- Catchment C has an area of 1.30ha. The greenfield runoff rate has been established as 8.5 l/s and the attenuation storage requirement is 300m³. Attenuation storage of 310m³ (210m³ + 100m³) is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 8.5 l/s.
- Catchment D has an area of 0.44ha. The greenfield runoff rate has been established as 2.9 l/s and the attenuation storage requirement is 160m³. Attenuation storage of 160m³ is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 2.9 l/s.
- Catchment E has an area of 0.62ha. The greenfield runoff rate has been established as 4.0 l/s and the attenuation storage requirement is 229m³. Attenuation storage of 300m³ is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 4.0 l/s.

Additional SuDS Measures

SuDS not only entail restricting stormwater discharge during extreme storm events but also improving the overall quality of the discharged stormwater, and reusing water on site where feasible. The features proposed shall reduce run-off volumes and pollution concentrations, and enhance groundwater recharge and biodiversity.

The proposed SuDS features within the subject development shall consist of:

- Low water usage sanitary appliances to reduce the volume of potable water required for use within buildings.
- Installation of online water butts to capture rainwater from roof areas and to store this for local use, landscaping and maintenance purposes, further reducing reliance on the potable water network.
- Permeable paving for car-parking bays to allow rainwater to dissipate into the ground to mimic the current natural arrangement.

7.8 Residual Impacts

7.8.1 Construction Phase Residual Impacts

In relation to the construction phase, the stripping of the existing ground surface and construction activities could potentially lead to increased sedimentation within nearby surface waters.

Operation of machinery and use of chemicals and concrete during the construction phase has the potential to pollute the nearby public surface water network and receiving watercourse.

Waste materials will be generated during the construction of the proposed development, including the initial site clearance and excavation. Careful management of these, including segregation at source, will help to ensure maximum recycling, reuse and recovery is achieved. It is expected, however, that a certain amount of waste will still need to be disposed of at landfill.

However, the implementation of mitigation measures highlighted in this report will significantly reduce the likelihood and magnitude of the potential impacts on the surface water environment occurring during the construction phase. The residual impact is

therefore considered to be low with a short duration and therefore considered to be not significant.

7.8.2 Operational Phase Residual Impacts

The sources of pollution that could potentially have an effect on surface or ground water during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV deliveries, etc. Hydrocarbon interceptors such as permeable paving will be provided in storm water drainage network and petrol interceptors will be installed within the development to cater for these oil/fuel leaks as required.

The likely effect on both the local wastewater system and the local water supply system is a reduction in spare capacity. However, the subject development has been designed to follow the planning objectives for these lands.

7.8.3 Residual Onsite and Offsite Flood Risk

The subject site is at negligible risk of flooding from fluvial and tidal sources. Implementation of the previously described mitigation measures (stormwater attenuation storage and SuDS features) will substantially reduce the risk of onsite pluvial flooding, as well as that of offsite flooding due to runoff from the subject site.

Hydraulic modelling conducted by JBA Consulting as part of the site-specific Flood Risk Assessment showed that the proposed RIRR bridge and culvert arrangement across the Rathnew Stream will not significantly increase water levels in the Rathnew stream. At a point 20m upstream of the bridge, these modelling results show an increase in water level of 180mm, allowing a 2.84m airgap within the bridge.

To ensure that residual risk related to this bridge and culvert arrangement is minimised, additional hydraulic modelling has been conducted by JBA under a scenario that assumes a 67% of the proposed bridge and culverts. The resultant predicted flooding extent under this scenario is similar to that predicted by the CFRAMS study for a 0.1% AEP event. Along the southern boundary of the proposed development, this residual risk scenario produces a flood level 0.05m lower than that of the 0.1% AEP; this confirms that the site will not be impacted by the potential blockage of this proposed bridge and culvert arrangement. Refer to **Appendix 7E** for the mapped results of this residual risk modelling.

The development's residual impacts in respect of flooding may therefore be characterised as long-term in duration, adverse in nature, but not significant.

7.9 Monitoring

7.9.1 Surface Water Drainage

The surface water network (drains, gullies, manholes etc) will need regular maintenance post completion of the development and where required be cleaned out or repaired. A suitable maintenance regime of inspecting and cleaning will be the responsibility of the developer (or an appointed management company) to carry out until such time as the development is taken in charge by the Local Authority.

7.9.2 Foul Water Drainage

Following the completion of the development there are no additional monitoring requirements envisaged other than normal monitoring and maintenance of the foul drainage network by Irish Water.

7.9.3 Potable Water Supply

Water usage and potential leakage will be monitored by Irish Water through the use of water meters installed at key locations across the site. These locations will be agreed with Irish Water and will be linked to the Irish Water monitoring system via telemetry.

7.10 Reinstatement

It is envisaged that no reinstatement works shall be required outside of normal site works.

7.11 Interactions

There is an interaction between the provision of surface water drainage for the proposed development and the water quality of the receiving environment of the Broadlough Estuary. Mitigation measures identified will ensure there is no adverse effect from the proposed works during both construction and operational phases. There is an interaction between soils and surface water, as the proposed works will slightly alter the topography of the site and its permeability to rainwater. There is also an obvious and directly proportional interaction between foul drainage and water supply in that the former will closely replicate the latter in volumetric terms.

7.12 Monitoring

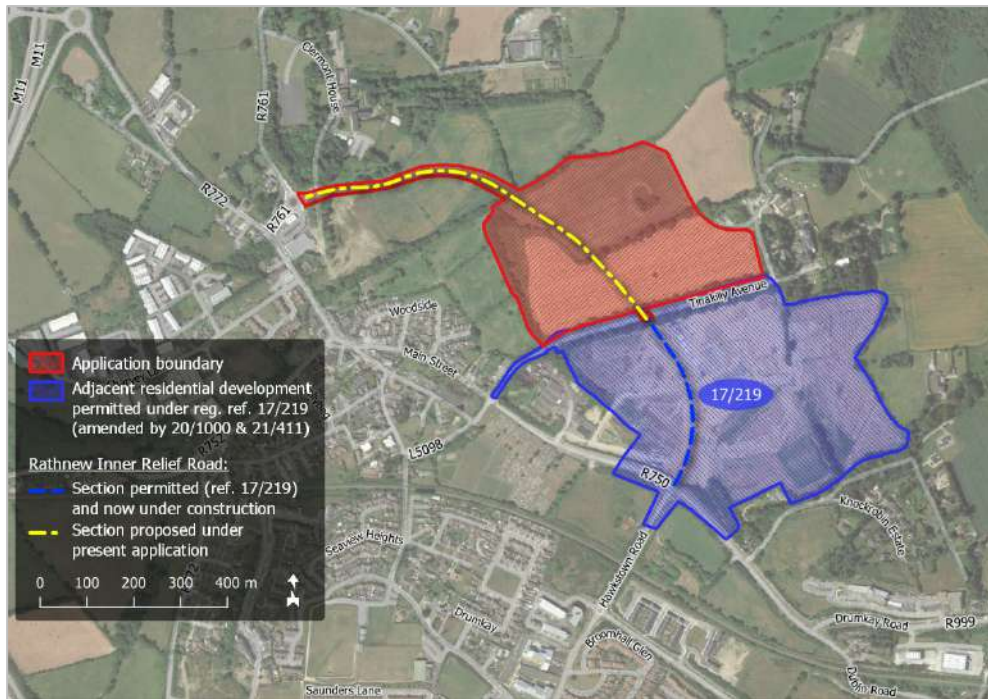


Figure 7.4 – Nearby Committed Development (sources: OSM Contributors, Google)

As shown in **Figure 14.4**, a committed development is currently under construction immediately to the south of the proposed development. This development was first approved under WCC ref. 17/219 (ABP Ref. 301261); minor amendments to residential unit types were subsequently approved under WCC refs. 20/1000 and 21/411. The permitted residential development now comprises a total of 355no. residential units.

This committed development is expected to be substantially complete and occupied during construction of the subject development. The committed development’s operational phase will therefore overlap with the subject development’s construction phase, as well as its operational phase. The long-term cumulative impact of these two

developments in terms of waste management is therefore represented by adding the committed development's projected residual operational impact to the subject development's residual impacts.

7.12.1 Cumulative Impacts in Terms of Water Supply and Foul Drainage

The committed development will generate the following peak demand for wastewater services and for potable water:

- 8.268 l/sec peak wastewater flow
- 6.260 l/sec peak potable water demand

The proposed development will generate the following:

- 8.163 l/sec peak wastewater flow
- 8.245 l/sec peak potable water demand

Their combined peak wastewater flow and potable water demand are therefore:

- 16.431 l/sec peak wastewater flow
- 14.505 l/sec peak potable water demand

Both development sites have been zoned for residential development and as such the current zoning would have taken into consideration the predicted effluent volumes to be generated on site by residential development, as well as the predicted increase in potable water demand. The cumulative effects of these two developments in terms of water supply and foul drainage are therefore not deemed to be significant.

7.12.2 Cumulative Impacts in Terms of Surface Water Drainage and Flood Risk

Stormwater drainage systems in both the committed development and the proposed development have been designed to attenuate surface water runoff and limit discharge to greenfield rates. It has also been shown that neither of these developments will significantly increase the risk of flooding either on-site or off-site. The cumulative effects of these two developments in terms of surface water drainage and flood risk are therefore not deemed to be significant.

7.13 'Do Nothing' Impact

Under a 'Do-Nothing' scenario, it is assumed that the subject site shall remain in its current greenfield state. There will therefore be no change to its existing natural drainage patterns, and no demand placed on the public potable water supply system or foul drainage system.

7.14 References

- JBA Consulting: *Tinakilly Flood Risk Assessment [2021s1666]* (2023)
- Environmental Protection Agency (EPA): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022)
- Wicklow County Council (WCC): *Wicklow County Development Plan 2022–2028* (2022)
- Wicklow County Council (WCC): *Wicklow Town – Rathnew Development Plan 2013-2019* (2013)
- Greater Dublin Regional Code of Practice for Drainage Works
- British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
- Part H of the Building Regulations (Building Drainage)
- Irish Water Code of Practice for Water Infrastructure
- Irish Water Code of Practice for Wastewater Infrastructure
- Environmental Protection Agency mapping

- Office of Public Works flood risk mapping and historical flooding records
- Department of the Environment Flooding Guidelines
- Geological Survey of Ireland mapping
- Local Authority and Irish Water drainage and water supply records

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8 BIODIVERSITY

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8.1 Introduction

8.1.1 Background

This Chapter was prepared by Scott Cawley Ltd.

It provides an assessment of the potential ecological effects of the proposed development at Tinakilly, Rathnew, Co. Wicklow (refer to figure 8.1 for location). The proposed development consists of construction of a large-scale residential development including 352 no. residential units, parking for cars and bicycles, private, communal, and public green spaces, and access routes. A detailed description of the proposed development is included in Chapter 1 of the EIA report.

8.1.2 Aims

The purpose of this chapter is to:

- Describe the methodologies and guidance / legislation used to collate information on the baseline biodiversity environment;
- Establish and evaluate the baseline ecological environment, as relevant to the proposed development;
- Identify, describe and assess all likely significant ecological effects associated with the proposed development;
- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation;
- Provide an assessment of the significance of any residual ecological effects; and
- Identify any appropriate compensation, enhancement, or post-construction monitoring requirements.

Separate stand-alone Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS) (Scott Cawley Ltd., 2023a, b) have been prepared and submitted as part of the planning application documentation. The AA Screening Report and NIS contains information to inform the competent authority's assessment of potential impacts on European sites as a result of the proposed development either alone or in combination with other plans/projects.

8.2 Study Methodology

8.2.1 Author Statement

This Biodiversity chapter for the EIAR was authored by Cathal O'Brien and Eoin Cussen and reviewed by Tim Ryle of Scott Cawley Ltd.

Cathal O'Brien

Cathal O'Brien is a Senior Consultant Ecologist at Scott Cawley Ltd. with over three years' professional ecological consultancy experience in preparing Environmental Impact Assessment Reports (EIARs). Cathal is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds a BSc (Hons) in Environmental Biology from University College Dublin and a MSc (Hons) in Ecology from the University of Bremen. He also has over three years' experience across a range of field surveys such as breeding birds, tree inspections for bat roosts, invasive species and other mammal survey including for badger activity. He also has over three years' consultancy experience report writing including, preparing Ecological Impact Assessments (EclAs),

Preliminary Ecological Appraisal reports (PEAs), Appropriate Assessment screening reports (AAs) and Planning Compliance and/or Technical Note reports

Eoin Cussen

Eoin Cussen is a Senior Ecologist with Scott Cawley Ltd. Eoin holds a BSc (Hons) in Zoology from University College Cork and MSc (Hons) in Ecological Assessment from the same institution. Eoin is an experienced ecologist with over 5 years' professional postgraduate experience in ecological consultancy including planning related casework for state and non-governmental organisations within Ireland and the UK, input to and preparation of Appropriate Assessment (AA) screenings, Natura Impact Statements, Preliminary Ecological Assessments and Ecological Impact Assessments, and a wide range of experience of ecological surveys for protected habitats and species including botany, mammals, bats and birds.

Tim Ryle

Tim Ryle is a Principal Ecologist with Scott Cawley Ltd. He holds an honours degree in Botany from University College Dublin and was later awarded a Ph.D. from the same institution. He is a full Member of the Institute of Environmental Scientists. Tim is an experienced ecological consultant with twenty years' experience in private consultancy in designing, undertaking and managing a wide range of ecological surveys and in assessing impacts and designing mitigation measures and biodiversity enhancements, in particular for protected species including badgers, otters, bats, birds, amphibians as well as habitats of conservation importance. He is also experienced in undertaking Appropriate Assessment for small-scale development projects and larger infrastructural projects, land plans as well as national/government plans.

8.2.2 Scope of the Assessment

The study area is defined by the Zone of Influence (Zoi) of the proposed development with respect to the ecological receptors that could potentially be affected.

The Zoi, or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present within, and in the vicinity of, the proposed development site. The Zoi and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed development.

The Zoi of habitat loss impacts is confined to within the proposed development boundary.

The Zoi of potential impacts on surface water quality in the receiving environment extends downstream to freshwater, estuarine and coastal ecosystems associated with waterbodies that are hydrologically connected to the proposed development via the Rathnew and Rosanna Lower Streams, which form the northern and western boundaries of the site, respectively.

The unmitigated Zoi of air quality effects is generally local to the proposed development and not greater than a distance of 50m from the proposed development boundary, and 500m from a Construction Compound during the Construction Phase

The Zoi of general construction activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed development.

8.2.3 Desk Study

A desk study was undertaken on the 20th of June 2023, to collect any available information on the local ecological environment. The following resources assisted in the production of this report, in addition to those listed in the References section of this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from <https://www.npws.ie/protected-sites> and <https://www.npws.ie/maps-and-data> – refer to Appendix 8C and Figure 2-3 for descriptions and locations of protected sites in the vicinity of the proposed development;
- Habitat and species GIS datasets provided by the NPWS, including Article 12 and Article 17 data;
- Records of rare and protected species, as held by the National Biodiversity Data Centre www.biodiversityireland.ie or the NPWS – refer to Appendix 8D for all desk study flora and fauna records;
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from <https://myplan.ie/>;
- Ordnance Survey Ireland mapping and aerial photography from www.osi.ie;
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from <https://gis.epa.ie/EPAMaps/>
- Information on soils, geology and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from <https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx>;
- Information on local biodiversity policies and objectives within the Wicklow County Development Plan 2022-2028^{Error! Bookmark not defined.}, and County Wicklow Biodiversity Plan 2010-2015¹;
- Survey information on adjacent, consented development Scott Cawley Ltd. (2021) Ecological Impact Assessment for the proposed residential development at Tinakilly, Rathnew, Co. Wicklow (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118),);
- Information on the location, nature and design of the proposed development supplied by the applicant’s design team; and, Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (Gilbert *et al.*, 2021).

¹ Wicklow County Council (2010) Wicklow Biodiversity Action Plan 2010-2015. Plan in effect and yet to be superseded. Accessible from www.wicklow.ie Accessed: 20th June 2023.

8.2.4 Field Study Methodology

This section describes the ecological surveys carried out to inform the ecological assessment presented in this chapter.

Habitats and Flora Survey

A habitat survey was undertaken of the proposed development site on the 4th May 2022 by Cathal O'Brien BSc (Hons) MSc following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*². All habitat types were classified using the *Guide to Habitats in Ireland*³, recording the indicator species and abundance using the DAFOR scale⁴ and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*⁵, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*⁶ and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*⁷.

Fauna Surveys

Terrestrial Mammals (Excluding Bats)

Terrestrial fauna surveys (excluding bats) were undertaken on the 4th May and July 1st 2022 by Cathal O'Brien BSc (Hons) MSc. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys to check for the presence of badger setts and/or otter holts within the study area, and to record any evidence of use, were undertaken.

Breeding birds

Breeding bird surveys were undertaken on the 12th April, 4th May and 15th June 2022 by Cathal O'Brien BSc (Hons) MSc., using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*⁸. The study area covered the lands within the red line boundary and a buffer of 50m from it. Lands within the study area were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Bird

2 Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

3 Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

4 The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

5 Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

6 Stace, C. (2019) *New Flora of the British Isles*. 4th Edition. C&M Floristics.

7 Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

8 Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

species nomenclature follows Collins Bird Guide (Svensson, 1999). The survey details are provided in table 8.1 below.

Date (Sunrise)	Survey Time	Weather Conditions
12/04/2022 (06:32)	06:55-08:20	Mild, cloudy with persistent rain, temperatures around 13°C. Light wind.
04/05/2022 (05:45)	06:20-08:30	Mostly clear with temperatures of around 8°C. Dry with a gentle breeze.
15/06/2022 (04:56)	05:20-07:33	Mild, partially overcast with temperatures around 10°C. No rain in calm conditions.

Table 8.1 Details of breeding bird surveys undertaken within the proposed development site.

Wintering Birds

Wintering bird surveys were undertaken on the 27th January, 3rd and 8th February, and 1st, 9th, 23rd and 28th March 2022 by Cathal O'Brien BSc (Hons) MSc., and on the 23rd February and 16th March 2022 by Lorna Gill BSc (Hons) MSc., using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*⁸. The study area covered the lands within the red line boundary including arable fields, areas of grassland and scrub, and which abounds the Rathnew Stream, Tinakilly Lane and Tinakilly Country House. Lands were surveyed visually using binoculars/scope from two vantage points within the study area, followed by a walkover of the area to identify evidence of usage by wildfowl such as waders, swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Bird species nomenclature follows Collins Bird Guide (Svensson, 1999). The survey details are provided in table 8.2 below.

Date	Survey Time (Sunrise to Sunset)	Weather Conditions
27/01/2022	10:00-15:00	Mild, partially overcast with temperatures of around 11°C. Light to moderate breeze. Dry..
03/02/2022	09:45-16:15	Mild, mostly cloudy with temperatures around 12°C. Dry with light to moderate wind.
08/02/2022	07:40-14:15	Mild, overcast with temperatures of around 12°C. Blustery winds. Light drizzle.
23/02/2022	13:00-18:00	Mild, overcast afternoon and mostly clear by evening with temperatures around 11°C. Showers in afternoon, dry after. Moderate breeze with strong gusts.
01/03/2022	12:25-18:00	Partly cloudy with temperatures of around 9°C. Light breeze. No rain.
09/03/2022	07:05-12:30	Overcast with temperatures around 9°C. Dry start, heavy rain later. Windy with strong gusts.
16/03/2022	08:00-13:00	Cold, overcast with temperatures of around 5°C. Light wind. No rain.
23/03/2022	11:55-17:35	Mild, clear with temperatures around 15°C. Dry. Light wind.
28/03/2022	07:00-12:00	Mostly clear with temperatures of around 7°C. Dry in calm conditions.

Table 8.2 Details of wintering bird surveys undertaken within the proposed development site.

Bats

A ground-level assessment of all trees within the proposed development site lands, to examine their suitability to support roosting bats and potential to act as important landscape features for commuting/ foraging bats, was completed over the course of the 12th April and 4th May 2022 by Cathal O'Brien BSc (Hons) MSc. There are no buildings or other structures within the proposed development site. The assessment was based on guidelines in *Bat Surveys for Professional Ecologists: Good Practice Guidance*⁹ (see table 8.3) and included inspections of trees for potential roost features (PRFs), and for signs of bats (staining at roost entrances, droppings, carcasses, insect remains).

⁹ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland. Site is close to and connected to known roosts.

Table 8.3 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, applied according to professional judgement⁹

Three separate bat activity surveys were undertaken within the lands by Scott Cawley Ltd., surveyors who are experienced in bat surveys. The surveys were designed with reference to methodologies in *Bat Surveys for Professional Ecologists: Good Practice Guidelines*⁹, and survey details are provided in table 8.4. Surveys involved activity surveys of walked transects along the boundaries of the proposed development site. Bat activity was recorded using a handheld bat detector (Batlogger-M2). Recordings collected in the field were analysed using specialist sound analysis software (Elekon BatExplorer) to aid in the identification of bat species by their calls, (where this was possible), using

professional judgement and with reference to *British Bat Calls: A Guide to Species Identification*¹⁰.

Date	Survey Time (Sunset)	Survey Type	Surveyor(s)	Weather Conditions
19/05/2022	21:10-22:50(21:24)	Dusk activity survey	Scott Cawley Ltd.	Mild, overcast with temperatures around 12°C and moderate wind.
15/06/2022	03:25-05:04 (04:58)	Dawn activity survey	Scott Cawley Ltd.	Partially overcast with temperatures around 10-12°C. No rain in calm conditions.
11/07/2022	21:40-23:25 (22:03)	Dusk activity survey	Scott Cawley Ltd.	Warm, overcast weather with temperatures around 20°C. Occasional light shower with light breeze.

Table 8.4 Details of bat surveys undertaken within the proposed development site.

Amphibians and Reptiles

An assessment of habitat suitability for amphibians and reptiles was completed on the 12th April 2022 by Cathal O’Brien BSc (Hons) MSc. Suitable habitat for amphibians, such as ponds and wet ditches, and for reptiles, such as stone walls, rocks or logs suitable for basking, were recorded, and mapped, as well as any direct observations of individuals.

Aquatic Surveys

Surveys of the Rathnew Stream and Rossanna Lower Stream were conducted on the 9th April 2022. Survey effort focused on both instream and riparian habitats in the vicinity of each survey site (Figure 8-1 and Appendix 8F). The surveys were conducted during bright weather and base flow riverine conditions. The watercourses at each survey site were described in terms of the important aquatic habitats and species. This helped to evaluate species and habitats of ecological value in the vicinity of each site. The aquatic baseline prepared has informed the mitigation strategy for the project.

A broad aquatic habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's '*River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003*'¹¹ and the Irish Heritage Council's '*A Guide to Habitats in Ireland*'¹³. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e., width, depth etc.)
- Substrate type, listing substrate fractions in order of dominance (i.e., bedrock, boulder, cobble, gravel, sand, silt etc.)
- River profile in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition

¹⁰ Russ, J. (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter, United Kingdom. ISBN 978-1-907807-25-1.

¹¹ Environment Agency (2003) *River Habitat Survey in Britain and Ireland Field Survey Guidance Manual* – 2022 reprint

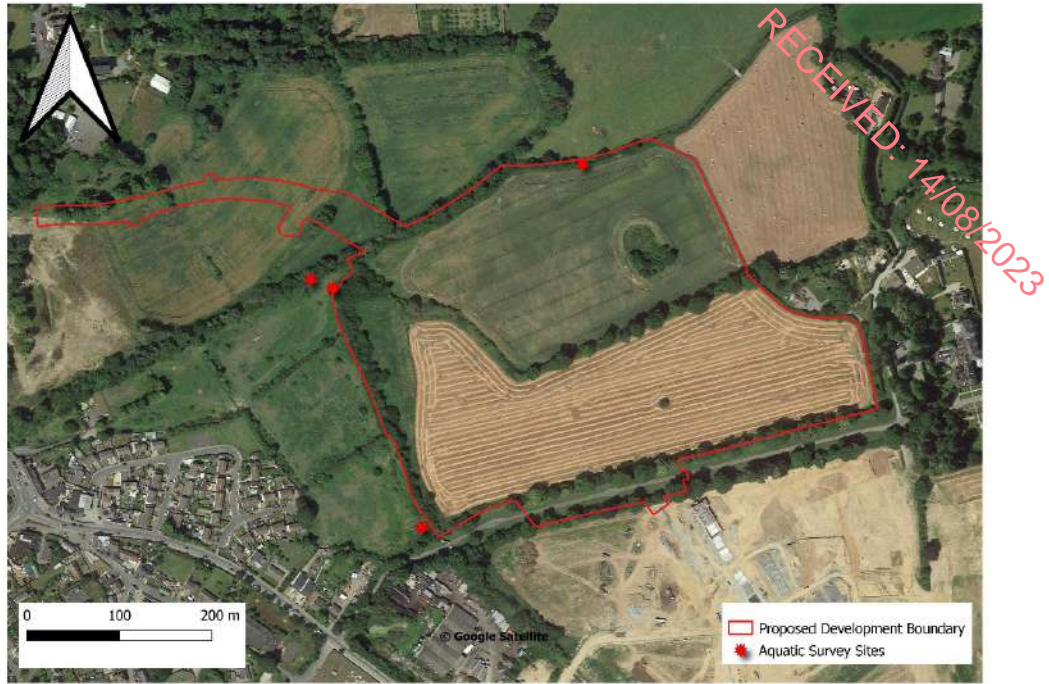


Figure 2-1 Aquatic Survey Site Locations

Otter signs

The presence of otter (*Lutra lutra*) at each aquatic survey site as well as upstream and downstream of the proposed development site, was assessed on the 9th April 2022 by Triturus Environmental Ltd., determined through the recording of otter signs, if encountered incidentally during surveys. The survey broadly followed the best practice survey methodology for otter as recommended by Lenton *et al.* (1980)¹², Chanin (2003)¹³ and Bailey & Rochford (2006)¹⁴. Notes on the age and location (ITM coordinates) were made for each otter sign recorded, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, molluscs etc.).

Fisheries habitat

Fisheries habitat quality for salmonids was assessed on the 9th April 2022 by Triturus Environmental Ltd., using the Life Cycle Unit method (Kennedy, 1984¹⁵; O'Connor & Kennedy, 2002¹⁶) to map the n=4 riverine sites as nursery, spawning and holding habitat, by assigning quality scores to each type of habitat. Those habitats with poor quality substrata, shallow depth and a poorly defined river profile receive a higher score (i.e. Excellent habitat quality = 1, good = 2, moderate = 3 and poor = 4). Higher scores in the

¹² Lenton, E.J., Chanin, P.R.F. and Jefferies, D.J. 1980. Otter Survey of England 1977-79. Nature Conservancy Council, London.

¹³ Chanin, P. 2003. Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.

¹⁴ Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

¹⁵ Kennedy, G.J.A. (1984). Evaluation of techniques for classifying habitats for juvenile salmon (*Salmo salar* L.) Proceedings of the Atlantic Salmon trust workshop on stock enhancement. 23 pp.

¹⁶ O'Connor, L. & Kennedy, R.J (2002). A comparison of catchment-based salmon habitat survey techniques on three rivers in N. Ireland. Fisheries Management and Ecology, 9, 149-161.

Life Cycle Unit method of fisheries quantification are representative of poorer value, with lower scores being more optimal despite this appearing counter intuitive.

Lamprey habitat

Lamprey habitat evaluation for each survey site was undertaken on the 9th April 2022 by Triturus Environmental Ltd., using the Lamprey Habitat Quality Index (LHQI) scoring system, as devised by Macklin et al. (2018)¹⁷. The LHQI broadly follows a similar rationale as the Life Cycle Unit score for salmonids (i.e. Excellent habitat quality = 1, good = 2, moderate = 3 and poor = 4). Those habitats with a lack of soft, largely organic sediment areas for ammocoete burrowing, shallow sediment depth (<10cm) or compacted sediment nature receive a higher score. Higher scores in this index are thus of poorer value (in a similar fashion to the salmonid Life Cycle Unit Index), with lower scores being more optimal. Overall scores are calculated as a simple function of the sum of individual habitat scores.

Larval lamprey habitat quality as well as the suitability of adult spawning habitat is assessed based on the information provided in Maitland (2003)¹⁸ and other relevant literature (e.g. Gardiner, 2003)¹⁹. Unlike the salmonid Life Cycle Unit index, holding habitat for adult lamprey is not assessed owing to their different migratory and life history strategies, and that electro-fishing surveys routinely only sample larval lamprey.

White-clawed crayfish

White-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken at the aquatic survey sites on the 9th April 2022 by Triturus Environmental Ltd., under a National Parks and Wildlife (NPWS) open licence (no. C31/2022), as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2021), to capture and release crayfish to their site of capture, under condition no. 6 of the licence. As per Inland Fisheries Ireland recommendations, the crayfish licence sampling started at the uppermost site of the survey area to minimise the risk of transfer invasive propagules (including crayfish plague) in an upstream direction.

Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds *et al.*, (2010)²⁰. Trapping of crayfish was not feasible given the small nature of the watercourses surveyed. An appraisal of white-clawed crayfish habitat at each site was conducted based on physical channel attributes, water chemistry and incidental records in mustelid spraint. Additionally, a desktop review of crayfish records within the wider survey area was undertaken.

Biological water quality (Q-sampling)

The four number aquatic survey sites were assessed for biological water quality through Q-sampling on the 9th April 2022 by Triturus Environmental Ltd., (**Tables 2.1, 4.1 Figures 2.1 of Appendix 8F**). All samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, with an additional one-minute hand search of instream substrata, as per EPA methodology

¹⁷ Macklin, R., Brazier, B. & Gallagher, C. (2018). Fisheries assessment of selected weir sites on the River Barrow, Counties Carlow & Kilkenny. Unpublished report prepared by Triturus Environmental Services for McCarthy-Keville O' Sullivan on behalf of Waterways Ireland.

¹⁸ Maitland P.S. (2003) Ecology of river, brook and sea lamprey. Conserving Natura 2000 Rivers Ecology Series No. 4. English Nature, Peterborough.

¹⁹ Gardiner R (2003). Identifying Lamprey. A Field Key for Sea, River and Brook Lamprey. Conserving Natura 2000 Rivers Conservation Techniques Series No. 4. English Nature, Peterborough.

²⁰ Reynolds, J.D., O'Connor, W., O'Keeffe, C. & Lynn, D. (2010) A technical manual for monitoring white-clawed crayfish *Austropotamobius pallipes* in Irish lakes. Irish Wildlife Manuals, No 45, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

(Feeley *et al.*, 2020a)²¹. Samples were elutriated and fixed in 70% ethanol for subsequent laboratory identification. Macro-invertebrate samples were converted to Q-ratings as per Toner *et al.* (2005)²². Any rare invertebrate species were identified from the NPWS Red List publications for beetles (Foster *et al.*, 2009)²³, mayflies (Kelly-Quinn & Regan, 2012)²⁴, stoneflies (Feeley *et al.*, 2020b)²⁵ and other relevant taxa (i.e., Byrne *et al.*, 2009)²⁶; Nelson *et al.*, 2011²⁷).

Aquatic ecological evaluation

The evaluation of aquatic ecological receptors contained within this report uses the geographic scale and criteria defined in the 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009)²⁸.

Biosecurity

A strict biosecurity protocol including the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced.

²¹ Feeley, H. B., Bradley, C., Free, G., Kennedy, B., Little, R., McDonnell, N., ... & Boyle, S. O. (2020a). A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018. *Scientific Data*, 7(1), 1-9.

²² Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., ... & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.

²³ Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

²⁴ Kelly-Quinn, M. & Regan, E.C. (2012). *Ireland Red List No. 7: Mayflies (Ephemeroptera)*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

²⁵ Feeley, H. B., Baars, J. R., Kelly-Quinn, M., & Nelson, B. (2020b). *Ireland Red List No. 13: Stoneflies (Plecoptera)*. National Parks and Wildlife Service.

²⁶ Byrne, A. W., Moorkens, E. A., Anderson, R., Killeen, I. J., & Regan, E. (2009). *Ireland Red List no. 2: non-marine molluscs*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

²⁷ Nelson, B., Ronayne, C. & Thompson, R. (2011). *Ireland Red List No.6: Damselflies & Dragonflies (Odonata)*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

²⁸ NRA (2009) *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*. National Roads Authority.

8.2.5 Field Study Methodology

Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*²⁸ and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland*²⁹ – refer to Appendix 8B for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (Zoi) of the proposed development which are “both of sufficient value to be material in decision making and likely to be affected significantly” are deemed to be ‘Key Ecological Receptors’ (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

Impact Assessment

Ecological Impact Assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works;
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats; and
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support.

Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA’s *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*³⁰ and CIEEM’s *Guidelines for Ecological Impact Assessment in the UK and Ireland*: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and cumulative effects.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational);
- Projects which have been granted consent but not yet started;
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal; and
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways).

²⁹ CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

³⁰ Environmental Protection Agency. (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports*. April 2022.

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases, it may not be possible to definitively conclude that an impact will not occur. In these cases, the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied, and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM guidelines (CIEEM, 2018)²⁹ and the NRA guidelines (NRA, 2009)³¹ were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats, or ecosystems; and,
- the conservation status of habitats and species (including extent, abundance, and distribution) within a given geographic area.

Integrity

The term “*integrity*” may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009)²⁸.

The term “*integrity*” is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites’ habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018)²⁹ and NRA (2009)²⁸ guidance which are summarised as follows:

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale; and,
- For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale.

³¹ NRA (2009). Guidelines for Assessment of Ecological Impacts of National Roads Schemes. Available at: <https://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf>

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

According to the CIEEM methodology (2018)²⁹, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases, an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

8.3 The Existing Receiving Environment (Baseline)

8.3.1 Proposed Development Lands

The proposed development lands are located north-west of Wicklow town, Co. Wicklow, east of the R750, west of Tinakilly Country House and adjacent to the northern boundary of Tinakilly Lane. The proposed development lands contain habitats typically found in an agricultural setting comprising predominantly arable fields, bordered by discrete areas of wet grassland, dry grassy verges, scrub and extensive mature treelines and hedgerows. The surrounding areas immediately adjacent to the site largely comprise agricultural land. The lands to the south constitute Tinakilly residential development currently under construction (registered planning ref. WCC reg. ref. 17/219 / ABP ref. 30126118), Tinakilly Country House is located to the east, while agricultural fields are adjacent to the north and west. The Rathnew Stream abounds the northern boundary while the Lower Rosanna Stream is situated along the western boundary of the site. Broadlough and the Irish Sea are located to the east of the proposed development. The Rathnew Stream is a known EPA waterbody (Rathnew Stream_010), while the Lower Rosanna Stream which is a tributary of the Rathnew Stream, is unnamed. Both waterbodies connect the proposed development site to the wider surface waterbody network (i.e. Broadlough and the Irish Sea) downstream.

The location of the proposed development site in relation to the surrounding environment is presented below in Figure 8-2.



Figure 2-2 Location of the proposed development in relation to its surroundings

8.3.2 Designated Areas

European Sites

Special Areas of Conservation (SACs) are designated under the EC Habitats Directive (92/43/EEC), which is transposed into Irish law through a variety of legislation including the Birds and Habitats Regulations and the Planning and Development Acts. The legislation enables the protection of certain habitats (listed on Annex I of the Directive) and/ or species (listed on Annex II). Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC). This allows for the protection of bird species on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and important wetland habitats for birds.

The proposed development lands are not located within any European sites (see Figure 8-3 and Figure 8-4). The nearest European sites are The Murrough Wetlands SAC and The Murrough SPA, located c. 450m east of the proposed development. The Murrough Wetland SAC has been designated for coastal and fen habitats, whereas The Murrough SPA has been designated for wintering bird species.

The site is located within the Vartry (Vartry_SC_010) sub-catchment, which is contained within the Ovoca-Vartry catchment, and Rathnew Stream sub-basins which drain into Broad Lough and from there to the Irish Sea.

There is one EPA waterbody which abounds the subject lands (see Figure 8.4), namely the Rathnew Stream_010 (IE_EA_10R020600) and the Lower Rosanna Stream adjacent to the western boundary have the potential to hydrologically connect the proposed development site to European sites including The Murrough SAC [02249] and the Murrough SPA [004186] at Broadlough, and Wicklow Head SPA [004127] and Wicklow Reef SAC [002274] in the Irish Sea.

The Lower Rossana Stream flows along the western site boundary where it joins the Rathnew Stream at the northwest corner of proposed development site, the Rathnew

Stream flows along the northern boundary and subsequently discharges into the Broad Lough transitional waterbody (TWB) (IE_EA_130_0100), c. 1km downstream and east from the proposed development site. The Broad Lough TWB joins the South-western Irish Sea at Killiney Bay (HA10) coastal waterbody (CWB) (referred to as 'Irish Sea' from here onwards) at Wicklow town, c. 4.9km downstream and south-east of the proposed development (see Figure 8-5, below).

The latest river Q-value from 2020 for Rathnew Stream is 'Good'. There is no Q-value data for Rossana Lower, however both have been listed as 'Not at Risk' waterbodies by the EPA and have a 'Good' Water Framework Directive (WFD) status 2016-2021. The Broad Lough Transitional Water Body (TWB) has a 'Moderate' WFD status 2016-2021, with 'Intermediate' water quality 2018-2020, and has been listed as an 'At Risk' TWB by the EPA. The South-western Irish Sea-Killiney Bay Coastal Waterbody (CW) has a 'High' WFD status and is not listed as 'At Risk' and the water quality is considered to be unpolluted by the EPA³².

The Groundwater Body (GWB) underlying the site is the Wicklow GWB, which is currently classified by the EPA as having 'Good Status'. Its risk status is currently under review. The Wicklow GWB overlaps with four European sites that are designated in part for groundwater dependent terrestrial habitats, i.e. The Murrough Wetlands SAC, Magherabeg Dunes SAC, Buckroney-Brittias Dunes and Fen SAC and Knocksink Wood SAC, which are located c. 450m east, 7.5km and 10.9km south-east, and 22.8km north-west of the proposed development site, respectively.

Based on information published by GSI on the Wicklow GWB³³, 'the groundwater discharges directly to the sea along the coast. The GWB will also discharge to the overlying streams and rivers as baseflow. The proportion of river flow that is baseflow will vary throughout the area.'

There are five SACs and two SPAs that are potentially hydrologically connected to the proposed development via surface water pathways: The Murrough Wetlands SAC, Wicklow Reef SAC, Magherabeg Dunes SAC, Buckroney-Brittias Dunes and Fen SAC, Wicklow Mountains SAC, The Murrough SPA and Wicklow Head SPA. These European sites are illustrated in Figure 8-3. The QIs/SCIs of the European sites in the vicinity of the proposed development are provided in Appendix 8C.

There is one SPA, namely The Murrough SPA, designated for wintering SCI species that are known to forage and/or roost at inland sites in Ireland. Wicklow Mountains SPA, located c. 12.4km west of the proposed development, is designated for birds of prey (peregrine *Falco peregrinus* and merlin *Falco columbarius*) that are known to not hold exclusive home ranges

In addition, Wicklow Mountains SAC, which contains a considerable range of Qualifying Interests (QIs), is designated for mobile QI species (otter *Lutra lutra*) known to utilise wide range of aquatic habitats (freshwater and marine) on the east coast.

The subject lands do not contain any habitats for which any European sites have been designated. However, based on a desk study and site surveys, they do contain suitable habitat for Qualifying Interest or Special Conservation Interest species for which nearby European sites have been designated.

³² <https://gis.epa.ie/EPAMaps/>

³³ https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/WicklowGWB.pdf

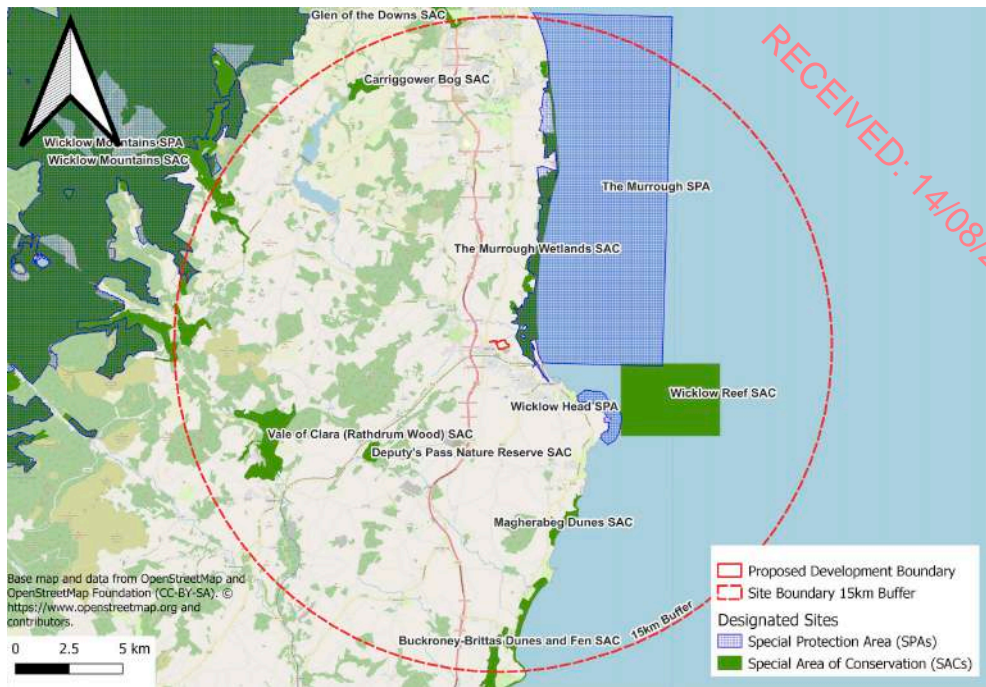


Figure 2-3 European sites in the vicinity of the proposed development site

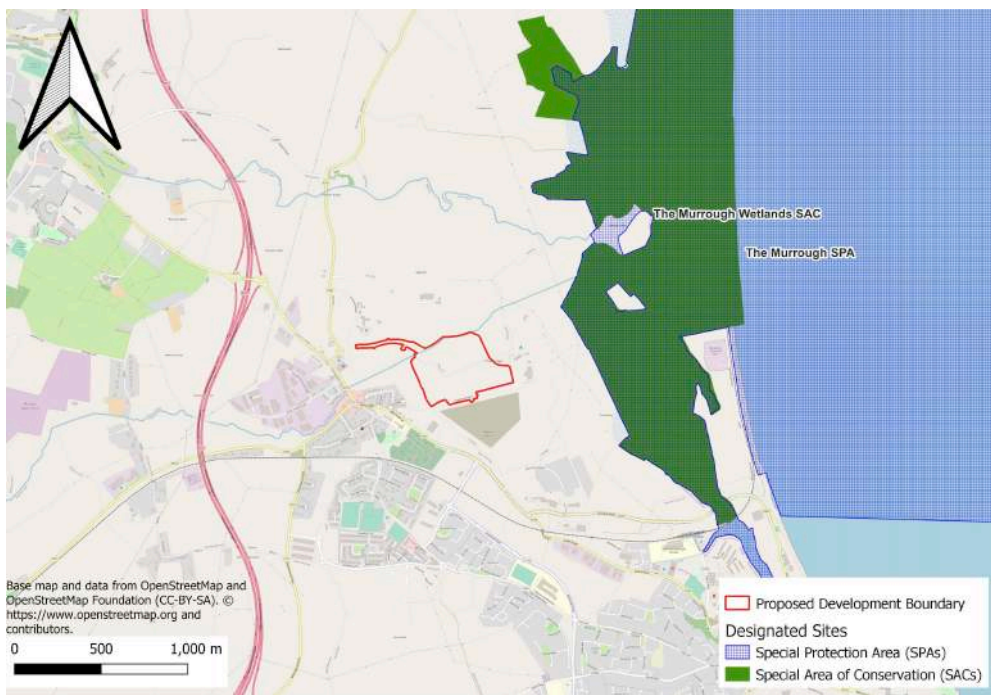


Figure 2-4 European sites immediately adjacent to the proposed development site

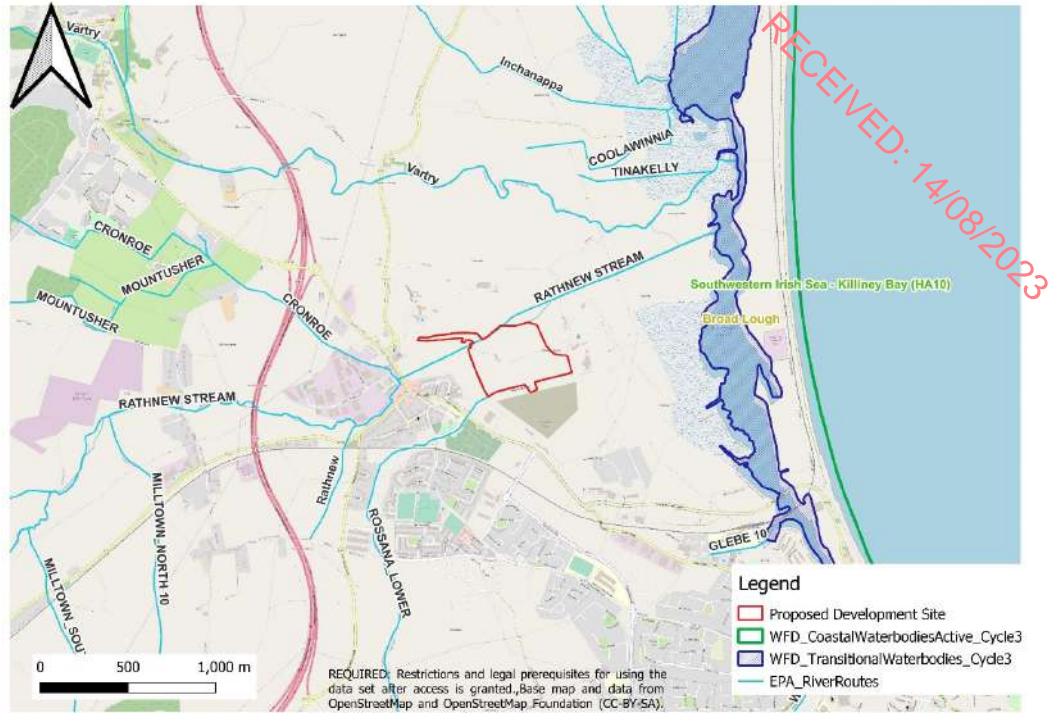


Figure 2-5 Waterbodies in the vicinity of the proposed development site

Nationally Designated Sites

Natural Heritage Areas (NHAs) are designations under the Wildlife Acts, that have been proposed in order to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with European sites. Although many NHA designations are not yet fully in force under this legislation (referred to as ‘proposed NHAs’ or pNHAs), they are typically offered similar protection as the statutory NHA designation under planning legislation which requires that planning authorities give recognition to their ecological value³⁴.

Wicklow County Council includes policies and objectives for the protection of the NHAs and pNHAs within the Wicklow County Development Plan 2022-2028^{Error! Bookmark not defined.}. Two such objectives, NH3 and NH5, state that it is the policy of Wicklow County Council “To contribute, as appropriate, towards the protection of designated ecological sites including ... Wildlife Sites (including proposed Natural Heritage Areas)”, and “To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Wicklow”, respectively. Objective NH6 states to “Ensure ecological impact assessment is carried out for any proposed development likely to have a significant impact on proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats, or rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.”

The proposed development lands do not overlap with any NHAs or pNHAs (see Figure 8-6 and Figure 8-7). There are 12 national sites located within c. 15km of the proposed development, of which all are pNHAs. The nearest national site is The Murrough pNHA, located c. 450m east of the proposed development (see Figure 8-7).

The Murrough pNHA is hydrologically connected to the proposed development site via surface water pathways running along the northern and western boundaries (i.e. the Rathnew Stream and Rosanna Lower Stream) of the site. To the east, there is a buffer of c. 450m of agricultural land between the proposed development site and the pNHA. There are other pNHAs hydrologically connected via surface water network to the proposed development which are located downstream in the Irish Sea, and are designated for similar reasons as the overlapping European sites.

The pNHA sites in the vicinity of the proposed development, their distance from the proposed development site and the reason for their designations are presented in Appendix 8D.

³⁴ NPWS (2023). Natural Heritage Areas Webpage. Available online at www.npws.ie/protected-sites/nha. Accessed 20th June 2023

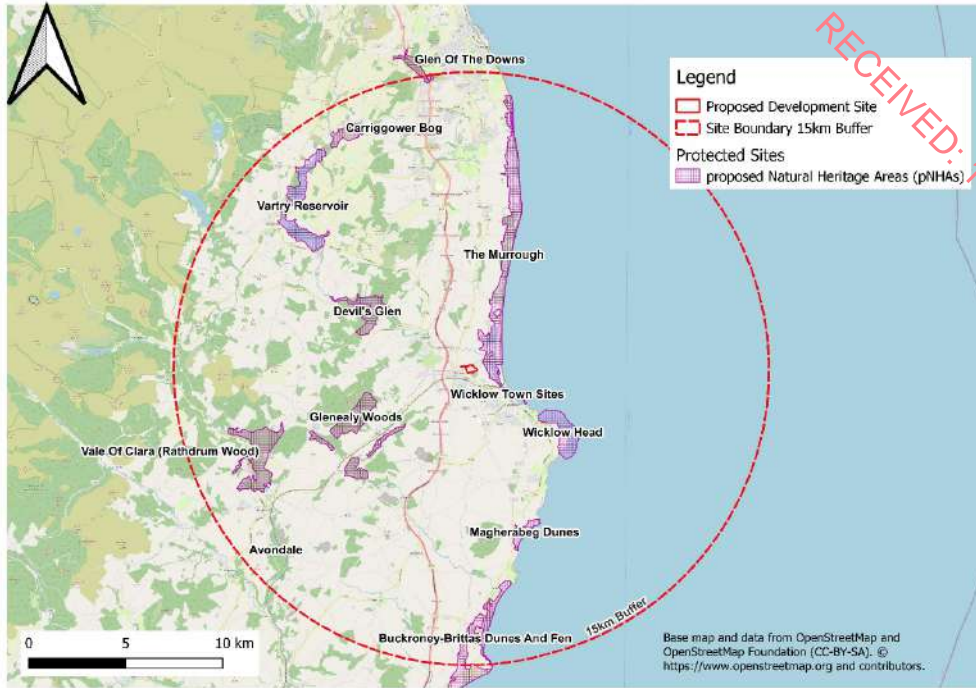


Figure 2-6 Proposed Natural Heritage Areas within the vicinity of the proposed development site. Note that there are no Natural Heritage Areas within 15km of the proposed development site



Figure 2-7 Proposed Natural Heritage Areas within the immediate vicinity of the proposed development site

8.3.3 Habitats and Flora

Rare and Protected Flora

A search of the NBDC database for records of rare and/or protected species within c. 2km of the proposed development site returned records for two Flora (Protection) Order 2022 plant species, namely: meadow barley *Hordeum secalinum*, sub-terranean clover *Trifolium subterraneum* as well as spring vetch *Vicia lathyroides*, which is listed in Ireland’s Red list for Vascular Plants³⁵. The desktop study returned no records for Annex II flora species within c. 2km of the proposed development.

There is one record for *H. secalinum* to the east of the proposed development at Broadlough, from 2007. There are four records of *T. subterraneum* of which the most recent and nearest to the proposed development is from along the River Leitim (IE_EA_10W080880), c. 1.25km south-east, from 2011. *H. secalinum* and *T. subterraneum* are listed as ‘Vulnerable’ in the ‘Checklist of Protected and Threatened Species in Ireland’³⁶. They are also listed on the Flora (Protection) Order 2022³⁷. There are two records of *V. lathyroides* with the nearest noted c. 300m north of the Proposed Development site from 2007. *V. lathyroides* is listed as ‘Least Concern’ in the ‘Checklist of Protected and Threatened Species in Ireland’³⁶.

In addition to the rare and/or protected flora records returned by the NBDC database search, the NPWS database holds records for additional 22 species from the 10km grid squares, T29 and/or T39, in which the proposed development is located in. These species are listed in Table 11.5 below.

Species	FPO/EU Habitats Directive	Red-listed ³⁶	Origin of record
<i>Asparagus prostratus</i> (<i>Asparagus officinalis</i> subsp. <i>prostratus</i>)	FPO	Endangered	NPWS database record (T39)
<i>Cephalanthera longifolia</i>	FPO	Vulnerable	NPWS database record (T29 and T39)
<i>Clinopodium acinos</i> (<i>Acinos arvensis</i>)	-	Near Threatened	NPWS database record (T39)
<i>Crambe maritima</i>	-	Near Threatened	NPWS database record (T39)
<i>Cynoglossum officinale</i>	-	Near Threatened	NPWS database record (T39)
<i>Equisetum x moorei</i> (<i>Equisetum hyemale</i> x <i>E. ramosissimum</i>)	FPO	Near Threatened	NPWS database record (T39)
<i>Glaucium flavum</i>	-	Near Threatened	NPWS database record (T39)
<i>Gymnocarpium dryopteris</i>	-	Regionally Extinct	NPWS database record (T29 and T39)

³⁵ Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

³⁶ Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

³⁷ FLORA (PROTECTION) ORDER 2022 - S.I. No. 235 of 2022

Species	FPO/EU Habitats Directive	Red-listed ³⁶	Origin of record
<i>Hordeum secalinum</i>	FPO	Vulnerable	NBDC database record; NPWS database record (T39)
<i>Hyoscyamus niger</i>	-	Near Threatened	NPWS database record (T39)
<i>Linaria repens</i>	-	Near Threatened	NPWS database record (T29 and T39)
<i>Logfia minima</i> (<i>Filago minima</i>)	-	Near Threatened	NPWS database record (T39)
<i>Lycopsis arvensis</i> (<i>Anchusa arvensis</i>)	-	Near Threatened	NPWS database record (T39)
<i>Malva neglecta</i>	-	Near Threatened	NPWS database record (T29 and T39)
<i>Omalotheca sylvatica</i> (<i>Gnaphalium sylvaticum</i>)	FPO	Endangered	NPWS database record (T29 and T39)
<i>Orobanche rapum-genistae</i>	-	Near Threatened	NPWS database record (T29 and T39)
<i>Roemeria hispida</i> (<i>Papaver hybridum</i>)	-	Regionally Extinct*[neo]	NPWS database record (T39)
<i>Scandix pecten-veneris</i>	-	Regionally Extinct	NPWS database record (T39)
<i>Scleranthus annuus</i>	FPO	Vulnerable	NPWS database record (T39)
<i>Sorbus hibernica</i>	-	Vulnerable	NPWS database record (T29 and T39)
<i>Torilis nodosa</i>	-	Near Threatened	NPWS database record (T39)
<i>Trifolium glomeratum</i>	FPO	Endangered	NPWS database record (T39)
<i>Trifolium scabrum</i>	-	Near Threatened	NPWS database record (T29 and T39)
<i>Trifolium subterraneum</i>	FPO	Vulnerable	NBDC database record; NPWS database record (T39)
<i>Vicia lathyroides</i>	-	Vulnerable	NBDC database record

*Species assessed as Regionally Extinct (RE) by Wyse Jackson *et al.* (2016) for which introduced, neophyte populations have since been discovered as *[neo].

Table 11.5 Records of protected, red-listed or notable flora returned from the NBDC and NPWS databases

The field surveys undertaken within the proposed development site did not find any protected and/or rare plant species within the subject lands. There is no suitable habitat for the majority of the above listed rare and/or protected flora species returned from the NBDC and NPWS databases. *H. secalinum* can usually be found associated with meadows, old pastures, alluvial or coastal grasslands³⁸, whereas *Asparagus prostratus*, *Crambe maritima*, *Cynoglossum officinale*, *Glaucium flavum*, *Hyoscyamus niger*, *Logfia minima*, *Lycopsis arvensis*, *Roemeria argemone*, *Scleranthus annuus*, *Torilis nodosa*, *T. glomeratum*, *T. scabrum*, *T. subterraneum* and *V. lathyroides* prefer open sandy and gravelly habitats such as those found near the sea (e.g. sand banks, shingle beaches, sandy grasslands)³⁹. The remainder of the species are generally associated with open calcareous habitats, such as calcareous grasslands (*Clinopodium acinos*, *Linaria repens*, *Orobanche rapum-genistae*, *Roemeria hispida* and *Scandix pecten-veneris*³⁹), woodlands (*Cephalanthera longifolia*³⁹ and *Sorbus hibernica*⁴⁰), damp habitats such as shaded stream banks and dune slacks

³⁸ Streeter, D. (2009) *Collins Flower Guide: The Most Complete Guide to the Flowers of Britain and Europe*. Harper Collins Publishers.

³⁹ Rose, F. (2006) *The Wildflower Key: How to Identify Wild Flowers, Trees and Shrubs in Britain and Ireland*. Penguin Books.

⁴⁰ *Sorbus hibernica* habitat preferences. Available at: www.habitas.org.uk Accessed on: 20th June 2023.

(*Equisetum x moorei* and *Gymnocarpium dryopteris*³⁸) or acidic soils (*Omalotheca sylvatica*³⁹). *Malva neglecta* is typically found at wasteland, roads and hedge banks, as well as on the beach³⁹.

No rare and/or protected flora were recorded during the surveys, although the desk study returned records for some within c. 2km of the proposed development. Given these species designation under the FPO and/or Ireland's Red list for Vascular Plants³⁵ the above listed species are considered to be of County Importance. However, given the lack of suitable habitats for these species within the proposed development site, there is no potential impact and therefore they are not being considered further as KERs.

Non-native Invasive Flora

With regards to records for non-native invasive species within c. 2km of the proposed development, the NBDC database search returned records for the following six non-native invasive flora: *Elodea canadensis*, *Gunnera tinctoria*, *Impatiens glandulifera*, *Lysichiton americanus*, *Reynoutria japonica*⁴¹ and *Rhododendron ponticum*. With the exception of *Elodea canadensis*⁴², are all listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). There is one record for *E. canadensis* and *I. glandulifera* each, from alongside River Vartry, c. 1km north-west from 2009. There are two records of *G. tinctoria* from 2009 and 2021, and one record for *R. ponticum* from 2021, from the same location as the *E. canadensis* and *I. glandulifera* records. There is a record of *L. americanus* c. 1km northeast associated with watercourses draining into Broadlough from 2005. The most recent record of the six records on the database for *R. japonica* is from 2021. The nearest of these records is located c. 1.4km south-east of the proposed development, on the bank of the River Leitim, in Wicklow town, from 2019.

Other non-native invasive species within c. 2km of the proposed development returned from the NBDC data search included *Acer pseudoplatanus*, *Buddleja davidii*, *Clematis vitalba*, and *Rosa rugosa*. These species are currently not listed on the Third Schedule but are regarded as medium impact invasives by the NBDC and Invasive Species Ireland⁴³.

The field surveys undertaken at the proposed development site in April, May and July 2022 recorded two species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended), Himalayan balsam *I. glandulifera* along the banks of the Rathnew Stream, and Spanish bluebell *Hyacinthoides hispanica* or its hybrid *Hyacinthoides x hybridum* within the eastern portion of the central and southern treelines (shown in Figure 8-8, below).

Ecological evaluations are not applicable with non-native invasive species considering their invasive non-native status.

⁴¹ Previously known as *Fallopia japonica*.

⁴² *Elodea canadensis* was delisted as Third Schedule Invasive plant by virtue of SI 255 of 2015.

⁴³ NBDC (2022). Invasive Species of Ireland. Available online at: <https://invasives.ie/> Accessed 2^o June 2023.

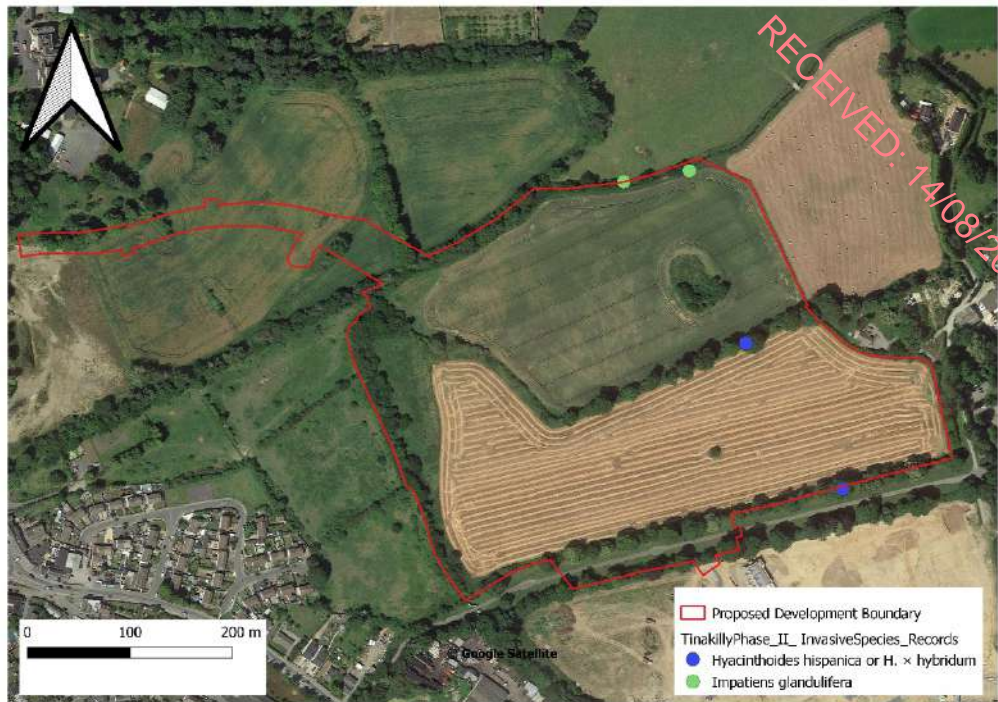


Figure 2-8 Invasive Non-native Species Recorded within the Proposed Development Site.

Habitats

The subject lands contain a range of habitats which are typical of the wider agricultural landscape found to the west and north of the proposed development (see Figure 8.7). A full list of species recorded within each habitat is included in Appendix 8E.

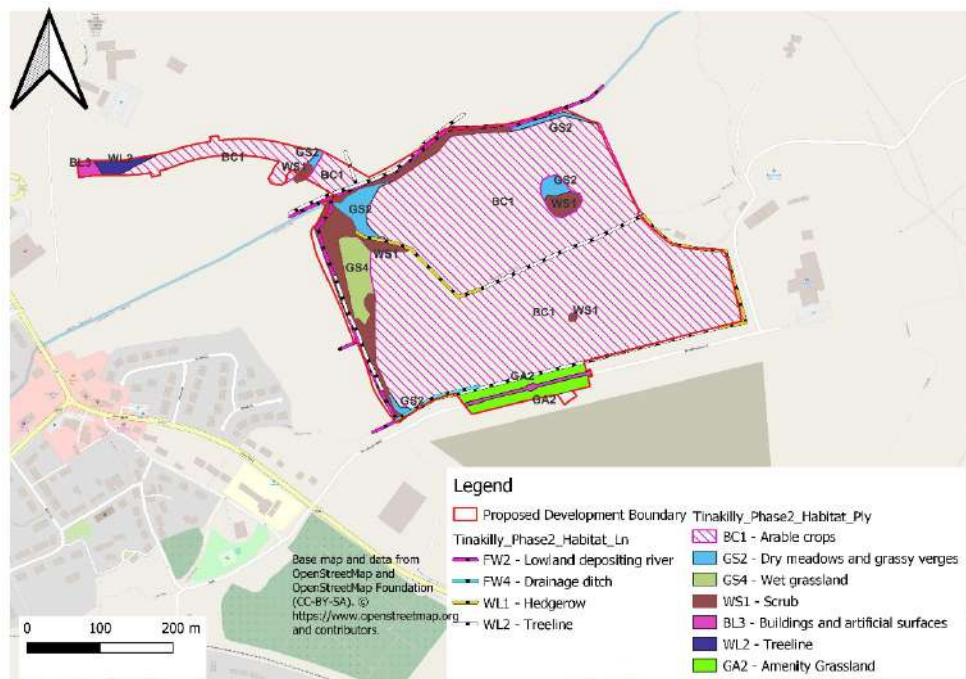


Figure 2-9 Habitats recorded within the proposed development site boundary.

Depositing/ lowland rivers (FW2)

This habitat comprises the Rathnew Stream and Rosanna Lower Stream, which abound the north and west of the proposed development site, respectively. The Rathnew Stream is relatively species poor with the dominant species instream being hemlock water-dropwort. The banks comprise willow scrub (WS1) (see below) with the dominant species consisting of rusty willow *Salix cinerea* subsp. *oleifolia* and alder *alnus glutinosa* while pedunculate oak *Quercus robur* and wych elm *Ulmus glabra* occur on the opposite bank. The understorey is dominated by great willowherb *Epilobium hirsutum*, common nettle *Urtica dioica*, pendulous sedge *Carex pendula*, ramsons *Allium ursinum* and hedge bindweed *Calystegia sepium*.

This habitat is part of the aquatic and terrestrial corridor linking downstream Broadlough and the Irish Sea with the hydrological network upstream and to other linear features such as treelines and hedgerows in the wider landscape. The Rosanna Lower Stream, is considered to contain poor quality fisheries habitat, poor suitability for otter and no suitability for white-clawed crayfish with a Moderate water quality status (Q3-4), as such this stream is considered to be of local importance lower value.

The Rathnew Stream is considered to contain excellent quality salmonid nursery habitat with good quality spawning and good holding habitat; good quality Lampetra sp. nursery & spawning habitat; good-quality European eel habitat; good suitability for white-clawed crayfish; otter signs recorded at the site; Q4 (good status) water quality. Therefore, this Stream is considered to be of local importance (higher value).



Plate 1 Depositing lowland watercourse (FW2) habitat in the proposed development site.

Scrub (WS1)

The scrub habitat occurs along the Rathnew Stream along the northern boundary and the confluence with the Rosanna Lower Stream in the northwest of the proposed development (see Plate 2) as well as along the bottom of two arable crop (BC1) fields in the west of the proposed development site and in discrete areas within these fields (see Plate 3). Largely dominated by Willow *Salix sp.*, including rusty willow, immature alder *Alnus glutinosa*, wild cherry *Prunus avium*, bramble *Rubus fruticosus agg.* and gorse *Ulex europaeus* the scrub habitat overlaps with the lowland streams, namely the Rathnew Stream, Rosanna Lower Stream and drainage ditch (FW4) along the north and western boundaries and also encroaches onto the adjacent dry meadow and grassy verge (GS2) habitat. The ground flora along the watercourses are dominated by creeping buttercup, hemlock water-dropwort *Oenanthe crocata* and meadowsweet *filipendula ulmaria*. The Third Schedule non-native invasive species Himalayan balsam occurs between gaps in the shrub layer across this habitat. This section of scrub is well established and contains semi-mature trees of willow and alder, and has the potential to develop into riparian woodland overtime. This feature is connected further upstream and to other linear features to the north and west, to Broadlough downstream and also provides shelter to the Rathnew stream. Owing to this, this portion of scrub is considered to be of local importance (higher value).

Willow and wild cherry dominate a small discrete area of scrub within the arable field bordering the Rathnew Stream while a patch of scrub in the arable field along Tinakilly Lane is comprised of hawthorn *Crataegus monogyna* and elder *Sambucus nigra*.

This habitat is considered to be of local importance (higher value) due to its relatively well-developed scrub vegetation and the potential for the scrub to become more species diverse over time and develop into a riparian woodland habitat.



Plate 2 Scrub (WS1) along the north of the proposed development site.



Plate 3 Scrub (WS1) habitat in the proposed development site.

Treelines (WL2)

Treelines (WL2) habitat differs from hedgerow (WL1) habitat in that the single lines of trees (typically planted as single or double rows) are above five metres in height (see Plate 4). The treelines within the proposed development are situated along the southern boundary and part of the western boundary as well as the linear feature in the centre of the site which divides the two arable fields. There are two treelines with predominantly large and very mature specimen trees in the centre and along the south, bordering Tinakilly Lane, and another semi-mature treeline in the west of the proposed development. Treelines within the proposed development are characterised by such species as ash *Fraxinus excelsior*, wild cherry, beech *Fagus sylvatica*, Spanish chestnut *Castanea sativa*, Oak *Quercus sp.*, sycamore *Acer pseudoplatanus*, Douglas fir *Pseudotsuga menziesii*, horse-chestnut *Aesculus hippocastanum* and elder *Sambucus nigra*. The understory layer of the treelines contains such shrubby species as bramble, hawthorn, blackthorn *Prunus spinosa*, elder, dog rose *Rosa canina* agg. and holly *Ilex aquifolium*. The ground layer of the treelines include species like lesser celandine *Ficaria verna*, lords and ladies *Arum maculatum*, cleavers *Galium aparine*, ground ivy *Glechoma hederacea*, common hogweed *Heracleum sphondylium*, common ivy *Hedera helix*, nettles *Urtica dioica*, ramsons and soft shield-fern *Polystichum setiferum*. These are all common species from the wider landscape.

The treelines form part of the wider linear network through the local landscape and are therefore considered to be of local importance (higher value).



Plate 4 Mature treeline (WL2) in the south of the proposed development site.

Hedgerows (WL1)

Small sections of linear features in the proposed development site comprise hedgerows, namely in the centre and to the east. The feature to the west of the central treeline (WL2) contains blackthorn, hawthorn, bramble and gorse while the feature to the east contains oak, beech, sycamore, bramble and elder. The eastern hedgerow partly forms the boundary of a neighbouring private house, which is dominated by heavily managed, planted cherry laurel *Prunus laurocerasus* and yew *Taxus baccata*. The ground vegetation generally comprises lesser celandine, lords and ladies, cleavers, hogweed and creeping buttercup *Ranunculus repens*.

Although, the hedgerows are relatively species poor, they are well developed and along with the treelines and scrub they provide connectivity to the wider landscape, Thus, hedgerows are considered to be of local importance (higher value).



Plate 5 Mature hedgerow (WL1) in the west of the proposed development site.

Dry meadows and grassy verges (GS2)

This habitat occurs predominantly adjacent to the west of the proposed development and has formed in the northeast portion along the Rathnew Stream and beside an area of

scrub in the northern arable field. This habitat is largely dominated by grass species such as false-oat grass *Arrhenatherum elatius* and Yorkshire-fog *Holcus lanatus* but is interspersed with forb species such as bush vetch *Vicia sepium*, ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense*, creeping buttercup, germander speedwell *Veronica chamaedrys* and meadow vetchling *Lathyrus pratensis*. This habitat forms a mosaic with wet grassland (GS4) where species of such wet ground including great willowherb and meadowsweet begin to overlap.

This habitat is overall species poor due a lack of management and nutrient run-off from the fertilised arable fields which allows grasses to dominate and in patches where encroachment of vegetation such as bramble, common nettle, field horsetail *Equisetum arvense* and gorse.

This habitat is considered to be of local importance (lower value) due to its low species diversity, scrub encroachment and continuing unmanaged condition.



Plate 6 Dry meadow and grassy verge (GS2) in the west of the proposed development site.

Wet grassland (GS4)

Wet grassland is restricted to a small area in the west of the proposed development site located between willow scrub (WS1) and dry meadows and grassy verges habitat (GS2). This area of habitat contains a variable range of species including reed canary grass *Phalaris arundinacea*, common reed grass *Phragmites australis* and marsh foxtail *Alopecurus genticulatus*. While forb species include flag iris *Iris pseudacorus*, marsh-bedstraw *Galium palustris*, soft rush *Juncus effusus*, sharp-flowered rush *Juncus acutiflorus*, compact rush *Juncus conglomeratus*, water horsetail *Equisetum fluviatile*, marsh woundwort *Stachys palustris* and great willowherb.

This habitat is relatively species rich and adjoins an area of wet scrub. Therefore, this habitat is considered as of local importance (higher value).



Plate 7 Wet grassland (GS4) in the west of the proposed development site.

Drainage ditch (FW4)

Drainage ditch (FW4) habitat occurs along the southwest of the proposed development. The feature runs alongside a hedgerow (WL1). The drainage ditch was dry at the time of the habitat surveys and is species poor. The drainage ditch is comprised of cleavers, hogweed, common nipplewort *Lapsana communis* and creeping buttercup, all species typically associated with adjacent grassland habitats.

Considering the sparse vegetation cover and low species diversity, this habitat is considered to be of local importance (lower value).

Amenity Grassland (GA2)

This habitat occurs along the northern and southern edge of the Tinakilly House Avenue, in the southern extent of the proposed development. This habitat is largely dominated by grass species such as perennial ryegrass *Lolium perenne*, Yorkshire fog *Holcus lanatus* and sweet vernal grass *Anthoxanthum odoratum*, but is also interspersed with some forb species including daisy *Bellis perennis*, creeping buttercup *Ranunculus repens* and red clover *Trifolium pratense*. This habitat is overall species poor due to reseeding and intensive management as such is considered to be of local importance lower value.

Arable crops (BC1)

The dominant habitat within the proposed development site was arable crops (BC1). This is a species poor habitat with barley crop (*Hordeum vulgare*) dominating the sward at the time of survey, forb species comprised: groundsel *Senecio vulgaris*, nipplewort *Lapsana communis*, field-speedwell *Veronica persica*, common chickweed *Stellaria media*, red dead nettle *Lamium purpurea*, field spurrey *Spergula arvensis* and shephard's purse *Capsella bursa pastoris*, as well as the graminoid annual meadow grass *Poa annua*. This habitat is heavily managed through regular harvesting, ploughing and application of fertilisers, as such species diversity is relatively low. Therefore, it is considered as of local importance (lower value).



Plate 8 Arable field (BC1) in the proposed development site.

8.3.4 Fauna

Otter

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive where they are afforded strict protection. They are regarded to be of “Least Concern” in terms of conservation status in Ireland (Marnell *et al.*, 2019)⁴⁴. The NBDC database search returned four records for otter within c. 2km of the proposed development. The nearest record is from Broadlough, c. 760m east of the proposed development. All the other records are from Broadlough as well. There are additional records for otter in the wider area of Co. Wicklow, noted from the National Otter Survey reports from 1980-1981⁴⁵, 2004-2005¹⁴ and 2010-2011⁴⁶. The nearest of these records is from River Vartry, c. 9.4km north-west and dates back to 1980. Additionally, Scott Cawley Ltd. ecologists anecdotally recorded otter in River Vartry, c. 2.1km north-west of the proposed development in September 2021. The NPWS database holds no records for otter in the 10km grid squares, T29 and T39, in which the proposed development is located in.

Signs (e.g. holts, couches, spraints or tracks) of otter were noted by Triturus Environmental Ltd. along the Rathnew Stream during aquatic baseline surveys conducted in April 2022 (Appendix 8F). The evidence recorded during aquatic surveys included spraints at three locations and a resting place in the form of a couch site (see Figure 8.9 below).

Further to the evidence of otter within the proposed development site, the local otter populations are considered to be of International Importance, as they have the potential to be associated with the Wicklow Mountains SAC QI populations due to its proximity to the proposed development site and considering that otter territories can reach up to 21km along hydrological pathways (Ó' Neill *et al.*, 2009)⁴⁷. Wicklow Mountains SAC is located within a different sub-catchment (e.g. Avonmore_SC_010) to the proposed development (Vatry_SC_010), however considering the distance between some watercourses within the Avonmore and Vartry sub-catchments are not long, i.e. starting from c. 200m, and the fact that otter do not strictly travel within watercourses when commuting, although they never move far from one, there is potential for otter crossing from one sub-catchment to another (Ó' Neill *et al.*, 2009)⁴⁷.

⁴⁴ Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

⁴⁵ Chapman, P.J. & Chapman, L.L. (1982). Otter Survey of Ireland 1980-81. Survey carried out on behalf of The Vincent Wildlife Trust.

⁴⁶ Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) mNational Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

⁴⁷ Ó'Neill, L., Veldhuizen, T., de Jongh, A., Rochford, J. (2009) Ranging behaviour and socio-biology of Eurasian otters (*Lutra lutra*) on lowland mesotrophic river systems. *European Journal of Wildlife Research*. 55:363-370.



Figure 2-10 Locations of signs of otter activity within the proposed development site.

Badger

Badger *Meles meles*, and their breeding and resting places, are protected under the Wildlife Acts. The NBDC data search returned seven records for badger within c. 2km of the proposed development site. The most recent and closest record (dated 2013) was of roadkill on the M11 located c. 1.4km west of the proposed development site. With a number of other records dating from 2012 from the surrounding 1km Grid squares to the north of the proposed development site (T2896, to the northwest & T3096, to the northeast). In addition, the NPWS database holds two historical records for badger from the 10km grid square, T29 in which the proposed development site is located in, dating from 1960 and 1990.

A badger sett was recorded within the proposed development within the treeline in the centre of the site. The sett was recorded during the multidisciplinary survey when four obvious entrance holes were recorded under dense undergrowth, although it recognised that owing to the dense nature of the scrub, that further entrances may be present. There were also snuffle holes north of the treeline and at least two trails leading directly to the sett and/or between entrances. Two camera traps were positioned at two separate entrance holes for 14 and 11 days, respectively. The recordings from the first camera location confirmed the active use of the sett by badger. The second camera location also confirmed badger activity associated with the 2nd sett entrance. As the sett comprises at least four entrances, it is considered an outlier sett.

It should be noted that this badger sett was previously identified during field for another project in 2016 (Scott Cawley Ltd., 2016)⁴⁸. However, this badger sett appeared inactive when it was visited again in May 2021 as part of fieldwork to inform the adjacent Tinakilly Phase 1 planning application (Scott Cawley Ltd., 2022)⁴⁹.

⁴⁸ Scott Cawley Ltd. (2016) Ecological Impact Assessment. Proposed Residential Development. Tinakilly, Rathnew, Co. Wicklow.

⁴⁹ Scott Cawley Ltd. (2022). Tinakilly LRD EIAR Chapter 8

Badgers, and their breeding and resting places, are protected under the Wildlife Acts. Due to their stable Irish populations, they are considered to be of “Least Concern” in terms of conservation (Marnell *et al.*, 2019)⁴⁴. The local badger populations are valued to be of local importance (higher value), as there is a sett present within the proposed development which is confirmed to support badgers. Considering the size of the recorded badger sett and the low levels of badger activity evidence recorded within the proposed development site, the surrounding area is considered likely to only support local badger populations and is unlikely to support large numbers of badger.

Bats

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the lesser horseshoe bat also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011.

The NBDC holds records for the following bat species within c. 2km of the proposed development site:

- Brown long-eared bat *Plecotus auritus*, one record exists c.1.8km northwest of the proposed development, from 2007;
- Common pipistrelle *Pipistrellus pipistrellus*, two records, with the nearest and most recent record located at the Tinakilly Country House, immediately north of the proposed development, from 2022;
- Daubenton’s bat *Myotis daubentonii*, 31 records, with the nearest and the most record located c. 1.4km north-west of the proposed development, from 2012;
- Lesser noctule *Nyctalus leisleri*, two records, with the nearest and most recent record located at the Tinakilly Country House, immediately north of the proposed development, from 2008; and,
- Soprano pipistrelle *Pipistrellus pygmaeus*, one record from the Tinakilly Country House, immediately north of the proposed development from 2008.

No bat species records were returned from the NPWS database when interrogated, however, two known bat roosts were returned from the Bat Conservation Ireland’s roost database⁵⁰. They are located c. 200m north-east and c. 650m south-east of the proposed development.

The linear habitat on the boundaries of the lands provides good commuting and foraging routes for bats within the area and their level of suitability is valued ‘High’ as per the Bat Conservation Trust guidelines⁹. The treelines, hedgerows and woodlands west of Tinakilly Country House (hereafter referred to ‘TCH’) along the site boundaries connect to treelines and hedgerows in the surrounding area, therefore forming part of a wider ecological network in the locality. The habitats between these linear boundary features are valued ‘Low’ due to their sparse vegetation which is unlikely to provide significant foraging opportunities for most bats.

The proposed development site is largely unlit, with the exception of areas that are lit by flood lights namely, from two sources one of which is northwest of the proposed development site from near the R750, and flood lighting associated with the car park of TCH. Although, only noted to be in use during the dusk surveys, the flood lights associated with TCH emit high levels of light spill into the adjacent arable field and central treeline. Otherwise, much of the site is unlit which increases the suitability of the linear features for any foraging and commuting bats.

⁵⁰ Bat Conservation Ireland roost database. Available at: www.batconservationireland.org Accessed on: 20th June 2023.

Twenty-Eight (28) no. trees with potential roost features (PRFs) were identified within the proposed development lands during the ground-level assessment on the 12th April and 4th May 2022. The trees noted to contain PRFs are situated primarily along the southern and central treelines with two others within the riparian scrub habitat (see Figure 7.10 for locations). These trees were assessed to be of ‘Low’ to ‘Moderate’ potential for roosting bats based on their PRFs.

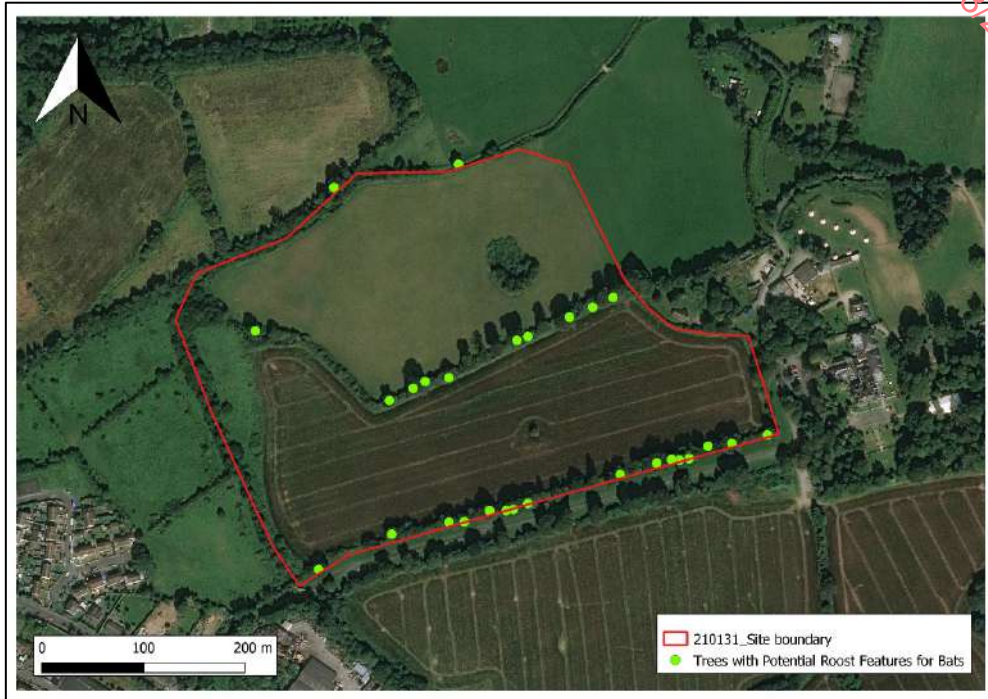


Figure 2-11 Trees with potential roost features for roosting bats within the proposed development site.

The bat emergence/re-entry surveys did not note any bats emerging or re-entering the gate lodge, however a bat roost that was previously recorded at the TCH in 2016 by Scott Cawley Ltd.⁴⁸, was confirmed to be still active, as a common pipistrelle bat was seen re-entering the structure during 2021 surveys (Scott Cawley Ltd., 2022)⁴⁹. In August 2016, eight common pipistrelle bats were seen re-entering the same PRF that the bat re-entered in 2021.

The bat activity surveys recorded four bat species: common pipistrelle, soprano pipistrelle unidentified pipistrelle, Leisler’s bat and brown long-eared bat foraging and commuting within the proposed development lands. The activity was largely focused around the treeline, scrub and hedgerow habitat found along the site boundaries (see Figure 8.11).

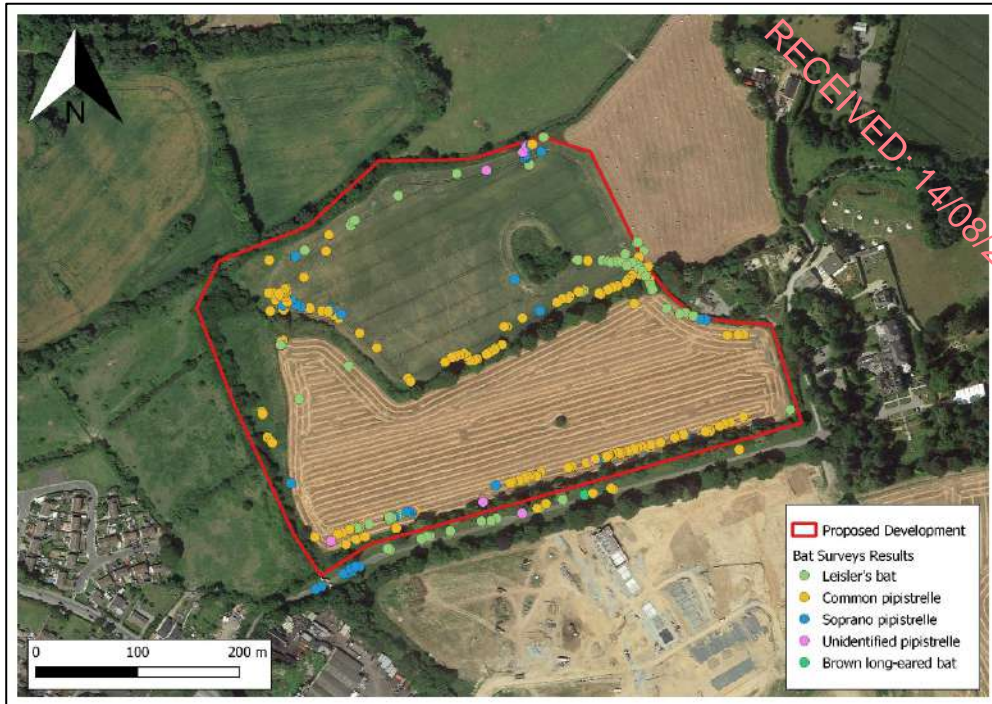


Figure 2-12 Bat activity recorded within the proposed development site.

The bat species recorded during the surveys and returned in the NBDC data search are all common species and of “Least concern” (Marnell *et al.*, 2019)⁴⁴. The local bat populations using the proposed development site and the surroundings as foraging and commuting habitat are valued as being of local importance (higher value).

Small Non-Volant Terrestrial Mammals

Small mammals, hedgehog *Erinaceus europaeus*, Irish hare *Lepus timidus hibernicus*, Irish stoat *Mustela erminea hibernica*, pine marten *Martes martes*, pygmy shrew *Sorex minutus* and red squirrel *Sciurus vulgaris* are protected under the Wildlife Acts. The NBDC database search returned six records of hedgehog within c. 2km of the proposed development site. The closest most recent record for hedgehog is c.200m east of the proposed development, dating from 2020. In addition, the NPWS database returned seven records for hedgehog (from between 1960 and 1977), three records for Irish hare (from between 1960 and 1992), four records for Irish stoat (from between 1960 and 1976) and two records for red squirrel (from 1960 and 1990) for the 10km grid squares, T29 and T39, in which the proposed development is located in. Many of these records are historical but provide an indication of the potential for their occurrence in the wider area. A record of an Irish stoat was recorded by Scott Cawley Ltd. (2022)⁴⁹ as part of the Tinakilly Phase 1 baseline ecology surveys, by the Broadlough, c. 750m south-east of the proposed development.

No signs of activity of protected small mammal fauna were noted within the subject lands during surveys. There was limited suitable foraging habitat for hedgehog, Irish hare, Irish stoat, pine marten or red squirrel on the proposed development site, primarily in the form of the hedgerows, treelines, scrub and riparian wetland vegetation, however small numbers of some of these species may use the habitats for commuting through and limited foraging opportunities.

All small mammal species returned in the NBDC search are of “Least Concern” in terms of conservation status (Marnell *et al.*, 2019)⁴⁴. They are widely distributed throughout Ireland. Although the habitats onsite do not present ideal habitat for breeding small

mammals, they may be potentially used by commuting and foraging small mammals. The local small mammal populations are valued to be of local importance (higher value).

Non-native Invasive Terrestrial Mammals

With regards to records for invasive non-native mammal species within c. 2km of the proposed development, the NBDC database search returned records for grey squirrel *Sciurus carolinensis*, which is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Records of grey squirrel were recorded as part of the adjacent Tinakilly Phase 1 development by Scott Cawley Ltd., during ecological surveys undertaken in 2021. The nearest and most recent NBDC record is from the gardens of Tinakilly Country House which is located immediately east of the proposed development site, from 2017. Other invasive non-native species returned in the NBDC data search included rabbit *Oryctolagus cuniculus*. Evidence of this species was recorded along arable field margins throughout the ecological surveys for the proposed development. The nearest of the two records held by the NBDC database is located c. 800m north-east of the proposed development. In addition to the NBDC database records, the NPWS database holds 10 records for sika deer *Cervus nippon* from the 10km grid square, T29, in which the proposed development is located in, with the recorded dated between 1990 and 2004. Rabbit and sika deer are currently not listed on the Third Schedule but are regarded as invasive by the NBDC⁴³. Scott Cawley Ltd., ecologists recorded sika deer near the western margin of the site once during multidisciplinary surveys in July 2022.

A bank vole *Myodes glareolus* was recorded via a trail camera set up at the badger sett in early May 2022. Bank vole are considered a Medium Impact Invasive Species, largely distributed in the south and west of Ireland which are spreading northwards⁵¹.

Ecological evaluations are not applicable with non-native invasive species considering their invasive and non-native status.

Marine Mammals

The NBDC database holds records for two marine mammal species grey seal *Halichoerus grypus* (Annex II and V species of the EU Habitats Directive) and harbour porpoise *Phocoena phocoena* (Annex II and Annex IV species of the EU Habitats Directive) within c. 2km of the proposed development. There is one record for grey seal c. 1km north-east and one record for harbour porpoise, located c. 2.5km south-east, from 2014 and 2017, respectively.

Additionally the NPWS database holds one record for harbour seal *Phoca vitulina* (Annex II and V species of the EU Habitats Directive) from the same 10km grid square, T29, in which the proposed development is located; the Irish Whale and Dolphin Group holds records for bottlenose dolphin *Tursiops truncatus* (Annex II and Annex IV species of the EU Habitats Directive) and harbour porpoise from the Irish Sea along the coastline running past the proposed development site from 2021; and Scott Cawley Ltd., ecologists recorded a grey seal at Broadlough, c. 1km east of the proposed development site on the 26th January 2021. A rare Sowerby's beaked whale *Mesoplodon bidens* (Annex IV species of the EU Habitats Directive) was also recorded at Wicklow Harbour in 2020 (NBDC record beyond 2km of the proposed development The grey seal and the harbour seal are of "Least Concern", whereas the Red list status for the other cetaceans have not been evaluated (Marnell et al., 2019)⁴⁴.

⁵¹ <https://maps.biodiversityireland.ie/Species/119785>

There is no suitable habitat within the proposed development site for marine mammals, however, the proposed development is hydrologically connected via the surface water network to the coastal waters they inhabit. Marine mammals downstream of the proposed development are considered to be of County to International importance depending on the species.

Birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive. The NBDC database holds records for 50 bird species which are known to occur within c. 2km of the proposed development site. Of these species, 23 are special conservation interest (SCI) species of European sites, 10 are listed under Annex I of the Birds Directive, 5 are Red-listed (of High Conservation Concern) and 12 Amber-listed (of Medium Conservation Concern) on the Birds of Conservation Concern of Ireland 2020-2026⁵² list. Species listed under the Birds Directive or in the Birds of Conservation Concern of Ireland 2020-2026 are presented in a table in Appendix 8D.

Breeding Birds

A range of common bird species were noted using the site or lands immediately adjacent to it for foraging and breeding purposes during the breeding bird surveys undertaken in spring/summer 2022 (see Figure 8.12). These included blackbird *Turdus merula*, blackcap *Sylvia atricapilla*, blue tit *Cyanistes caeruleus*, coal tit *Periparus ater*, common chaffinch *Fringilla coelebs*, common chiffchaff *Phylloscopus collybita*, common pheasant *Phasianus colchicus*, dunnock *Prunella modularis*, Eurasian bullfinch *Pyrrhula pyrrhula*, Eurasian magpie *Pica pica*, Eurasian wren *Troglodytes troglodytes*, European goldfinch *Carduelis carduelis*, European greenfinch *Chloris chloris*, European herring gull *Larus argentatus*, European robin *Erithacus rubecula*, feral pigeon *Columba livia f. domestica*, grasshopper warbler *Locustella naevia*, goldcrest *Regulus regulus*, great spotted woodpecker *Dendrocopus major*, great tit *Parus major*, hooded crow *Corvus cornix*, common house martin *Delichon urbicum*, jackdaw *Corvus monedula*, jay *Garrulus glandarius*, lesser redpoll *Carduelis flammea cabaret*, long-tailed tit *Aegithalus caudatus*, mallard *Anas platyrhynchos*, mistle thrush *Turdus viscivorus*, rook *Corvus frugilegus*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, siskin *Carduelis spinus* and woodpigeon *Columba palumbus*.

In addition to these species, the following species were observed flying across the site including; barn swallow *Hirundo rustica*, common buzzard *Buteo buteo*, common swift *Apus apus*, house martin, peregrine *Falco peregrinus*, red kite *Milvus milvus* and sparrowhawk *Accipiter nisus*. Of these species, two are Red listed (of High Conservation Concern) (common swift and red kite) and seven are Amber listed (of Moderate Conservation Concern) (barn swallow, European greenfinch, European herring gull, goldcrest, house martin, mallard and starling). No species recorded is listed on Annex I of the EU Birds Directive, however, two species are listed as SCIs (herring gull and mallard).

⁵² Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 43:1-22.

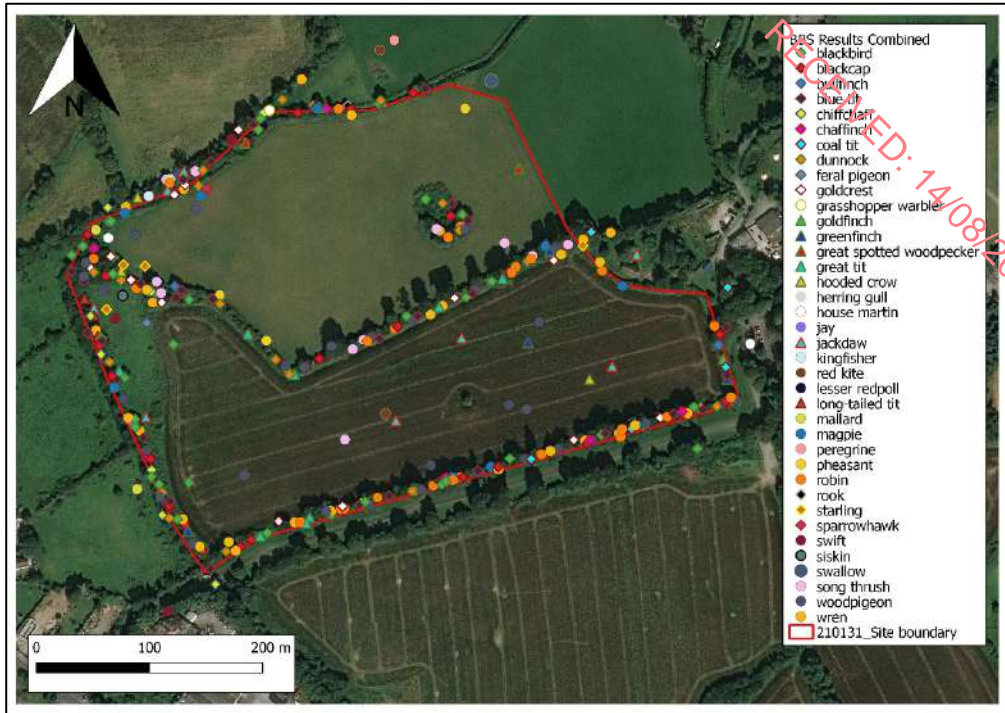


Figure 2-13 Locations of breeding bird records.

Breeding birds use various habitats, including trees, structures and scrub, for nesting. The presence of several bird species with territories within the proposed development site indicates that it is likely to be used for breeding by a number of species. No nests were observed within the proposed development site during the surveys; however, they are usually camouflaged and therefore well-hidden and so it is acknowledged that they could have gone unnoticed despite the survey effort.

Drumming by great-spotted woodpeckers occurred on two trees within TCH grounds which are possibly used as nesting sites (pers. comm. TCH grounds keeper). This species was also recorded along the Rathnew Stream during two of the breeding bird surveys where they hold a potential breeding territory. House martins were noted to be nesting in a shed adjoining the west facing side of TCH.

A single kingfisher *Alcedo atthis*, an Annex I species, was recorded on the 16th of June 2022, during field surveys, it was recorded flying upstream along the Rathnew Stream on the northern boundary of the proposed development site. The closest European site designated for the protection of Kingfisher is the River Boyne and River Blackwater SPA located approximately 76km north of the proposed development site.

Given the abundance of green listed species recorded, the small numbers of amber or red listed species (with suitable breeding habitat of these Red and Amber listed species within the proposed development site for only greenfinch, goldcrest, mallard and starling) and the abundance of suitable surrounding habitat; the proposed development site is considered to be of Local Importance (higher value) for local breeding bird populations.

Wintering birds

The wintering bird surveys recorded little wintering bird activity on site (see Figure 8.13). The only wintering bird species recorded within the site included redwing *Turdus iliacus*, recorded during two surveys visits, while a cormorant was observed in Rathnew Stream during one survey visit. Common buzzard was recorded using the treeline in the centre of the site for roosting.

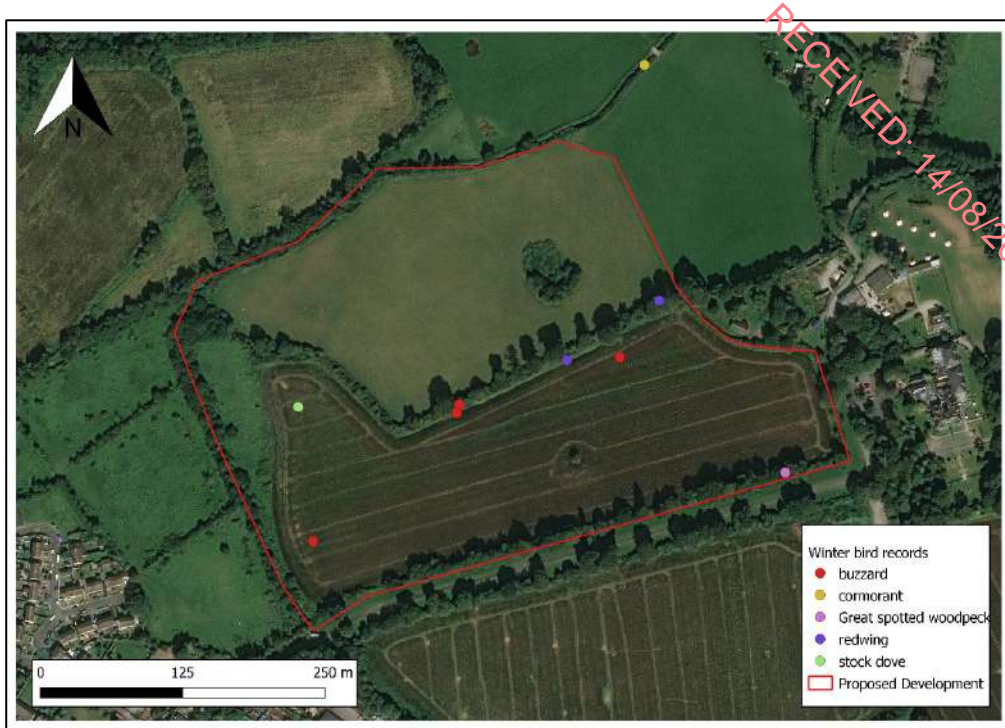


Figure 2-14 Locations of wintering bird records.

The proposed development site is potentially suitable for wintering birds including geese, gulls and waders which tend to favour agricultural fields or wet grassland suitable for foraging and roosting. No geese droppings were recorded during walked transects across the fields.

Species recorded flying over the proposed development included: black-headed gull *Chroicocephalus ridibundus*, common gull *Larus canus*, cormorant *Phalacrocorax carbo*, European herring gull, great black-backed gull *Larus marinus*, grey heron *Ardea cinerea*, lesser black-backed gull *Larus fuscus*, little egret *Egretta garzetta*, mallard *Anas platyrhynchos* and mute swan *Cygnus olor* (see Figure 8-15, Figure 8-16 and Figure 8-17, below).

Of the total 15 wintering bird species recorded, one (little egret) is listed under the Annex I of the EU Birds Directive, six are SCI species of European sites (black-headed gull, common gull, European herring gull, cormorant, lesser black-backed gull, mallard), one (redwing) is Red listed (of High Conservation Concern) and one (mute swan) is Amber listed on the Birds of Conservation Concern of Ireland 2020-2026⁵². Two out of the six SCI species recorded are SCI species of The Murrrough SPA (black-headed gull and European herring gull).

Only one of the SCI species recorded, namely cormorant was recorded utilising the proposed development site during the winter bird surveys. A single record of an individual foraging in the Rathnew Stream downstream of the proposed site boundary. All other records of SCI species were of flightlines over or near the proposed development site. Three SCI species including cormorant, little egret and mallard were recorded flying along the Rathnew Stream. The only Red listed wintering passerine species recorded on the site was redwing. Stock dove *Columba oenas* was also recorded during one of the survey visits. This Red listed species typically forages in arable fields during the winter months⁵³ and does not move far from their breeding grounds which suggests they may breed in

⁵³ RSPB – Stock Dove: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/stock-dove/>

woodland near the site. Although, the agricultural lands from within the proposed development largely comprise arable fields and are as such unsuitable for various wintering bird species for large parts of the year, including geese, gulls and waders. The treelines and hedgerows along the site boundaries still offer suitable foraging habitat and shelter for smaller overwintering species such as passerines for example blackcap and redwing.

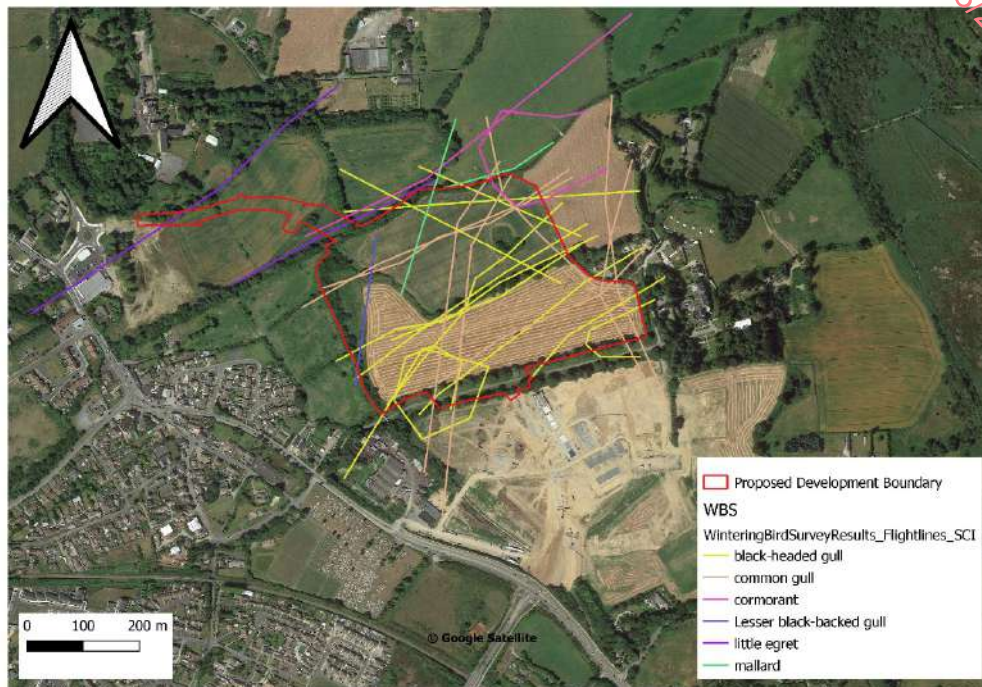


Figure 2-15 Records of SCI wintering bird flightlines.

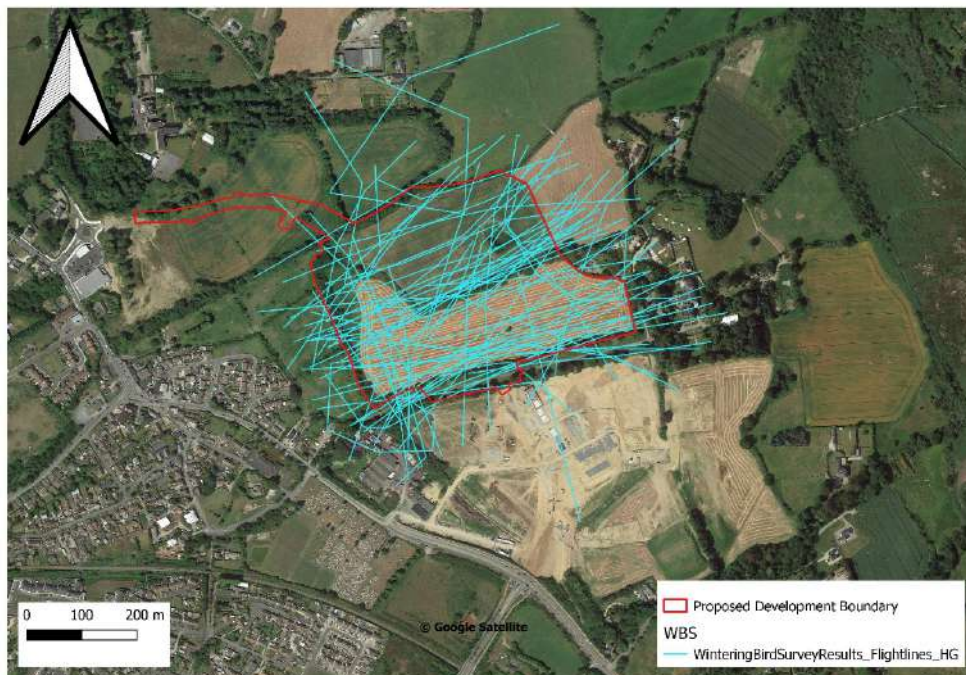


Figure 2-16 Records of SCI Herring Gull wintering bird flightlines

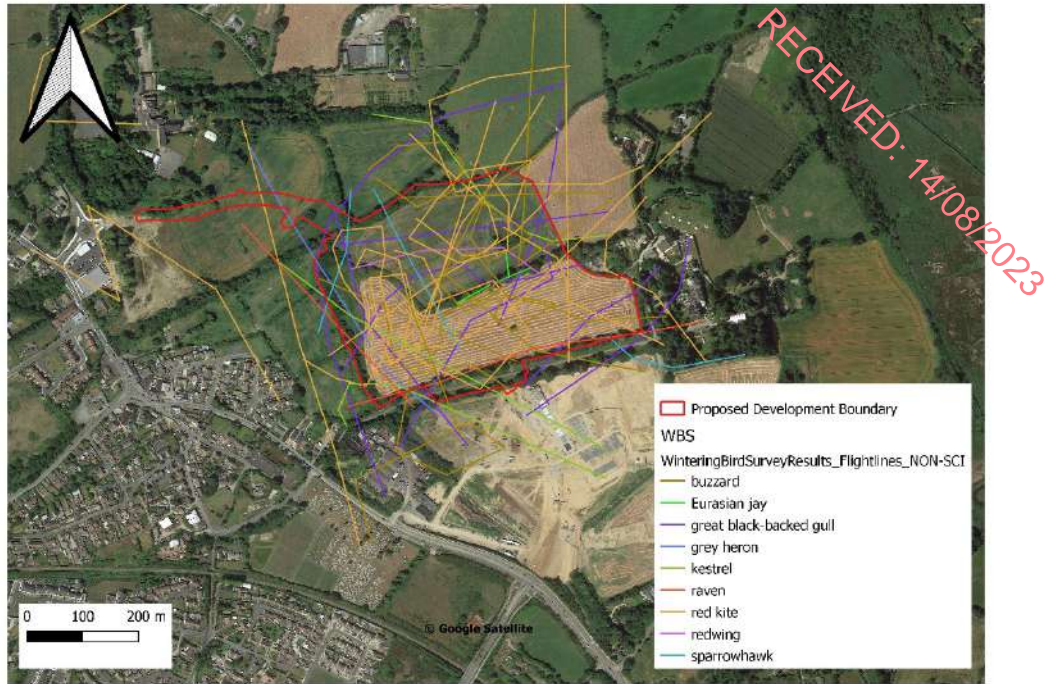


Figure 2-17 Records of Non-SCI wintering bird flightlines

Raptor Surveys

Raptor surveys undertaken in support of the adjacent consented Tinakilly Phase 1 development's (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118),) ecological impact assessment did not record any activity that would indicate that there are nesting raptors within the proposed development site or its immediate vicinity. No active raptor nests, such as red kite nests, were recorded within the proposed development site, or within c. 500m radius of the proposed development. There is an old buzzard nest in the Tinakilly Country House grounds, but this was used by ravens at the time of the surveys. Red kite were recorded flying over the proposed development site on two occasions. On both these occasions, the birds flew from the direction Broadlough across the proposed development site heading in a northerly direction.

Raptor species recorded during the raptor surveys included common buzzard, common kestrel *Falco tinnunculus*, peregrine falcon *Falco peregrinus* and red kite. In addition, common buzzard, common kestrel, hen harrier *Circus cyaneus*, red kite and sparrowhawk *Accipiter nisus* were recorded hunting in proximity to the proposed development site wintering bird surveys of the adjacent consented Tinakilly Phase 1 development. Of these species, common kestrel and red kite are Red listed (of High Conservation Concern), while hen harrier is Amber listed, where the remainder of the species are Green listed on the Birds of Conservation Concern of Ireland 2020-2026⁵².

Bird Summary

In summary, the proposed development site and its surrounding territory support a variety of bird species, including supporting foraging raptors. The breeding bird populations within the area are valued to be of local importance (higher value), given the large number of Green listed bird species recorded, the low numbers of Amber or Red listed species and the lack of use of the site by breeding SCI species.

No SCI wintering species were recorded utilising the site itself or the surrounding lands, with the exception of a single Cormorant within the Rathnew Stream downstream of the proposed development, the majority of species were observed only commuting over the

site. However, considering some of the species recorded are likely to be commuting to and from The Murrugh SPA populations by virtue of proximity to the designated site, and the designation of several of the recorded species as SCIs for this site, wintering SCI bird populations are valued to be of County to International Importance, depending on the species and numbers present.

Both SCI and non-SCI raptors are valued as local importance (higher value), considering there is no evidence of species nesting within the site and the distance between the nearest SPA, Wicklow SPA, designated for SCI raptors.

Amphibians and Reptiles

The Wildlife Acts provide protection to Ireland's only reptile species, common lizard, *Zootoca vivipara* and two amphibian species, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*. All of these three species are listed as of "Least Concern" in terms of conservation (Marnell *et al.*, 2019).

Common frog

The NBDC database holds one record for common frog *Rana temporaria* within c. 2km of the subject lands. The record is from a garden c. 900m south-west of the proposed development. In addition, the NPWS database holds 20 records for common frog from the 10km grid squares, T29 and T39, in which the proposed development is located in, from between 1974 and 2011.

Common frogs can be typically found associated with standing water. Open streams recorded within the proposed development site provide potential habitat for this species. Streams on the site are heavily shaded by vegetation in places with the Rosanna Lower Stream experiencing low flow at the time of survey. Given the continuous flow present in the Rathnew Stream it is unlikely to be utilised by breeding frogs, however the potential partially stagnant nature of the Rosanna Lower Stream provides some limited potential breeding habitat. In addition, a small area of wet grassland, in the north-western corner of the site, seasonally floods, and this is likely to extend between the two streams. Therefore, the proposed development site offers a small area in which breeding habitat may become available following periods of heavy rainfall. Arable fields cover most of the site which are unsuitable for movement of common frogs.

Although no common frogs were observed during the surveys, their presence on site cannot be ruled out, based on availability of potentially suitable habitat within the subject lands and their wider distribution across the local area. Considering the presence of suitable habitat for common frog in the proposed development site and in its vicinity, as well as the number of records of common frog in the area, the local common frog populations are valued to be of local importance (higher value).

Smooth newt

The NBDC database search did not return any records of the elusive smooth newt *Lissotriton vulgaris* within c. 2km of the subject lands. The nearest records for smooth newt on the NBDC database are located c. 3km south-east of the proposed development site, the most recent of which dates back to 2013. The NPWS database returned four records for the species from the same grid square, T29, in which the proposed development is adjacent to, from 1993 and 2010.

No individuals were observed at the time of the survey. The streams located on the proposed development site are considered less than ideal for breeding smooth newt, considering they are ephemeral in places (Rosanna Lower Stream) and unlikely to contain slow-flowing or stagnant water deep enough (0.5-1meter) for a sustained period.

Although, the presence of suitable dense vegetation in the form of hedgerows, treelines and scrub may provide suitable habitat for hibernation during the winter months. Local smooth newt populations are of local importance (higher value), however, they are not considered to be a key ecological receptor due to lack of suitable habitat, provided that there will be no indirect off-site effects.

Common lizard

There is one record for common lizard *Zootoca vivipara* within c. 2km of the proposed development site on the NBDC database. This record is located c. 800m north-east of the proposed development site, from 2017. The NPWS database holds one historical record for the species from the grid square, T29, which the proposed development within, from 1976.

The majority of the habitats recorded on the proposed development site are considered to be suboptimal for common lizard due to lack of suitable basking habitat, e.g. rocky habitat, within the proposed development site. This species is widely distributed in Ireland and is found in a variety of habitats⁵⁴, including grassland, scrub and hedgerows, which all occur on site and the surrounding environment. Although the site is considered suboptimal for common lizard, there are records of the species in the vicinity. The local common lizard populations are therefore considered to be of local importance (higher value).

Fish and aquatic surveys

The NBDC and NPWS database searches returned records for only one protected and/or rare fish species, namely; European eel *Anguilla anguilla*, within c. 2km of the proposed development. The record is from the Rathnew stream, from c. <50m north-west of the proposed development, from 2009.

Inland Fisheries Ireland (IFI) recorded one protected fish species, river lamprey *Lampetra fluviatilis* (Annex II and V species of the EU Habitats Directive) in the Broad Lough during surveys in 2010⁵⁵. Broadlough is also likely to hold other salmonids considering that the River Vartry, which discharges to Broadlough, is designated under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293) and is considered capable of supporting Atlantic salmon *Salmo salar*, an Annex II and V species. Based on this and that the river has been listed on the North Atlantic Salmon Conservation Organization (NASCO) Irish Salmon Rivers Database⁵⁶ and Angling Ireland website⁵⁷ for Atlantic salmon, it can be considered that Atlantic salmon are present within the river, and Broad Lough, in the absence of other records. European eel and river lamprey are listed as “Critically Endangered” and of “Least Concern”, respectively. In addition, European eel is listed under the OSPAR Convention.

The aquatic surveys undertaken by Triturus Environmental (see Appendix 8F) found that the Rossana Lower Stream was not suitable for salmonids at both sampling points and had limited suitability for brook lamprey *Lampetra planeri* at the upstream sampling point due to compaction of sediment areas and a high clay content. The watercourse had good potential for this species at the downstream sampling point near the confluence with the

⁵⁴ The Herpetological Society of Ireland (2020). *Common Lizard*. Available online at www.thehsi.org Accessed on: 20th June 2023.

⁵⁵ Inland Fisheries Ireland (2010) *Sampling Fish for the Water Framework Directive: Transitional Waters 2010. Broad Lough*. Available at: www.wfdfish.ie Accessed on: 20th June 2023.

⁵⁶ NASCO Database of Irish Salmon Rivers. Available at: <https://nasco.int/rivers-database/> and <https://nasco.int/wp-content/uploads/2020/02/CNLO545.pdf> Accessed on: 8th April 2022.

⁵⁷ Angling Ireland. Information on River Vartry fishing available at: www.fishingireland.info Accessed on: 20th June 2023.

Rathnew Stream. The Rosanna Lower Stream was considered of low suitability for European eel aside from localised pools at both sampling points. The channel was unsuitable for white-clawed crayfish *Austropotamobius pallipes* due to an absence of refugia and shallow flow at both sampling points.

The Q-value score for the Rosanna Lower Stream was (Q3-4) moderate status and no macro-invertebrates outside of 'Least concern' species were recorded during Q-sampling across the two sampling points. The aquatic ecological evaluation of this waterbody was of local importance (lower value).

The aquatic surveys at two sampling points (see Appendix 8F) on the Rathnew Stream found the watercourse was an excellent nursery habitat for salmonids including good spawning and holding habitat. Atlantic salmon fry was noted during the surveys and salmonid remains were present in an otter spraint. This stream was also found to be a very good site for brook lamprey and a nursery habitat for the species. Suitable conditions were also noted for European eel due to the presence of undercut banks with pools and shaded areas. The Rathnew Stream had suitability for white-clawed crayfish though none were recorded.

The Q-value score for the Rathnew Stream was (Q4) good status from Q-sampling. There were no macro-invertebrate species outside of 'Least concern' recorded. Given the Rathnew Stream had very high fisheries value (i.e. high suitability for lamprey, salmonids and European eel) in addition to supporting an otter population and Q4 (good status) water quality, the site was considered of local importance (higher value) (Table 4.1 of Appendix 8F).

Fish are present in a wide range of waterbodies with varying water quality throughout Ireland. Considering that the waterbodies hydrologically connected to the proposed development site contain protected and/or rare fish species (i.e. Atlantic salmon, European eel and lamprey species) these fish populations are considered to be of National-International importance (international importance for Eel, as OSPAR Convention Species), whereas fish populations of species of no conservation concern (e.g. sand goby *Pomatoschistus minutus* and flounder *Platichthys flesus* - recorded in Broadlough during the 2010 IFI surveys) are valued as local importance (higher value).

Invertebrates

The NBDC database returned records for three protected and/or rare invertebrate species, within approximately 2km of the proposed development site, of which, the small blue butterfly *Cupido minimus*, is listed as endangered; while the small heath butterfly *Coenonympha pamphilus* and the large red-tailed bumble bee *Bombus lapidarius* are listed as "Near Threatened" on Ireland's Red lists⁵⁸⁵⁹.

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples collected from the Rosanna Lower Stream and Rathnew Stream in aquatic surveys in April 2022.

There is minimal suitable habitat for majority of the above listed species within the proposed development site. The small blue is a specialist, preferring unimproved dry calcareous grassland, coastal grey dunes, machair, limestone pavement, calcareous

⁵⁸ Ú. Fitzpatrick, T.E. Murray, A. Byrne, R.J. Paxton & M.J.F. Brown (2006). Regional Red List of Irish Bees. Higher Education Authority. Ireland

⁵⁹ Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) Ireland Red List No. 4 – Butterflies. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland

moraine, and scree⁶⁰. The small heath prefers dry well-drained grasslands⁶¹. Considering the large red-tailed bumblebee can be found in a wide range of habitats, including gardens and parks⁶², it is the least specialised of the Red listed species returned from the NBDC database search and is the only one with the potential to be found onsite. Its populations have declined from the agricultural landscape which has resulted in it being listed as “Near Threatened”.

There is no suitable habitat for Annex II species marsh fritillary *Euphydryas aurinia*, or white-clawed crayfish or the Annex II and V species freshwater pearl mussel *Margaritifera margaritifera* within the proposed development site. The marsh fritillary is typically found associated with damp grasslands containing its larval foodplants devil’s-bit-scabious *Succisa pratensis*, which was absent from the proposed development site. However, suitable habitat was noted in the Rathnew Stream for Annex IV species white-clawed crayfish *Austroptamobius pallipes*. White-clawed crayfish and freshwater pearl mussel in turn are typically found in open freshwater waterbodies. Given the freshwater pearl mussels sedentary nature, it is not considered likely to establish within the Rathnew stream, which is identified from NPWS data as being within a catchment with previous records, but whose status is unknown and is not listed on SI 296 of 2009 as an SAC population.

Although majority of the proposed development site is comprised of heavily managed arable crop habitat, the surroundings are still largely of agricultural nature and rough grassland which provide important resources to the local invertebrate populations in a wider setting. The presence of both the Rossana Lower Stream and Rathnew Stream provide suitable habitat for aquatic invertebrates. The local invertebrate populations are considered to be of local importance (higher value).

Limitations

The above-described surveys to inform the baseline ecology of the proposed development site have all been conducted over the course of a single year, 2022. This data is now one year old. CIEEM guidance notes that typically, ecological surveys are considered valid for a period of 12-18 months⁶³. Given this and considering that there has not been a significant change in management of the site since these surveys have been conducted, the results of these surveys are still considered valid.

The exception to this is the above-described Raptor surveys, which were conducted as part of the adjacent, now consented development of Tinakilly Phase 1 (Wicklow Reg. Planning Ref. 22837). Given that these surveys covered the proposed development lands, the minimal results and activity recorded across the survey area, subsequent surveys to update these results and inform the proposed development specifically were not deemed necessary.

⁶⁰ Small Blue habitat preferences. Available at: <https://species.biodiversityireland.ie/profile.php?taxonId=77246#:~:text=Habitat,basking%20with%20wings%20half%20opened>. Accessed on 20th June 2023

⁶¹ Invertebrate habitat preferences. Available at: www.habitas.org.uk Accessed on: 20th June 2023.

⁶² Large tailed bumble bee habitat preferences. Available at: www.biodiversityireland.ie Accessed on: 20th June 2023.

⁶³ CIEEM (2019) Advice Note on the Lifespan of Ecological Reports & Surveys. April 2019. Chartered Institute of Ecology and Environmental Management, Winchester, England

8.3.5 Summary of Ecological Evaluation

Table 8.6 and Table 8.7 below summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

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Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
The Murrrough Wetlands SAC	International	Yes
Wicklow Reef SAC	International	No
Magherabeg Dunes SAC	International	No
Deputy's Pass Nature Reserve SAC	International	No
Vale of Clara (Rathdrum Wood) SAC	International	No
Buckroneys-Brittans Dunes And Fen SAC	International	No
Wicklow Mountains SAC	International	Yes
Carriggower Bog SAC	International	No
Glen of the Downs SAC	International	No
The Murrrough SPA	International	Yes
Wicklow Head SPA	International	No
Wicklow Mountains SPA	International	No
All other European sites	International	No
The Murrrough pNHA	National	Yes
Wicklow Town Sites pNHA	National	No
Wicklow Head pNHA	National	No
Glenealy Woods pNHA	National	No
Devil's Glen pNHA	National	No
Magherabeg Dunes pNHA	National	No
Vartry Reservoir pNHA	National	No
Vale of Clara (Rathdrum Wood) pNHA	National	No
Buckroneys-Brittans Dunes and Fen pNHA	National	No
Avondale pNHA	National	No
Carriggower Bog pNHA	National	No
Glen of the Downs pNHA	National	No
All other nationally designated sites	National	No

Table 8.6 Summary of the ecological evaluation of designated sites.

Ecological Receptor	Ecological Valuation	KER?
Habitats and Flora		
Rare and protected flora	Local importance (higher value)	No
Non-native invasive flora	N/A	-
Depositing/lowland rivers (FW2)	Local importance (higher value) (Rathnew Stream) and Local importance (lower value) (Rosanna Lower Stream)	Yes
Scrub (WS1)	Local importance (higher value)	Yes
Treelines (WL2)	Local importance (higher value)	Yes
Hedgerows (WL1)	Local importance (higher value)	Yes
Dry meadows and grassy verges (GS2)	Local importance (lower value)	No
Wet grasslands (GS4)	Local importance (higher value)	Yes
Drainage ditches (FW4)	Local importance (lower value)	No
Arable crops (BC1)	Local importance (lower value)	No
Fauna Species		
Badger	Local importance (higher value)	Yes
Otter	International importance	Yes
Bats	Local importance (higher value)	Yes
Small non-volant terrestrial mammals	Local importance (higher value)	Yes
Non-native Invasive Terrestrial Mammals	N/A	-
Marine mammals	County importance – International Importance	Yes
Breeding and wintering birds non-SCI species	Local importance (higher value)	Yes
Breeding SCI species	Local importance (higher value)	Yes
Wintering SCI Species	Local importance (higher value)	Yes
Common frog	Local importance (higher value)	Yes
Smooth newt	Local importance (higher value)	No
Common lizard	Local importance (higher value)	Yes
Fish (rare and protected species such as Atlantic salmon, European eel and river lamprey)	National- International importance	Yes
Fish (other species)	Local importance (higher value)	No
Invertebrates	Local importance (higher value)	Yes

Table 8.7 Summary of the ecological evaluation of habitats and fauna.

8.4 Characteristics of the Proposed Development

The development will consist of a residential development and public park (a full detailed description of the proposed development is provided in Chapter 1 of this EIAR) comprising the following:

- a) Construction of 352 no. residential units as follows:
 - I. 220 no. 3-4 bed houses
 - II. 132 no. 1-3 bed apartments
- b) Residential open space in the form of public/communal spaces for passive recreation (c. 0.94ha). Active open space constituting retained habitats along the western boundary (c. 2.40ha). Passive open space constituting retained and developed habitats and pathways along the northern boundary (c. 1.94ha).
- c) Provision of car parking and bicycle parking.
- d) All associated vehicular and pedestrian accesses from the Rathnew Inner Relief Road including carriageways, paths and junctions permitted under WCC Ref. 17/219/ ABP Ref. PL27.301261 and revised under WCC Ref. 20/1000 and WCC Ref. 21/411 (under construction) and all internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- e) No changes to development permitted under WCC Refs. 20/1000 and 21/411.
- f) No proposed works to Tinakilly Country House Hotel (a protected structure Reference No. 25-15).
- g) All associated site development works, services provision, infrastructural and drainage works, provision of substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

Surface water drainage infrastructure

The proposed development comprises five principal catchments for the collection and disposal of stormwater runoff from impermeable areas:

- Catchment A of 5.93ha, representing the majority of the site to the east of the proposed Rathnew Inner Relief Road.
- Catchment B of 3.16ha, including the southernmost section of the Rathnew Inner Relief Road proposed under this application, as well as areas to the west and east of this.
- Catchment C of 1.3ha, comprising the north-east corner of the development site.
- Catchment D of 0.443ha, representing the central section of the Rathnew Inner Relief Road proposed under this application.
- Catchment E of 0.617ha, representing the Rathnew inner relief road on the northern side of Rathnew Stream.

Areas outside these defined catchments shall not be significantly developed and shall maintain their current natural drainage patterns. Full details of the proposed surface water drainage can be found in CS Consulting drawings A034-CSC-ZZ-XX-SK-C-0003 and A034-CSC-ZZ-XX-SK-C-0004.

Stormwater runoff from the proposed development's five defined catchment areas shall drain to internal swales, stormwater detention basins and a stormwater attenuation tank. These SuDS features allow some direct infiltration of stormwater, and also provide attenuation storage to cater for extreme rainfall events. All stormwater from the development's drainage network shall discharge to the existing Rathnew Stream and Rossana Lower stream, at the development site's northern and western boundaries, respectively. Flow control devices shall restrict the discharge rate to the greenfield runoff rates established for each catchment. The greenfield runoff rate at the development site has been established as 6.56 l/s/ha.

Foul water

The proposed development site does not currently have sewers as it is not developed, however it is proposed to connect to the recently constructed drainage network in the adjacent consented development of Tinakilly Phase 1, to the south of the proposed development. All effluent generated at the site will be conveyed to the Wicklow Wastewater Treatment Plant via proposed foul drainage network. The P.E. for the proposed development is calculated to be 950 P.E.

Foul water, comprising sewage (and some surface water run-off), is treated at Wicklow WwTP prior to discharge to the Irish Sea. The most recent information from Uisce Éireann indicates that the plant is operating within its capacity of 34,000 P.E. (Irish Water, 2020⁶⁴), with a current operational loading of c. 18,762 P.E. Wicklow WWTP operates under a discharge licence from the EPA (D0012-01) and must comply with the licence conditions.

Construction Programme

The construction programme will take approximately 48 months.

It is proposed to proceed with construction of the development's road, water supply, and drainage infrastructure in accordance with the following phasing sequence:

- Phase R1 – south-east section of Rathnew Inner Relief Road within application boundary.
- Phase R2 – final north-western section of Rathnew Inner Relief Road within application boundary.
- Phase 1 – Infrastructure to serve 217no. residential units.
- Phase 2 – Infrastructure to serve 76no. residential units.
- Phase 3 – Infrastructure to serve 59no. residential units.

The construction and delivery of all other elements of the development (structures, landscaping, etc.) shall proceed in accordance with the delivery of these infrastructure phases. Refer to CS Consulting drawing A034-CSC-ZZ-XX-DR-C-0046 for a more detailed illustration of the proposed infrastructure phasing areas.

Phase R1

Phase R1 comprises construction of the Rathnew Inner Relief Road along a distance of 380m, from the southern boundary of the application site. This includes:

- Closure of Tinakilly Avenue and construction of the new access junction to serve the Tinakilly House hotel.
- Construction of the 2no. access junctions to serve the subject development.
- Pedestrian footpaths and cycle tracks along this section of the RIRR.
- 225mm and 160mm watermains along either side of the RIRR.
- Principal stormwater sewers, foul sewers, and foul rising main to serve the subject development.
- Stormwater drainage and attenuation facilities to accommodate runoff from this section of the RIRR.

⁶⁴ Irish Water (2020) Annual Environmental Report 2020 Wicklow D0012-01. https://www.water.ie/_uid/51cce695-6b1d-43d4-9ccc-30a09b186f1c/d0012-01_2020_aer_1.pdf (Accessed 20/06/2023)

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Phase 1

Phase 1 comprises the construction of infrastructure to serve 217no. residential units (137no. houses, 16no. duplex units, and 64no. apartments). This includes:

- Internal roads, footpaths, and car parking.
- Construction of the development's foul pumping station and foul rising main to connect to that in the RIRR.
- Internal watermains, stormwater sewers, and foul sewers to serve all residential units in this area.
- Stormwater drainage and attenuation facilities to accommodate all runoff from this area.

Phase 2

Phase 2 comprises the construction of infrastructure to serve 76no. residential units (24no. houses, 12no. duplex units, 32no. apartments, and 8no. maisonettes). This includes:

- Internal roads, footpaths, and car parking.
- Internal watermains, stormwater sewers, and foul sewers to serve all residential units in this area.
- Stormwater drainage and attenuation facilities to accommodate runoff from this area that is not already catered for by Phase 1 infrastructure.

Phase 3

Phase 3 comprises the provision of connections for 59no. houses to the infrastructure already constructed under Phase 1.

Phase R2

Phase R2 comprises construction of the final 430m section of the Rathnew Inner Relief Road, completing the link between the Phase R1 section and the section constructed under reg. ref. 21/1333, to the north-west. This includes:

- Pedestrian footpaths and cycle tracks along this section of the RIRR.
- Stormwater drainage and attenuation facilities to accommodate runoff from this section of the RIRR.

Operation

Operation of the proposed development will consist of a residential housing estate with access roads, public green space and surface water attenuation features.

8.5 Potential Impact of the Proposed Development

8.5.1 Construction Stage

Potential Impacts on Designated Sites during Construction Stage

European Sites

The assessment presented in the Appropriate Assessment Screening Report and follow on Natura Impact Statement (NIS) in respect of the proposed development (Scott Cawley Ltd., 2023 a & b) concluded that the potential impacts associated with the proposed development have the potential to affect the receiving environment and, consequently, have the potential to affect the conservation objectives supporting the Qualifying Interests (QI) or Special Conservation Interests (SCI) of three European sites, namely Wicklow Mountains SAC, The Murrough Wetlands SAC and The Murrough SPA; either alone or in combination with any other plans or projects.

The proposed development does not traverse any European sites, so there is no potential for direct habitat loss or fragmentation to occur.

The proposed crossing of the Rathnew Stream has the potential to cause habitat severance/ barrier effects to QI otter along the Rathnew Stream.

In line with good practice effective mitigation measures for surface water have been included in the construction design and management of construction programme of the proposed development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any European sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study (DDS 2005) and Wicklow County Council Development Plan (WCCC 2022) and in line with good construction practice.

No Third Schedule non-native invasive species were recorded within the proposed development site. Considering this, the proposed development does not pose a risk to any European sites in terms of risk of spreading/introducing non-native invasive species.

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m⁶⁵. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance⁶⁶. There are no European sites designated for QI species within the disturbance Zol for mammal species, however, evidence of otter,

⁶⁵ This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006)* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (2005)*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual Zol of construction related disturbance likely to be much less in reality.

⁶⁶ The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) *Exploring Behavioural Responses of Shorebirds to Impulsive Noise*. *Wildfowl* (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

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potentially associated with the Wicklow Mountains SAC has been recorded from along the Rathnew Stream along the northern boundary of the proposed development site. Therefore, the proposed development site has the potential to support populations of fauna species potentially linked with QI populations of the Wicklow Mountains SAC and there is potential for habitat loss/fragmentation impacts on this species to occur through the loss of resting places and foraging and commuting habitat.

The Murrough SPA is located c. 440m to the east of the proposed development which lies just outside of the ZOI for birds. However, it should be noted that lands suitable to support SCI species of The Murrough SPA, lie directly adjacent to the proposed development within this ZOI. Therefore, suitable supporting habitat occurs within the ZOI for birds from The Murrough SPA.

There are habitat areas within the disturbance ZOI of the proposed development that has the potential support populations of QI and/or SCI species of nearby SACs or SPAs⁶⁷:

- The nearest SAC designated for otter is the Wicklow Mountains SAC, c.12.4km north-east of the proposed development. The bounding watercourses, Rossana Lower and Rathnew Stream are small order streams located in a different sub-catchment than the Wicklow Mountains SAC, however the rivers within these two sub-catchments are not too far apart at their sources. Considering the size of otter territories in Ireland⁶⁸, and the proposed development's location relative to the Wicklow Mountains SAC, any otters using the nearby watercourses or the Broadlough may potentially form part of, or support, individuals of the SAC population.
- The nearest SAC designated for QI marine mammal species, common seal *Phoca vitulina*, grey seal and harbour porpoise are the Lambay Island SAC and Rockabill to Dalkey Island SAC and are located c. 54km and c. 28.2km north of the proposed development, respectively. Considering the foraging and/or commuting ranges of all these species extend beyond c. 54km, the individuals recorded at the coast near the proposed development may form part of the SAC populations.
- The nearest SPA to the proposed development site designated for wintering SCI species is The Murrough SPA, located c. 440m east of the proposed development. The proposed development is within a foraging range of SCI species of this European site, however it has limited suitable habitat for wintering SCI species such as light-bellied Brent goose *Branta bernicla hrota*. The only wintering SCI species recorded in proximity to the proposed development site were herring gull and black-headed gull, both recorded flying over the proposed development site. They are both SCI species of the adjacent The Murrough SPA and the individuals recorded within the site are likely to form part of the SCI populations of this SPA. Considering neither of these species were recorded utilizing the proposed development site during wintering bird surveys 2021/22, with the proposed development site providing only limited foraging and/or roosting opportunities for these SCI species, the proposed development will not result in displacement of SCI populations of herring gull or black-headed gull, or any other SCI species, for which there are European sites designated for within the vicinity of the proposed development.
- The nearest designated site for river lamprey and other QI fish species, such as Atlantic salmon, is the Slaney River Valley SAC, located c.30.9km south-west of the proposed development. Considering that the watercourses in the vicinity of the

⁶⁷ There is a need to consider use of habitat areas outside of an SPA by SCI bird species where they support the SCI populations and the site's conservation objectives. These habitat areas can comprise alternative roosting sites, foraging areas, staging grounds or migration routes and can, but not necessarily exclusively, be situated within the immediate hinterland of the SPA, or in areas ecologically connected to it.

⁶⁸ Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) *National Otter Survey of Ireland 2010/12*. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

proposed development, as well as the Broad Lough, are located in a different sub-catchment than the Slaney River Valley SAC and its location relative to the proposed development site, QI fish populations found in these waterbodies do not form part of, or support, any SAC population.

The proposed development has the potential to generate dust during construction works which could potentially affect the wetland habitats at The Murrough Wetlands SAC, and result in a significant negative effect ranging from local to International level. However, this is unlikely due to the temporary nature of the proposed construction works and the distance (c. 440m) between the proposed development site and the SAC, which will provide a buffer from dust deposition between The Murrough Wetlands SAC and the proposed development.

Therefore, as the proposed development has the potential to result in loss and/or fragmentation of *ex-situ* habitat utilised by a QI species potentially associated with a European site, there is potential for cumulative effects to occur in this regard.

Nationally Designated Sites

The proposed development does not overlap with any national site. The Murrough pNHA is located c. 440m east of the proposed development. There are no other nationally designated sites in the immediate vicinity.

As the proposed development does not traverse any national site there is no potential for habitat fragmentation to occur.

The proposed development is hydrologically connected to the Murrough pNHA through the Rathnew Stream which forms the northern boundary of the proposed development site. As there are hydrological or hydrogeological risks associated with the proposed development from the construction of the Rathnew Inner Relief Road, which is proposed to cross Rathnew Stream. Therefore, the proposed development has the potential to affect the receiving environment and, consequently, has the potential to affect the integrity of the nationally designated site; either alone or in combination with any other plans or projects.

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development site. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m⁶⁹. For birds, disturbance effects would not be expected to extend beyond a distance of c. 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance⁷⁰. The Murrough pNHA is just outside the disturbance Zol.

The Murrough pNHA is designated for similar reasons as its corresponding SAC and SPA. The next nearest pNHAs are the Wicklow Town pNHA and the Wicklow Head pNHA. The

⁶⁹ This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006) and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (2005)) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual Zol of construction related disturbance likely to be much less in reality.

⁷⁰ The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) *Exploring Behavioural Responses of Shorebirds to Impulsive Noise*. *Wildfowl* (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Wicklow Town Sites pNHA is designated for the presence of rare terrestrial plants, such as *T. subterraneum*, whereas the Wicklow Head pNHA is designated for similar reasons as its SPA designation, Wicklow Head SPA. Many of the pNHAs (e.g. Glenealy Woods pNHA and Devil's Glen pNHA) are located upstream of the proposed development or are not hydrologically connected to it (e.g. Avondale pNHA). There are two pNHAs hydrologically connected to the proposed development downstream: Magherabeg Dunes pNHA and Buckroney-Brittass Dunes and Fen pNHA. These sites are designated for similar reasons as their SACs, Magherabeg Dunes SAC and Buckroney-Brittass Dunes and Fen SAC, respectively. Therefore, these nationally designated sites (The Murrough pNHA, Magherabeg Dunes pNHA and Buckroney-Brittass Dunes and Fen pNHA) would be subjected to the same potential impacts, or lack of described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

Habitat Degradation - Dust Deposition

The proposed development has the potential to generate dust during construction works which could potentially affect the wetland habitats at The Murrough pNHA, and result in a significant negative effect ranging from local to national level. However, this is unlikely due to the temporary nature of the proposed construction works and the distance (c. 440m) between the proposed development site and the pNHA, which will provide a buffer from dust deposition between The Murrough pNHA and the proposed development.

Potential Impacts on Habitats during Construction Stage

Habitat Loss/Fragmentation

It is the general objective NH1 of the Wicklow County Council to “To ensure that the impact of new developments on biodiversity is minimised and to require measures for the protection and enhancement of biodiversity in all proposals for large developments.”. In addition objective NH12 aims to “To support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses (rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the Natura 2000 network in Wicklow.”

The county development plan also has specific objectives to afford protection for the woodlands, trees and hedgerows, such as NH18 “To encourage the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development management process, and require the planting of native, and appropriate local characteristic species, in all new developments”, NH17 “To discourage the felling of mature trees to facilitate development and encourage tree surgery rather than felling where possible”, and NH19 “To encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority). Other relevant policies and objectives of Wicklow County Development Plan 2022-2028^{Error! Bookmark not defined.} can be found in Appendix 8A.

Construction of the proposed development will result in the loss of habitat area; totalling c. 14.2ha. None of the habitats directly affected by the proposed development are considered to be any greater than of local biodiversity importance (higher value).

The majority of the habitats within the proposed development boundary (c. 16.8ha in total area) are of local biodiversity importance (lower value) and predominantly comprise of arable crops (BC1) (c. 14ha in total area), dry meadows and grassy verges (GS2) (c. 0.4ha in total area), drainage ditches (FW4) (c. 120m in total length) and buildings and artificial surfaces (BL3) (c. 0.14ha in total area). The loss or modification of habitats of local biodiversity importance (lower value) will not result in a likely significant effect on biodiversity.

The habitat types within the proposed development boundary, and the area of each, that are of local importance (higher value) are:

- Depositing lowland rivers (FW2) – c. 870m
- Scrub (WS1) – c. 1.23ha
- Treelines (WL2) – c. 1100m
- Hedgerows (WL1) – c. 560m
- Wet grassland (GS4) – c. 0.36ha

Sections of the treeline (WL2) habitat, and hedgerow habitat will be removed to accommodate an access road to the Tinakilly Lane and for the creation of housing and landscaping within the site. In addition, areas of scrub (WS1) will be removed to accommodate the proposed Rathnew Inner Relief Road crossing the Rathnew Stream in the north-western corner of the site. Considering the area removed to facilitate construction of the proposed development is small, the loss of these habitat types is significant albeit at the local scale only.

Habitat Degradation – Surface Water Quality

During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have significant negative effects on water quality and consequently affect aquatic and wetland habitats in the receiving environment. The effects of frequent and/or prolonged pollution events has the potential to be extensive and far-reaching and could potentially have significant long-term effects. In a worst-case scenario, the downstream habitats of the Broadlough and the Irish Sea could also be affected.

It is considered unlikely that a pollution event of such a magnitude would occur during construction or if it did occur, it would be temporary and imperceptible in nature. Nevertheless, a precautionary approach has been adopted in the assessment of potential risk of impacts on water quality. Consequently, detailed mitigation measures are included as part of the design to further minimise the risk contaminated surface water runoff and/or an accidental spillage or pollution event of the proposed development having any perceptible effect on water quality during construction.

Construction works could result in generated silt/sediment being released into surface waterbodies and in a worst-case scenario, potentially being transferred downstream. Any potential cement-based products used in the construction stage of the proposed development (e.g. concrete and/or bentonite which are highly corrosive and alkaline materials), if released into the surface water network may cause surface water degradation and damage to aquatic fauna (mammals, birds, fish and invertebrates). This has the potential to result in significant negative effects on water quality at a local geographical scale and consequently affect aquatic and wetland habitats in the receiving

environment. In a worst-case scenario, transitional and coastal habitats downstream and in the Broadlough and the Irish Sea, could also be affected.

Habitat Degradation – Groundwater

Any effects on the existing hydrogeological baseline supporting wetland habitats, particularly at the Broadlough, has the potential to negatively affect habitat extent and distribution, and vegetation structure and composition. The potential effects upon the existing hydrogeological regime are not necessarily limited to habitats within the proposed development boundary but can be far-reaching, with significant negative long-term effects.

As discussed in Chapter 6 (Land, Soils, Geology & Hydrogeology), the proposed development requires shallow soil excavation only and therefore there will be no groundwater collection or disturbance, which could result in damage to the aquifer, or change the existing groundwater regime.

Groundwater dependent habitats were not recorded in close proximity to the proposed development, therefore no potential impacts as a result of the proposed development.

However, it is predicted that while there may be no direct impact on the groundwater regime, there is potential indirect impacts associated with the proposed development through surface water interaction. Given that pumping is expected to be limited, localised and temporary, the magnitude of this impact is considered negligible.

As detailed in the Outline Construction Environmental Management Plan (OCEMP) for the proposed development (included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), specific controls/mitigation measures, i.e. pollution control plan shall be put in place to manage runoff and minimise pollution to receiving waterbodies during the construction stage. Therefore, there are no predicted impacts that could give rise to a likely significant negative impact on any aquatic habitats or species at any time scale as a result of hydrogeological impacts (for more detail refer to Chapter 6 (Land, Soils, Geology & Hydrogeology)).

Habitat Degradation - Dust Deposition

As discussed in Chapter 10 (Air Quality), the proposed development has the potential to generate dust during construction works which could potentially affect the adjacent habitats and result in a significant negative effect at the local scale only. However, this is unlikely due to the temporary and short-term nature of the proposed construction works.

The mitigation measures to control dust emissions during the construction stage are outlined in **Error! Reference source not found.** of this EIAR and OCEMP (A034-CSC-ZZ-XX-RP-C-0004-P3, included as a standalone document in support of this planning application). These include standard measures to control nuisance dust such as inspection and cleaning of public roads, measures for stockpiling of materials within construction compounds, water misting/spraying, vehicle coverings, and hoarding around the construction compound.

Non-native Invasive Plant Species

Planting, dispersing, or allowing and causing the dispersal, spread or growth of certain non-native plant species is controlled under Regulation 49 of the *European Communities (Birds and Natural Habitats) Regulations, 2011* (as amended); and refers to plant or animal species listed on the Third Schedule of those regulations. The accidental spread of non-

native invasive plant species as a result of construction works has the potential to impact upon terrestrial habitats within, immediately adjacent and downstream of the proposed development site boundary; potentially affecting plant species composition, diversity and abundance over the long-term. The effects of introducing such non-native invasive plant species to sensitive and ecologically important habitat areas (e.g. areas of local importance (higher value)) has the potential to result in a likely significant negative effect, at geographic scales ranging from local to international.

Two non-native invasive species listed on the Third Schedule were recorded within the proposed development site, Himalayan balsam along the Rathnew Stream and Spanish bluebell or its hybrid within the central and southern treelines. Therefore, site traffic and clearance has the potential, in the absence of mitigation, to result in the introduction and/or spread of non-native invasive species to adjacent and downstream habitats of the proposed development, and their spread beyond the site boundary if left unmanaged. The potential impacts in this instance could have local to International level impact depending on if the species were to expand to The Murrrough SPA and spread further on.

It is the objective NH9 of the Wicklow County Development Plan to “To support, as appropriate, relevant public bodies (such as the National Parks and Wildlife Service), efforts to seek to control and manage alien / invasive species within the County.”

Potential Impacts on Fauna during Construction Stage

Badger

Habitat Loss/Fragmentation

A single outlier badger sett was recorded within the proposed development site. Considering this and the presence of limited suitable breeding, foraging and commuting habitat for badgers, the proposed development site has the potential to be utilised by badger. The construction of the proposed development will temporarily reduce the amount of semi-natural habitat available to local badger populations and potentially fragment habitat corridors used by badger. Considering the current habitats (e.g. arable crop (BC1), dry meadows and grassy verges (GS2) and scrub (WS1)) will be replaced by buildings and artificial surfaces (BL3) habitat, this will result in an overall loss of foraging and commuting habitats for the species. However, the landscaping plans include for retention of some areas of semi-natural habitats (wet grassland – GS4 and riparian scrub (WS1)) and propose additional areas of supplemental pond, meadow and tree planting. Given this and the overall abundance of suitable habitat in the wider environs, especially to the east and north of the proposed development, the proposed development will not result in a significant impact on badgers at any geographical scale.

Disturbance/Displacement

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m⁷¹. While the proposed development will result in increased human presence on site, the potential effects on badger in terms of disturbance of the active badger sett, from construction are considered significant in this instance. This is because the badger sett is within the

⁷¹ This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006)* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (2005)*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

proposed development site and therefore located within the 150m buffer within which disturbance effects on mammals are expected to occur (NRA 2005). The proposed construction works will be largely confined to daylight hours, when badgers are least likely to forage within the proposed development site. Although there are large areas of suitable habitat in the wider environs, if the construction stage of the proposal coincides with construction of other projects in the immediate vicinity, there will likely be significant disturbance and displacement effects on badgers, particularly in combination with the consented developments to the south. Given the extensive areas zoned as passive open space (POS) and active open space (AOS) to the north, east and south-east of the proposed development, within the *Wicklow County Development Plan* Error! Bookmark not defined., that badgers are widespread in Ireland and found also in close proximity to human settlements, including in urban areas and the sett recorded onsite is small and used on a sporadic basis only. Therefore, badgers are likely to adapt to the temporary changes in human activity levels in the proposed development site and surrounding area. Given the extensive areas of retained semi-natural vegetation and habitats on the periphery of the proposed development site and the proposed landscaping regime to include additional areas of semi-natural habitats, including woodland, meadow and ponds, the loss of sub-optimal foraging and commuting habitat, in the form of arable fields, as well as the loss of a single small outlier sett is not likely to result in a significant negative effect at any geographic scale.

Otter

Loss of breeding/resting sites

The single resting site (couch site) recorded along the Rathnew Stream, is located in the north-eastern corner of the proposed development site, away from the proposed bridge crossing of the Rathnew Stream. As this couch site will be unaffected by construction works, therefore, the proposed development will not have a likely significant effect on the conservation status of otter, as there will be no loss of breeding / resting sites, and will not have a likely significant negative effect, at any geographic scale.

Habitat Loss/Fragmentation

There is suitable foraging and commuting habitat within the proposed development site, with evidence of active use recorded along the Rathnew Stream on the northern site boundary. Furthermore, there is potential for otter using this stream to be associated with the Wicklow Mountains SAC, therefore there is potential for the proposed development to result in a significant impact on otter at an international geographical scale.

The loss of suitable otter foraging and commuting habitat as part of the construction of the Rathnew Inner Relief Road across the Rathnew Stream, will be limited to the extent of the proposed bridge crossing, with the retention of suitable bankside and riparian habitat upstream and downstream of the proposed bridge construction area. Given this, the overall area of suitable foraging and commuting habitat will be reduced temporarily for the construction stage of the proposed bridge crossing. As otter are known to routinely use highly modified habitat within culverts and beneath bridges, any habitat loss arising from the proposed development would not constitute a significant decline in the extent of available otter habitat and will not affect the local otter population's ability to maintain itself, even in the short-term.

Habitat Severance/barrier effect

There are construction works proposed within and adjacent to the Rathnew Stream as part of the proposed Rathnew Inner Relief Road Bridge crossing. These works could result in a temporary barrier effect to local otter. However, given that otter are generally

diurnal or nocturnal in nature and works will typically be carried out during normal daylight working hours, affected otters would be expected to habituate to the altered landscape and any resulting barrier effect would be temporary in nature.

The severance / barrier effect of construction works on otter is not likely to affect the local population, over even the short-term, and is not likely to affect the species conservation status and result in a significant negative effect, at any geographic scale.

Habitat and Food Source Degradation – Water Quality

During construction, a potential contaminated surface water runoff and/or an accidental spillage or a pollution event into any surface water feature / existing drainage infrastructure has the potential to have a significant negative impact on water quality and consequently an impact on otter; either directly (e.g., acute or sub-lethal toxicity from pollutants) or indirectly (e.g., affecting their food supply or supporting habitats). The effects of frequent and/or prolonged pollution events in a river system have the potential to be extensive and far-reaching and could potentially have significant long-term effects. However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or be any more than temporary in nature. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts and detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality during construction.

Construction works in close proximity to the Rathnew Stream or any existing surface water drainage infrastructure could result in generated silt / sediment being released into these surface water features and potentially being transferred downstream including, potentially, into the transitional waters of Broadlough, and potentially the Irish Sea. In the absence of mitigation, the potential increase in water turbidity, as a result of increased sedimentation in receiving watercourses, could affect the visibility of prey species for foraging otter. Cement based products used in the Construction Phase of the proposed development (e.g., concrete and/or bentonite which are highly corrosive and alkaline materials), if released into the surface water network may cause surface water degradation and damage to aquatic fauna. This has the potential to result in significant negative effects on food supply for aquatic mammals such as otter.

Habitat degradation as a result of effects on surface water quality during Construction Phase has the potential to affect the species' conservation status and result in a significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for otter in the wider vicinity and the relative abundance of otter across the study area, as revealed in the results of the desk study.

Disturbance/Displacement

No otter holts were recorded during the field surveys undertaken. The Rathnew Stream, Broadlough and waterbodies connected to it, e.g. River Vartry and the Irish Sea are likely to form a part of the territories of local otter populations based on desk study records of otter. Rathnew Stream and Broadlough, are likely to be used by commuting and/or foraging otters, whereas the stream identified on the western site boundary, Rossana Lower, is considered unsuitable for otter, given its low flow and lack of fisheries (prey) resources. Increased human presence and/or noise and vibration associated with construction works within the footprint of the proposed development is likely to have the potential to (at least temporarily) displace commuting or foraging otter.

As construction works will typically be undertaken during normal daylight working hours and otter are generally nocturnal in habit, and that otter can (in many circumstances)

tolerate high levels of human presence and disturbance, displacement of otter from their habitat is extremely unlikely to affect the local otter population. Therefore, disturbance during construction is not likely to have a significant effect on the species' conservation status and will not result in a likely significant negative effect, at any geographic scale.

Disturbance and displacement effects on otter may also be the result of increased artificial lighting during construction. Nocturnal mammals, such as otter, are likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich and Longcore 2005). As the majority of the proposed development site is not currently lit, the construction of the proposed development may result in the introduction of artificial lighting to previously unlit areas, if construction compounds require security lighting for the duration of construction. In light of this mitigation measures have been designed to avoid and minimise any potential light spill onto surrounding watercourses during construction.

Bats

Habitat Loss/Fragmentation

There are 28 trees with PRFs which display suitability for bat tree roosts present within the proposed development site and as such there is potential for direct impacts on roosting bats to occur as a consequence of vegetation removal and/or works associated with the proposed development.

According to the NBDC database, there are records of four bat species within c. 2km of the proposed development, *i.e.* common pipistrelle bat, Daubenton's bat, lesser noctule and soprano pipistrelle bat (see Section 7.3.4 for more details on the locations of these records). During activity surveys, three of these bat species, common pipistrelle bat, Leisler's bat and soprano pipistrelle bat, as well as brown long-eared bat were recorded foraging and commuting within the proposed development.

The majority of this bat activity was concentrated along the wooded treelines and hedgerows on the boundaries of the proposed development. Considering that majority of bat activity was generally concentrated along the boundaries, there is potential for direct impacts on foraging and commuting bats from increased light levels during construction *e.g.* along the treelines. However, the impact is considered to be insignificant on the local bat populations due to working hours being restricted to daytime when there is no requirement for lighting in the summer, and due to bats hibernating during winter months when there is a more significant requirement for lighting during construction. The clearance of vegetation may result in a permanent loss of bat foraging habitat, however considering that the extent of this loss is limited to less than c. 0.39ha of scrub and c. 180m of hedgerow/treeline; the amount of suitable foraging/commuting habitat located within the wider area, as well as the extensive proposed planting of trees, woodland, hedgerow and grassland habitat that will provide additional foraging habitat to the local bat populations, the temporary habitat loss will result in a short-term significant negative effect on bat populations at a local scale only.

Disturbance/Displacement (Lighting)

Temporary artificial lighting associated with the construction works will further illuminate the site and its immediate environs. In absence of mitigation, this could potentially displace bats foraging and/or commuting bats from the lands within the proposed development site and in the locality. In consideration of the nature of the surrounding environment (*i.e.* semi-urban) and the fact that any artificial light during construction would be temporary, it is considered that the proposed development will not result in a significant negative effect on local bat populations at any geographical scale. As a

precaution, lighting mitigation has been provided to minimise any effect on individual bats during construction.

Small Non-Volant Terrestrial Mammals

Habitat Loss/Fragmentation

The proposed development site contains suitable foraging, commuting and breeding habitat for e.g. hedgehogs and pygmy shrews. The clearance of low value habitats (e.g. arable land (BC1) and dry meadows and grassy verges (GS2)) will reduce foraging and commuting opportunities at the proposed development. However, considering the abundance of available suitable habitat along the periphery of the proposed development and in the surrounding environment, as well as the fact that the proposed landscaping plans will improve the site for small mammal species via extensive planting of trees, hedgerow, woodland and grassland habitats, the proposed development will not result in a significant impact on small mammals at any geographical scale.

Disturbance/Displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace small mammals from both breeding and resting places and from foraging habitat. However, given the limited potential for the majority of the site to support any locally significant small mammal populations, and disturbance will be short-term (two years), it is extremely unlikely to result in any long-term effects on the local small mammal populations or their conservation status. Disturbance or displacement during construction therefore is unlikely to result in a significant negative effect, at any geographic scale.

Marine Mammals

Habitat Loss/Fragmentation

There are no marine habitats within the proposed development site, and therefore there is no potential risk of habitat loss/fragmentation impacts on marine mammals.

Habitat and Food Source Degradation – Water Quality

Direct and indirect impacts from surface water pollutants on marine mammals may arise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual animals and/or a fish kill, therefore potentially affecting the prey availability in waterbodies downstream of the pollution event (i.e. Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on marine mammals and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. Given the low numbers of marine mammals potentially utilising the downstream habitats of Rathnew Stream and Broadlough and their capability of travelling significant distances in search of food sources, the effects on marine mammals would be minor, likely at the local geographic level only.

Disturbance/Displacement

There are no marine habitats within the ZOI of the proposed development site, and therefore there is no potential risk of disturbance/displacement impacts on marine mammals.

Breeding birds

Habitat Loss/Fragmentation

In the absence of mitigation to protect birds and their nests, there is potential for direct impacts on breeding birds due to loss of suitable breeding bird habitat and/or the risk of direct mortality and injury to birds, which may arise from the clearance of vegetation within the proposed development site. This potential impact would be most likely to arise if clearance works are undertaken during the time of year when birds are likely to be nesting (*i.e.* 1 March to 31 August, inclusive).

The bird species recorded at the proposed development site during surveys include those that are commonly found in suburban and urban habitats (*e.g.* blackbird, hooded crow, robin and wren). These include habitats such as agricultural grasslands, hedgerows, treelines and areas of woodland, which can be found in the wider surrounding area. A total of 22 of the 29 species recorded during the breeding bird surveys were BoCCI Green-listed species and are considered to be of Least Conservation Concern⁵². A single BoCCI Red listed species was recorded (Red Kite) and six no. Amber listed species were recorded (goldcrest, greenfinch, herring gull, House martin, starling and the barn swallow) within the proposed development site. These species are also likely to be encountered either foraging or breeding in these commonly found habitats.

The clearance of vegetation will result in a loss of breeding bird habitat, however considering that the extent of this loss is limited to minor areas of these habitats associated with the internal treelines and bridge crossing of the Rathnew Stream considering the amount of suitable foraging habitat located within the wider area and proposed planting of trees (*c.* 830 no. trees), hedgerow and woodland habitat as part of the design, the habitat loss will result in a significant temporary negative effect on the populations of bird species at local scale only.

Under the Wildlife Acts, it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure or mutilate their eggs or nests. Mitigation measures have been provided to ensure adherence to the Wildlife Acts.

Habitat and Food Source Degradation – Water Quality

Direct and indirect impacts from surface water pollutants on breeding birds may rise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual animals and/or a fish/invertebrate kill, therefore potentially affecting the prey availability in waterbodies located in the downstream environment (*i.e.* Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on breeding birds and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on breeding birds would be significant, likely at the local geographic level only.

Disturbance/Displacement

For bird species, disturbance effects would not be expected to extend beyond a distance of *c.* 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance⁷². The construction of the proposed

⁷² The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise*) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) *Exploring Behavioural Responses of Shorebirds to Impulsive Noise*. *Wildfowl* (2010) 60: 150–

development will result in a temporary increase in construction related noise and vibration and human disturbance over a construction period of approximately two years. This could potentially result in a short-term (two years) reduction in the breeding success of birds that utilise suitable breeding habitat in the locality of the proposed development site, such as Red-listed common swift and stock dove, whose breeding populations have seen national short-term decline of more than 70%⁵². Common swift typically use tall buildings for nesting, whereas stock dove breeds in forest edge, wooded areas and larger undisturbed parks. The Amber-listed species (barn swallow, European greenfinch, European herring gull, goldcrest, linnets and house martin) recorded within the proposed development site, have similarly seen short-term declines in their populations, although not to the same extent as those on the Red list⁵². European greenfinch, goldcrest and linnets rely on hedgerows and woodland for breeding, whereas barn swallows and house martins nest in buildings. European herring gull nests in variety of habitats including on buildings in urban areas, coastal islands, cliffs or at lakes.

Given the low numbers recorded and the similar habitats found in the immediate vicinity to the proposed development and the wider environs, it will not result in a significant negative effect on the populations of these bird species at any geographic scale.

Raptors (Non-SCI Species)

Habitat Loss/Fragmentation

No breeding raptors were recorded within the proposed development site; however, they were occasionally recorded hunting and flying over the proposed development site. Considering there is no suitable nesting habitat (e.g. mature woodland, cliffs) within the proposed development site and the abundance of suitable alternative hunting habitat (e.g. agricultural grasslands) within the wider landscape, as well as the fact that proposed planting scheme will enhance the habitats for their prey species (small mammals); the proposed development may result in a permanent loss of hunting habitat for raptors as a consequence of the clearance of vegetation which may impact their prey availability. However, this will not result in a significant negative effect on the populations of these species at any geographic scale, given the retained areas of semi-natural habitat and the proposed semi-natural landscaping plantings.

Disturbance/Displacement

The impacts of construction of the proposed development will result in impacts associated with temporary increase in construction-related noise and vibration and human disturbance over a construction period of approximately 48 months, as well as the permanent displacement from foraging habitat on raptors. This could potentially result in a short-term displacement of raptors within the proposed development site, and birds utilising similar foraging habitat in the surrounding areas up to c. 300m of the proposed development and the permanent displacement of raptors utilising the proposed development site as a foraging area. However, as this potential disturbance impact would be short-term in nature, and given the abundance of similar habitats within the wider environs which will be retained as Active Open Space (AOS) and Passive Open Space (POS) under the zonings in the Wicklow County Development Plan^{Error! Bookmark not defined.}, it will not result in a significant negative effect on the populations of raptors at any geographic scale.

Wintering birds

167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Habitat Loss/Fragmentation

The only wintering bird species recorded from within the proposed development site was the Red listed redwing. In addition, cormorant was recorded foraging in the Rathnew Stream to the north-east of the proposed development site. Herring gull, black-headed gull, common gull, lesser black-backed gull, little egret and mallard were also recorded flying over the proposed development site. Herring gull and black-headed gull are both SCI species of The Murrrough SPA, whereas redwing is a widespread, non-SCI winter visitor from northern Europe. Herring gull and black-headed gull are regular foragers on ploughed fields and urban areas, as well as pasture and inland amenity grassland. Redwings are typically associated with fields, woodland edges and parks while wintering in Ireland.

The clearance of vegetation will result in a loss of foraging habitat (e.g. Arable lands (BC1) and Dry meadows and grassy verges (GS2)) of these species, however considering the abundance of the habitat type in the surrounding vicinity and the proposed landscape design will enhance portions of the proposed development site in terms of foraging opportunities, especially for wintering passerine species such as redwing, the habitat loss will result in a short-term significant negative effect on the populations of wintering bird species at local scale only.

Habitat and Food Source Degradation – Water Quality

Direct and indirect impacts on wintering birds from surface water pollutants may rise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual birds and/or a fish/invertebrate kill, therefore potentially affecting the prey availability in waterbodies located in the downstream environment (i.e. Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on wintering birds and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on wintering birds would be significant, likely at the local geographic level only.

The impacts of construction of the proposed development will result in short-term impacts associated with temporary increase in construction-related noise and vibration and human disturbance over a construction period of approximately 48 months on wintering birds. This could potentially result in a short-term displacement of foraging and/or roosting wintering birds within the proposed development site, and birds utilising similar foraging habitat in the surrounding areas up to c. 300m of the proposed development.

The permanent loss of potential *ex-situ* foraging habitat within the proposed development site has the potential to displace SCI birds species which may forage on inland arable and grassland fields (such as herring gull, black-headed gull and light-bellied brent goose).

However, considering the small number of wintering bird using the proposed development site (redwing), and the lands immediately adjacent to it (great cormorant), with all other SCI species only recorded as flyovers of the proposed development site, and the abundance of similar habitats within the wider environs (herring gull and black-headed gull), it will not result in a significant negative effect on the populations of these bird species at any geographic scale.

In addition to the aforementioned, screen planting has been included as a part of the landscaping plans at the easternmost boundary of the proposed development, i.e. the section of site boundary closest to The Murrrough SPA/pNHA, which will, together with

the existing separation distance of approximately 440 metres from the Broadlough, minimise potential noise originating from construction.

Common Frog

Habitat Loss/Fragmentation

There is potential for direct impacts on individual common frogs due to the loss of suitable habitat and/or the risk of direct mortality and injury, which may arise from the clearance of vegetation within the proposed development site, however, these impacts will not affect local populations at any significant geographic level.

The proposed development will result in the permanent loss of suitable common frog habitat (e.g. drainage ditch (FW4)); however, there is suitable breeding and foraging habitat located in the wider area. In consideration of this and that the majority of suitable breeding habitat to be lost is ephemeral in nature, the potential loss of habitat will not result in a significant negative effect on common frog populations at any geographic scale.

Common frog is protected under the Wildlife Act (as amended) and it is an offence to hunt, take or kill them, or wilfully to interfere with or destroy their breeding places. Precautionary mitigation measures have been provided to ensure adherence to the Wildlife Act.

Habitat and Food Source Degradation – Water Quality

Direct and indirect impacts from surface water pollutants on common frog may arise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual animals and/or invertebrate kill, therefore potentially affecting the prey availability in waterbodies located in the immediate environs (i.e. Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on common frog and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on common frog would be significant, likely at the local geographic level only.

Disturbance/Displacement

Displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace individual common frog from the proposed development site. However, given that disturbance will be short-term (maximum of 48 months), it is extremely unlikely that disturbance related impacts as a consequence of the proposed development will result in any long-term effects on local common frog populations or their conservation status, especially considering that construction phasing will ensure that the proposed attenuation pond habitats will be constructed as part of the initial phases of the proposed development. Disturbance or displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

Common lizard

Habitat Loss/Fragmentation

There is potential for direct impacts on common lizards due to the loss of suitable habitat within the proposed development footprint, and/or the risk of direct mortality and injury to common lizards, which may arise from the site clearance of suitable habitats within the proposed development site. Due to common lizard being a mobile species, and the

amount of suitable habitat in the wider environs, the risk of disturbance and mortality is not considered significant at any geographic level.

Disturbance/Displacement

Displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace individual common lizards from the proposed development site. However, given that the disturbance will be short-term (two years), it is extremely unlikely that disturbance related impacts as a consequence of the proposed development will result in any long-term effects on local common lizard populations or their conservation status. Disturbance or displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

Fish

Habitat Loss/Fragmentation

There is potential for direct and indirect temporary habitat loss/fragmentation to occur on fish, given the proposed Rathnew Stream bridge crossing. However as this bridge has been designed as a clear span bridge retaining the existing profile of the Rathnew Stream, direct habitat loss/ fragmentation will be significantly limited and temporary in nature. In direct effects associated with the potential to affect fish habitats as part of the construction of the Rathnew bridge are associated with impacts on water quality and is discussed in the section below. Therefore, given the proposed clear span bridge design habitat loss/ fragmentation of fish habitats is unlikely to result in a significant negative effect, at any geographic scale.

Habitat and Food Source Degradation – Water Quality

Direct and indirect impacts from surface water pollutants on fish may rise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual animals and/or fish/invertebrate kill, therefore potentially affecting the prey availability in surrounding waterbodies (i.e. Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on fish and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on fish would be significant, potentially at the national-international geographic level.

Invertebrates

Habitat Loss/Fragmentation (Terrestrial Invertebrates)

The proposed development site contains suitable foraging, commuting, and breeding habitat for a variety of terrestrial invertebrates including three protected and/or rare invertebrate (See Section 7.3.4), although none were recorded during surveys. Permanent and temporary removal of suitable habitats may temporarily disconnect habitat corridors and will temporarily reduce the amount of semi-natural habitat available to local terrestrial invertebrate populations. The overall area of permanent habitat loss is small, considering it in the context of the abundance of available suitable habitat in the surrounding environment, and extensive landscape plans that will enhance the site for terrestrial invertebrates, the proposed development will not result in a significant impact on terrestrial invertebrate at any geographical scale.

Habitat Loss/ Fragmentation (Aquatic Invertebrates)

The proposed development entails the construction of a bridge crossing the Rathnew stream. This construction has the potential to result in habitat loss and/or fragmentation for aquatic invertebrates, as result of direct habitat loss and/or changes to the hydrological regime, causing habitat fragmentation as a result of construction. Given the proposed bridge has been designed in accordance with up-to-date international guidance and following the policies and objectives in the *Wicklow County Development Plan* ^{Error!} *Bookmark not defined.* in relation to the design of bridges over watercourses, which ensures a clear-span bidge design The effects on aquatic invertebrates would be minor, likely at a local geographic scale only.

Habitat and Food Source Degradation – Water Quality (Aquatic Invertebrates)

Direct and indirect impacts from surface water pollutants on freshwater and/or marine invertebrates may rise from a potential pollutant event during the construction stage of the proposed development and may result to either direct toxicity on individual animals and/or invertebrate kill, therefore potentially affecting the prey availability in waterbodies located in the downstream environment (*i.e.* Rathnew Stream, Rosanna Lower Stream and Broadlough). The effects from surface water pollutants on aquatic invertebrates and their prey could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on aquatic invertebrates would be significant, likely at the local geographic level only.

8.5.2 Operational Stage

Potential Impacts on Designated Sites during Operational Stage

European Sites

The assessment presented in the Appropriate Assessment Screening Report and NIS (Scott Cawley Ltd., 2023a, b) concluded that the potential impacts associated with the proposed development have the potential to affect the receiving environment and, consequently, have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of European sites, namely the Murrough Wetland SAC, the Murrough SPA and the Wicklow Mountains SAC; alone or in combination with any other plans or projects:

Surface Water

During operation, surface water run-off and discharges from the proposed development will enter the downstream receiving environment via the proposed surface water drainage network.

In line with good practice effective mitigation measures have been included in the operational stage of the proposed development. However, it must be noted that these are included in the design and will have been already constructed, not for the purposes of avoiding or reducing any potential harmful effects to any European sites, but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study (DDS 2005) and Wicklow County Council Development Plan and in line with good construction practice.

Onsite Sustainable Urban Drainage Systems (SuDS) will include five no. dedicated internal drainage catchments draining to vegetated ponds, bioswales, attenuation tank,

permeable paving at car parking bays and installation of online water butts for stormwater harvesting for local use.

Foul Water

The foul water produced from the proposed development will be connected to recently installed sewers under the adjacent approved planning permission (WCC Ref. 17/219/ABP Ref. PL27.301261) and consent from Uisce Éireann to connect to the local foul infrastructure. All foul water effluent generated at the proposed development site during its operational phase will be conveyed to the Wicklow Wastewater Treatment Plant via proposed foul drainage network. There is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Irish Sea as a result of foul water discharges during operation. In conclusion, there is no potential for a significant effect on any European sites as a result of foul water discharge.

Nationally Designated Sites

Nationally designated sites would be subjected to the same potential impacts from operational stage described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

Potential Impacts on Habitats during Operational Stage

The majority of the habitats within the central parts of the proposed development site, will be either removed or partially replaced during the construction stage prior to the early stages of the operation of the proposed development. The remaining sensitive habitats located within the proposed development site are the treelines (WL2), hedgerow (WL1), scrub (WS1), wet grassland (GS4) and depositing river (FW2) habitats located on the periphery of the site. These habitats will largely be retained (with the exception of a small portion of scrub in the north-west corner of the proposed development, where the Rathnew Inner Relief Road Bridge is proposed) and enhanced by further planting within the proposed development. In consideration of this, the proposed development will not result in a significant negative effect on habitats of ecological value within the proposed development site at any geographical scale as a consequence of the operational stage.

Potential Impacts on Fauna during Operational Stage

Badger

Disturbance/displacement

The operational stage of the proposed development will result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site. Considering the increasing semi-urban location of the proposed development site, the local badger populations likely being habituated to human presence in the vicinity of site to some degree, and the zonings of surrounding land to the north, east and south-east as Active open space and Passive open space; the potential impacts from disturbance on badgers as a consequence of noise and/or human disturbance are not considered to be significant at any geographic scale.

Otter

Habitat and Food Source Degradation – Water Quality

There is potential albeit minor for a pollution event during the operational stage of the proposed development to result in a fish kill, and therefore affect prey availability within waterbodies located in the immediate environs (i.e. the outfall location of the attenuation ponds discharging to the Rathnew and Rosanna Lower Stream). The effects on prey availability could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on otter would be significant, likely at the local geographic level only.

Bats

Lighting

In absence of mitigation, permanent artificial lighting associated with the operation of the proposed development could potentially displace foraging and/or commuting bats from the lands within the proposed development site. The wider surrounding lands are semi-urban in nature towards west and south. A precautionary approach has been adopted and it is considered that, in the absence of mitigation, the potential displacement of bats from the proposed development site as a consequence of artificial lighting could potentially have in a negative significant effect in the long-term on bat populations at a local geographic scale.

Disturbance/Displacement

The proposed development during operation will result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site, however considering that bats are nocturnal, and given the already limited feeding territory within the central part of the proposed development site, the effects on local bat populations from increased human presence on site is considered to not have a significant negative effect on the bat populations at any geographic scale.

Mortality Risk – Collisions with Building

Considering bats frequently navigate between obstacles in the landscape at night using echolocation, the proposed development is not considered to create a collision risk for bat movements through the site. Therefore, the proposed development is not considered to have a significant negative effect on the bat populations at any geographic scale.

Small Non-Volant Terrestrial Mammals

Disturbance/Displacement

The proposed development during operation will result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site. Considering the increasing semi-urban location of the site, and given the already limited territory within the developed parts of the proposed development and the local small mammal populations being habituated to human presence in the vicinity of site to some degree, the potential impacts from disturbance on small mammals as a consequence of noise and/or human disturbance are not considered to be significant at any geographic scale.

Marine Mammals

Habitat and Food Source Degradation – Water Quality

There is potential for a pollution event, albeit minor, during the operational stage of the proposed development to result in a fish kill, and therefore affect prey availability within

waterbodies located in the downstream environment (*i.e.* Rathnew Stream and Broadlough). The effects on prey availability could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. Following the full effective implementation of the proposed SuDs design mitigation measures, the effects on marine mammals are not considered to be significant at any geographic scale.

Birds (Breeding Birds/Raptors/Wintering Birds)

Disturbance/Displacement

The proposed development during operation will result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site. Considering the semi-urban location of the site and given the already limited territory within the proposed development and the local bird populations being habituated to human presence in the vicinity of the site to some degree, as well as the buffer between the Broadlough wetlands which are favoured by especially wintering bird species, the potential impacts from disturbance on birds as a consequence of noise and/or human disturbance are not considered to be significant at any geographic scale.

Mortality Risk – Collisions with Building

The proposed development may lead to increased mortality risk associated with window strike by low-flying birds. In cities and towns, bird species navigate in an urban and semi-urban environment with built structures daily. To put some context on their avoidance capabilities, in a different setting and for use in collision risk modelling for onshore wind turbines, an avoidance rate of 99.5% is applied for large gull species and an avoidance rate of 99.2% is applied for small gull species (Furness, 2019), which essentially this means that 99.5% and 99.2% of gull flights, respectively, will avoid collision with a moving turbine. For light-bellied Brent geese the avoidance rate applied is 99.8% (SNH, 2018). The risk of collision is considered even less with a static, clearly detectable building.

From the literature, bird collisions with man-made structures are common and well documented (Banks, 1979; Klem, 1990; Erickson *et al.*, 2005, Jenkins *et al.*, 2010; SNH, 2018), with migratory passerine species the most prevalent collision victims (Erickson *et al.*, 2001; Bing *et al.*, 2012). Bird collision with buildings is generally associated with reflective material such as windows or large surfaces of glass which create a mirror and appear to show the continuation of the sky or surrounding landscape, an effect that can be exacerbated by lighting (Sheppard and Phillips, 2015). In the absence of mitigation there could be a low level of mortality attributable to bird collision with windows of the proposed development, however this impact is unlikely to cause any significant impact above the local scale.

Common Frog

No significant effects on common frog are predicted during the operational stage of the proposed development, therefore no mitigation is required.

Common Lizard

No significant effects on common lizard are predicted during the operational stage of the proposed development, therefore no mitigation is required.

Fish

Habitat and Food Source Degradation – Water Quality

There is potential for a pollution event during the operational stage of the proposed development to result in a fish kill in the immediate environs (i.e. Rathnew Stream and Broadlough). The effects on fish could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on fish would be significant, likely at the local geographic level only.

Invertebrates

Habitat and Food Source Degradation – Water Quality (Aquatic Invertebrates)

There is potential for a pollutant event during the operational stage of the proposed development to result in an aquatic invertebrate kill in the immediate environs (i.e. Rathnew Stream and Broadlough). The effects on aquatic invertebrates could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Vartry sub-catchment. The effects on aquatic invertebrates would be significant, likely at the local geographic level only.

8.5.3 Do Nothing Impact

The continuation of the existing management practices at the proposed development site in a “do-nothing” scenario, would likely maintain the current habitats present. However, it is likely that the fields that were previously in agricultural use, would continue to be utilised as tillage. The proposed development site would continue to provide suitable foraging, commuting and breeding habitat for mammal and bird species.

The lands were zoned under the *Wicklow County Development Plan 2022-2028*^{Error! Bookmark not defined.} as ‘R1 –New Residential’ and are likely to be developed for this purpose in future.

8.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures).

All of the mitigation measures prescribed here in respect of the Construction stage (including the landscaping which may extend into the operational phase owing to the establishment in the appropriate season shall be included in the project Outline Construction environmental Management Plan (CEMP) included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4. It will be revised by the appointed contractor and approved by the planning authority in advance of commencement of construction.

8.6.1 Construction Stage

Mitigation Measures for Habitats during Construction Stage

Water quality

The following mitigation measures, properly implemented will ensure there are no impacts on water quality in the immediate vicinity (i.e. receiving drainage network, Rathnew Stream and Broadlough) of the proposed development from release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control during the construction stage of the proposed development and therefore no potential impacts on any waterbodies within the proposed development site or its vicinity:

- Specific measures to prevent the release of sediment over baseline conditions to the existing surface water drainage network, during the construction work, which will be implemented. These measures include, but are not limited to, the use of silt fences, silt curtains, settlement lagoons and filter materials.

- Provision of exclusion zones and barriers (e.g. silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment. Stockpiled soil will also be allowed to revegetate to reduce potential of sediment runoff during wet periods;
- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimize risk of run-off from the site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to any surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located removed from any surface water drainage features, where feasible, to avoid accidental discharge to watercourses. Washing out of any concrete trucks on site will be avoided (dry brush shoots will be used instead).
- Any fuels of chemicals (including hydrocarbons or any polluting chemicals) will be stored in a designated, secure bunded area(s) to prevent any seepage of potential pollutants into the local surface water/drainage network. These designated areas will be clearly sign-posted and all personnel on site will be made aware of their locations and associated risks.
- All mobile fuel bowsers shall carry a spill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention should be taken during refueling and maintenance operations. Particular attention will be paid to gradient and ground conditions, which could increase risk of discharge to waters.
- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
 - Valid Safety Data Sheets;
 - Health & Safety, Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
 - Emergency response procedures/precautions for each material; and,
 - The Personal Protective Equipment (PPE) required when using the material.
- Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plan will be prepared prior to works commencing and they will be communicated, resourced and implemented for the duration of the works. Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that shall cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licensed facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.

- A discovery procedure for contaminated material will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.
- Implementation of measures to minimize waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required and applicable, and to address any potential issues that may arise.

Dust Suppression

The following mitigation measures will ensure there are no impacts from dust deposition in the immediate vicinity of the proposed development.

A series of mitigation measures will be implemented to minimise dust nuisance impacts:

- Public roads affected by the proposed development works will be regularly inspected for soiling associated with the construction activities and cleaned as necessary;
- Material handling systems and stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays (or similar dust suppression methods) will be used as required if particularly dusty activities associated with the construction contract are necessary during dry or windy periods;
- Stockpiled soil allowed to revegetate to reduce potential of dust generation;
- During movement of dust generating materials both on and off-site, trucks will be covered with tarpaulin, and before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place; and,
- The effectiveness of the mitigation measures will be kept under review and revised as necessary. In the event of dust nuisance associated with the proposed development occurring outside the works boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem.

Non-Native Invasive Species

A confirmatory pre-construction non-native invasive species survey will be undertaken by a suitably qualified specialist to confirm the presence and extent of the establishment of all Third Schedule invasive species, and other non-native invasive species, within the footprint of the proposed development.

Following the confirmatory pre-construction survey, the following mitigation measures will be implemented, as required:

- Where a pre-construction non-native invasive species survey identifies established non-native invasive species within the footprint of the proposed development, the non-native invasive species management plan produced will provide a detailed description of the infestations (e.g. approximate area of the respective colonies (m²), where feasible; approximate total number of stems, pattern of growth and information on other vegetation present), and where necessary, include calculations of volumes of infested soils to be excavated;
- The ISMP will be updated following the pre-construction survey by a suitably qualified specialist, with regard to the National Roads Authority (2020) *The Management of Invasive Alien Species on National Roads – Technical Guidance*, and other species-specific guidance documents;

- All control measures specified in the ISMP shall be implemented in full by a suitably qualified specialist prior to the construction of the proposed development to control the spread of non-native invasive species within the footprint of the proposed development. Furthermore, the control measures specified within the ISMP will be adhered to throughout the construction stage of the proposed development; and,
- The site will be monitored by a suitably qualified specialist after control measures have been implemented (which could take a number of years depending on the final solution to eradicate them. Any re-growth will be subsequently treated by the suitably qualified specialist as detailed in the ISMP. It is noted that the treatment may extend into the operation of the proposed development until such time that the appointed specialist contractor issues a certificate of completion.

Mitigation Measures for Badger during Construction Stage

Disturbance/Displacement – Construction Works

As a single Annex badger sett was recorded within the proposed development site, with limited badger activity also noted within the site and its vicinity. Considering this and adjacent ongoing construction, badger could potentially establish new setts within the ZOI of the proposed development. Therefore, a confirmatory pre-construction check of all suitable badger habitat will be completed within 12 months prior to any construction works commencing by a suitably experienced and qualified ecologist.

The presence of any new setts or significant badger activity will be treated and/or protected in accordance with the *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2005).

Mitigation Measures for Otter during Construction Stage

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and are replicated in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

Disturbance/Displacement - Loss of Breeding/Resting Sites

Although there were no holts recorded during field surveys, a single rest site (couch site) and three no. spraints were recorded along the Rathnew Stream. Therefore, otter could potentially establish new holt or couch sites within the ZOI of the proposed development. A confirmatory pre-construction check of all suitable otter habitat within the proposed development site will be completed within 12 months prior to any construction works commencing by a suitably experienced and qualified ecologist.

The presence of any new holt/couch sites will be treated and/or protected in accordance with the *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (NRA 2006).

Mitigation Measures for Bats during Construction Stage

Roost Loss/Mortality Risk - Protection of Bats during Vegetation Clearance

All bat species and their roost sites are strictly protected under both European and Irish legislation including:

- Wildlife Act 1976 (as amended);
- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC); and,
- European Communities (Birds and Natural Habitats) Regulations, 2011.

It is an offence under Section 23 of the Wildlife Act 1976 (as amended) and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations 2011, to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations 2011, it is not necessary that the action should be deliberate for an offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. Under Section 54 of S.I. 477 of 2011, a derogation may be granted by the Minister where there is no satisfactory alternative, and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats (see Figure 7.8). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by felling works.

Potential Roost Feature Re-appraisal (First Step of Preconstruction Survey)

The appointed contractor will ensure that a confirmatory pre-construction survey of all trees, previously identified as containing PRFs or not, to be removed within the boundary of the proposed development shall be rechecked for Potential Roost Features (PRFs) by a suitably qualified ecologist. The appraisal will:

- Confirm that previously identified PRFs which are to be retained are still standing; and,
- Identify whether new PRF features (if any) may have developed owing to damage or management change to PRF in the intervening period between the original surveys and grant of planning.

Preconstruction Survey

In the unlikely event that new PRFs are detected during the pre-construction survey it is recommended that:

- In advance of any clearance all trees deemed to be PRF which are subject to felling/clearance will be checked for the presence of bats by a suitably qualified/licensed bat specialist (using an endoscope under a separate license held by the specialist);
- In the event that bats are confirmed using PRFs on the proposed development site during construction works such as vegetation clearance, works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted;
- An application will then be made to the National Parks and Wildlife Service for a derogation license to permit actions affecting bats or their roosts that would normally be prohibited by law;
- After license approval from the NPWS (which may include the necessity for additional mitigation measures to those recommended here) bats may be removed

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by a bat specialist licensed to handle bats and released in the area in the evening following capture; and;

- Only then will PRF trees be felled and where possible this will be undertaken ‘in sections’ where the section can be handled to avoid sudden movements or jarring of the sections.

In addition to the above, the following mitigation procedures will be followed if trees identified as potential bat roost trees are to be removed:

- Felling of potential tree roosts will be undertaken during the periods April – May or September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation;
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present;
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist;
- Trees should only be felled “in section” where the sections can be rigged to avoid sudden movements or jarring of the sections, and when a bat specialist is in attendance;
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation license held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licensed to handle bats and released in the area in the evening following capture; and,
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation license will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes (as appropriate and advised by the bat specialist).

For trees identified as PRF that are being retained, the following mitigation measures will be implemented by the appointed contractor:

- Where works are required within the Root Protection Area (RPA) of trees (including those trees identified as PRFs), the mitigation measures will follow the requirements of the British Standard Institution (BSI) British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations will be implemented.
- These PRFs trees will be protected by the appointed contractor in advance of any works commencing in the area and for the duration of construction works associated with the proposed development.
- Where a qualified arborist engaged by the appointed contractor is required to assess the condition of, and advise on any repair works necessary to, any trees which are to be retained (including PRF-containing trees or category U trees), these will be

notified to the appointed ecologist to be surveyed to confirm if these trees are PRF's (as done for the pre-construction surveys outlined above).

Disturbance/Displacement – Light Spill

During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area. Light levels in these areas will be maintained at baseline levels.

Lighting of sensitive wildlife areas and primary ecological corridors (e.g. treelines (WL2), hedgerows (WL1), Depositing rivers (FW2) and scrub (Ws1) on the site boundaries) and light pollution in general should be avoided.

Lighting of the site during construction is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020);
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010); and
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2018).

It will be ensured in liaison with the suitably experienced and qualified ecologist that lighting at the construction compound, and active work areas within and adjacent to the proposed development, will be designed to minimise light spill outside the footprint of the proposed development, and be cognisant of light-spill into previously unlit areas. Any light spill to commuting/foraging habitats of bats may exclude them from using these areas and therefore have a negative impact on them through reduced food resources and/or longer flight routes as they try to avoid flying through the lit-up area by flying around it.

Mitigation measures to reduce light spill during construction will include the following:

- the use of sensor/timer triggered lighting;
- LED luminaires to be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- column heights to be considered to minimise light spill;
- accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only where needed; and,
- Where night-time works are required the suitably experienced and qualified ecologist will be liaised with to implement measures to mitigate the impact of such works.

Mitigation Measures for Marine Mammals during Construction Stage

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

Mitigation Measures for Breeding Birds during Construction Stage

Vegetation clearance

The following mitigation measures are proposed to comply with the legal protection afforded to breeding birds and their nests under the Wildlife Acts:

- In order to avoid disturbance or harm to breeding birds, their nests, eggs and/or their unfledged young, all works involving the removal of trees, woodland or grasslands, or any other potential nesting habitat, will be undertaken outside of the nesting season (i.e. 1 March to 31 August inclusive)

Or where this seasonal restriction cannot be observed then:

- A breeding bird survey will be undertaken by a suitably experienced ecologist in order to assess whether birds are nesting within suitable habitat affected by or immediately adjacent to the proposed works. Should nesting birds be encountered during surveys, it may be necessary to delay the removal of nesting habitat (e.g. trees and shrubs) until after the nesting season (i.e. 1 March to 31 August inclusive).

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

Mitigation Measures for Wintering Birds during Construction Stage

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

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Disturbance/Displacement

Considering the distance (over 440m in total) between the construction of the proposed development and Broadlough, as well as the proposed landscape planting, no mitigation measures are required for disturbance/displacement of wintering birds at the Broadlough or adjacent agricultural field.

Mitigation Measures for Common Frog during Construction Stage

Disturbance of Breeding Waterbodies

If works to clear any of the habitat features suitable to support common frog are to begin during the season where frogspawn or tadpoles may be present (i.e. February to mid-summer), a pre-construction survey will be undertaken to determine whether breeding common frogs are present. If required, a licence permitting their removal should be applied for from the NPWS.

Any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to suitable alternative donor habitat within the vicinity of the proposed development.

Any capture and translocation works shall be undertaken immediately in advance of site clearance and construction works commencing.

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

Mitigation Measures for Common Lizard during Construction Stage

No significant effects on common lizard are predicted during the construction stage of the proposed development, therefore no mitigation is required.

Mitigation Measures for Fish during Construction Stage

Habitat and Food Source Degradation – Water Quality

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

Mitigation Measures for Invertebrates during Construction Stage

Habitat and Food Source Degradation – Water Quality (Aquatic Invertebrates)

Measures to protect water quality have been incorporated into the design. These measures are presented in the Construction Surface Water Management Plan (CSWMP) (provided in the OCEMP, included as a standalone document in support of this planning application, A034-CSC-ZZ-XX-RP-C-005-P4), and detail control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction stage of the proposed development.

Specific mitigation measures which the appointed contractor will implement in relation to surface water quality are described in detail in Chapter 7 (Hydrology) and summarised in Section 7.6.1 of this Chapter at 'Mitigation Measures for Habitats during Construction Stage – Water Quality'.

8.6.2 Operational Stage

Mitigation Measures for Habitats during Operational Stage

Landscape Planting

The landscape design for the proposed development site is cognisant of the requirements of the *Wicklow County Development Plan 2022-2028* (Wicklow County Council, 2022), and *All-Ireland Pollinator Plan 2021-2025* (NBDC, 2021) and consideration for using plants of native origin in planting and by leaving unmanaged and/or enhanced areas for biodiversity has been incorporated into the proposed landscape scheme .

To offset any habitat loss, the proposed landscape plans include planting of 831 trees along streets, within open spaces, as native hedgerow, as native woodland and as screen planting. 14,134m² native wildflower meadows, 10,863m² public/ communal open space planting and 33,750m² private open space planting. The planting will enhance the retained habitats (18,240m²) that will not be developed for many foraging and breeding species as there will be a greater diversity and number of flowering and fruiting trees, shrubs and hedgerows, as well as grassland, that will provide additional breeding and foraging opportunities to many species

The proposed planting will use a mix of native and non-native species and pollinator-friendly species, for example:

- The park trees will comprise of 80% native species (*Sorbus aucuparia* Rowan, *Pinus sylvestris* Scots Pine, *Betula pubescens* downy birch and *Quercus robur* Oak) and 20% non-native *Tilia cordata* lime.
- The riparian buffer trees will include 100% native tree species (alder *Alnus glutinosa*, aspen *Populus tremula*, spindle *Eunonymus europaeus*, willow *salix spp.* and hornbeam *Carpinus betulus*).

- The native hedgerows will comprise of species such as *Corylus avellana*, *Crataegus monogyna*, *taxus baccata*, *fagus sylvatica* and *ilex aquifolium*

The majority of the existing boundary treelines (WL2) and scrub (WS1) will be retained and enhanced as part of the proposed development through screen planting.

Mitigation Measures for Badger during Operational Stage

The operation of the proposed development is not predicted to result in any significant effects to populations of badger in the vicinity of the proposed development. Therefore, no mitigation is proposed.

Mitigation Measures for Otter during Operational Stage

Habitat and Food Source Degradation – Water Quality

Refer to Section 7.5.2 'Potential Impacts on Designated Sites during Operational Stage – Water Quality' and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

Mitigation Measures for Bats during Operational Stage

Lighting

The Lighting design for the site will have been installed during the construction phase and which will be in effect during operation is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020);
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010);
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2018).

Adhering with these guidelines ensures sensitive siting and design of the lighting elements and will include careful consideration of light placement on buildings, column heights and luminaire design.

The following recommendations based on the above guidance have been considered in relation to the detailed construction and operational lighting design, and have been reviewed by a suitably qualified and experienced ecologist:

- Lighting levels should be the minimum required for health and safety requirements.
- Vertical light spill shall be minimized by the use of suitable cut off luminaires.
- No floodlighting should be used, this causes a large amount of light spillage into the sky. The spread of light should be kept below the horizontal.
- Lights should be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting should be used with a low UV component (UV filters can be used to reduce the UV component emitted by lights). Glass also helps reduce the UV component emitted by lights.
- The use of LED directional lighting (through the use of hoods, louvres, shields, or cowls) to restrict light to those areas where it is needed.

- Consideration the use of automatic sensor or dimming systems to minimize the duration and intensity of lighting on the site.

The technical details of the lighting plans for the proposed development include the following:

- LED-based lighting (Cree LED lanterns);
- P4 class lighting levels; and,
- 3000K warm white CCT.

These are in adherence with the guidance presented above in relation to bats and lighting, as well as Wicklow County Council specifications (Wicklow County Council, 2022)^{Error!}
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Mitigation Measures for Small Terrestrial Non-volant Mammals during Operational Stage

The operation of the proposed development is not predicted to result in any significant effects to populations of small mammals in the vicinity of the proposed development. Therefore, no mitigation is proposed.

Mitigation Measures for Marine Mammals during Operational Stage

Habitat and Food Source Degradation – Water Quality

Refer to Section 7.5.2 ‘Potential Impacts on Designated Sites during Operational Stage – Water Quality’ and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

Mitigation Measures for Birds during Operational Stage

Habitat Loss/Fragmentation

The proposed development will result in foraging and breeding habitat loss of various bird species, however the proposed planting will mitigate this loss and in addition will enhance it for many bird species. The landscape planting includes planting of 831 trees across the site, 14,134m² native wildflower meadows, as well as 10,863m² public/communal open space planting and 33,750m² private open space planting. The planting will enhance the retained habitats (18,240m²) that will not be developed for many foraging and breeding species as there will be a greater diversity and number of flowering and fruiting trees, shrubs and hedgerows, as well as grassland, that will provide additional breeding and foraging opportunities to many species.

Habitat and Food Source Degradation – Water Quality

Refer to Section 7.5.2 ‘Potential Impacts on Designated Sites during Operational Stage – Water Quality’ and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

Mitigation Measures for Amphibians and Reptiles During Operational Stage.

Common Frog

Habitat Degradation – Surface Water Quality

Refer to Section 7.5.2 'Potential Impacts on Designated Sites during Operational Stage – Water Quality' and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

Common Lizard

The operation of the proposed development is not predicted to result in any significant effects to populations of common lizard in the vicinity of the proposed development. Therefore, no mitigation is proposed.

Mitigation Measures for Fish During Operational Stage

Habitat Degradation – Surface Water Quality

Refer to Section 7.5.2 'Potential Impacts on Designated Sites during Operational Stage – Water Quality' and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

Mitigation Measures for Invertebrates During Operational Stages

Habitat Loss/Fragmentation (Terrestrial Invertebrates)

The proposed development will result in habitat loss in respect of foraging and breeding resource of various terrestrial invertebrate species. However, the proposed planting design will mitigate this loss and in addition will enhance it for many terrestrial invertebrates. The landscape planting includes planting of 831 trees across the site, 14,134m² native wildflower meadows, as well as 10,863m² public/ communal open space planting and 33,750m² private open space planting. The planting will enhance the retained habitats (18,240m²) that will not be developed for many foraging and breeding species as there will be a greater diversity and number of flowering and fruiting trees, shrubs and hedgerows, as well as grassland, that will provide additional breeding and foraging opportunities to many species.

Habitat Degradation – Surface Water Quality (Aquatic Invertebrates)

Refer to Section 7.5.2 'Potential Impacts on Designated Sites during Operational Stage – Water Quality' and specific mitigation measures which will be implemented in relation to surface water quality and are described in detail in Chapter 7 (Hydrology).

8.7 Residual Impact of the Proposed Development

8.7.1 Construction Stage

Following the full and effective implementation of the mitigation measures outlined in Section 7.6, the proposed development will not result in any significant residual effect on the Key Ecological Receptors identified (see Table 8.8 and Table 8.9) on its own, or cumulatively together with other proposed developments.

Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
European Sites					
The <u>Murrough</u> Wetlands SAC	International	None	N/A	Mitigation measures to protect water quality outlined in Section 7.6. Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6.	None
Wicklow Mountains SAC	International	None	N/A	Mitigation measures to protect water quality outlined in Section 7.6. (otter)	None
The <u>Murrough</u> SPA	International	None	N/A	Mitigation measures to protect water quality outlined in Section 7.6. Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6.	None
National Sites					
The <u>Murrough</u> pNHA	National	None	N/A	Mitigation measures to protect water quality outlined in Section 7.6. Mitigation measures to control the spread of non-native invasive species and to control	None

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Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
European Sites					
Habitats					
Scrub (WS1)	Local importance (higher value)	Permanent loss of habitat (c. 0.39ha) Introduction/spread of non-native species Habitat degradation (dust deposition)	Local importance (higher value)	Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6. Full implementation of the proposed landscaping plan.	None
Treelines (WL2)	Local importance (higher value)	Permanent loss of habitat (c. 180m) Introduction/spread of non-native species Habitat degradation (dust deposition)	Local importance (higher value)	Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6. Full implementation of the proposed landscaping plan.	None
Hedgerow (WL1)	Local importance (higher value)	Permanent loss of habitat (c. 180m) Introduction/spread of non-native species Habitat degradation (dust deposition)	Local importance (higher value)	Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6. Full implementation of the proposed landscaping plan.	None?

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Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
European Sites					
Depositing River (FW2) Lowland	Local importance (higher value)	Introduction/spread of non-native species. Habitat degradation (dust deposition)	Local importance (higher value)	Mitigation measures to protect water quality outlined in Section 7.6. Mitigation measures to control the spread of non-native invasive species and to control dust deposition outlined in Section 7.6. Full implementation of the proposed landscaping plan outlined in Section 7.6.	
Badger	Local importance (higher value)	None	N/A	Mitigation measures for construction stage outlined in Section 7.6.	None
Otter	International importance	Direct and indirect water quality impacts (toxicity; prey availability)	Country importance	Precautionary mitigation measures for construction stage outlined in Section 7.6. Mitigation measures to protect water quality outlined in Section 7.6.	None
Bats	Local importance (higher value)	Habitat loss Disturbance/displacement (roost loss)	Local importance (higher value)	Full implementation of proposed landscape planting outlined in Section 7.6.	None
Small non-volant terrestrial mammals	Local importance (higher value)	None	N/A	Precautionary mitigation measures for construction stage outlined in Section 7.6.	None

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Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
European Sites					
Marine mammals	County importance to International	Direct and indirect water quality impacts (toxicity; prey availability)	N/A	Landscape planting outlined in Section 7.6. Mitigation measures to protect water quality outlined in Section 7.6.	None
Breeding and wintering birds non-SCI species	Local importance (higher value)	Vegetation clearance Habitat loss Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Seasonal vegetation clearance outlined in Section 8.6. Breeding bird surveys prior to vegetation clearance in breeding season. Mitigation measures to protect water quality outlined in Section 7.6. Landscape planting outlined in Section 7.6.	None
Breeding and wintering SCI bird species	County importance	Vegetation clearance Habitat loss	County importance	Seasonal vegetation clearance outlined in Section 7.6. Breeding bird surveys prior to vegetation clearance if required to be undertaken in breeding season. Mitigation measures to protect water quality outlined in Section 7.6.	None

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Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
European Sites					
Raptors (Non-SCI Species)	Local importance (higher value)	None	N/A	Landscape planting outlined in Section 7.6. N/A	None
Common frog	Local importance (higher value)	Habitat loss Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Pre-construction checks in adherence with Wildlife Acts. Mitigation measures to protect water quality outlined in Section 7.6.	None
Common lizard	Local importance (higher value)	None	N/A	N/A	None
Fish (rare and protected species such as Atlantic salmon, European eel and river lamprey)	National to International importance	Direct and indirect water quality impacts (toxicity; prey availability)	National to International importance	Mitigation measures to protect water quality outlined in Section 7.6.	None
Invertebrates	Local importance (higher value)	Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Mitigation measures to protect water quality outlined in Section 7.6. Landscape planting outlined in Section 7.6.	None

Table 11.8 - Summary of the significant residual ecological effects of the proposed development during construction stages

8.7.2 Operational Stage

Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
The <u>Murrrough Wetlands SAC</u>	International	None	N/A	Mitigation measures included as part of design to protect water quality outlined in Section 7.6.	None
Wicklow Mountains SAC	International	None	N/A	Mitigation measures included as part of design to protect water quality outlined in Section 7.6 (otter).	None
The <u>Murrrough SPA</u>	International	None	N/A	Mitigation measures included as part of design to protect water quality outlined in Section 7.6.	None
The <u>Murrrough pNHA</u>	National	None	N/A	Mitigation measures included as part of design to protect water quality outlined in Section 7.6.	None
Rare and protected flora	Local importance (higher value)	None	N/A	N/A	None

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Scrub (WS1)	Local importance (higher value)	None	N/A	N/A	None
Treelines (WL2)	Local importance (higher value)	None	N/A	N/A	None
Hedgerow (WL1)	Local importance (higher value)	None	N/A	N/A	None
Depositing River (FW2)	Local importance (higher value)	Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Mitigation measures included as part of design to protect water quality outlined in Section 8.6.	None
Badger	Local importance (higher value)	None	N/A	N/A	None
Otter	International importance	Direct and indirect water quality impacts (toxicity; prey availability)	County importance	Mitigation measures included as part of design to protect water quality outlined in Section 8.6.	None
Bats	Local importance (higher value)	Disturbance/displacement (lighting)	Local importance (higher value)	Bat sensitive lighting plans outlined in Section 8.6.	None
Small non-volant terrestrial mammals	Local importance (higher value)	None	N/A	N/A	None
Marine mammals	County - International importance	Direct and indirect water quality impacts (toxicity; prey availability)	County Importance	Mitigation measures included as part of design to protect water	None

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						quality outlined in Section 8.6.	
Breeding and wintering birds non-SCI species	Local importance (higher value)	None	None	N/A	N/A	None	None
Breeding and wintering SCI bird species	International importance	None	None	N/A	N/A	None	None
Raptors (Non-SCI Species)	Local importance (higher value)	None	None	N/A	N/A	N/A	N/A
Common frog	Local importance (higher value)	Direct and indirect water quality impacts (toxicity; prey availability)	Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Local importance (higher value)	Mitigation measures included as part of design to protect water quality outlined in Section 8.6.	None
Common lizard	Local importance (higher value)	None	None	N/A	N/A	N/A	None
Fish (rare and protected species such as Atlantic salmon, European eel and river lamprey)	Country importance	Direct and indirect water quality impacts (toxicity; prey availability)	Direct and indirect water quality impacts (toxicity; prey availability)	Country importance	Country importance	Mitigation measures included as part of design to protect water quality outlined in Section 8.6.	None
Invertebrates	Local importance (higher value)	Direct and indirect water quality impacts (toxicity; prey availability)	Direct and indirect water quality impacts (toxicity; prey availability)	Local importance (higher value)	Local importance (higher value)	Mitigation measures included as part of design to protect water quality outlined in Section 8.6.	None

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Table 11.2 Summary of the significant residual ecological effects of the proposed development during operational stage

8.8 Cumulative Impacts

This section of the report presents the assessment carried out to examine whether any other proposed developments have the potential to act cumulatively with the proposed development to give rise to likely significant effects on biodiversity.

The potential for in combination effects to arise in Broadlough and the Irish Sea from any existing or proposed land use plans or developments is regulated and controlled by the environmental protective policies and objectives of the Wicklow County Development Plan 2022-2028^{Error! Bookmark not defined.}. Any existing/proposed plan or project that could potentially affect biodiversity, in combination with the proposed development, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the European site within the zone of influence of the proposed development, and include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects.

As set out in the *Wicklow County Development Plan 2022-2028* the subject lands are zoned under 'R1 – Residential'. The adjacent lands immediately to the south the proposed development, on the other side of the Tinakilly Lane are currently under development for residential purposes (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), with areas to the east and west of the proposed development site are zoned for 'Passive Open Space (POS)' and 'RE – Existing Residential', to the south for 'R1 – New Residential' (currently under development as mentioned above); and to the north for 'Passive Open Space (POS)' and the 'Clermont Campus (CC)' in the *Wicklow County Development Plan 2022-2028* and therefore the majority of the surrounding lands which have yet to be developed will remain undeveloped based on Wicklow County Council's zoning.

There are specific objectives and policies in the Wicklow County Development Plan 2022-2028 to protect biodiversity. Policies CPO17.1, CPO17.4, CPO17.5, CPO17.6, CPO17.7, CPO17.8, CPO17.12, CPO17.14 and CPO17.15 relate to the protection of biodiversity. The Wicklow County Development Plan 2022-2028 also includes policies to protect (from risk of pollution), manage and enhance the counties' surface water and groundwater resources (CPO13.1 and CPO13.21).

Land use plans for the other local authorities (e.g. Dun Laoghaire- Rathdown Council and Dublin City Council) whose functional areas include surface water features which drain to the Irish Sea, were examined and analysed and those land use plans also include protective environmental policies to protect European sites and the receiving surface water environments.

The main project with the potential for cumulative effects is the adjacent consented development of Tinakilly Phase 1 (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118). This consented development has undergone a similar environmental assessment as this proposed development, including an EIAR biodiversity chapter and AA screening. This project has incorporated into its design measures to avoid, reduce and alleviate all potentially significant effects on biodiversity and ruled out the potential for significant effects on European sites, and as such in-combination effects on European sites are not considered to be significant.

8.8.1 Construction Stage and operation Stage

Surface and Foul Water

There is potential for cumulative or "in combination" effects on water quality of downstream waterbodies located in the Vartry sub-catchment and Ovoca-Vartry

catchment from any other projects carried out within the functional areas of the *Wicklow County Development Plan 2022-2028* (Wicklow County Council, 2022) and any other county level land use plans which can influence conditions in the Irish Sea, e.g. *Dublin City Development Plan 2022-2028* (Dublin City Council, 2022), the *Dún Laoghaire-Rathdown County Development Plan 2022-2028* (Dún Laoghaire-Rathdown County Council, 2022), or any other county level land use plans which can influence conditions in the Irish Sea via rivers and other surface water features.

Broadlough and Irish Sea

The proposed development will not impact on the water quality in the Broadlough or the Irish Sea, as concluded by the Chapter 6 – Land Soils and Hydrogeology, of this EIAR. As noted under Section 7.3.2 above, according to the EPA, the Broad Lough TWB has a ‘Moderate’ water quality, whereas the Irish Sea is currently unpolluted, and the proposed development will not result in any measurable effect on water quality in either of these waterbodies. There are also protective policies and objectives in place at a strategic planning level to protect water quality in Irish Sea (as outlined below and in Appendix 8A). The pollutant content of future surface water discharges to Irish Sea is considered likely to decrease in the long-term in the vicinity for the following reasons:

- Irish Water are currently undertaking a major upgrade of the Ringsend WwTP to increase the plant’s wastewater treatment capacity to a population equivalent of 2.4 million, which is programmed for completion in 2025⁷³
- There is a commitment in the National Development Plan 2021-2030⁷⁴ to invest in and progress the Greater Dublin Drainage Project which includes the development of a new regional wastewater treatment facility and associated infrastructure to serve Dublin and parts of the surrounding counties of Kildare and Meath. The project will involve the provision of a new regional wastewater treatment plant at a site in the northern part of the Greater Dublin Area and the provision of a new Orbital Drainage Sewer linking the new plant to the existing regional sewer network, which will enable future connections for identified areas of development within the catchment area. The provision of the Greater Dublin Drainage Project—will augment the wastewater treatment capacity currently provided by Ringsend WwTP across the Greater Dublin Area and alleviate pressure within the existing wider wastewater network and help to ensure that the wastewater generated is treated safely, in compliance with the EU and national wastewater treatment regulations.
- The Eastern & Midland Regional Assembly, *Regional Spatial & Economic Strategy 2019-2031*⁷⁵ (Eastern & Midland Regional Assembly, 2019) includes a range of policy objectives relevant to the protection of European sites and the protection of water quality in Irish Sea, to which the relevant planning authorities must have regard to in the preparation and adoption of their development plans (included in Appendix 8A).

It is also an objective of the Greater Dublin Strategic Drainage Study, and all development plans within the catchment of Ringsend WWTP, to include Sustainable Urban Drainage Systems (SuDS) within new developments. The relevant development plans also have protective policies/objectives in place to protect water quality in the receiving freshwater and marine environments, and to implement the Water Framework Directive in achieving good water quality status for the Irish Sea.

Therefore, there is no possibility of any other plans or projects acting in combination with the proposed development to undermine the conservation objectives of any of the

⁷³ <https://www.water.ie/projects/local-projects/ringsend/> Accessed on: 20th June 2023.

⁷⁴ Government of Ireland (2021) *Project Ireland 2040, National Development Plan 2021-2030*.

⁷⁵ Eastern & Midland Regional Assembly (2019) *Regional Spatial & Economic Strategy 2019-2030*

qualifying interests or special conservation interests of Natural Heritage Areas or European sites in, or associated with the Irish Sea as a result of water quality effects.

Habitat Loss and Disturbance and/or Displacement

In the event that habitat loss of portions of scrub (WS1) and of treeline (WL2) habitat coincide with the loss of similar habitats in the vicinity of the proposed development, the geographic scale of the effects could rise from local level potentially to county level (although to reach county level a significant portion of these habitats would have to be removed in the wider area given their prevalence within Wicklow County), as these types of habitats are important for the biodiversity value of the locality and for local fauna (e.g. bats and breeding birds) in terms of providing foraging and breeding opportunities. However, given the nature and availability of these habitat types in the wider environment, any cumulative losses of these habitat types from the proposed development in combination with other development are not likely to increase the impact significance above the residual local geographic scale.

Various protective policies in place within the land use plans will also moderate any future losses of habitats of a biodiversity value. There are overarching plan level environmental protection policies from the following plans; *Wicklow County Development Plan 2022-2028* (Wicklow County Council, 2022), *Dublin City Development Plan 2022-2028* (Dublin City Council, 2022), the *Dún Laoghaire-Rathdown County Development Plan 2022-2028* (Dún Laoghaire-Rathdown County Council, 2022) and any other county level land use plans which provide protection to biodiversity.

The proposed development is compliant with all of the plan level biodiversity protection policies and objectives described within the *Wicklow County Development Plan 2022-2028* (Wicklow County Council, 2022). Furthermore, the proposed development will not prevent the achievement of any of these plan level biodiversity protection policies and objectives across the identified potential impact pathways.

The adjacent lands immediately to the south the proposed development, on the other side of the Tinakilly Lane are currently under development for residential purposes (planning reference), however areas to the east and west of the proposed development site are zoned for 'Passive Open Space (POS)' and 'RE – Existing Residential', to the south for 'R1 – New Residential' (currently under development as mentioned above); and to the north for 'Passive Open Space (POS)' and the 'Clermont Campus (CC)' in the *Wicklow County Development Plan 2022-2028* and therefore the majority of the surrounding lands which have yet to be developed will remain undeveloped based on their zoning. Considering the proposed development will comprise of large areas of green space with planted trees, hedgerows and ponds in its operational stage, it is unlikely for cumulative effects to occur.

There are potential temporary impacts on fauna as a result of habitat loss/fragmentation arising from the development. In addition, there is potential for cumulative impacts on fauna in the area to arise as a result of habitat loss, if further hedgerows, treelines and woodland in the locality are removed, or semi-natural grassland areas are replaced by areas of hard standing or buildings and artificial surfaces. However, given the extensive planting proposed for the proposed development, no significant cumulative effects are predicted that would increase the magnitude of the residual impacts associated with the proposed development as a result of habitat loss/fragmentation, in conjunction with the other projects.

There are granted planning permissions for residential or other small-scale developments such as extensions to existing dwellings, and the adjacent LRD development to the south of the proposed development, in the vicinity of the proposed site, some of which may be in construction at the same time as the proposed development. Therefore, there is

potential for cumulative impacts to arise with other local developments that would also result in increased noise, vibration, human presence and lighting. Any disturbance effects from other such local developments are likely to be relatively minor in nature, temporary, localised and over a similarly short duration, and for the larger developments have mitigation measures built into the conditional planning permission granted by Wicklow County Council, therefore, they are not likely to cumulatively affect the bird or bat populations in conjunction with the proposed development considering that they have to adhere to the same policies and objectives of the Wicklow County Development Plan as the proposed development.

Protective Policies and Objectives and Conclusion

Any long-term effects on biodiversity are likely to be moderated by the environmental protective policies and objectives of the *Wicklow County Development Plan 2022-2028* (Wicklow County Council, 2022).

There are general overarching policies and objectives in the *Wicklow County Development Plan 2022-2028* to ensure that proposals for development integrate the protection and enhancement of biodiversity (e.g. Objective NH1) and to identify and protect sites of local biodiversity importance (e.g. Objective NH3). There are also specific objectives to protect European sites and to prevent development that would adversely affect the integrity of any European site(s) (e.g. Objective NH2 and NH4) protect designated or proposed natural heritage areas (e.g. Objectives NH3 and NH5), to ensure that development does not have significant impact on protected habitats and species (e.g. Objectives NH6 and NH8), and to control and eradicate invasive species (e.g. Objective NH9). The *Wicklow County Development Plan 2022-2028* also has specific policies and objectives relating to the protection of surface water and groundwater resources (e.g. Objectives NH20, NH21, NH22 and NH24), and the protection of air quality (e.g. Objective NH2).

Land use plans for the other local authorities (e.g. Dún-Laoghaire-Rathdown County Council and Dublin City Council) whose functional areas include the Ovoca-Vartry Catchment or other surface water catchments that drain to the Irish Sea, were examined and analysed and those land use plans also include protective environmental policies to protect biodiversity, designated sites for nature conservation and the receiving surface water, estuarine and marine environments.

Considering the predicted impacts associated with the proposed development, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment, and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

8.9 Monitoring

8.9.1 Construction Stage

Monitoring may be required following the pre-construction checks for mammals, if a significant increase in activity levels, or additional holts/ setts have been created onsite in the interim. The discovery of additional holts/ setts will require liaison with the local authority and NPWS and the potential acquisition of a derogation licence application and/or a follow-on condition of said licence.

8.9.2 Operational Stage

Monitoring will be required following the removal and disposal of the INNS recorded onsite, as part of the ISMP.

Ongoing maintenance of the proposed SuDs measures will be required as part of the management of the completed housing estate to ensure ongoing compliance with objectives and policies within the Wicklow County Development Plan.

8.10 Difficulties Encountered

8.10.1 Survey Limitations

Habitat, bat, breeding and wintering bird surveys were carried out within the optimal survey periods for these disciplines. Any perceived aged data from surveys carried out in 2022 are still considered valid as per guidance⁶³.

With regard to mammal surveys, the timing of the surveys was not within the optimal survey period for mammals. Mammal surveys, such as badger surveys, are ideally carried out during winter months, due to better visibility associated with vegetation dormancy. Dense vegetation may affect the surveyor's ability to find entrances to for example badger setts, and these may be missed even when reasonable effort is applied into finding them. The aforementioned factors are not considered to pose a limitation on the ecological assessment of the proposed development site for mammals, due to the limited extent of suitable undisturbed habitat within the proposed development site.

The surveys did not include aquatic surveys for marine mammals, considering there are no suitable coastal waterbodies within the proposed development footprint for these species. This is not considered to pose any limitation on the ecological assessment of the proposed development on marine mammals considering the lack of suitable habitat for these species within the proposed development site.

Wintering bird surveys were carried out over a three-month period between January 2021 and March 2022 rather than the recommended seven months from September to March. However, this is not considered to be a limitation considering that a total of 9 surveys were conducted across this three-month period and that the proposed development site was in use for winter arable crops at the time of these surveys and is therefore, not suitable for majority of wetland wintering birds which the wintering bird surveys aim to record.

Despite the limitations noted above, sufficient survey data was gathered to fully inform the assessment of impacts, the mitigation measures described in this chapter and the assessment of residual impacts predicted in relation to the proposed development.

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9 AIR QUALITY AND CLIMATE

9.1 Introduction

This Chapter was prepared by AWN Consulting Ltd.

This chapter assesses the likely air quality and climate impacts associated with the proposed residential development at Tinakilly, Rathnew, Co. Wicklow. The development will consist of a mix of residential units a public park, a new section of the Rathnew Inner Relief Road and all associated site development works. A full description of the development is available in Chapter 2 - Description of Development.

This chapter was completed by Ciara Nolan, a senior environmental consultant in the air quality and climate section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is a Member of both the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Science (MIEnvSc). She has over 6 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical and data centres.

9.2 Study Methodology

9.2.1 Criteria Rating for Impacts

9.2.1.1 Air Quality

9.2.1.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

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 2022 (S.I. No. 739 of 2022), which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values in relation to NO₂, PM₁₀ and PM_{2.5} are applicable to this assessment (see **Table 9.1**). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions.

Pollutant	Regulation ^{Note 1}	Limit Type	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
		Critical level for protection of vegetation	30 µg/m ³ NO + NO ₂
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³
Dust Deposition	TA Luft	Annual average dust deposition at site boundary	350 mg/m ² /day

^{Note 1} EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Table 9.1 Air Quality Standards Regulations & TA Luft

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (shown in **Table 9.2**). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final PM_{2.5} target of 5 µg/m³. The strategy also acknowledges that “meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both PM_{2.5} and NO₂”. Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO ₂	WHO Air Quality Guidelines	24-hour limit for protection of human health	50µg/m ³ NO ₂	50µg/m ³ NO ₂	25µg/m ³ NO ₂
		Annual limit for protection of human health	30µg/ m ³ NO ₂	20µg/ m ³ NO ₂	10µg/m ³ NO ₂
PM (as PM ₁₀)		24-hour limit for protection of human health	75µg/ m ³ PM ₁₀	50µg/m ³ PM ₁₀	45µg/m ³ PM ₁₀
		Annual limit for protection of human health	30µg/ m ³ PM ₁₀	20µg/ m ³ PM ₁₀	15µg/m ³ PM ₁₀
PM (as PM _{2.5})		24-hour limit for protection of human health	37.5µg/m ³ PM _{2.5}	25µg/m ³ PM _{2.5}	15µg/m ³ PM _{2.5}
		Annual limit for protection of human health	15µg/m ³ PM _{2.5}	10µg/m ³ PM _{2.5}	5µg/m ³ PM _{2.5}

Table 9.2 WHO Air Quality Guidelines

9.2.1.1.2 Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}) and the EU ambient air quality standards outlined in **Table 9.1** have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/m²/day to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

9.2.1.1.3 Air Quality & Traffic Impact Significance Criteria

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do Nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) and reproduced in **Table 9.3** below. These criteria have been adopted for the proposed development to predict the impact of NO₂, PM₁₀ and PM_{2.5} emissions as a result of the proposed development.

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: TII (2022a) *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106*

Table 9.3 Air Quality Significance Criteria

9.2.1.2 Climate

9.2.1.2.1 Climate Agreements

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, 2019). 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) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023.

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”.

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states ‘A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a ‘budget period’)’. The carbon budget is to be produced for 3 sequential budget periods, as shown in **Table 9.4**. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in July 2022 and are shown in **Table 9.5**. Industry and Buildings (Residential) have a 35% and 40% reduction requirement respectively and a 2030 emission ceiling of 4 Mt CO_{2eq}⁷⁶.

Sector	Reduction Required	2018 Emissions (Mt CO _{2eq})
2021-2025	295 Mt CO _{2eq}	Reduction in emissions of 4.8% per annum for the first budget period.

⁷⁶ Mt CO_{2eq} denotes million tonnes carbon dioxide equivalent.

2026-2030	200 Mt CO ₂ eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from ‘Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change’

Table 9.4 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Sector	Baseline (MtCO ₂ eq)	Carbon Budgets (MtCO ₂ eq)		2030 Emissions (MtCO ₂ eq)	Indicative Emissions % Reduction in Final Year of 2025-2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Transport	12	54	37	6	50
Electricity	10	40	20	3	75
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Agriculture	23	106	96	17.25	25
LULUCF	5	-	-	-	-
Industry	7	30	24	4	35
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Unallocated Savings	-	7	5	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from ‘Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change’

Table 9.5 Sectoral Emission Ceilings 2030

In December 2022, CAP23 was published (Government of Ireland, 2022). This is the first CAP since the publication of the carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP23 states that the decarbonisation of Ireland’s manufacturing industry is key for Ireland’s economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP23 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

In April 2023 the Government published a draft Long-term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland 2023b). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan. The strategy will be updated on the basis of a

second round of public consultation throughout 2023 with an updated strategy published after this is complete.

9.2.1.2.2 Climate Assessment Significance Criteria

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. The approach is based on comparing the ‘Do Something’ scenario and the net project GHG emissions (i.e. *Do Something – Do Minimum*) to the relevant carbon budgets (Department of the Taoiseach 2022). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO₂ project GHG emissions from the proposed development. The Industry and Buildings (Residential) sectors emitted approximately 7 Mt CO_{2eq} in 2018 and have a ceiling of 4 Mt CO_{2eq} in 2030 which is a 35% and 40% reduction respectively over this period (see **Table 9.5**).

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA’s (2022) ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project’s emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project’s residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project’s remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland’s National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero⁷⁷ by 2050”.

Significance is determined using the criteria outlined in **Table 9.6** (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Effects	Significance Level	Description
Significant adverse	Major adverse	The project’s GHG impacts are not mitigated. The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and No meaningful absolute contribution to Ireland’s trajectory towards net zero.
	Moderate adverse	The project’s GHG impacts are partially mitigated. The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and Falls short of full contribution to Ireland’s trajectory towards net zero.
Not Significant	Minor adverse	The project’s GHG impacts are mitigated through ‘good practice’ measures. The project has complied with existing and emerging policy requirements; and Fully in line to achieve Ireland’s trajectory towards net zero.
	Negligible	The project’s GHG impacts are mitigated beyond design standards. The project has gone well beyond existing and emerging policy requirements; and Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero.
Beneficial	Beneficial	The project’s net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. The project has gone well beyond existing and emerging policy requirements; and Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero, provides a positive climate impact.

Table 9.6 GHGA Significance Criteria

Significance Criteria for CCRA

⁷⁷ Net Zero: “When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.” Net zero is achieved where emissions are first reduced in line with a ‘science-based’ trajectory with any residual emissions neutralised through offsets.

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

The vulnerability assessment takes any proposed mitigation into account. **Table 10.7** details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 - High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 - Low	1 - Low

Table 9.7 Vulnerability Matrix

9.2.2 Construction Phase Methodology

9.2.2.1 Air Quality

9.2.2.1.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (2014) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a).

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

9.2.2.1.2 Construction Phase Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

The construction phase traffic associated with the worst-case peak construction scenario (see Traffic and Transport Assessment for further detail) was reviewed with reference to the above criteria to determine the need or otherwise for a detailed air quality assessment of construction phase vehicle exhaust emissions. The worst-case construction scenario is referred to as Stage D within the Traffic and Transport Assessment prepared by CS Consulting. This worst-case scenario includes construction stage traffic for Phase 2 and 3 of the proposed development and includes some operational phase traffic from completed Phase 1 of the proposed development. In this scenario the Rathnew Inner Relief Road (RIRR) is fully completed and traffic can access from the R750 and R761. As a result there are a number of road links (see **Figure 9.1** and **Table 9.8**) which will experience a change of over 1,000 AADT and /or a change of over 200 HDV AADT in the worst-case construction year of 2026. A detailed air quality assessment of the construction phase traffic emissions was conducted. Modelling of NO₂, PM₁₀ and PM_{2.5} concentrations was carried out at 6 no. worst-case sensitive receptors (residential properties R1 – R6, see **Figure 9.1**) within 200m of the impacted road links. The TII criteria state that receptors within 200m of impacted road links should be assessed; roads which are greater than 200m from receptors will not impact pollutant concentrations at that receptor. The modelling assessment was carried out as per the methodology in **Section 9.2.3.1.1**. The traffic data used in the construction phase modelling assessment is detailed in **Table 9.8**.

Road Link	Speed (kph)	Construction Year 2026	
		Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
A	50	2,512 (61)	6,617 (204)
D	50	17,741 (631)	13,036 (476)
E	50	19,416 (692)	14,573 (533)
G	50	20,561 (889)	15,932 (734)
I	50	3,932 (112)	8,813 (379)
K	60	64 (36)	5,658 (323)

Table 9.8 Traffic Data used in Construction Phase Air Quality Assessment

9.2.2.2 Climate

9.2.2.2.1 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see **Section 9.3.4**). The impact of the proposed development on climate is determined in relation to

this baseline. As per the IEMA guidance (2022) where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate. The construction stage activities and potential for GHG emissions have been reviewed as part of the construction stage climate assessment and a quantitative assessment conducted.

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022b). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2022b) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. Given the nature of the proposed development use of the TII carbon tool is not ideal. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material/activity that will be used over the entire construction phase. The output is provided in terms of tonnes CO₂e.

The Irish Green Building Council in partnership with One Click LCA Ltd. have developed the Carbon Designer for Ireland tool (One Click LCA Ltd., 2023) for use on Irish specific building projects. The Carbon Designer tool is promoted by the EPA and the Land Development Agency. OneClickLCA is certified to EN 15978, EN 15978, ISO 21931-1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at an early stage using typical default materials and values. Inputs to the tool include the gross floor area and number of stories above ground level along with the building frame type. Once the baseline is established using generic data the tool allows for optioneering and optimization of the carbon impact by highlighting the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials. The Carbon Designer for Ireland tool has been used to assess the embodied carbon impact of the residential units.

9.2.3 Operational Phase Methodology

9.2.3.1 Air Quality

9.2.3.1.1 Operational Phase Traffic Assessment

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in **Section 9.2.2.1.2** were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. The proposed development will result in the operational phase traffic increasing by more than 1,000 AADT on a number of road links. Therefore, a detailed air dispersion modelling assessment of operational phase traffic emissions was conducted.

The impact to air quality as a result of changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022a) 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. The TII criteria state that receptors within 200m of impacted road links should be assessed; roads which are greater than 200m from receptors will not impact pollutant concentrations at that receptor. The TII guidance (2022a) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of

the public are likely to be regularly present. A total of 6 no. high sensitivity residential receptors (R1 – R6) were included in the modelling assessment (see **Figure 9.1**).

The TII guidance (2022a) states that modelling should be conducted for NO₂, PM₁₀ and PM_{2.5} for the base, opening and design years for both the Do Minimum (Do Nothing) and Do Something scenarios. Modelling of operational NO₂, PM₁₀ and PM_{2.5} concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2022c).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection, as per TII Guidance (TII, 2022c). The *Intermediate Case* assumes a linear interpolation between the *Business as Usual* case – where current trends in vehicle ownership continue and the *Climate Action Plan (CAP)* case – where adoption of low emission light duty vehicles occurs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM₁₀ emissions associated with brake and tyre wear (TII, 2022c). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII guidance (2022a) also states that impacts to sensitive ecology as a result of traffic emissions should be considered. Consideration should be given to designated sites within 2km of the proposed development, however, a detailed assessment is only required at a local level, where there is a designated site within 200m of impacted road links. The TII guidance (TII, 2022a) notes that only sites that are sensitive to nitrogen and acid deposition need to be included in the assessment, it is not necessary to include sites for example that have been designated as a geological feature or water course. The Murrough Wetlands SAC (site code 002249), The Murrough pNHA (site code 000730) and The Murrough SPA (site code 004186) are approximately 475m to the direct east of the proposed development. However, none of the designated sites identified are within 200m of an impacted road link. A detailed assessment of NO_x concentrations and nitrogen deposition has been screened out as there is no potential for significant impacts to the designated sites as a result of changes in air quality.

Traffic Data used in Modelling Assessment

Traffic flow information was obtained from CS Consulting Engineers for the purposes of this assessment. Data for the Base Year 2023 and the Do Nothing and Do Something scenarios for the Opening Year 2028 and Design Year 2043 were provided. In order to assess the full cumulative impact of the development, a growth factor was applied to the base year traffic to determine the traffic for future years. Additionally, the traffic associated with the permitted development to the direct south of the site was included in the data (see Traffic Impact Assessment and Chapter 13 for further details). The proposed development involves the completion of the Rathnew Inner Relief Road (RIRR), the completion of this road leads to a redistribution of traffic in the area and thus results in a greater degree of change on some road links which is not solely as a result of the new

residential development. The air quality assessment has looked at the cumulative impact and the redistribution of traffic.

The traffic data is detailed in **Table 9.9**. Only road links that met the TII scoping criteria and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per **Section 9.3.2** of this chapter based on available EPA background monitoring data (EPA, 2022).

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Road Link	Speed (kph)	Base Year		Opening Year		Design Year				
				Do Nothing		Do Something				
		LDV (HDV AADT)	AAADT	LDV (HDV AADT)	AAADT	LDV (HDV AADT)	AAADT	LDV (HDV AADT)	AAADT	
A	60	547 (35)		2,525 (61)		6,785 (208)		2,559 (70)		6,819 (217)
D	60	16,020 (585)		18,143 (653)		13,452 (498)		19,166 (775)		14,470 (620)
E	50	17,730 (652)		19,863 (727)		15,020 (568)		20,994 (863)		16,151 (704)
G	50	19,117 (848)		21,043 (934)		16,462 (781)		22,262 (1111)		17,681 (958)
I	50	3,743 (106)		4,027 (116)		9,074 (273)		4,266 (138)		9,313 (295)
K	60	62 (34)		66 (38)		5,833 (215)		70 (44)		5,837 (221)

Table 9.9 Traffic Data used in Operational Phase Air Quality & Climate Assessments

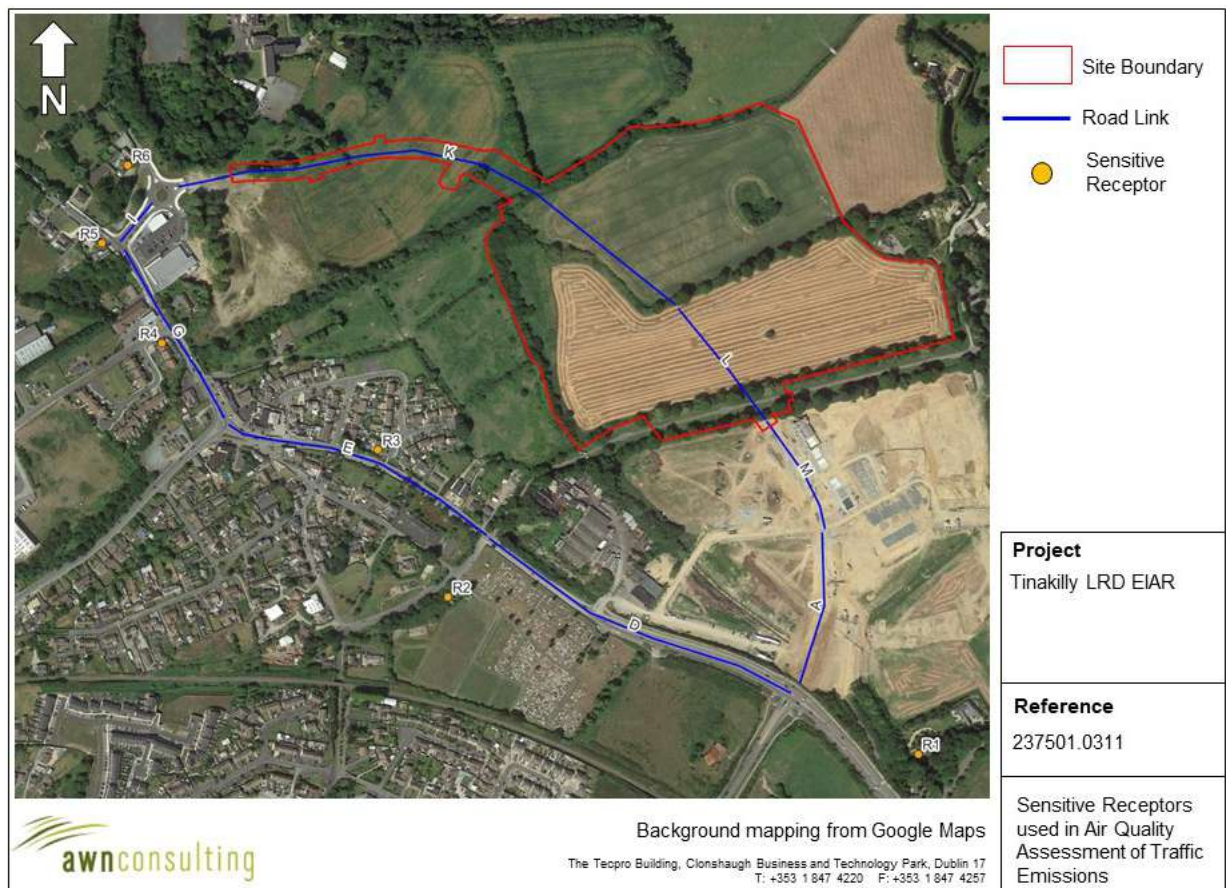


Figure 9.1 Sensitive Receptors used in Air Quality Assessment of Traffic Emissions

9.2.3.2 Climate

9.2.3.2.1 Climate Change Vulnerability Assessment

The operational phase assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022b) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in **Section 9.3.4**, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used in order to assess the likelihood of a climate risk.

The initial stage of an assessment is to establish a scope and boundary for the assessment taking into account the following criteria:

- **Spatial Boundary** As per PE-ENV-01104 (TII, 2022b), the study area with respect to the GHGA is Ireland's Climate budget. The study area with respect to the CCRA can be considered the project boundary and its assets. The study area will be influenced by current and future baselines (**Section 9.3.4**). This study area is influenced by the input of other experts within the EIAR team;
- **Climate Hazards** The outcomes of the climate screening i.e. vulnerability assessment and baseline assessment; and
- **Project Receptors** TII state that the project receptors are the asset categories considered in the climate screening. In addition, any critical connecting infrastructure and significant parts of the surrounding environment e.g. water bodies that should be considered as a part of the indirect, cumulative and in combination impact assessment should also be considered project receptors.

Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a) outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact. The role of the climate consultant in assessing the likelihood and impact is often to facilitate the climate change risk assessment process with input from the design team or specific specialists such as hydrology.

The climate screening risk assessment or vulnerability assessment is carried out by determining the sensitivity and exposure of the project to climate change. Firstly the project asset categories must be assigned a level of sensitivity to climate hazards irrespective of the project location (example: Sea level rise will affect seaport projects regardless of specific location). PE-ENV-01104 (TII, 2022b) provide the below list of asset categories and climate hazards to be considered. The asset categories will vary for project type and need to be determined on a project by project basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.

- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in **Table 9.7**. TII guidance (TII, 2022b) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore be considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

9.2.3.2.2 Climate and Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO₂) and other GHGs which will impact climate.

The UK Highways Agency DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a number of road links that will experience a change of over 10% in the AADT during the operational phase as a result of the proposed development. As a result a detailed assessment of traffic related carbon dioxide (CO₂) emissions was conducted.

PE-ENV-01104 (TII, 2022c) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022c) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO₂eq for the Base Year 2023, Opening Year 2028 and Design Year 2043. Both the Do Nothing and Do Something scenarios are quantified in order to determine the degree of change in emissions as a result of the proposed development. Traffic data was obtained from CS Consulting Engineers for the purpose of this assessment (see **Table 9.9**). Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location. See Chapter 13 Material Assets – Transport and the Traffic and Transport Assessment for further details on the traffic data.

9.2.3.2.3 Operational Energy Usage

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. The Utilities and Energy Sustainability Report prepared by Penston MEP Consulting in relation to the proposed development has been reviewed and used to inform the operational phase climate assessment. This report outlines a number of measures in relation to energy usage from the proposed development primarily in relation to heat and electricity. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate where possible.

9.3 The Existing Receiving Environment (Baseline)

9.3.1 Meteorological Conditions

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 49 km north of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see **Figure 9.2**). For data collated during five representative years (2018 - 2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.4 m/s over the period 1991 - 2020 (Met Eireann, 2023).

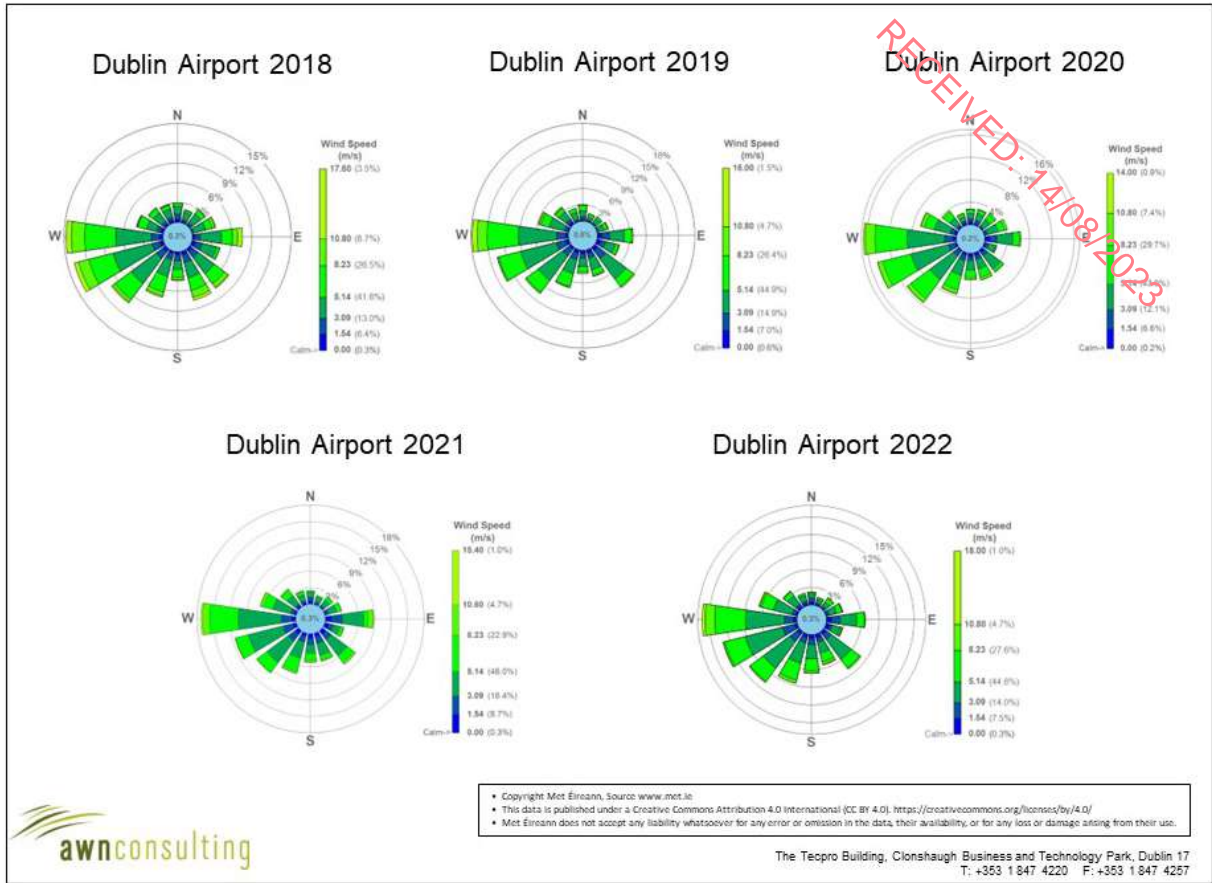


Figure 9.2 Dublin Airport Windrose 2018 - 2022

9.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is “Air Quality In Ireland 2021” (EPA, 2022). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2023).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2022). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone D (EPA, 2022). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA Air Quality in Ireland 2020 report details the effect that the Covid-19 restrictions had on air 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 been included in the baseline section for representative purposes only and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

Long-term NO₂ monitoring was carried out at the Zone D locations of Castlebar, Emo and Kilkitt for the period 2017 - 2021 (EPA, 2022). Long term average concentrations are significantly below the annual average limit of 40 µg/m³; average results range from 2 – 8 µg/m³. Additionally, the 1-hour limit value of 200 µg/m³ (measured as a 99.8th percentile) was not exceeded at any location. The NO₂ annual average for this five-year period suggests an upper average limit of no more than 8 µg/m³ (Table 9.10) as a background concentration. Based on the above information an estimate of the current background NO₂ concentration for the region of the proposed development is 8 µg/m³.

Station	Averaging Period ^{Note 1}	Year				
		2017	2018	2019	2020	2021
Castlebar	Annual Mean NO ₂ (µg/m ³)	7	8	8	6	6
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	60	60	59	54	48
Kilkitt	Annual Mean NO ₂ (µg/m ³)	2	3	5	2	2
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	17	22	42	13	11
Emo	Annual Mean NO ₂ (µg/m ³)	3	3	4	4	4
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	28	42	28	23	28

^{Note 1} Annual average limit value of 40 µg/m³ and hourly limit value of 200 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

Table 9.10 Trends in Zone D Air Quality – NO₂

Continuous PM₁₀ monitoring was carried out at the Zone D locations of Castlebar, Claremorris and Kilkitt over the period 2017 - 2021. These showed an upper average limit of no more than 16 µg/m³ (Table 9.11). Levels range from 7 – 16 µg/m³ over the five-year period. In addition the 24-hour limit value of 50 µg/m³ (as a 90.4th percentile) was complied with at all sites (EPA, 2022). Based on the EPA data, an estimate of the current background PM₁₀ concentration in the region of the proposed development is 16 µg/m³.

Station	Averaging Period ^{Note 1}	Year				
		2017	2018	2019	2020	2021
Castlebar	Annual Mean PM ₁₀ (µg/m ³)	11	11	16	14	10
	90 th %ile 24-hr PM ₁₀ (µg/m ³)	19	20	24	22	22
Killkitt	Annual Mean PM ₁₀ (µg/m ³)	8	9	7	8	8
	90 th %ile 24-hr PM ₁₀ (µg/m ³)	14	15	13	14	13
Claremorris	Annual Mean PM ₁₀ (µg/m ³)	11	12	11	10	10
	90 th %ile 24-hr PM ₁₀ (µg/m ³)	17	20	20	16	13

^{Note 1} Annual average limit value of 40 µg/m³ and 24-hour limit value of 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

Table 9.11 Trends in Zone D Air Quality – PM₁₀

Monitoring of both PM₁₀ and PM_{2.5} takes place at the station in Claremorris which allows for the PM_{2.5}/PM₁₀ ratio to be calculated. Average PM_{2.5} levels in Claremorris over the period 2017 - 2021 ranged from 4 – 8 µg/m³, with a PM_{2.5}/PM₁₀ ratio ranging from 0.4 – 0.8 (EPA, 2022). Based on this information, a conservative ratio of 0.8 was used to generate an existing PM_{2.5} concentration in the region of the development of 12.8 µg/m³.

Based on the above information the air quality in suburban rural areas is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO₂. There is the potential for breaches in the annual NO₂ limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM₁₀ and PM_{2.5}). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2022).

The current estimated background concentrations have been used in the operational phase air quality assessment for both the opening and design year as a conservative approach in order to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022a).

9.3.3 Sensitivity of the Receiving Environment to Dust

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 are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, schools and hospitals.

In terms of receptor sensitivity to dust soiling, there is 1 no. high sensitivity residential property within 20m of the site boundary (see **Figure 9.3**). Therefore, the sensitivity of the area to dust soiling impacts is considered medium based on the IAQM criteria outlined in **Table 9.12**.

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

Table 9.12 Sensitivity of the Area to Dust Soiling Effects on People and Property (IAQM, 2014)

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the proposed development is 16 µg/m³ and there is 1 no. high sensitivity receptor within 20 m of the proposed development boundary (see **Figure 9.3**). Based on the IAQM criteria outlined in **Table 9.13**, the worst-case sensitivity of the area to human health is considered low.

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m ³	>100	Medium	Low	Low	Low	Low

		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m³	>1	Low	Low	Low	Low	Low

Table 9.13 Sensitivity of the Area to Dust Related Human Health Impacts (IAQM, 2014)

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site and 50 m from site access roads, up to 500 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present.

There are no sensitive designated habitats within 50 m of the proposed development or site entrance. Therefore, impacts from dust emissions on ecology has been screen out of a detailed assessment.

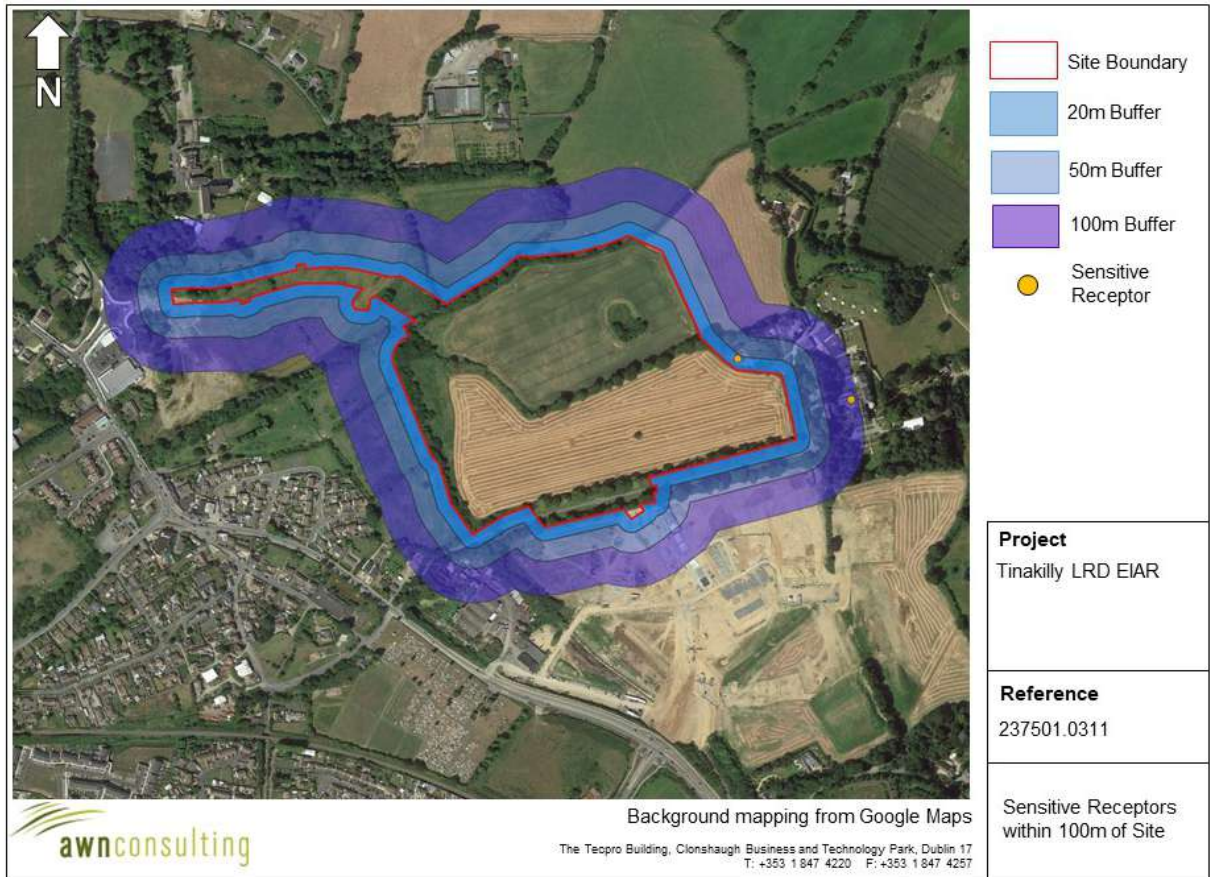


Figure 9.3 Sensitive Receptors within 20m, 50m and 100m of Site Boundary

9.3.4 Climate Baseline

PE-ENV-01104 (TII, 2022b) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland’s current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

9.3.4.1 Greenhouse Gas Emissions

Data published in July 2023 (EPA, 2023) predicts that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU’s Effort Sharing Decision (ESD) (EU 2018/842) by 3.72 Mt CO₂eq. When the available flexibilities are taken into account, the limit is exceeded by 1 MtCO₂eq. The sectoral breakdown of 2022 GHG emissions is shown in **Table 9.14**. The sector with the highest emissions in 2022 was agriculture at 38.4% of the total, followed by transport at 19.1%. For 2022 total national emissions (excluding LULUCF) were estimated to be 60.76 Mt CO₂eq (EPA, 2023) (see **Table 9.14**).

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022b) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, “whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”.

The future baseline will be determined by Ireland meeting its targets set out in the CAP23, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted ‘Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013’ (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

Category	2022 Kilotonnes CO ₂ eq	% of Total GHG emissions
Waste	23.34	38.41%
Energy Industries	11.63	19.15%
Residential	10.08	16.58%
Manufacturing Combustion	6.11	10.05%
Commercial Services	4.29	7.06%
Public Services	2.29	3.77%
Transport	0.74	1.22%
Industrial Processes	0.77	1.26%
F-gases	0.66	1.08%
Agriculture	0.87	1.43%
Total	60.76	100%

Table 9.14 Total National GHG Emissions in 2022

9.3.4.2 Climate Change Vulnerability

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020c) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25 per cent by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020c) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020c). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020c).

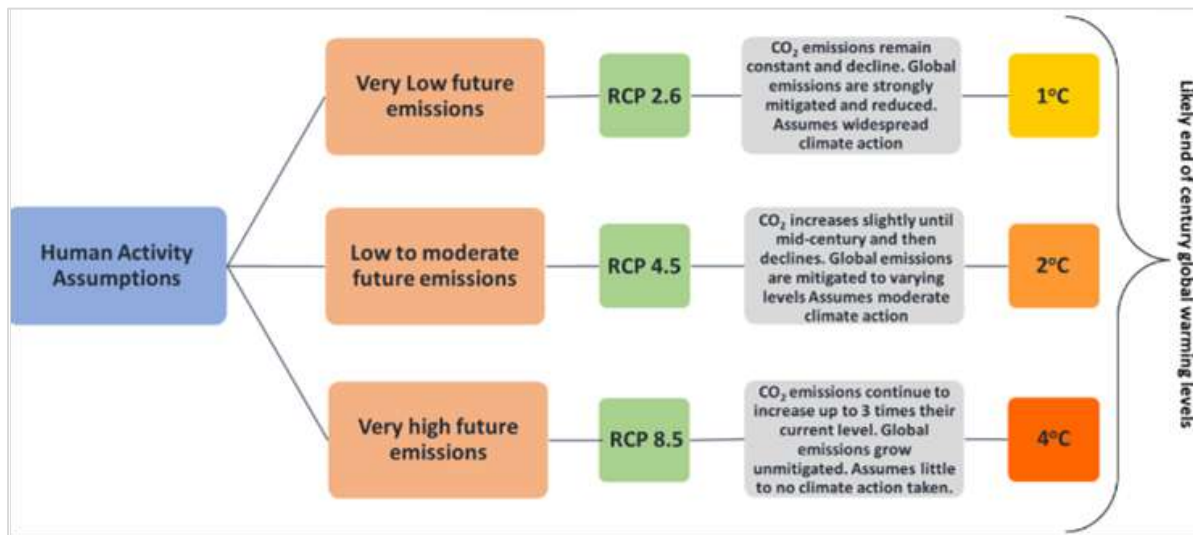
TII's Guidance document PE-ENV-01104 (TII, 2022b) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RCP4.5 is considered moderate while RCP8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in 'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020d). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as

wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA’s Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021b) assesses the future performance of Ireland’s critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE’s outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for “least” (RCP2.6), “more” (RCP4.5) or “most” (RCP8.5) climate change, see **Figure 9.4**.



Source: TRANSLATE project storymap (Met Éireann 2023)

Figure 9.4 Representative Concentration Pathways associated emission levels

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland’s climate could change as global temperatures increase to 1.5°C, 2°C, 2.5°C, 3°C or 4°C. Projections broadly agree with previous projections for Ireland. Ireland’s climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm

water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SST)s (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland’s temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (see **Figure 9.5**). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.



Source: TRANSLATE project storymap (Met Éireann, 2023b)

Figure 9.5 Change of climate variables for Ireland for different Global warming thresholds

9.4 Characteristics of the Proposed Development

The proposed development is located at Tinakilly, Rathnew, Co. Wicklow. The development will consist of a mix of residential units a public park, a new section of the Rathnew Inner Relief Road and all associated site development works. A full description of the development is available in Chapter 3 - Description of Development.

Impacts to air quality and climate can occur during both the construction and operational stages of the development. Construction stage impacts will primarily relate to fugitive dust emissions from construction works and vehicle and machinery emissions as well as embodied carbon in building materials. Operational phase impacts are deemed long-term and will involve a change in traffic levels and associated emissions on the roads in the vicinity of the proposed development.

9.5 Potential Impact of the Proposed Development

9.5.1 Construction Phase

9.5.1.1 Air Quality

9.5.1.1.1 Construction Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Dublin Airport meteorological data (see **Section 9.3.1**) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Dublin Airport meteorological station indicates that on average 200 days per year have rainfall over 0.2 mm (Met Eireann, 2023) and therefore it can be determined that 55% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see **Section 9.3.3**). As per **Section 9.2.2.1** the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

Demolition

There are no demolition activities associated with the proposed development. Therefore, there is no demolition impact predicted as a result of the works.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area > 10,000m², 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 > 8m in height, total material moved >100,000 tonnes;
- **Medium:** Total site area 2,500m² – 10,000m², moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 – 100,000 tonnes;
- **Small:** Total site area < 2,500m², soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

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The dust emission magnitude for the proposed earthwork activities can be classified as large as the total site area is greater than 10,000m². However, the site will be developed on a phased basis which will reduce the potential for dust emissions across the entirety of the site at any one time.

The sensitivity of the area, as determined in Section 9.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. Using the criteria in **Table 9.15**, this results in an overall medium risk of dust soiling impacts and a low risk of dust-related human health impacts.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 9.15 Risk of Dust Impacts – Earthworks

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume > 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 for the proposed construction activities can be classified as large as the total building volume will be greater than 100,000 m³. Using the criteria in **Table 9.16** this results in an overall medium risk of dust soiling impacts and a low risk of dust-related human health impacts.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 9.16 Risk of Dust Impacts – Construction

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 medium, as at worst-case peak periods there will likely be between 10 – 50 outward HGV movements per day. As per the criteria in **Table 9.17**, this results in an overall medium risk of dust soiling impacts and a low risk of dust-related human health impacts.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 9.17 Risk of Dust Impacts – Trackout

Summary of Dust Emission Risks

The risk of dust impacts as a result of the proposed development are summarised in **Table 9.18** for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a medium risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the proposed works. Best practice dust mitigation measures for medium risk sites will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be short-term, negative and slight.

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	N/A	Large	Large	Medium
Dust Soiling Risk	N/A	Medium Risk	Medium Risk	Medium Risk
Human Health Risk	N/A	Low Risk	Low Risk	Low Risk

Table 9.17 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

9.5.1.1.2 Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been undertaken at 6 no. worst-case sensitive residential properties within 200m of the impacted road links. The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. Results are compared against the ‘Do-Nothing’ (DN) scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

Concentrations of NO₂, PM₁₀ and PM_{2.5} have been modelled for the worst-case peak construction year of 2026. This worst-case scenario includes construction stage traffic for Phase 2 and 3 of the proposed development and includes some operational phase traffic from completed Phase 1 of the proposed development. In this scenario the Rathnew Inner Relief Road (RIRR) is fully completed as part of the proposed development and traffic can access from the R750 and R761. The completion of the Rathnew Inner Relief Road (RIRR)

leads to a redistribution of traffic in the area and thus results in a greater degree of change on some road links which is not solely as a result of the new residential development.

NO₂ emissions as a result of the worst-case construction phase of the proposed development are in compliance with the ambient air quality standards for NO₂ set out in **Table 9.1**. Concentrations of NO₂ are at most 32% of the annual limit value during the worst-case construction period in 2026 (see **Table 9.18**). In addition, the TII guidance (2022a) states that the hourly limit value for NO₂ of 200 µg/m³ is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m³. As predicted NO₂ concentrations are significantly below 60 µg/m³ (**Table 9.18**) it can be concluded that the short-term NO₂ limit value will be complied with at all receptor locations. Compared to 'Do Nothing' levels, concentrations of NO₂ will increase by 1.1 µg/m³ at receptor R5 (see **Table 9.18**) which is an increase of 2.8% compared to the annual limit value. There are predicted to be some decreases in emissions at a number of receptors (R2, R3, R4) as a result of the redistribution of traffic associated with the opening of the RIRR. NO₂ emissions will decrease by at most 0.56 µg/m³ at receptor R2 (a 1.4% decrease). Where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 9.1**) and there is a less than 5% change in concentrations relative to the air quality standard, then the impact is considered neutral as per the TII significance criteria (see **Table 9.3**). Therefore, the impact of the construction of the proposed development on NO₂ concentrations is neutral.

PM₁₀ emissions as a result of the worst-case construction phase of the proposed development are in compliance with the ambient air quality standards for PM₁₀ set out in **Table 9.1**. Concentrations of PM₁₀ are at most 47% of the annual limit value during the worst-case construction period in 2026. In addition the proposed development will not result in any exceedances of the daily PM₁₀ limit value of 50 µg/m³. Compared to 'Do Nothing' levels, concentrations of PM₁₀ will increase by 0.66 µg/m³ at receptor R5 (see **Table 9.19**) which is an increase of 1.7% compared to the annual limit value. There are predicted to be some decreases in emissions at a number of receptors (R2, R3, R4) as a result of the redistribution of traffic associated with the opening of the RIRR. PM₁₀ emissions will decrease by at most 0.33 µg/m³ at receptor R3 (a 0.8% decrease). Where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 9.1**) and there is a less than 5% change in concentrations relative to the air quality standard, then the impact is considered neutral as per the TII significance criteria (see **Table 9.3**). Therefore, the impact of the construction of the proposed development on PM₁₀ concentrations is neutral.

PM_{2.5} emissions as a result of the worst-case construction phase of the proposed development are in compliance with the ambient air quality standards for PM_{2.5} set out in **Table 9.1**. Concentrations of PM_{2.5} are at most 58% of the annual limit value during the worst-case construction period in 2026. Compared to 'Do Nothing' levels, concentrations of PM_{2.5} will increase by 0.38 µg/m³ at receptor R5 (see **Table 9.20**) which is an increase of 1.5% compared to the annual limit value. There are predicted to be some decreases in emissions at a number of receptors (R2, R3, R4) as a result of the redistribution of traffic associated with the opening of the RIRR. PM_{2.5} emissions will decrease by at most 0.19 µg/m³ at receptor R3 (a 0.8% decrease). Where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 9.1**) and there is a less than 5% change in concentrations relative to the air quality standard, then the impact is considered neutral as per the TII significance criteria (see **Table 9.3**). Therefore, the impact of the construction of the proposed development on PM₁₀ concentrations is neutral.

Overall, the impact of the construction phase traffic on ambient air quality is considered short-term, localised, neutral, imperceptible and non-significant.

Receptor	Impact Construction Year				
	DN	DS	DS-DN	% Change of AQAL	Description
R1	8.2	8.2	0.02	0.0%	Neutral
R2	8.9	8.8	-0.16	-0.4%	Neutral
R3	13.3	12.8	-0.56	-1.4%	Neutral
R4	13.0	12.6	-0.46	-1.2%	Neutral
R5	8.9	10.0	1.10	2.8%	Neutral
R6	8.0	8.5	0.47	1.2%	Neutral

Table 9.18 Predicted Annual Mean NO₂ Concentrations – Construction Year 2026 (µg/m³)

Receptor	Impact Construction Year				
	DN	DS	DS-DN	% Change of AQAL	Description
R1	16.1	16.1	0.02	0.0%	Neutral
R2	16.5	16.4	-0.09	-0.2%	Neutral
R3	19.1	18.8	-0.33	-0.8%	Neutral
R4	18.9	18.7	-0.26	-0.6%	Neutral
R5	16.5	17.1	0.66	1.7%	Neutral
R6	16.0	16.3	0.29	0.7%	Neutral

Table 9.19 Predicted Annual Mean PM₁₀ Concentrations – Construction Year 2026 (µg/m³)

Receptor	Impact Construction Year				
	DN	DS	DS-DN	% Change of AQAL	Description
R1	12.9	12.9	0.00	0.0%	Neutral
R2	13.1	13.1	-0.05	-0.2%	Neutral
R3	14.6	14.4	-0.19	-0.8%	Neutral
R4	14.5	14.4	-0.15	-0.6%	Neutral
R5	13.1	13.5	0.38	1.5%	Neutral
R6	12.8	13.0	0.17	0.7%	Neutral

Table 9.20 Predicted Annual Mean PM_{2.5} Concentrations – Construction Year 2026 (µg/m³)

9.5.1.2 Climate

9.5.1.2.1 Greenhouse Gas Assessment

There is the potential for release of a number of greenhouse gas emissions to atmosphere during the construction of the proposed development.

The embodied carbon construction materials (including maintenance), waste, and transport has been calculated. This calculation was based on OneClickLCA Carbon Designer Tool for Ireland for the structural building elements. The assessment indicates that the key sources of GHG emissions are associated with the embodied carbon of the construction materials.

The proposed development is estimated to result in total annualised GHG emissions of 15,021 tonnes embodied CO₂eq. This is equivalent to 0.38% of the 2030 Buildings (Residential) or Industrial sector budgets (both have same 2030 budget) when annualised over the project lifespan (assumed 50 years). It should be noted that this is an estimate

of the emissions associated with the project for the EIAR, with particular consideration on how to mitigate them, at detailed design phase.

9.5.1.2.2 Climate Change Risk Assessment

Examples of potential climate impacts are included in Annex D (Climate proofing and environmental impact assessment) of the technical guidance on the climate proofing of infrastructure (European Commission, 2021a). Potential impacts of climate change of the proposed development include:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

Each of these potential risks are considered with respect to the operational phase of the proposed development as detailed in **Section 9.5.2.2**. During the construction phase no assessment is required however consideration will be given to the project's vulnerability to climate impacts. During construction, the Contractor will be required to mitigate against the effects of extreme rainfall / flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction.

During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

9.5.2 Operational Phase

9.5.2.1 Air Quality

9.5.2.1.1 Operational Phase Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. To provide a worst-case assessment cumulative traffic has been included within the assessment and the impact of the opening of the RIRR, which is completed as part of the proposed development, has also been assessed. The RIRR results in a redistribution of traffic in the local area and thus results in a greater degree of change on some road links which is not solely as a result of the new residential development. The air quality assessment has looked at the cumulative impact and the redistribution of traffic. The traffic data includes the Do Nothing (DN) and Do Something (DS) scenarios. The impact of NO₂, PM₁₀ and PM_{2.5} 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.

The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and

relative impact of the proposed development. Results are compared against the ‘Do-Nothing’ scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO₂ in the Opening Year 2028 and Design Year 2043 are shown in **Table 9.21**. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2028 and 2043. Concentrations of NO₂ are at most 29% of the annual limit value in 2028 and 25% of the limit value in 2043. There are predicted to be some increases in traffic between the Opening and Design years. Therefore, any decrease in concentration is due to increased uptake in electric vehicles and lower vehicle exhaust emissions. In addition, the TII guidance (2022a) states that the hourly limit value for NO₂ of 200 µg/m³ is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m³. As predicted NO₂ concentrations are significantly below 60 µg/m³ (**Table 9.21**) it can be concluded that the short-term NO₂ limit value will be complied with at all receptor locations.

The impact of the proposed development on annual mean NO₂ concentrations can be assessed relative to “Do Nothing (DN)” levels. NO₂ concentrations at receptors R1, R5 and R6 will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.86 µg/m³ at receptor R5. There will also be some decreases in concentrations at receptors R2, R3 and R4 as a result of the redistribution of traffic associated with the completed RIRR. Concentrations will decrease by at most 0.43 µg/m³ at receptor R3. When comparing the change in concentration with the air quality limit value this results in a maximum change of 2.2% at receptor R5. Where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 9.1**) and there is a less than 5% change in concentrations, then the impact is considered neutral as per the TII significance criteria (see **Table 9.3**). Therefore, the impact of the proposed development on NO₂ concentrations is neutral.

In relation to changes in PM₁₀ concentrations due to the proposed development, the results of the assessment can be seen in **Table 9.22** for the Opening Year 2028 and Design Year 2043. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2028 and 2043. Concentrations of PM₁₀ are at most 47% of the annual limit value in 2028 and 2043. In addition, the proposed development will not result in any exceedances of the daily PM₁₀ limit value of 50 µg/m³. The impact of the proposed development on annual mean PM₁₀ concentrations can be assessed relative to “Do Nothing (DN)” levels. PM₁₀ concentrations will increase at receptors R1, R5 and R6 as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.62 µg/m³ at receptor R5, this is a 1.6% change when compared with the ambient air quality limit value of 40 µg/m³. Concentrations will decrease at receptors R2, R3 and R4. There will be at most a 0.8% decrease in concentrations. As with NO₂, where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 9.1**) and there is a less than 5% change in concentrations then the impact is considered neutral as per the TII significance criteria (see **Table 9.3**). Therefore, the impact of the proposed development on PM₁₀ concentrations is neutral.

The results of the assessment of changes in PM_{2.5} concentrations due to the proposed development, can be seen in **Table 9.23** for the Opening Year 2028 and Design Year 2043. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2028 and 2043. Concentrations of PM_{2.5} are at most 58% of the annual limit value in 2028 and 2043. The impact of the proposed development on annual mean PM_{2.5} concentrations can be assessed relative to “Do Nothing (DN)” levels. PM_{2.5} concentrations at receptors R1, R5 and R6 will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.37 µg/m³ at receptor R5, this is a 1.5% change when compared with the ambient air quality limit value of 25 µg/m³. Concentrations will decrease at receptors R2, R3 and R4. There will be

at most a 0.7% decrease in concentrations. As with NO₂ and PM₁₀, where the predicted annual mean concentrations are less than 75% of the air quality (see Table 9.1) and there is a less than 5% change in concentrations then the impact is considered neutral as per the TII significance criteria (see Table 9.3). Therefore, the impact of the proposed development on PM_{2.5} concentrations is neutral.

Overall, the impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, neutral, imperceptible and non-significant.

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	8.1	8.1	0.01	0.0%	Neutral	8.1	8.1	0.01	0.0%	Neutral
R2	8.7	8.6	-0.10	-0.2%	Neutral	8.4	8.3	-0.04	-0.1%	Neutral
R3	12.2	11.8	-0.43	-1.1%	Neutral	10.1	9.9	-0.20	-0.5%	Neutral
R4	11.9	11.6	-0.35	-0.9%	Neutral	10.0	9.8	-0.16	-0.4%	Neutral
R5	8.7	9.5	0.86	2.2%	Neutral	8.4	8.8	0.42	1.1%	Neutral
R6	8.0	8.4	0.36	0.9%	Neutral	8.0	8.2	0.19	0.5%	Neutral

Table 9.21 Predicted Annual Mean NO₂ Concentrations (µg/m³)

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	16.1	16.1	0.02	0.0%	Neutral	16.1	16.1	0.02	0.0%	Neutral
R2	16.5	16.4	-0.08	-0.2%	Neutral	16.5	16.5	-0.05	-0.1%	Neutral
R3	19.1	18.8	-0.32	-0.8%	Neutral	19.1	18.8	-0.29	-0.7%	Neutral
R4	18.9	18.7	-0.24	-0.6%	Neutral	19.0	18.8	-0.22	-0.5%	Neutral
R5	16.5	17.1	0.62	1.6%	Neutral	16.5	17.1	0.60	1.5%	Neutral
R6	16.0	16.3	0.27	0.7%	Neutral	16.0	16.3	0.27	0.7%	Neutral

Table 9.22 Predicted Annual Mean PM₁₀ Concentrations (µg/m³)

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	12.9	12.9	0.00	0.0%	Neutral	12.9	12.9	0.00	0.0%	Neutral
R2	13.1	13.1	-0.04	-0.2%	Neutral	13.1	13.1	-0.03	-0.1%	Neutral
R3	14.6	14.4	-0.18	-0.7%	Neutral	14.6	14.4	-0.17	-0.7%	Neutral
R4	14.5	14.4	-0.15	-0.6%	Neutral	14.5	14.4	-0.13	-0.5%	Neutral
R5	13.1	13.5	0.37	1.5%	Neutral	13.1	13.4	0.35	1.4%	Neutral
R6	12.8	13.0	0.16	0.6%	Neutral	12.8	13.0	0.15	0.6%	Neutral

Table 9.22 Predicted Annual Mean PM_{2.5} Concentrations (µg/m³)

9.5.2.2 Climate

9.5.2.2.1 Climate Change Risk Assessment

In order to determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be

determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning, hail, landslides and fog.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. **Table 9.23** details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per **Table 9.6**. The results of the vulnerability assessment are detailed in **Table 9.23** below.

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (coastal, pluvial, fluvial)	2 (Medium)	1 (Low)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	2 (Medium)	2 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)

Table 9.23 Climate Change Vulnerability Assessment

The sensitivity and exposure of the area was determined with reference to a number of online tool and with input from the various discipline specialists on the project team. It was concluded that proposed development does not have any significant vulnerabilities to the identified climate hazards. All vulnerabilities are classified as low.

Chapter 7 Hydrology prepared by CS Consulting and the Flood Risk Assessment prepared by JBA indicate that the proposed residential development is outside the 1% AEP and 0.1% AEP flood extent areas and is within Flood Zone C. However, the proposed Rathnew Inner Relief Road (RIRR) alignment extends to the west of the site, where it passes over the Rathnew Stream that discharges into Broadlough Estuary and intersects with Flood Zone A/B. The risk of fluvial flooding impacting upon the residential properties within the subject development is negligible, even during a 1-in-1000-year flooding event. Fluvial flooding to the section of the RIRR has been considered in the design of the development and will not be significant. Tidal flooding was not considered a risk to the site. The drainage design for the proposed development has been designed to account for pluvial flooding and increases in rainfall due to future climate change therefore no significant risk is predicted.

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) (2023), indicates that the wildfire hazard is classified as low for the Wicklow area. This means that there is between a 4% to 10% chance of experiencing weather that could support a problematic wildfire in the project area that may cause disruptions and low but tangible risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. However, due to the project location in a suburban area the

risk of wildfire is significantly lessened and it can be concluded that the proposed development is of low vulnerability to wildfires.

Landslide susceptibility mapping developed by GSI indicates that the proposed development location is not within an area that is susceptible to landslides and there are no recorded historical landslide events at the project locations. It can be concluded that landslides are not a risk to the proposed development site.

At the detailed design stage chosen building materials will be high quality, durable and hard-wearing and chosen to withstand increased variations in temperature in the future as a result of climate change. Overall, the proposed development has at most low vulnerabilities to the identified climate hazards and therefore no detailed risk assessment is required.

9.5.2.2.2 Climate and Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. The predicted concentrations of CO₂ for the future years of 2028 and 2043 are detailed in **Table 9.24**. These are significantly less than the 2028 and 2030 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2028 the proposed development will increase CO₂ emissions by 0.00008% of the EU 2028 target. Similarly low increases in CO₂ emissions are predicted to occur in 2043 with emissions increasing by 0.00008% of the EU 2030 target.

In addition, electric vehicle charging infrastructure has been allowed for in the design of the development in addition to bicycle parking to promote the use of more sustainable modes of transport.

Year	Scenario	CO _{2eq}
		(tonnes/annum)
2028	Do Nothing	864
	Do Something	892
2043	Do Nothing	938
	Do Something	965
Increment in 2028		27
Increment in 2043		27
Emission Ceiling (Tonnes) 2028 ^{Note 1}		35,625,332
Emission Ceiling (Tonnes) 2030 ^{Note 1}		33,381,312
Impact in 2028 (%)		0.00008%
Impact in 2043 (%)		0.00008%

^{Note 1} Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council

Table 9.24 Traffic Emissions GHG Impact Assessment

9.5.2.2.3 Operational Energy Use

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 Utilities and Energy Sustainability Report prepared in relation to the development. The primary elements with respect to reducing climate impacts are summarised below.

The development will be a Nearly Zero Energy Building (NZEB) in accordance with the 2022 Part L requirements. The following measures are being considered for the proposed development and will be reviewed in further detail at the detailed design stage:

- The development will target a Building Energy rating (BER) that complies with the NZEB regulations.
- Air source heat pumps are proposed for the heating requirements for the residential houses with exhaust air heat pumps proposed for the apartment units.
- The use of photovoltaic (PV) panels as a renewable energy source.
- Low energy LED lighting will be utilised where possible with lighting control methods installed.

Overall these measures will aid in reducing the impact to climate during the operational phase of the proposed development.

9.6 Potential Cumulative Impacts

9.6.1 Air Quality

9.6.1.1 Construction Phase

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction of any other permitted developments within 350m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors. The dust mitigation measures outlined in **Section 9.9.1** will be applied throughout the construction phase of the proposed development which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development are deemed short-term, negative and imperceptible.

9.6.1.2 Operational Phase

The traffic data reviewed for the operational stage air quality impact assessment included the cumulative traffic associated with other existing and permitted developments in the local area. A growth factor was applied to the base year traffic to determine the traffic for future years which allows for additional development in the area in future years. Additionally, the traffic associated with the permitted development to the direct south of the site was included in the traffic data (see Traffic Impact Assessment and Chapter 13 for further details). The proposed development involves the completion of the Rathnew Inner Relief Road (RIRR), the completion of this road leads to a redistribution of traffic in the area. The air quality assessment in **Section 9.5.2.1** has assessed the cumulative impact and the redistribution of traffic as a result of the RIRR. The impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, neutral, imperceptible and non-significant.

9.6.2 Climate

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022b) states that:

“for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable.”

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

9.7 Do Nothing Scenario

9.7.1 Air Quality

Under the Do-Nothing Scenario no construction works associated with the proposed development will take place and the identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. Impacts from increased traffic volumes and associated air emissions from the proposed development will also not occur.

The Do-Nothing scenario associated with the operational phase of the development is assessed within **Section 9.5.2.1** and it was found to be imperceptible. Therefore, this scenario can be considered neutral in terms of air quality.

9.7.2 Climate

Under the Do-Nothing Scenario no construction works will take place and the site will remain as it currently is. The climate baseline will continue to develop in line with the identified trends (see **Section 9.3.4**). This scenario is considered neutral in relation to climate.

9.8 Risks to Human Health

9.8.1 Construction Phase

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM₁₀ and PM_{2.5} emissions. As per **Table 9.17** there is at most a low risk of dust impacts from the proposed construction works. Therefore, in the absence of mitigation there is the potential for localised, imperceptible, negative, short-term impacts to human health as a result of the proposed development.

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be neutral, short-term, localised and imperceptible with respect to human health.

9.8.2 Operational Phase

Traffic related air emissions have the potential to impact air quality which can affect human health. However, the changes in traffic will result in imperceptible and neutral impacts to air quality. It is predicted that levels of all pollutants will be in compliance with the ambient air quality standards set for the protection of human health (see **Table 9.1**). It can be determined that the impact to human health during the operational stage is long-term, neutral, localised and imperceptible.

9.9 Mitigation Measures

9.9.1 Construction Phase

9.9.1.1 Air Quality

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts, during the construction phase, as a result of earthworks, construction and trackout activities (see **Section 9.5.1.1**). Therefore, the following dust mitigation measures shall be implemented during the construction phases of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension, therefore, mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control

measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).

- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel. (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Street and footpath cleaning must be undertaken during the ground works phase to minimise dust emissions. This can be carried out using water-assisted dust sweeper(s). If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.

- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the ground works phases of the proposed development is required to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

9.9.1.2 Climate

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO₂ emissions.

9.9.2 Operational Phase

9.9.2.1 Air Quality

The impact of the operational phase of the proposed development on air quality is predicted to be imperceptible. Therefore, no mitigation measures are required.

9.9.2.2 Climate

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see **Section 9.5.2.2**).

A number of design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Full details of these

measures are outlined within the Utilities and Energy Sustainability Report prepared in relation to the development. These measures are detailed in **Section 9.5.2.2**. These measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Change Action Plan.

9.10 Predicted Impacts of the Proposed Development

9.10.1 Construction Phase

9.10.1.1 Air Quality

Once the dust minimisation measures outlined in **Section 9.9.1** are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative, localised and imperceptible at nearby receptors.

9.10.1.2 Climate

The impact to climate must be assessed as a whole and cannot be determined for the individual phases of the development. **Section 9.10.2** below details the full impact of the development on climate.

9.10.2 Operational Phase

9.10.2.1 Air Quality

Operational traffic emissions associated with the proposed development are predicted to have an imperceptible impact on air quality. The operational phase impact to air quality is long-term, localised, neutral and imperceptible.

9.10.2.2 Climate

The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is “*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*”. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in **Table 9.5** the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant provided the final design and construction phase take account of GHG mitigation measures set out in local and National Climate Action Plans.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change.

9.11 Monitoring

9.11.1 Construction Phase

The following monitoring measures are proposed in relation to construction phase dust emissions:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should

include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the ground works phases of the proposed development is required to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

9.11.2 Operational Phase

There is no monitoring recommended for the operational phase of the development.

9.12 Reinstatement

Not applicable to air quality and climate.

9.13 Interactions

9.13.1 Air Quality

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term, negative and imperceptible with respect to the construction phase and long-term, neutral and imperceptible with respect to the operational phase in terms of human health impacts.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. No other significant interactions with air quality have been identified.

9.13.2 Climate

Climate has the potential to interact with a number of other environmental attributes.

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 20% climate change allowance (which allows for the future moderate risk climate scenario RCP4.5). Waste management

measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. In addition, climate impacts will interact with the proposed developments design both with respect to embodied carbon but also through its vulnerability to future climate change impacts (e.g. wind loading, extreme temperatures). The detailed design for the proposed buildings will be finalised with potential future climate hazards in mind. Building design will also take into account energy efficiency measures to reduce construction phase and operational carbon emissions. The impact of the interactions between design considerations (flood mitigation design, landscaping design and building design) and climate are considered to be long-term and significant.

9.14 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

9.15 References

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The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

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Transport Infrastructure Ireland (TII) (2022b) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (2022c) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

Transport Infrastructure Ireland (TII) (2022d) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Transport Infrastructure Ireland (TII) (TII 2021) Sustainability Implementation Plan – Our Future

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10 NOISE AND VIBRATION

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10.1 Introduction

This chapter of the EIAR assesses the potential noise and vibration impact of the proposed large scale residential development within the site at Tinakilly, Rathnew, Co. Wicklow. in support of a planning application.

The development will consist of a residential development and public park comprising the following:

- I. Construction of 352 no. residential units comprising 220 no. 2-4 bedroom houses and 132 no. 1-3 bedroom apartments.
- II. Provision of private, communal and public open space. Provision of a new park to the north and west of the site (c.4.34ha).
- III. All internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- IV. Provision of car and bicycle parking.
- V. Proposed pedestrian connections and landscape revisions to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

Figure 10.1 illustrates the site location and red line boundary.



Figure 10.1: Site Location and Red Line Boundary

A full description of the development is available in Chapter 2 – Description of the Site and Proposed Development.

The assessment considers both the short-term construction phase and the long-term operational phase impacts on the surrounding environment. Mitigation measures are

included, where relevant, to ensure the proposed development is constructed and operated with minimal impact on the receiving noise environment.

This chapter was prepared by Dominic Wright, Acoustic Consultant in AWW Consulting. Dominic holds a Diploma in Music Technology and has completed the Institute of Acoustics Diploma in Acoustics and Noise Control. He has previous knowledge and experience in the world of audio engineering and has amassed experience in both noise modelling and environmental noise surveying and reporting over a variety of residential and infrastructure projects. The Chapter has been reviewed by Jennifer Harmon (Associate) who holds a BSc in Environmental Science and a Diploma in Acoustics and Noise Control. She is a member of the Institute of Acoustics and has over 20 years' experience in the field of environmental noise and vibration impact assessment, room acoustics, sound insulation and inward impact assessments. She has worked extensively on all aspects of environmental noise assessments and has developed numerous noise models and mitigation assessments for industrial and infrastructural projects throughout the country.

10.2 Methodology

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:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022).

The study has been undertaken using the following methodology:

- Environmental noise surveys have been conducted in the vicinity of the proposed development to assess the existing baseline noise environment. Noise surveys conducted in relation to the Tinakilly Phase 1 development (WCC Ref. 22/837) have been considered representative of the noise environment surrounding the proposed development and are used as part of this assessment.
- A review of published noise data from the EPA for road traffic noise has been undertaken to provide additional information relating to the baseline noise levels in the surrounding area;
- A review of the most applicable standards and guidelines has been carried out in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development which are discussed in the following sections;
- Predictive calculations have been performed to determine the noise and vibration impact on the nearest sensitive locations during the construction phase;
- Predictive calculations have been performed to determine the noise impact on the nearest noise-sensitive locations during the operational phase;
- A schedule of mitigation measures has been proposed for both the construction and operational phases to reduce, where necessary, the outward noise and vibration from the development.

10.2.1 Assessment Criteria and Guidelines - Construction Phase

There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-

statutory national guidelines, where available, in addition to international standards and guidelines relating to noise and / or vibration impact for environmental sources.

Local Authorities typically control construction activities by imposing limits on the hours of construction and consider noise limits at their discretion. Construction noise sources include construction plant and machinery and construction related traffic on surrounding roads. Reference is made to the following guidelines and standards to inform the most appropriate construction noise and vibration significance thresholds and assessment methodologies:

- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228-1) (BSI 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (hereafter referred to as BS 5228 - 2) (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (hereafter referred to as BS 7385- 2). (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472-1) (BSI 2008);
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UKHA 2020); and
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (hereafter referred to as ISO 9613 – 2) (ISO 1996).

Construction Noise Thresholds

The British Standard BS 5228-1 (BSI 2014a) ‘ABC’ method is referenced here for the purposes of setting appropriate construction noise limits for the development. This is the most widely accepted standard for this purpose in Ireland.

The ABC approach designates a noise sensitive residential location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise effect is associated with the construction activities, depending on context. This is set as a construction noise threshold (CNT). Table 10.1. sets out the CNTs at the facades of residential receptors as recommended by BS 5228-1 (BSI 2014a); for the different baseline categories.

Assessment Category and Threshold Value Period	Threshold value (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23:00 – 07:00)	45	50	55
Evenings ^{D)} and weekends ^{D)}	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Table 10.1: Threshold of Potential Significant Effect at Dwellings.

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

- B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
- C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.
- D) 19:00–23:00 weekdays, 13:00–23:00 Saturdays and 07:00–23:00 Sundays.

It should be noted that this assessment method is only valid for residential properties and if applied to commercial premises without consideration of other factors may result in an excessively onerous thresholds being set. For commercial premises, the Category C value is considered an appropriate threshold value.

Significance of Construction Noise Levels (CNL)

(CNL) compared to the CNTs, Table 10.2 includes guidance as to the likely magnitude of impact associated with construction noise levels, relative to the threshold value. This guidance is taken from DMRB: Noise and Vibration (UKHA 2020) and adapted to include the EPA EIAR Guidelines.

The approach is as follows:

- determine the threshold value for construction noise according to the method from BS5228-1 (BSI 2014a) described above;
- compare the predicted construction noise level with the existing noise levels and the CNT according to the criteria in Table 10.2; and
- A significant effect is deemed to occur where a moderate or major impact is likely to occur for a period of greater than 10 days/nights over 15 consecutive day/nights, or greater than 40 days over 6 consecutive months.

Guidelines for Noise Impact Assessment Significance (DMRB)	Construction Noise Level 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 +5dB	Moderate to Significant	
Major	Above CNT +5 to +15dB	Significant, to Very Significant	

Table 10.2: Construction Noise Significance Ratings

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stage.

Construction Phase – Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. For the purpose of the proposed development, 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.

Peak Particle Velocity (PPV) is a measure of the velocity of vibration displacement in terms of millimetres per second (mm/s). It is defined as follows within BS 7385-2 (BSI 1993) as ‘the maximum instantaneous velocity of a particle at a point during a given time interval’.

Building Response

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2 (BSI 2014b); and
- British Standard BS 7385-2 (BSI 1993)

BS7385-2 (BSI 1993) and BS5228-2 (BSI 2014b) advise that, for soundly constructed residential properties and similar light-framed structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS5228-2 (BSI 2014b) might need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The recommend transient vibration thresholds from BS5228-2 (BSI 2014b) for the avoidance of cosmetic damage to buildings are summarised in Table 10.3.

Type of building	Peak component particle velocity in frequency range of predominant pulse ^{Note 1}	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s	
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz ^{Note 2} increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Table 10.3: Transient vibration guide values for cosmetic damage.

Note 1: Values referred to are at the base of the building.

Note 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

BS 5228-2 (BSI 2014b) and BS 7485-2 (BSI 1993) state that minor structural damage can occur at vibration magnitudes greater than twice those in and major structural damage can occur at vibration magnitudes greater than four times those in Table 10.3.

Human Response

Humans are sensitive to vibration stimuli, and perception of vibration at magnitudes significantly lower than those related to building response may cause concern to building occupants. BS5228-2 (BSI 2014b) notes that vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are typically tolerated for single events or events of short-term

duration, particularly during construction projects and when the origin of vibration is known.

Table 10.4 presents the significance table relating to potential effects to building occupants during construction based on guidance from BS5228-2 (BSI 2014b), the DMRB Noise and Vibration (UKHA 2020) document and the associated EPA significant ratings.

PPV range	BS 5228-2 (Note A, B, C)	DMRB Impact Magnitude	EPA Significance Ratings
≥10 mm/s PPV	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.	Very High	Very Significant
≥1 mm/s PPV	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents	High	Moderate to Significant
≥0.3 mm/s PPV	Vibration might be just perceptible in residential environments.	Medium	Slight to Moderate
≥0.14 mm/s PPV	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Low	Not significant to Slight
<0.14 mm/s PPV	Not perceptible	Very Low	Imperceptible to Not significant

Table 10.4: Guidance of effects of human response to PPV magnitudes

Notes from BS5228-2

- A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
- B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
- C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472 (BS1 2008), and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

Construction Phase – Traffic Noise

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHA 2020) and the EPA EIAR Guidelines (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the ‘short term’ period in accordance with the

DMRB document. Table 10.5 relates changes in noise level to impact on human perception based on the guidance contained in these documents.

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant - Slight
3 – 4.9	Perceptible	Moderate	Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

Table 10.5: Classification of magnitude of noise impacts in the short-term.

10.2.2 Assessment Criteria and Guidelines - Operational Phase

The main potential source of outward noise from the proposed development will be limited to traffic flows to and from the development site onto the public roads. There will also be an element of mechanical and electrical plant required to service apartment buildings. The relevant guidance documents used to assess potential operational noise and vibration impacts on the surrounding environment are summarised below.

- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS 8233) (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS 4142) (BSI 2019);
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (ISO 2016);
- The UK Department of Transport Calculation of Road Traffic Noise (hereafter referred to as the CRTN) (UK Department of Transport 1988).
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UKHA 2020);
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (hereafter referred to as ISO 9613 – 2) (ISO 1996);

Building Services Plant Noise

In the case that heating, cooling or other fixed items of plant forms part of the development, there is the potential for additional plant noise to be introduced to the surrounding environment. To assess this, reference is made here to the BS 4142 (BSI 2019). This standard can be used to assess the impact of a new continuous source to a residential environment and is used commonly by local authorities in their standard planning conditions and also in compliant investigations.

The method for assessing plant noise set out in BS 4142 is based on the following definitions:

“Specific noise level, $L_{Aeq, T}$ ” is the equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T;

“Rating level, $L_{Ar,T}$ ”	is the specific noise level plus adjustments for the character features of the sound (if any);
“Residual noise level, $L_{Aeq,T}$ ”	is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval, T;
“Background noise level, $L_{A90,T}$ ”	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 L_{A90} parameter. These levels were measured as part of the baseline survey.

Adjustments to the rating level are appropriate where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention. In these cases, penalties are applied of either an additional 2 dB, 4 dB or 6 dB depending on how perceptible the tone is at the noise receptor.

The background level should then be subtracted from the rating level. The greater this difference, the greater the magnitude of the impact will be, in general. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, while a difference of around +5 dB is likely to be an indication of an adverse impact (as referred to in BS 4142), depending on the context.

For residential units within the proposed development, acceptable noise levels both internally and externally, can be determined by referring to the British Standard BS 8233 (BSI 2014c). The following guidance, summarised in Table 10.6, is provided in this standard for internal ambient noise levels in dwellings:

Activity	Location	Daytime (07:00 to 23:00hrs)	Night (23:00 to 07:00hrs)	Derived External Levels
Resting	Living room	35 dB $L_{Aeq, 16hr}$	-	50 dB $L_{Aeq, 16hr}$
Dining	Dining room	40 dB $L_{Aeq, 16hr}$	-	55 dB $L_{Aeq, 16hr}$
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$	50 dB $L_{Aeq, 16hr}$ (45 dB $L_{Aeq, 8hr}$ at night)

Table 10.6: Guidance on Indoor Ambient Noise Levels for Dwellings.

The derived external levels are based on the approximate attenuation provided by a partially open window of 15 dB, as advised in BS 8233, and represent the appropriate noise level at the external façade of the building.

Additional Traffic on Surrounding Roads

Vehicular movement to and from the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHA 2020) and the EPA EIAR Guidelines (EPA 2022). For the operational phase, traffic noise impacts are assessed against the ‘long term’ magnitude ratings from the DMRB. These are set out in Table 10.7.

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0	Inaudible	No impact	Imperceptible
0.1 – 2.9	Barely Perceptible	Negligible	Not significant
3 – 4.9	Perceptible	Minor	Slight
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate - Significant
10+	Doubling of loudness and above	Major	Significant - Very significant

Table 10.7: Classification of magnitude of traffic noise impacts in the long term.

Operational Phase – Vibration

The development is residential in nature and there are no vibration sources associated with the proposed development. Therefore, there will be no outward impacts associated with vibration for the operational phase, and accordingly such impacts have been scoped out.

10.3 Existing Receiving Environment

The subject lands are located at Tinakilly to the east of Rathnew Town, Co. Wicklow. To the north, the site is bound by agricultural lands and various scattered properties with farms. To the south, the site is bound by Tinakilly Lane and the under construction Tinakilly Phase 1 development (WCC Ref. 22/837). To the southwest the site is bound by commercial businesses and the R750.

To the east and northeast there are residential properties close to the proposed development red line boundary. To the southeast lies Tinakilly Country House.

To the west lies residential properties at woodside. Beyond that much of the site is bound by the R750 regional road and agricultural land, a cemetery and properties located in Rathdrum Town.

The prevailing noise environment has been characterised through baseline noise surveys and a desktop review of available published noise mapping. Both are discussed in the following sections.

10.3.1 Baseline Noise Survey

Environmental noise surveys have been conducted in the vicinity of the proposed site in order to quantify the existing noise environment. The surveys were conducted in general accordance with ISO 1996-1 + 2.

Baseline Noise Survey Locations

The measurement locations were selected to represent the noise environment at noise-sensitive locations (NSLs) surrounding the proposed development. The selected locations are shown in Figure 10.2 and described as follows:

- N1** This measurement location was at the entrance to Tinakilly Country House Hotel. Measured noise levels at this location are representative of the noise environment at properties to the east and south-east of the proposed

development. Four rounds of attended measurements were carried out at this location.

- N2** This monitoring location was positioned along the local road to the southwest of the site boundary. Noise levels measured at this location are representative of NSLs along the western site boundary. Three rounds of attended measurements were carried out at this location.
- N3** This monitoring location was positioned along the south of the Tinakilly Phase 1 site. Selected to capture the daytime noise environment typical of residential properties within the area of the proposed site set back from road traffic. Three rounds of attended measurements were carried out at this location.

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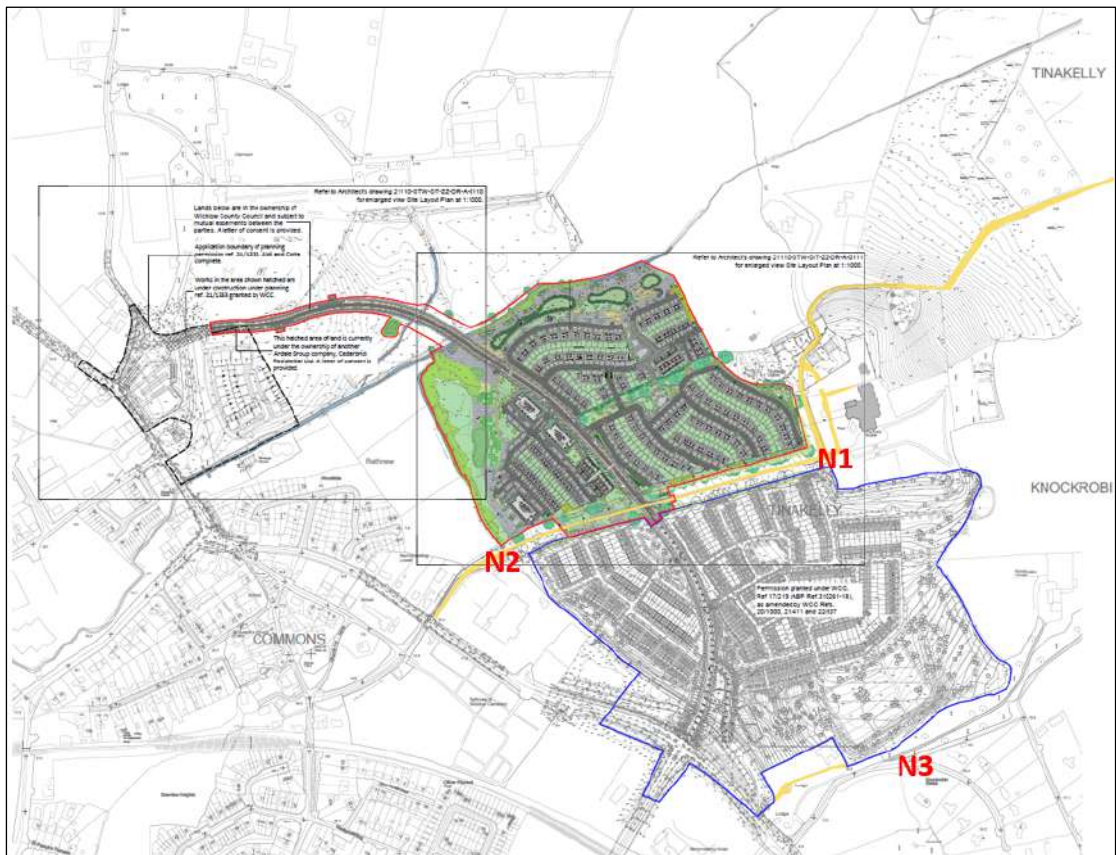


Figure 10.2: Baseline noise survey locations. (Google Earth, annotated by AWN)

Survey Periods

All attended noise measurements were conducted between 10:10 and 13:50 on Wednesday 20 April 2022.

Weather conditions during all survey periods were dry and clear with low cloud cover. Temperatures were between 11°C and 13°C and wind speeds were below 5 m/s, which is the maximum wind speed at which the microphone windshield is effective.

Instrumentation

All attended measurements were carried out by AWN. The following instrumentation was used in Conducting the noise surveys:

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	RION NL-52	01076328	21/08/2020
Calibrator	Brüel & Kjaer 4231	2022651	01/02/2022

Table 10.8: Instrumentation details.

Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters:

- L_{Aeq}** is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- L_{A10}** is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.
- L_{A90}** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- L_{AFmax}** is the instantaneous maximum sound level measured during the sample period using the ‘F’ time weighting.
- L_{AFmin}** is the instantaneous minimum sound level measured during the sample period using the ‘F’ time weighting.

The “A” suffix for the noise parameters denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

Survey Results

The results of the attended daytime noise surveys at N1, N2 and N3 are summarised in Tables 10.9 to 10.11. It should be noted that a logarithmic average is used for the L_{Aeq} parameter, while an arithmetic average is used for the L_{A10} and L_{A90} parameters.

Location N1

Start Time	Measured Noise Levels (dB)				
	L _{Aeq}	L _{AFmax}	L _{AFmin}	L _{A10}	L _{A90}
10:10	59	83	33	60	39
11:25	71	79	62	73	66
12:30	67	81	51	72	52
13:35	53	71	40	54	43
Average	67	-	-	65	50
Average (No Construction)	57	-	-	57	41

Table 10.9: Summary of attended daytime noise measurements at N1.

The primary noise contributor at location N1 was construction works from the Phase 1 development site close to the measurement position. The dominant noise sources were

construction vehicles within the line of site of the measurement position. Measurement rounds 1 and 4, however, represent the noise environment in the absence of construction activity. During these periods, the dominant noise sources were both birdsong and the occasional passing of vehicles into Tinakilly Country House Hotel. The measured ambient noise levels at this location in the absence of construction activities were in the range of 53 to 59 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 39 to 43 dB $L_{A90,15mins}$ in the absence of construction activity.

Location N2

Start Time	Measured Noise Levels (dB)				
	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A10}	L_{A90}
10:30	54	76	34	55	43
11:45	53	74	37	52	41
12:50	57	87	38	58	43
Average	55	-	-	55	42

Table 10.10: Summary of attended daytime noise measurements at N2.

The noise contributors at location N2 were road traffic noise from the R750 and occasional passing vehicles close to the measurement position. Other contributing factors included distant site works and distant construction vehicle movements which were audible at low level but were not significant contributors to the measured noise levels. Birdsong was also a contributor to the noise environment.

The ambient noise levels at this location were measured in the range of 53 to 57 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 41 to 43 dB $L_{A90,15mins}$.

Location N3

Start Time	Measured Noise Levels (dB)				
	L_{Aeq}	L_{AFmax}	L_{AFmin}	L_{A10}	L_{A90}
11:00	51	75	37	50	41
12:05	47	61	36	50	40
13:10	51	75	36	53	39
Average	50	-	-	51	40

Table 10.11: Summary of attended daytime noise measurements at N3.

The noise contributors at N3 were distant construction works including vehicle movements and vehicle reversing alarms. Both birdsong and distant road traffic were also noted contributors to the noise environment at this measurement location. The ambient noise levels at this location were measured in the range of 47 to 51 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 39 to 41 dB $L_{A90,15mins}$.

10.3.2 Desktop Review of Noise Mapping

A desktop review of publicly available data has been undertaken to further characterise the baseline noise environment in the study area. Reference has been made to the most recent Round 3 noise maps published by the Environmental Protection Agency (EPA) (<http://gis.epa.ie>) for road traffic. The published noise maps are provided for the overall day-evening-night period in terms of L_{den} and the L_{night} parameters, defined below.

L_{den} is the 24-hour noise rating level determined by the averaging of the L_{day} with the $L_{evening}$ (plus a 5 dB penalty) and the L_{night} (plus a 10 dB penalty). L_{den} is calculated using the following formula, as defined within the Noise Regulations:

$$L_{den} = 10 \log \left(\frac{1}{24} \left(12 * \left(10^{\frac{L_{day}}{10}} \right) + 4 * \left(10^{\frac{L_{evening}+5}{10}} \right) + 8 * \left(10^{\frac{L_{night}+10}{10}} \right) \right) \right)$$

Where:

L_{day} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the day periods of a year. The 12 hour daytime period is between 07:00hrs and 19:00hrs

$L_{evening}$ is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the evening periods of a year. The four-hour evening period is between 19:00hrs and 23:00hrs

L_{night} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the night periods of a year. The eight-hour night-time period is between 23:00hrs and 07:00hrs.

Figure 10.2 presents the mapped road traffic noise levels in the vicinity of the development site as reported in the Wicklow County Council Noise Action Plan 2018-2023 in terms of the L_{den} parameter. The R750 Road is mapped to the west of the site.

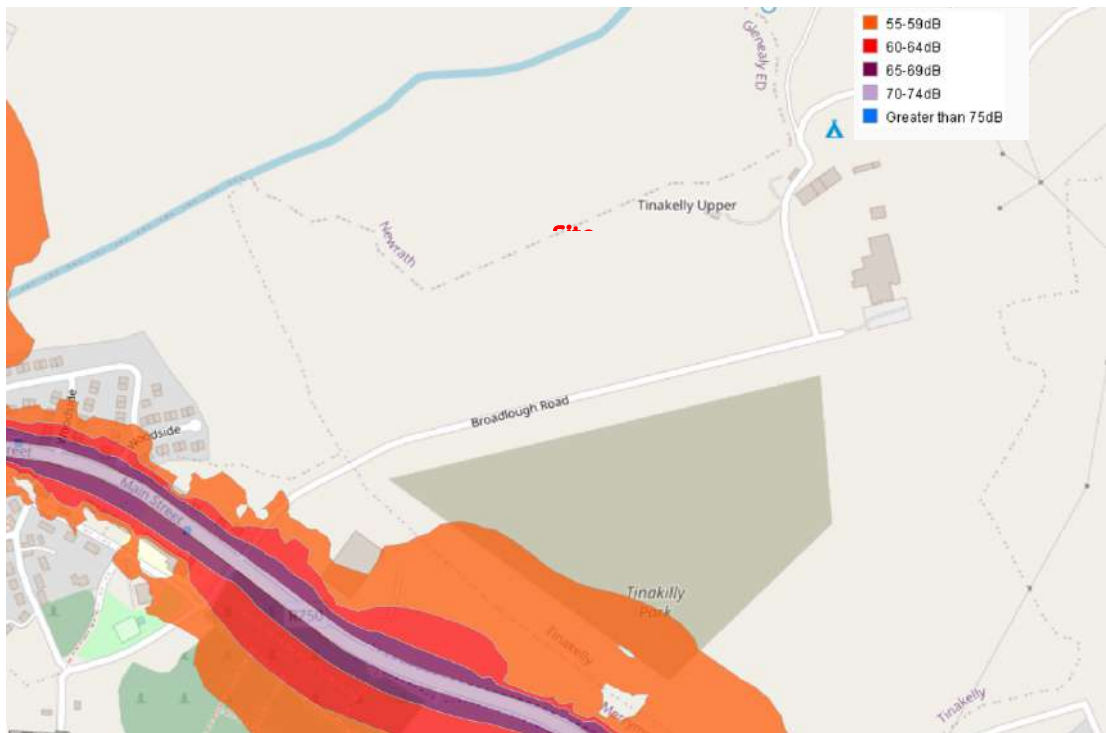


Figure 10.2: Mapped dB L_{den} Traffic Noise Level (Source: <http://gis.epa.ie>)

The road traffic noise mapping for the R750 indicates that noise levels are below 55 L_{den} across the development site. This indicates that road noise levels throughout the development site are below levels that are likely to cause an adverse impact.

Figure 10.3 presents the mapped road traffic noise levels in the vicinity of the development site as reported in the Wicklow County Council Noise Action Plan 2018-2023 in terms of the L_{night} parameter.

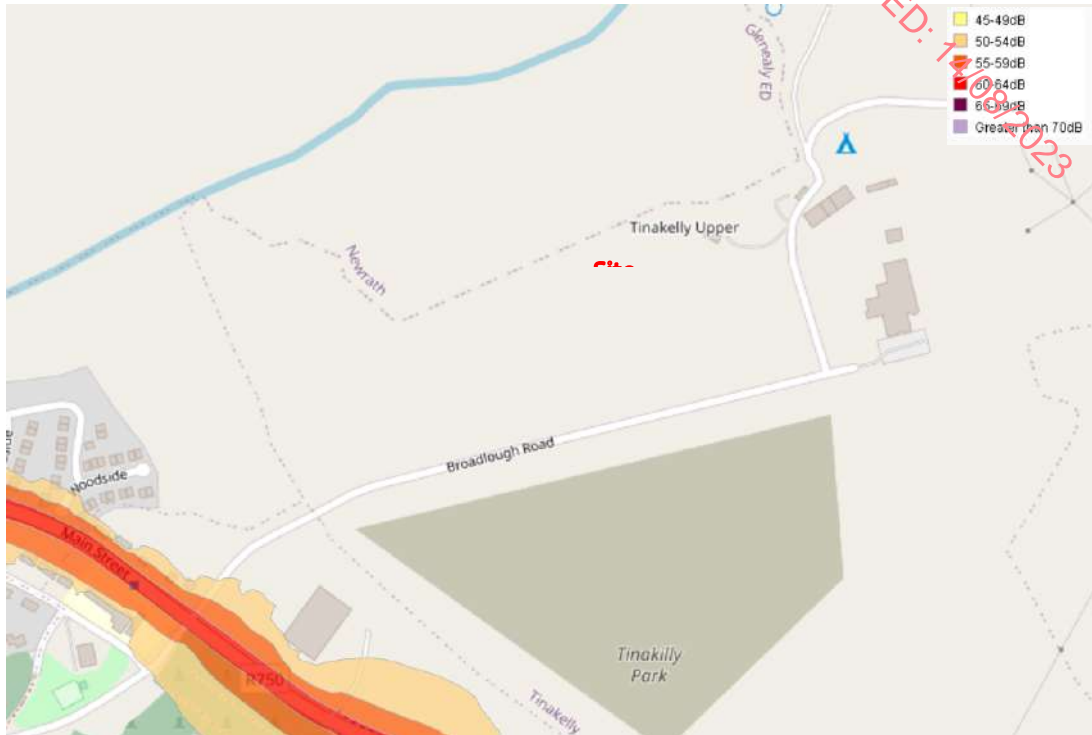


Figure 10.3: Mapped dB L_{night} Traffic Noise Level (Source: <http://gis.epa.ie>)

The road traffic noise mapping for the R750 indicates that noise levels are below 50 L_{night} across the development site. The results of the noise mapping and baseline noise survey indicate a low noise environment is experienced across the development site where the proposed residential units are positioned.

10.4 Potential Impacts of the Proposed Development

10.4.1 Potential Construction Phase Impacts

Construction Phase Noise

The highest potential noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery used to construct the various phases in addition to Heavy Goods Vehicles (HGVs) movement to, from and around the site. However, impacts during this phase are short-term in duration.

The nearest NSLs to the site are residential dwellings along the north-eastern site boundary at a distance of approximately 170m from the red line boundary (NSL1). To the mid-eastern portion of the site, the closest NSLs are residential dwellings at Tinakilly Upper at distances of 10 to 30m from the red line boundary (NSL2). Along the southeastern boundary, the closest NSL is Tinakilly House (NSL 3) at a distance of approximately 100m from the redline boundary. To the south of the site, the closest NSLs are the residential properties within the Tinakilly Phase 1 development at approximately 75m from the redline boundary (NSL4). To the west of the site, several residential properties at woodside lie approximately 150m from the redline boundary (NSL6).

Figure 10.4 illustrates the positions of the closest NSL's.



Figure 10.4: Closest NSL’s

Thresholds for significance relating to construction noise can be determined by referring to Table 10.1 (BS 5228-1) and the baseline ambient noise levels, as outlined in the assessment criteria section. These thresholds are shown in Table 10.12. Based on the prevailing noise environment, the construction noise thresholds are defined from Category A.

The proposed construction working hours are between 07:00 to 19:00, Monday to Friday and 08:00hrs to 14:00hrs on Saturdays (subject to planning conditions). There may be occasions where it is necessary to make certain deliveries outside of these times, for example, where large loads are limits to road usage outside peak times. The relevant significant thresholds during normal working hours and for occasional evening periods are set out in Table 10.12. A night-time threshold is not included as construction work will not be taking place at night.

Noise Location	Sensitive	Period	Construction Noise Category (BS 5228-1)	Significance Threshold
Residential properties north, west and south of site.		Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	A	65 dB LAeq,T
		Evenings and weekends 19:00–23:00 weekdays, 13:00–23:00 Saturdays 07:00–23:00 Sundays.	A	55 dB LAeq,T

Table 10.12: Significance thresholds for construction noise.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to mobile plant, loading lorries and material handling (dozers, tracked excavators and wheeled loaders) are in the range of 70 to 81 dB LAeq,T at a distance of 10m. Given the nature of the proposed works which will include standard house and apartment building

techniques across the site, a cumulative construction noise level of 80 dB $L_{Aeq,T}$ at 10m represents a conservative noise level used to assess general construction activities associated with the majority stages of construction. This scenario is a robust assumption made for developments of this size, that allows for a range of construction plant items operating simultaneously (e.g. one item of plant with a sound pressure level of 70dB at 10m and 3 items of plant with a sound pressure level of 75 dB at 10m operating concurrently at the same location). In reality items of construction plant and machinery will be operating at varying distances from any one NSL meaning the adopted value of 80 dB $L_{Aeq,T}$ at 10m is a conservative and appropriate value to adopt.

Guidance on the approximate attenuation achieved by site hoarding 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.

A conservative scenario of 5 dB screening is used for the purposes of this assessment, this assumes a standard 2.4m site hoarding will be used around sensitive site boundaries where NSL are in proximity and will partially screen adjacent sensitive buildings.

Table 10.13 presents the calculated noise levels at various distances based on the assumed sound pressure level. The values are calculated with a construction site hoarding in place and are calculated with the assumption of 100% soft ground due to the topography of the surrounding area.

Construction Scenario	Predicted Noise Level (dB $L_{Aeq,T}$) at NSLs				
	NSL 1	NSL 2	NSL 3	NSL 4	NSL 5
Combined total noise level of 80dB at 10m. – hoarding in place	45	67	51	54	47

Table 10.13: Potential construction noise levels at NSLs

The calculated noise levels in Table 10.13 indicate that with the presence of a construction site hoarding, construction noise levels at the closest NSLs are within the daytime construction noise threshold of 65 dB L_{Aeq} with the exception of NSL2 where a slight exceedance of the CNT is calculated when activities are taking place within 20m of these properties. At distances of 25m and beyond, noise levels are reduced to within the CNTs.

The construction phase activities can operate within and below the construction noise significant thresholds at the closest NSLs with the inclusion of a standard site hoarding. The impact is negative, moderate, and short-term.

Construction Phase Traffic

The access and egress points for construction vehicles will vary over the course of the overall development as the Rathnew Inner Relief Road (RIRR) is constructed and the new access junction to the Tinakilly House Hotel is developed. Construction traffic volumes will also vary over the course of the overall construction phase.

The Traffic and Transport Assessment prepared as part of the proposed development has assessed a number of scenarios relating to construction traffic. The worst case scenario ‘Stage D’ has been used to assess potential noise impacts. During this scenario the full extent of the RIRR is open to traffic in both directions and includes traffic from the Phase 1 Tinakilly development, other committed developments and some diverted traffic off the

R750 and R772 Roads . The construction phase of remaining units of Development Phase 1 and construction of Development Phase 2 and 3 are included as part of the construction traffic flows. Construction generated light good vehicles (LGV) traffic will use the RIRR. Heavy Good Vehicle (HGV) traffic will access the site via the R761 /R772 Road. The traffic volumes associated with the ‘Do Something’ construction scenario therefore includes the additional operational traffic along the RIRR in addition to the short-term construction traffic. The Do Nothing scenario assumes the extension of the RIRR in not in operation.

Traffic data has been provided in terms of the Annual Average Daily Traffic (AADT) with associated HGVs and traffic speed. Further details of the traffic scenarios assessed as set out in Chapter 13 (Traffic and Transportation). The information has been used to calculate the change in traffic noise levels along the surrounding road network where traffic will access and exit the site onto.

Table 10.14 summarises the traffic flow along the adjacent roads with and without the proposed development construction phase traffic and presents the calculated change in noise level between both scenarios.

Road Link	Description	2026 – Do Nothing (Permitted Developments)		2026 – Do Something Construction Phase		Calculated traffic noise increase, dB
		AADT	HGVs	AADT	HGV	
B	R750 (south-east of Merrymeeting Interchange)	15,812	539	16,226	543	+0.1
C	Hawkstown Road (south of Merrymeeting Interchange)	6397	142	6,565	142	+0.1
D	R750 (between Tinakilly Avenue & Merrymeeting Interchange)	17,741	631	13,036	476	-1.3
E	R750 Main Street (between R752 and Tinakilly Avenue)	19,416	692	14,573	533	-1.2
F	R752 (south-west of Rathnew Mini Roundabout)	8,051	458	8,265	462	+0.1
G	R772 (between R761 and Rathnew Mini Roundabout)	20,561	889	15,932	734	-0.9
H	R772 (north-west of R761)	18,932	896	19,430	1,020	+0.4
I	R761 (between R772 and ALDI roundabout)	3,932	112	8,813	379	+4.6
J	R761 (north-west of ALDI roundabout)	1,417	63	1,456	63	0.0

Table 10.14: change in traffic noise levels during construction phase, surrounding road network

The change in noise level along the surrounding road network ranges between a reduction in noise level of the order of 1 dB to an increase of 4.6dB. Along the majority of the road sections assessed, the change in traffic noise level is less than 2 dB. Reference to Table 10.5 categorised a change of this magnitude as Not Significant to Slight.

Along the R761 between the R772 and ALDI Roundabout an increase in traffic noise of 4.6 dB is calculated. The higher volume of traffic along this road link during the Do Something scenarios relates to the additional traffic serving Phase 1 development along the full length of the RIRR in both directions, diverted hotel traffic, adjacent committed developments accessing the RIRR and construction vehicles.

A change in noise level of this magnitude is categorised as Moderate in the short-term period (Reference to Table 10.5). The resultant impact is neutral, imperceptible and short-term to negative, not significant to moderate and short-term during the construction phase.

Along the RIRR road, once extended, traffic volumes will increase as a result of the scenarios discussed above. As noted the Do Something scenario for the construction phase, includes operational phase traffic along the RIRR and light construction vehicles accessing the Phase 2 construction site. The specific calculated noise levels at the closest NSLs within Phase 1 are set out in Table 10.15.

Road Link	Description	2026 – Do Something Construction Phase		Calculated traffic noise at closest NSLs, L _{day}
		AADT	HGV	
A	Rathnew Inner Relief Road (existing southern section)	6,617	204	60
M	Rathnew Inner Relief Road (between Tinakilly Avenue and Tinakilly Park)	5,591	163	60

Table 10.15: Traffic noise levels during construction phase, RIRR road network

The calculated noise levels are of the order of 60dB L_{Aeq,12hr} at the closest NSLs within Phase 1 to the RIRR road. These properties will experience an increase in traffic noise as part of the full extent of the RIRR becomes operational compared to the small volumes of local access traffic currently using the small section of the road constructed to date.

Construction Phase Vibration

Potential for vibration impacts during the construction phase of the residential element and the RIRR extension are likely to be limited to piling of apartment foundations, depending on the methodologies used. There is no excavation into rock required for the site development for any basement construction works, hence there is no rock breaking is required. Road rollers during the road completion phase generate perceptible levels of vibration at close proximity to the equipment, but at the distance to the closest off-site NSLs (>200m from road works) and closest Phase 1 NSLs (>40m from road works), vibration from this activity will be imperceptible.

For the purposes of this assessment, the expected vibration levels during piling, assuming augured or bored piles, have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of vibration of rotary bored piling using a 600 mm pile diameter for bored piling into soft ground over rock:

- 0.54 mm/s at a distance of 5 m, for auguring;

- 0.22 mm/s at a distance of 5 m, for twisting in casing;
- 0.42 mm/s at a distance of 5 m, for spinning off; and
- 0.43 mm/s at a distance of 5 m, for boring with rock auger.

Considering the low vibration levels at very close distances to the piling rigs, vibration levels at the nearest off-site buildings (>180m from apartment buildings to south-east and >65m from Phase 1 NSLs) will be orders of magnitude below those associated with building response or human response to vibration referred to in Table 10.3 and Table 10.4.

The predicted vibration effect during the construction phase of the residential development and RIRR road is Neutral, Imperceptible and Short Term.

10.4.2 Potential Operational Phase Impacts

Once the development is operational, the potential noise impacts to the surrounding environment will be minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (estate vehicle movements, children playing etc.) and hence no significant impact is expected from this area of the development site.

The main potential noise impact associated with the proposed development is considered therefore to relate to the generation of additional traffic to and from the site as a result of the new residential element and any building services plant. Once operational, there are no vibration sources associated with the development site.

The review of standards and guidelines in Section 10.2.2 will be used here to assess the potential impact of the proposed development during the operational phase.

Operational Phase – Building Services Plant Noise

There are no sources of mechanical or electrical plant associated with the building types across the proposed development with potential to emit audible noise levels beyond the buildings themselves. (i.e. individual heat recovery systems serving the residential units where proposed). Plant rooms serving the apartment blocks are enclosed at basement level. Any required plant items serving development buildings will be designed and located so that there is no negative impact on sensitive receivers within the proposed development itself (e.g. within apartments above plant rooms etc.)

There is provision for a foul pump station within the south-east of the development. The entire structure, inclusive of pumps will essentially be below ground, with no open vents. The above ground structure is an control kiosk. There is no breakout noise associated with this part of the site.

There are four sub stations across the proposed development site serving the residential units. The closest noise sensitive locations to these structures are the proposed residential units within the development site at distances of the order of 20m. Operational noise levels from small substations are low and are well controlled through the structure itself. Once the structure is well sealed and designed to control tonal noise emissions, operational noise levels from these structures are low and do not give rise to any audible noise levels beyond their immediate structure. Given the distance to the nearest noise sensitive properties and the design of sealed modern structures, noise levels at the nearest on-site noise sensitive locations will be well controlled. Noise impacts associated with these units will be imperceptible at existing NSLs external to the site.

During the detailed design stage, operational noise levels associated with any such substations will be reviewed to ensure noise levels at the nearest noise sensitive buildings do not exceed the internal noise levels within Table 10.6.

Once noise emissions from operational plant are designed to not exceeded the internal noise criteria at the new residential units within the proposed development, the related noise impact to existing NSLs offsite will be imperceptible. The overall outward noise impact of mechanical and electrical services on site to existing surrounding NSLs is determined to be Neutral, Imperceptible and Long-Term.

Operational Phase – Additional Traffic on Surrounding Roads

Once operational, traffic associated with the Phase 2 development will access the site via the completed RIRR onto the surrounding road network. Table 10.16 summarises the traffic flow along the adjacent roads with and without the proposed development and presents the calculated change in noise level between both scenarios. The assessment year relates to the future design year 2043.

Road Link	Description	2043 – Do Nothing (Permitted Developments)		2043 – Do Something Construction Phase		Calculated traffic noise increase, dB
		AADT LGVs	HGVs	AADT LGVs	HGV	
B	R750 (south-east of Merrymeeting Interchange)	16,181	559	16,696	567	+0.1
C	Hawkstown Road (south of Merrymeeting Interchange)	6,547	148	6,755	148	+0.1
D	R750 (between Tinakilly Avenue & Merrymeeting Interchange)	18,143	653	13,452	498	-1.2
E	R750 Main Street (between R752 and Tinakilly Avenue)	19,863	727	15,020	568	-1.1
F	R752 (south-west of Rathnew Mini Roundabout)	8,240	481	8,502	487	+0.1
G	R772 (between R761 and Rathnew Mini Roundabout)	21,043	934	16,462	781	-0.9
H	R772 (north-west of R761)	19,376	940	19,992	952	+0.1
I	R761 (between R772 and ALDI roundabout)	4,027	116	9,074	273	+3.6
J	R761 (north-west of ALDI roundabout)	1,451	65	1,497	65	0.0

Table 10.16: Traffic noise levels during operational phase surrounding road network

The change in noise level along the surrounding road network ranges between a reduction in noise level of the order of 1 dB to an increase of 3.6dB. Along the majority of the road sections assessed, the change in traffic noise level is less than 1 dB. Reference to Table 10.7 categorised a change of this magnitude as Not Significant.

Along the R761 between the R772 and ALDI Roundabout (Link I) an increase in traffic noise of 3.6 dB is calculated. A change in noise level of this magnitude is categorised as Slight in the long-term period (Reference to Table 10.7).

The resultant impact is neutral, imperceptible and long-term to negative, not significant to slight and long-term during the operational phase on the surrounding road network.

Operational Phase –Traffic along RIRR

Once the RIRR link is completed and the full extent of the Tinakilly Phase 1 and 2 development is complete, this road will serve as the main connection link road for the full development, adjacent developments and diverted traffic from the R750 /R772 mainline.

The closest NSL within the Phae 2 development site are positioned at distances of approximately 20m from the road edge. All other residential units are set back further from the road edge and screened by the development buildings.

To assess the potential traffic noise at properties along the RIRR, a noise model of the new road was developed and traffic noise calculated at the closest NSLs. The model was developed using SoftNoise Predictor and the calculation methodology was the CRTN-TRL (1998) method used to calculate ambient L_{Aeq} traffic noise levels.

A traffic flow of 5,800 AADT and HGV of 4% was modelled along the road. In the absence of specific diurnal traffic profiles for the road, the TII diurnal profile for national road was used to breakdown the AADT traffic flow into a 24 hour profile to enable calculation of day and night-time traffic noise levels. The speed was modelled as 60 km/hr and the road surface was modelled as standard hot rolled asphalt.

Figure 10.5 presents the daytime calculated noise levels at the closest NSLs along the RIRR edge.

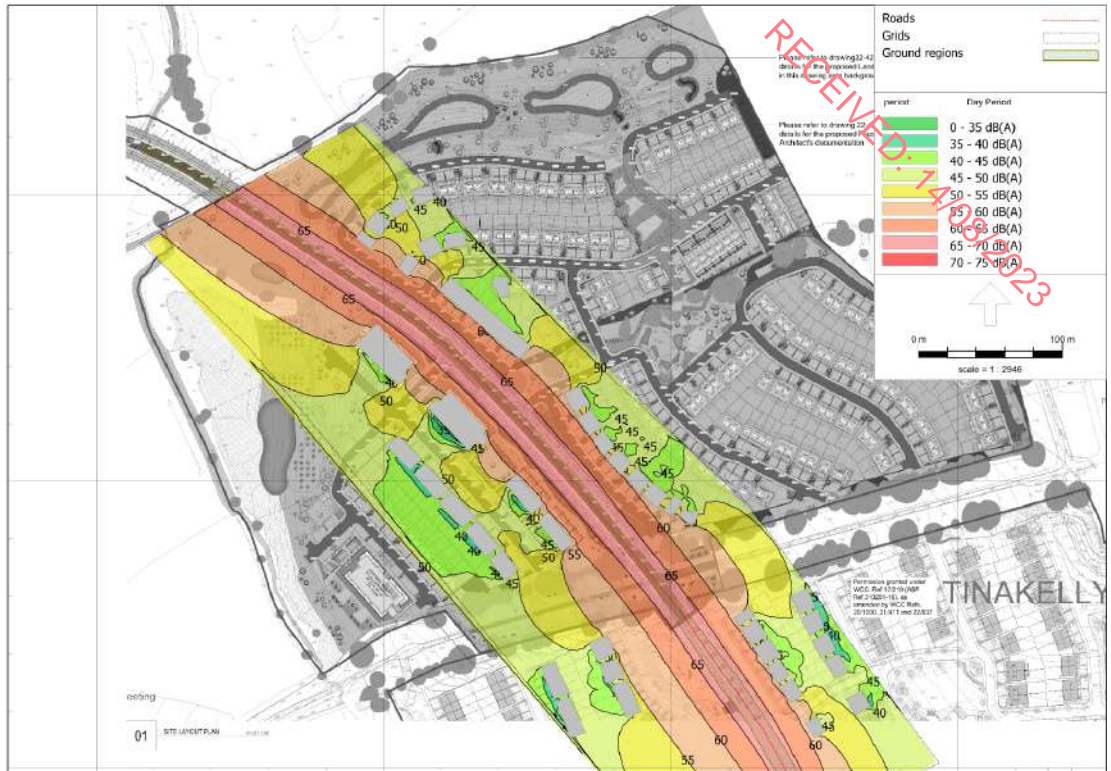


Figure 10.5: Calculated daytime traffic noise levels from RIRR within Phase 2

Calculated daytime noise levels are in the range of 60 to 62 dB $L_{Aeq,12hr}$ at the closest NSLs to the road edge, reducing to below 55dB $L_{Aeq,12hr}$ at NSLs set back from the road edge.

Figure 10.6 presents the night-time calculated noise levels at the closest NSLs along the RIRR edge.

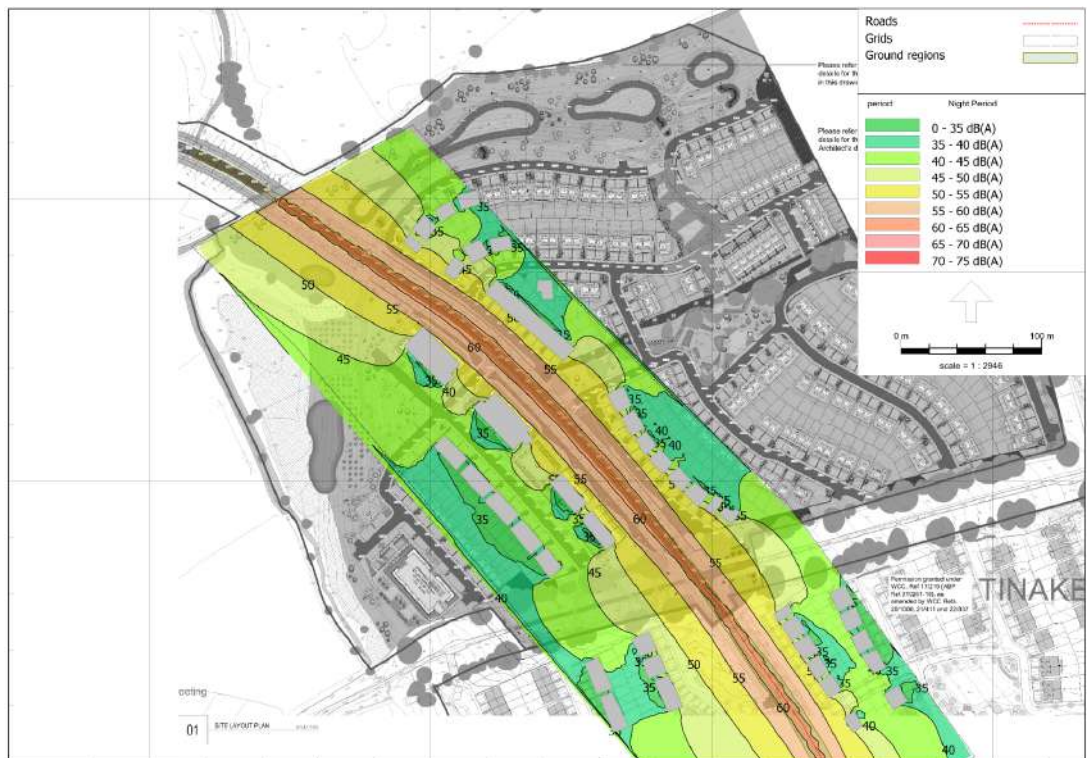


Figure 10.6: Calculated night-time traffic noise levels from RIRR within Phase 2

Calculated night-time noise levels are in the range of 52 to 55 dB $L_{Aeq,8hr}$ at the closest NSLs to the road edge, reducing to below 45dB $L_{Aeq,8hr}$ at NSLs set back from the road edge.

The typical level of sound reduction offered by a partially open window falls in the region of 10 to 15 dB. Considering the internal design goals for residential dwellings outlined in **Error! Reference source not found.** 10.6, and a sound reduction across an open window of 15 dB, the free-field noise levels required to ensure internal noise levels do not exceed good or reasonable internal noise levels for daytime periods are summarised in Table 10.17.

Internal Level Desired	External Noise Level Ranges
Good (i.e. at or below the internal noise levels in Table 10.6)	50 – 55 dB $L_{Aeq,16hour}$
Reasonable (i.e. 5 dB above the internal noise levels in Table 10.6)	55 – 60 dB $L_{Aeq,16hour}$
Good (i.e. at or below the internal noise levels in Table 10.6)	45 dB $L_{Aeq,8hour}$
Reasonable (i.e. 5 dB above the internal noise levels in Table 10.6)	50 dB $L_{Aeq,8hour}$

Table 10.17: External noise levels required to achieve suitable internal noise levels with windows open

During daytime periods, good to reasonable internal noise levels can be achieved with windows open within the majority of residential dwellings. The upper floors of the apartment buildings would likely result in internal noise levels of between 45 and 47 dB during daytime periods.

During night-time periods, good to reasonable internal noise levels can be achieved with windows open within the majority of residential dwellings. For residential properties immediately along the road edge in Phase 2, night-time internal noise levels of the order of 37 to 38 dB $L_{Aeq,8hr}$ are calculated assuming a 15 dB reduction across an open window.

Glazing

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. All residential units will include standard double glazing. The following minimum performance is assumed for a standard double glazed unit installed to the residential houses and apartments.

SRI	SRI (dB) per Octave Band Centre Frequency (Hz)						dB Rw
	125	250	500	1k	2k	4k	
Glazing Specification	24	20	25	35	38	35	31

Table 10.18: Sound insulation performance requirements for glazing, SRI (dB)

As noted, the acoustic specification listed in Table 10.18 can be achieved using a standard double-glazed unit and is likely to be used across the full extent of the site as a standard glazing system. As such, this does not warrant referencing as a mitigation measure as it is considered a standard specification.

In the context of the acoustic performance specification, the glazing system is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements, etc.

Wall Construction

In general, all external wall constructions offer a high degree of sound insulation, much greater than that offered by glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB Rw for this construction.

Ventilation

The ventilation strategy for the proposed development will be in accordance with Part F of the Building Regulations and will be finalised at the detail design stage. Options which will be considered to achieve compliance with background ventilation requirements will be a closed heat recovery system.

Internal Noise Levels

Taking into account the external façade levels and the building envelope, the internal noise levels for bedrooms and living spaces in all instances achieve the good internal ambient noise criteria referenced in Table 10.6 for daytime and night-time periods with windows closed.

10.5 Mitigation Measures

10.5.1 Construction Phase

BS 5228-1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites Parts 1 and 2 provide guidance on noise and vibration control in the context of construction. The control of noise from construction works can be divided into two categories:

- Controlling the noise at source; and
- Controlling the spread of noise.

Mitigation measures that will be employed in order to control construction noise at its source include the following:

- Avoid unnecessary revving of engines and switch off equipment when not required;
- Keep internal haul routes well maintained and avoid steep gradients;
- Minimise drop height of materials;
- Start up plant and vehicles sequentially rather than all together;
- The normal operating hours of the site will be adhered to. This also applies to the movement of plant onto and around the site;
- The plant and activities chosen to carry out the construction work will be the quietest available means of achieving the required purpose;
- Modifications may be made to plant and equipment, if appropriate, for noise attenuation purposes, provided the manufacturer has been consulted. For example, a more effective exhaust silencer may be fitted to a diesel engine;

- As far as is reasonably practicable, sources of significant noise will be enclosed provided that ventilation and potential hazards to operators have been considered;
- Plant and noisy activities will be located away from noise-sensitive areas where practicable and sources of directional noise should be oriented away from noise-sensitive areas; and
- All plant and equipment will be regularly maintained (increases in plant noise are often indicative of future mechanical failure).

Mitigation measures that will be employed in order to control the spread of construction noise include the following:

- The distance between noise sources and noise-sensitive areas will be increased as much as is reasonably practicable; and
- Where noise control at source is insufficient and the distance between source and receiver is restricted, screening will be implemented. The use of a standard 2.4m high hoarding is recommended along the site boundaries where noise sensitive properties are located within 25m of the works.

10.5.2 Operational Phase – Building Services Plant Noise

The pump stations and sub stations serving the proposed development will be fully sealed within structures. The units will be designed to ensure no tonal noise level is emitted that are audible at the nearest residential dwellings. All plant serving apartment buildings will be enclosed within plant rooms. The following control measures will be implemented:

- Where ventilation is required to basement plant rooms or car parks, consideration will be given to acoustic louvers or attenuated acoustic vents, where required, to reduce noise breakout to adjacent NSLs within the development ; and
- Any new or replacement mechanical plant items, including units serving the heat recovery systems of residential units, shall be designed so that all noise emissions do not exceed the noise limits outlined in this document.

10.5.3 Operational Phase – Additional Traffic on Surrounding Roads

Changes to traffic flows will not result in a perceptible increase in noise level in the surrounding environment at majority of roads. Highest increases in traffic noise are categorised as negative and slight. Therefore, no mitigation measures are necessary in this case.

Traffic noise levels at residential properties immediately adjacent to the RIRR will be controlled through the building facades to achieve suitable internal noise levels over day and night-time periods.

10.6 Residual effects of the proposed development

10.6.1 Construction Phase

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, and noise monitoring during this phase will be implemented.

Referring to the mitigation in Section 10.5 and the calculated noise levels in Table 10.13, residual construction noise levels are determined to be negative, slight to moderate and short-term.

In terms of construction traffic along the surrounding road network, impacts are determined to be neutral, imperceptible and short-term to negative, not significant to moderate and short-term during the construction phase.

The residual effect of construction vibration is neutral, imperceptible and short-term.

10.6.2 Operational Phase

Once operational, residual noise levels associated with building services plant from the proposed development including foul pump station, substations and apartment buildings. These will be designed to not exceed the derived external noise levels in Table 10.6 at all NSLs within the development site. The residual effect is expected to be neutral, not significant and long-term. Once building services plant noise levels are controlled within the development, the residual effect at NSLs outside of the site will be neutral.

Traffic along the surrounding road network will not lead to a change in noise level that would pose any significant effect. Highest changes in traffic noise along the surrounding road network are determined to be negative, slight and long-term. Along the remainder of roads, the impact is negative, not significant and long-term.

Along the RIRR, traffic noise will form part of the environment at the NSLs within the proposed development. Highest traffic noise will be experienced at NSLs closest to the road edge. The building façade including the use of standard double glazing will achieve suitable internal noise levels with windows closed.

10.7 Monitoring or Reinstatement

10.7.1 Construction Phase

During the demolition/construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996-1 (ISO 2016) and ISO 1996-2 (ISO 2017).

10.7.2 Operational Phase

There are no proposed monitoring requirements associated with the operational phase of the proposed Development.

10.8 Cumulative Impacts of the Proposed Development

10.8.1 Construction Phase

If construction activities at nearby sites are taking place concurrently with the construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The

noise contribution from other construction sites would need be equal to those associated with the proposed development in order to result in any cumulative effect.

In the event of the two construction phases of the proposed development overlapping predicted construction noise levels will rise by the order of +3 dB.

10.8.2 Operational Phase

The noise limits set for off-site noise sensitive locations are designed to avoid any significant increase in the prevailing background noise environment. Operational noise limits included in this report refer to cumulative noise from all fixed installations and pump stations on site. The design of plant and other fixed installations will be progressed during the design stage to ensure the noise limits at off-site noise sensitive locations are not exceeded.

Traffic volumes assessed take account of the traffic from full extent of the Tinakilly development alongside other permitted and planned developments, and therefore the traffic noise assessment presented is already assessing the cumulative impact.

10.9 References

- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (BSI 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (BSI 2008);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (BSI 2019);
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHA 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018;
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 1996);
- ISO 1996-1: 2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017), and;
- The UK Department of Transport Calculation of Road Traffic Noise (UK Department of Transport 1998).
- Wicklow County Council Noise Action Plan 2018-2023

11 LANDSCAPE VISUAL IMPACT ASSESSMENT

11.1 Introduction

This chapter of the Environmental Impact Assessment Report contains a Townscape and Visual impact Assessment (TVIA) in respect of Phase 2 of a residential development on lands at Tinakilly, Rathnew, County Wicklow. Its purpose is to identify and determine the likely impacts of the scheme on the receiving environment, in terms of both townscape character and visual amenity.

It has been prepared by Mark Salisbury, Associate Director at Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape/Townscape and Visual Assessment and associated maps and graphics. Mark is a Chartered Member of the Landscape Institute, and has over 15 years experience in LVIA/TVIA work. Macro Works' relevant experience includes a broad range of infrastructural, industrial and commercial projects since 1999, including numerous urban, residential, and mixed use development projects.

The methodology for this TVIA is based on the primary best practice document, the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (LI/IEMA, 2013). In accordance with this published guidance, townscape and visual impacts are assessed separately, although the procedure for assessing each of these is closely linked.

A clear distinction has been drawn between townscape and visual impacts as described below:

- Townscape impacts relate to the influence of the proposals on the physical and perceptual characteristics of the townscape and its resulting character and quality;
- Visual impacts relate to the influence of the proposals on specific views experienced by visual receptors and on visual amenity more generally.

The TVIA should be read in conjunction with the verified photomontages and Computer Generated Images (CGI) produced by 3D Design Bureau, which is included at Appendix 11A. These illustrate how the proposed development would appear from a variety of locations in the surrounding townscape.

11.2 Description of the Proposed Development

The proposed development will consist of the following:

- Construction of 352 no. residential units comprising 220 no. 2-4 bedroom houses and 132 no. 1-3 bedroom apartments.
- Provision of private, communal and public open space. Provision of a new park to the north and west of the site (c.4.34ha).
- All internal residential access roads and cyclist/pedestrian paths serving the proposed development.
- Provision of car and bicycle parking.
- Proposed pedestrian connections and landscape revisions to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

All vehicular and pedestrian connections between Tinakilly Park and Rathnew Village will be via a new section of the Rathnew Inner Relief Road. All associated site development works, services provision, infrastructural and drainage works, provision of esb substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

No further changes to development permitted under WCC Refs. 17/219/ ABP Ref. PL27.301261, 20/1000, 21/411, 22/837 or 21/1333.

11.3 Methodology

This document uses methodology as prescribed in the previously mentioned GLVIA3. Given the site's association with Rathnew, this is principally a 'townscape' assessment, albeit the assessment utilises the same outline methodology as would be employed for the more familiar Landscape and Visual Impact Assessment (LVIA) of developments in rural settings.

GLVIA3 follows the European Landscape Convention (ELC) definition of landscape:

'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded.

Townscape is defined in GLVIA3 in the following manner (section 2.7):

'Townscape' refers to areas where the built environment is dominant. Villages, towns and cities often make important contributions as elements in wider-open landscapes but townscape means the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces, and the relationship between buildings and open spaces. There are important relationships with historic dimensions of landscape and townscape, since evidence of the way the villages, towns and cities change and develop over time contributes to their current form and character.

In the context of 'townscape' it is recognised that there is a strong interrelationship between the 'townscape' and 'cultural heritage' assessments. As stated at section 5.11 of GLVIA;

"the sharing of relevant baseline information should not be confused with the need for separate cultural heritage appraisals such as historic landscape characterisation and assessment of historic townscape appraisal, or there will be a danger of both double handling and inappropriate judgements by non-experts. It is particularly important that responsibilities are clear in considering any effects on the settings and views for historic buildings, conservation areas and other heritage assets."

The identification of heritage assets in this assessment is made in order to indicate the value and quality of the wider townscape character as well as provide an indication of areas from which views are potentially more sensitive to change.

11.3.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface to GLVIA3 recognises that:

'This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.'

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose.

11.3.2 Study Area

Whilst the site’s wider landscape/townscape and visual context has been reviewed, due to the combined influence of natural topography, and screening elements (both buildings and successive layers of vegetation), the site is not readily visible from many locations in the wider landscape. With this in mind, and considering the general diminishment of landscape and visual effects over distance, a proportionate focus is placed on the landscape/townscape within approximately 500m of the development. This study area contains locations from where the development will be most visible, and beyond this distance the proposed development is not likely to give rise to significant townscape or visual impacts. The assessment study area is illustrated in Figure 11.18.

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Figure 11.18 - Site and focused study area

11.3.3 Townscape Impact Assessment

This part of the TVIA provides an assessment of how the introduction of the proposed development will affect the physical features and fabric of the townscape, and then how the proposals influence townscape character with reference to published descriptions of character and an understanding of the contemporary character of the townscape as informed through desktop and site studies.

When assessing the potential townscape effects of the development, the value and sensitivity of the townscape receptor is weighed against the magnitude of the townscape impact to determine the significance of the townscape effect. Criteria outlined below are used to guide these judgements.

Townscape Sensitivity

The sensitivity of the townscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its

essential characteristics. The judgement reflects such factors as its quality, value, contribution to urban character and the degree to which the particular element or characteristic can be replaced or substituted. Townscape Sensitivity is classified using the following criteria set out in table 11.1 below.

Criteria	Description
Very High	Areas where the townscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the townscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, 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 townscape character exhibits some capacity and scope for development. Examples of which are townscapes, 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 townscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of townscape character that include derelict sites and degradation 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 townscape improvements and/or restoration.

Table 11.1 – Townscape Sensitivity

Magnitude of change - Townscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of townscape components and/or a change that extends beyond the immediate setting that may have an effect on the townscape character. Table 11.2 outlines criteria used to inform this judgement.

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically 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 townscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important townscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the townscape 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.

Table 11.2 – Magnitude of Change – Townscape

11.3.4 Visual Impact Assessment

This part of the TVIA provides an assessment of how the introduction of the proposed development will affect views within the townscape. It therefore needs to consider:

- Direct impacts of the proposed development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the proposed development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

Sensitivity of Visual Receptors

As with townscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike townscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the townscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

Susceptibility of Visual Receptors to change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- *“Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area;*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened”.*

Visual receptors that are less susceptible to changes in views and visual amenity include;

- *“People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life”.*

Value attached to Views

The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
- Views from within highly sensitive townscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the townscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Viewer connection with the townscape. This considers whether or not receptors are likely to be highly attuned to views of the townscape i.e. commuters hurriedly driving on busy roads versus tourists focussed on the character and detail of the townscape;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;

- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain townscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the townscape character. This looks at the condition and intactness of the townscape in view and whether the townscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewers' interpretation and experience of the townscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the townscape that are considered to contribute more prominently and positively to the visual townscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Magnitude of Change - Visual

The magnitude of change is again a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. Criteria used to inform judgements are provided in table 11.3 below

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.

Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

Table 11.3 - Magnitude of Change - Visual

Significance of Effects

The significance of a townscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. ‘No Effect’ may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at table 11.4 as a guide. This applies the EPA assessments principles of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term ‘significant’ with the categories themselves (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at table 11.5.

	Sensitivity of Receptor				
Magnitude	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 11.4 - Significance Matrix

	Townscape		Visual
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Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the townscape. There are notable changes in landscape / townscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

Table 11.5 - Indicative significance of effect criteria descriptions

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision. As such, whilst the Significance Matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as ‘Substantial’ or greater (orange cells) are considered to be the most notable in townscape and visual terms, and may be regarded as ‘Significant’, albeit it is important to note that this is not a reflection on their acceptability in planning terms.

11.3.5 Quality of Effects

In addition to assessing the significance of townscape and visual effects, the quality of the effects is also determined. Whereas, the introduction of new built elements into countryside areas often results in negative landscape and visual effects, in urban and

urban edge settings, new built form often results in a combination of positive and negative effects.

Urban and residential projects (such as that proposed) often involves the incorporation of new built form which through its architectural design and public realm treatment can contribute positively to the receiving townscape.

In this regard, these types of projects can give rise to a broad spectrum of opinions ranging from strongly negative to strongly positive, with a wide range of opinions lying somewhere between these two positions. Whilst some impacts are quantifiable, other impacts (such as the influence of architecture), are more qualitative in nature, where professional judgement is required. In determining the quality of the effect, it is noted that the authors of this TVIA are Chartered members of the Landscape Institute, experienced in large-scale public realm and urban design and regeneration projects and the production of landscape/townscape and visual impact assessments.

Within this TVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- *Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/townscape;*
- *Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/townscape;*
- *Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/townscape.*

The judgment of the quality of the effects is made in combination with the significance judgement for both townscape and visual impacts e.g. Moderate / Positive, Moderate / Neutral, or Moderate / Negative.

11.4 The Receiving Environment

The landscape/townscape baseline represents the existing context, and is the scenario against which any changes to it, brought about by the proposed development, will be assessed. A description of the site's context is provided below.

11.4.1 Townscape Context

The site is located approximately 450 metres to the east of the village centre of Rathnew and to the north of the R750 which runs between Rathnew and Wicklow, approximately 2.5km to the south east. It lies immediately to the north of a mature avenue of oak trees lining Tinakilly Lane which runs between the R750 and Tinakilly Country House, a listed building set in mature grounds comprising designed gardens with mature tree, hedgerow and shrub boundaries.

Whilst it is recognised that the site lies close to a large, and complex area of coastal wetlands to the Murrough Wetlands (500 metres to the east), and may at one time (together with the development site to the south) formed part of the designed estate, the site now comprises part of the urban edge agricultural surroundings of the village.

The site is divided into two areas by an 'L' shaped vegetated field boundary that includes several mature trees, and is bound on its northern and western boundaries similarly. The site's southern boundary adjoins Tinakilly lane as previously described, and is therefore bound by the mature avenue oaks lining this route.

The site is generally typical of other areas of agriculture in the wider landscape, and is not considered to be of any additional condition or quality. It is also not readily visible from any location in the wider landscape, being screened by successive intervening layers of field boundary vegetation.

Rathnew is an evolving settlement, with many residential development projects underway around the edges of the village, and the land between Wicklow Town and Rathnew has gradually been converted from farmland to housing and office / commercial uses over the past two decades blurring the separation between the two settlements.

In the immediate context of the site to the south of the mature avenue of oak trees, lies one of the largest such sites, where a large tract of farmland has been altered to include residential dwellings and areas of associated open space. This forms the first phase of a wider residential development to which the proposals forms the second phase.

11.4.2 Visual Context

Whilst at an immediate site level, the site is relatively open, views from locations in the wider landscape are restricted due to a combination of the generally flat nature of the topography, and the presence of both mature trees and built form in the wider townscape.

Within the context of the study area, views of the site, and proposed development on it, will relate primarily with locations near to the site, and along the northern edge of the village. Visual receptors will include motorists and cyclists on the nearby road network (R772 and R750), patrons of Wicklow County Campus, patrons of Tinakilly House Hotel, and residential receptors in properties around Woodside (north of the R750).

11.5 Planning Context

11.5.1 Wicklow County Development Plan (CDP) 2022-2028

The CDP seeks to provide a framework that guides future development within the county, and accordingly contains many policies and objectives that deal with the strategic planning issues. Relevant to this assessment, are policies and objectives contained in Chapters 6 (Housing), 8 (Built Heritage), 17 (Natural Heritage & Biodiversity), and 18 (Green Infrastructure). Rathnew is seen as a settlement within the catchment of Wicklow Town, and thus is designated as a Level 2 – Core Region Key Town within the Settlement Strategy of the CDP.

Wicklow is often referred to as the ‘Garden of Ireland’, a reflection on the county’s scenic qualities, and is considered a national asset. The Wicklow CDP refers directly to the landscape assessment undertaken for the previous CDP in 2016, which identifies 15 distinctive landscape categories across the county.

The site of the proposed development is located in the ‘Urban Areas’ landscape category which are described as ‘lands located within Local Area and Town plan development boundaries’, and to have a low vulnerability to development. Furthermore, Urban Areas are considered to have a low sensitivity, i.e. the lands are considered more likely to be able to absorb change without impacting on the characteristics of the area.

The Landscape Assessment further states:

All locations designated as 'settlements' in the County settlement hierarchy (i.e. areas falling within Levels 1-6) are considered 'urban' areas for the purpose of landscape classification. In terms of landscape classification, these settlements have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable. Therefore it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment.

The CDP requires that development proposals have regard to the 'Key Development Considerations' set out for each landscape area set out in the Wicklow Landscape Assessment (CPO 17.35). 'Urban areas' are not accompanied with Key Development Considerations, however the following 'General Development Considerations' are considered relevant:

"Listed views and prospects will be protected from developments that would either obstruct the views / prospect from the identified vantage point or form an obtrusive or incongruous feature in that view / prospect. Due regard will be paid in assessing development applications to the span and scope of the view / prospect and the location of the development within that view / prospect."

"The preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees will be encouraged as part of the development management process and the planting of native and appropriate local characteristic species will be required in all new developments."

"New development shall be required to be visually integrated into the landscape by ensuring the retention, conservation and enhancement where possible of local characteristics such as stone walls, hedgerows, entrances and field boundaries."

Whilst the landscape to the north and east forms part of a broad area of coastal landscape that is designated an Area of Outstanding Natural Beauty (AONB), the site is not designated for any landscape or scenic importance. It is also noted that there are no Views or Prospects of 'Special Amenity Value or Special interest' likely to be influenced by the proposals.

11.5.2 Wicklow Town – Rathnew Development Plan 2013-2019 (as amended)

The site is located within the planning boundaries of the Wicklow – Rathnew Development Plan 2013 -2019 (see figure 11.2).

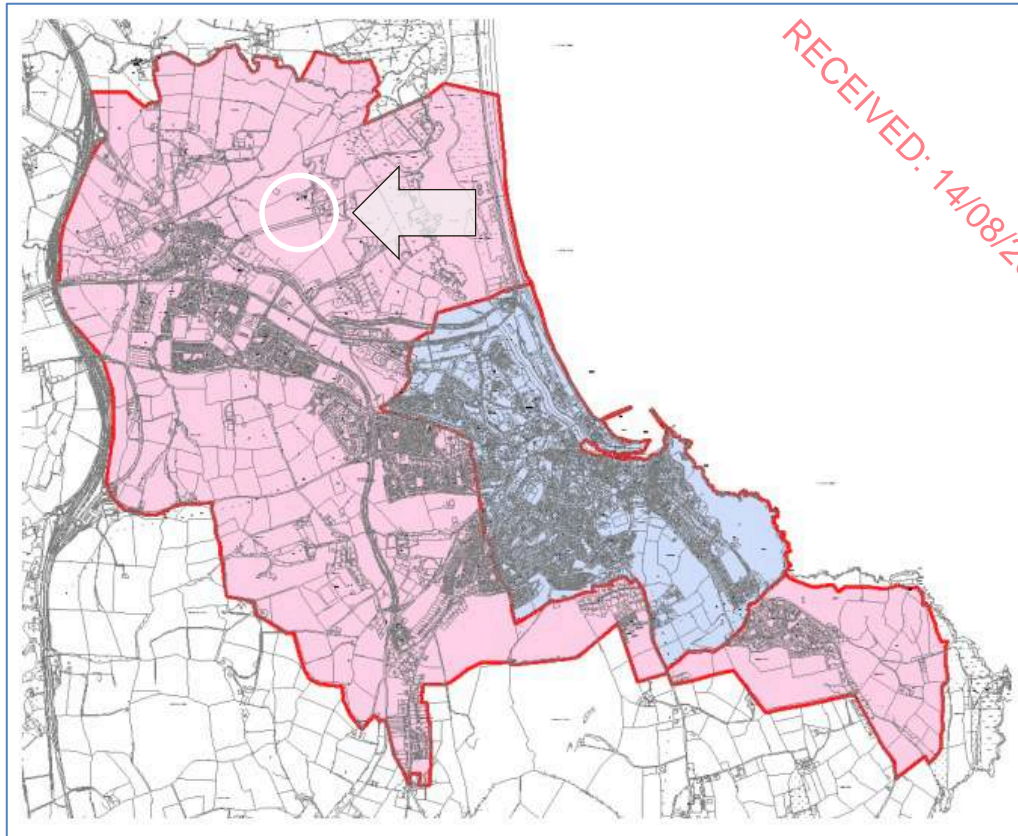


Figure 11.19 - Wicklow Town and Environs Boundaries

Under the land-use zoning objectives the subject lands have been designated for significant development (see figure 11.3) and fall within the Clermont-Tinakilly Action Area. The zoning in the lands have been defined as 'R1 – Residential Medium Density' and 'R2 – Residential Low Density'. A portion of the subject lands are also zoned as Passive Open Space (POS).

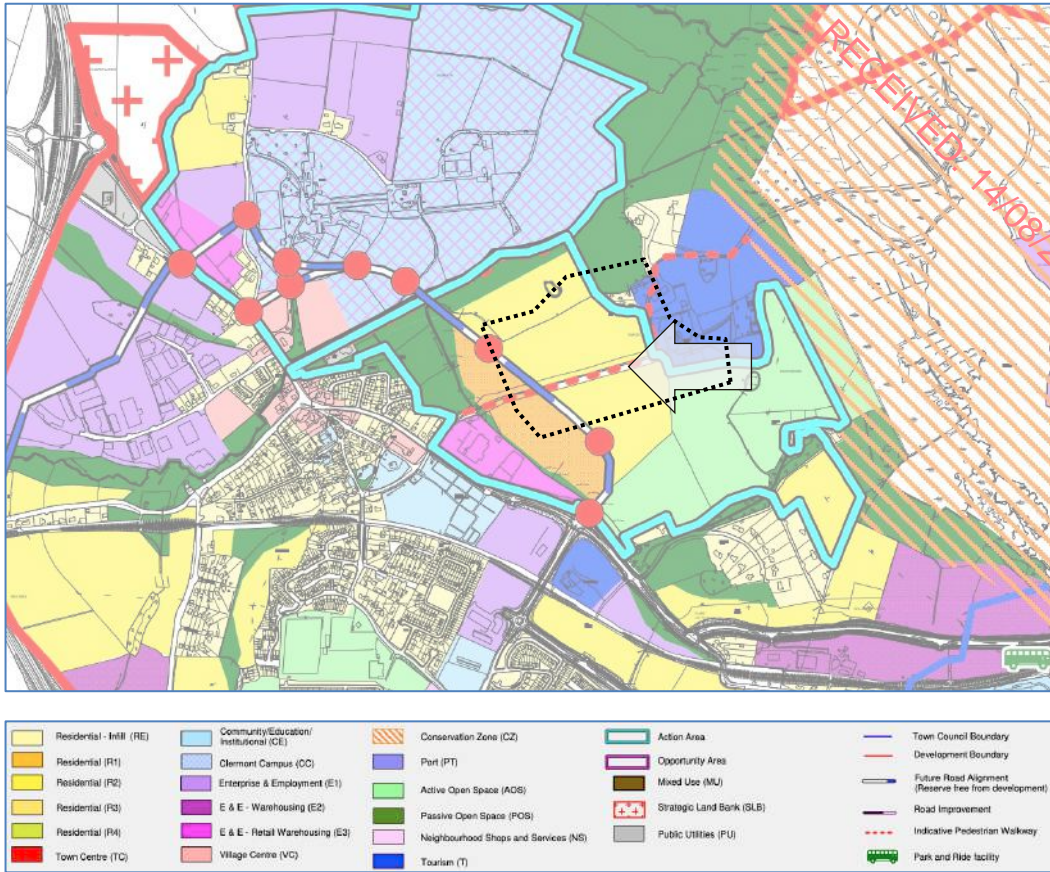


Figure 11.20 - Excerpt from Wicklow Town – Rathnew Development Plan 2013-2019 Zoning Objectives

Whilst it is clear that the site falls within an area that is planned for development, the written statement contains numerous objectives relating to landscape and visual matters. Chapter 3 ‘Residential Development’, and Chapter 11 ‘Built Heritage and Natural Environment’, contains a number of specific objectives of relevance, including:

- Chapter 3 Objectives R1, R2, NH1, NH2
- Chapter 11 Objectives NU7, NU8, NU9, and RN4.

11.6 Representative Assessment Viewpoints

It is not warranted to include each and every location that provides a view towards the proposed development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the assessment of visual impacts is structured around a total of 5 representative assessment viewpoint locations that are intended to reflect a range of different receptor types, distances and orientations, that help to inform the conclusions being made.

The viewpoints detailed in table 11.6 and illustrated in figure 11.4 are considered to be relevant to this application, in the context of this townscape, and pick up all key locations where the proposed development has the potential to generate the most notable effects. As such they are considered a comprehensive basis on which to communicate visual effects.

	Location	Approx Distance	Direction of view
VP1	R750 – view from the cycletrack	300m	North
VP2	R750 – view at the entrance to Tinakilly Lane	160m	North east
VP3	R772 on the M11 Rathnew/Wicklow approach	480m	East
VP4	Wicklow County Campus	350m	South East
VP5	Tinakilly Country House	100m	West

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Table 11.6 - Outline Description of Representative Viewpoints



Figure 11. 21 - Viewpoint Location Map

For each of the representative viewpoints, an existing (baseline) view is presented, together with a photomontage of the proposed development. Photomontages are a ‘photo-real’ depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale.

Where there is no visibility of the permitted or proposed development, an outline view has been produced to illustrate where the proposed development lies relative to intervening screening.

It is noted that the photography obtained for the photomontages represent summer conditions, and therefore that the effects of winter leaf loss is likely to increase the level of visibility towards the site generally. However, as can be seen in the photomontages (particularly VP1, VP2, and VP5), the density and, successive ‘layering’ of vegetation that occurs within this landscape, coupled with the relative elevation of visual receptors, will

result in a high degree of screening being maintained. In some views (such as VP2 and VP5), there is also a high proportion of evergreen content that will maintain a screening role throughout the year.

11.7 The Design Proposals and Embedded Mitigation

The development will be set within a framework of open space that includes private gardens, ancillary / curtilage open spaces, and generous swathes of open space that border the northern and western edge of the proposed development, within which recreational opportunities including looped trails have been incorporated.

The layout of the site can be seen Figure 11.22 11.5. A number of Computer-Generated Images (CGI) have been produced to illustrate the character of the proposals, and are presented at figure 6, figure 7, figure 8 and figure 9.



Figure 11.22 - Proposed layout and Computer-Generated Image (CGI) locations

The proposed development forms an extension of the first phase of the development which is currently under construction on lands to the south of the formal tree avenue approach to Tinakilly House and adjoining R750. Connections have been made with it in terms of both the character of the development, and physical road and trail connections, such that they present a unity of character and provide wider accessibility and connectivity benefits.



Figure 11.23 - CGI A

The site would be accessed via the entrance on the R750 through the adjacent site, but also via a new connection made to the west, off the roundabout on the R761 (north of the existing ALDI supermarket). Pedestrian pavements and active transport infrastructure has been integrated into the road layout.



Figure 11.24 - CGI B

The design of the scheme has been carefully considered, drawing reference to the site's adjacent and wider context, with the building frontages positively facing onto streets and public open spaces, and more strategically towards the wider landscape, avoiding abrupt and poorly considered runs of rear boundaries interfaces.

Whilst the proposals will result in the loss of some existing vegetation, the proposals have sought to substantively work with, and augment, the framework of vegetation within the site and along its boundaries, with existing mature vegetation being embedded within areas of open space as a feature of the development.



Figure 11.25 - CGI C



Figure 11.26 - CGI D

Landscape treatments and planting have also been employed to create areas of attractive and accessible public open space, and provide structure and character to the development, sensitively managing thresholds between areas that are predominantly public, from those that are more communal in nature. The layout of the development has also sought to create active frontages that face out onto areas of open space, affording passive surveillance.

The scheme is considered to represent a contemporary new residential built form set within a leafy, attractive suburban context, that will complement the character and quality of the wider urban area, and sensitively round off the northern urban edge in this direction. It is considered that the proposals represent a positive response to the overarching requirements of the Development and Design Standards presented in the Wicklow County CDP 2022-2028.

11.8 Townscape Impact Assessment

11.8.1 Townscape Sensitivity

In accordance with Section 5.5 of the GLVIA-2013, a townscape character assessment requires a particular understanding of, among other criteria, “*the context or setting of the urban area and its relationship to the wider landscape.*”

There is nothing unique about the land use pattern and character around the northern edge of Rathnew, which comprises other residential estates, commercial/retail premises, transport infrastructure, and former country estates. In a strategic planning role, the site is also categorised as being within an ‘Urban Area’, and together with the adjoining development site (which has been cleared and is undergoing extensive construction activities) has been zoned for substantial residential development.

Whilst the site is currently in agricultural use, and lies in close proximity to Tinakilly House and the Murrough Wetlands, it is not readily visible from many locations in the wider landscape, where views of agricultural land may be important in terms of the landscape setting, and has a strong physical relationship with the adjacent development site.

For the reasons outlined above, the townscape sensitivity of the site and its immediate surrounds is deemed to be **Medium-Low**.

11.8.2 Construction Phase Effects

During the construction stage there will be construction-related activity within and around the site, and nearby approach roads. This will include, but is not limited to:

- Site preparation works and groundwork operations;
- Intrusive foundation work including the installation of foundations and services;
- HGVs transporting materials to and from the site;
- Movement of heavy machinery on-site;
- Temporary storage of demolition debris / construction materials on-site;
- Security fencing/hoarding and site lighting.

Whilst the physical impacts to the site’s land cover will be permanent, and not readily reversible, the site is closely associated with the large area of adjacent land that is under construction, and which has been cleared and prepared for construction works. There will be impacts on the character of the study area as a result of the intensity of movement and clutter of temporary structures associated with the construction works, but these are likely to be minor in relation to the adjacent, and more visible site, and of a familiar scale and nature within an expanding townscape setting such as this. Construction stage effects on townscape character will be localised within the immediate setting and approach roads to the site.

Construction stage impacts on landscape/townscape character will be ‘short-term’ (i.e. lasting 1-7 years), in accordance with the EPA definitions of impact duration.

Significance of townscape effects (construction stage)

On the basis of the reasons outlined above, the magnitude of change is deemed to be **Medium-Low**. When combined with the **Medium-Low** sensitivity of the receiving townscape, the overall significance of effect is considered to be **Moderate-Slight / Negative**.

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11.8.3 Operational Phase Effects

Following the completion of the proposed works, townscape impacts will relate entirely to the development's impact on the character of the receiving townscape and whether this is positive or negative.

The most notable impacts will result from the permanent presence of new dwelling houses and associated infrastructure and landscaping. This will add considerable intensity of built development to this peri urban area, when considered against its former agricultural use. However, the intensity of built development is consistent with the emerging residential development being undertaken on the adjacent site, to which it forms a northwards extension, and its scale and form is considered appropriate to both its adjoining urban setting and the underlying zoning objectives. It is a low rise development of two storey dwelling houses that follows the profile of the site terrain, is of a high quality of design and finish, and is further integrated into its landscape setting through a considered landscape design that integrates open space around the northern and western boundaries of the site. Existing vegetation within and bounding the site has been afforded substantive retention, and has been enhanced with plentiful new planting, and incorporated into areas of open space. These considered measures will have a positive influence in terms of assimilating the development into its wider context, and affording the development an advanced level of maturity.

The proposals represent a nature and scale of development that is appropriate to the urban edge location, and is planned for through zoning objectives. It is not overly ambitious in terms of scale or site coverage and together with the adjacent development (under construction), will integrate well in this setting.

Significance of townscape effects (post construction / operational phase)

On the basis of the reasons outlined above, the magnitude of change is deemed to be **Medium to Low**. When combined with the **Medium-Low** sensitivity of the receiving townscape, the overall significance of effect is considered to be **Moderate-Slight / Positive**.

11.9 Visual Impact Assessment

11.9.1 Visual Receptor Sensitivity

All of the viewpoints are within a relatively contained peri-urban area with the main differential in visual receptor sensitivity relating to whether or not they represent residential receptors or those people within industrial / commercial areas or travelling on major routes. In terms of visual receptor sensitivity, the landscape surrounding the site is under development, and is zoned for urban development, and in this dynamic context where visual change is common and expected, visual sensitivity is not considered to be higher than **Medium-low**, and **low** for non-residential receptors.

11.9.2 Assessment of Visual Impacts

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed development (included elsewhere within the application). Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the existing view is presented, alongside the proposed development.

Construction Phase Visual effects

Effects during construction will be highly variable depending on the activity taking place, the angle of the view, and the degree to which activity would be visible. Views of construction activity has the potential to be noticeable, and visual effects will arise as a result of the presence of highly visible nature of construction related plant, views of fencing/hoarding, site lighting and temporary structures, and movement associated with the intensity of activity at the site.

Construction phase visual effects are an inevitable consequence of the development proposal being brought forward, and there are a range of standard best practice construction management measures able to moderate these during construction. Many views from the townscape surrounding the site are not immune to the influence of comparable construction activity given the works undertaken as part of phase 1. Indeed works at this adjacent site are comparatively more visible given its relative proximity to the urban edge and the reduced degree of screening.

Construction stage visual effects will be localised to the immediate landscape/townscape of the site, and key approach roads where increased construction traffic volumes may be noticeable, and will be 'short-term'.

Significance of visual effects (construction stage)

On the basis of the reasons outlined above, the magnitude of change is deemed to be **Medium**. When combined with the **Medium-Low** sensitivity of the visual receptor, the overall significance of effect is considered to be no greater than **Moderate-slight / Negative**.

A proportionate emphasis is made on the permanent effects of the development.

Operational Phase Visual effects

	Existing view	Sensitivity	Description and Magnitude of Visual Impact	Significance
VP1	Views towards the site (approximately 300m to the north) from the R750 and its accompanying cycletrack are experienced transiently, and are dominated by the foreground road context, within which extensive foreground residential development (undergoing construction), and features such as Rathnew Cemetery (south of the road) and the fuel supply commercial property (north of the road) present a mixed use urban context. Views of the site are precluded by vegetation.	Low	Whilst the roofline of the proposed development will be partially visible above the tree line in places, with likely increased filtered views during winter conditions, the change to the view is considered negligible in the context of the evolving foreground residential context, that will prevail in its influence on views. Overall, the magnitude of visual change is deemed to be Low – Negligible, and of a Neutral Quality.	Imperceptible / Neutral
VP2	Views towards the site at the entrance to Tinakilly Lane on the R750 (site is approximately 160m to the north east) are precluded by dense layers of vegetation lining the entrance to Tinakilly Lane.	Low	No views of the proposed development are anticipated.	No effect
VP3	Views towards the site from the R772 on the M11 Rathnew/Wicklow approach (site is approximately 480m to the east), are over the foreground parking area associated with the ALDI and Costa retail units adjoining the R761 intersection. Views of the site are precluded by recently built two storey properties at Claremont Grove (built since the photography was undertaken) which appear through the vegetative backdrop to the retail premises.	Low	No views of the proposed development are anticipated, as screened by properties at Claremont Grove. Any views between the properties would be difficult to discern.	No effect
VP4	Partial views of the site are possible in the middle distance from the rear car park area of the Wicklow County Campus (site is approximately 350m south east), as a result of the comparative elevation of the site and the sporadic nature of the intervening vegetation. The site contributes to the view generally as part of its wider agricultural setting, with views from this location being heavily influenced by mature vegetation associated with the campus (formerly Clemont House), and that which occurs in successive layers through the wider landscape.	Medium-Low	The proposed development would be visible in the middle distance in the foreground the mature vegetation that defines the horizon in this direction. Although partially visible, it is not considered that the additional of residential dwellings would alter the overall composition of the views, which would remain strongly influenced by the campus grounds, and which would in time become further restricted by maturing vegetation incorporated along the northern and western edges of the site. Overall, the magnitude of visual change is deemed to be Low. The development is not considered to notably detract from, nor enhance the view, and so is considered to be of Neutral Quality.	Slight/ Neutral
VP5	Views towards the site from the primary façade and entrance of Tinakilly House (site is within approximately 100m to the west of this location), are precluded by dense layers of vegetation along the western edge of the property.	High	Whilst there will be locations in the curtilage of the property that would obtain views, no views of the proposed development are anticipated from this key location owing to the density of ground level vegetation present along the western edge of the property and within the integrated parking areas, which is noted to contain a high proportion of ornamental, evergreen species.	No effect

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11.10 Landscape Visual Impact Mitigation Measures

11.10.1 Construction Phase

It is not considered that there are any additional mitigation measures required to reduce the anticipated construction phase townscape / visual effects over those that would be considered standard best practice construction management measures. It is anticipated that this may include aspects such as the timing of construction activities, which will be restricted in accordance with local authority guidance, and will likely be consistent with those enforced on nearby sites.

11.10.2 Operational Phase

Landscape and urban design measures are integral to the development proposals being assessed, and will help to assimilate built form within its surrounding context in a general sense whilst contributing to the character and quality of the development.

The layout of the development has sought to work with the existing framework of vegetation as far as practicable, augmenting this with additional planting. Whilst new planting is important to the character of the development, and will enhance the quality of the effects, it is not a case that its establishment will result in materially different impact judgements before and after landscape planting becoming established. In this regard, other than those features and characteristics of the development proposals that have been embedded into the design of the scheme, there are no additional townscape and visual mitigation measures considered necessary in this instance.

11.10.3 Monitoring

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. All landscape and planting works will be undertaken as soon as practicable in the planting season after completion of key civil engineering and building works. As supervised by a suitably qualified Clerk of Works.

All landscape works will be subject to an establishment phase for the initial three years from planting, with replacement plant material and required pruning measures captured in Landscape Management Plans (LMPs). LMPs are intrinsically linked to the successful establishment of landscape/townscape and visual mitigation measures and will form part of any planning approval.

Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place to ensure the successful long term establishment of all external landscape areas.

11.11 'Do Nothing' Scenario

The 'do nothing' impact presents the situation or environment that would exist if the Proposed Development were not carried out. The invariable consequence of this would be that the impacts and effects identified would not occur. In this regard, the following key scenarios are considered relevant.

The current land use of the subject site is not a land use which is likely to persist in the longer term due to the current residential zoning outlined in the Development Plan, and

the immediacy of other redevelopment works. In the event that the development does not proceed, it is likely that the subject site would be developed in the future for some residential and open space use.

If the site is left in its current state, as agricultural land use, the management of the fields and hedgerows will be likely to continue in its current manner and hence a neutral impact will persist on the existing landscape.

11.11.1 ‘Worst- Case’ Effects

The ‘worst-case’ effects arise when the mitigation measures (as proposed) substantially fail. In the case of this development, various measures of relevance to moderating townscape and visual effects have been incorporated within the layout proposed, and include considerations relating to layout, scale and disposition of development around the site. The worst case townscape and visual effects are therefore considered to relate primarily with the failure of planting proposed around the site.

The assessment provides judgements based on vegetation being in a relatively immature form, and as stated previously, it is not considered that the establishment of vegetation planted as part of the development will result in materially different impact judgements before and after landscape planting becoming established. As such, effects presented should be considered worst case.

It is also worthwhile noting that whilst plant failures can be an unfortunate reality on development sites, many of these can be readily attributed to site, plant material, or contractor issues, and quickly corrected. Holistic and widespread failure of plant material and other external landscape works is unlikely, and is not in the commercial interests of developers and contractors.

11.12 Residual Effects

11.12.1 Townscape Effects

The site lies close to the edge of Rathnew, an evolving urban area within the catchment of Wicklow that has undergone, and is undergoing, progressive expansion. The proposed site forms part of a wider planned area for growth, the evidence of which is seen locally, both at the adjacent site to the south, and in the development being carried out at Claremont Grove.

Effects to townscape character will naturally occur as a result of the change to the site’s agricultural use, and due to the intensity of built development on the site. This change is moderated by the evolving urban context, to which the proposals form a northwards extension, and its scale and form is considered appropriate to both this adjoining context and the underlying zoning objectives.

Although the proposed development will result in some ‘short-term’ and ‘negative’ construction stage impacts that are of ‘Moderate-Slight’ significance and ‘Adverse’ quality, the permanent operational stage impacts as a result of the development are deemed to be of ‘Moderate-Slight’ significance and ‘Positive’ quality.

This is on the basis that the proposed development has sought to complement the character and quality of the wider urban area, and sensitively round off the northern urban edge in this direction. Through a considered design, the proposals also work with, and augment, the framework of vegetation within the site and along its boundaries,

embedding mature vegetation within areas of positive open space that deliver wider townscape benefits, whilst delivering the underlying land use objectives.

11.12.2 Visual Effects

The proposed development would only be visible from a small number of proximate locations in the surrounding landscape/townscape, locations that are influenced by features associated with the urban edge of Rathnew such as highways infrastructure, residential development, commercial/retail developments, and large scale urban development projects. Where visible, this would generally only be partially in nature, where new built form seen above and through existing tree lines and any foreground built form that does not preclude views.

Although the proposed development will result in some 'short-term' and 'negative' construction stage impacts that are of 'Moderate-Slight' significance, and 'Adverse' quality, the permanent operational stage impacts as a result of the development are deemed to be of no greater than 'Slight' significance. In all instances where the development was visible, the quality of the effects were considered Neutral.

The extensive landscape proposals incorporated into the proposed layout would further assimilate built form into the visual context and progressively provide a degree of screening.

11.13 Interactions

This section considers the interaction between the identified townscape and visual effects and those identified within various other chapters within the EIAR. It is not considered that any of the interactions have the potential to be notable, and for relevant topic areas where potential interactions were identified, some narrative has been included.

11.13.1 Population and Human Health

Reference is made to Chapter 4 – Population and Human Health. Existing residents, workers and visitors, and those travelling towards Wicklow may be aware of a change at this site, as with the adjacent site. The impacts associated with human beings focuses on the visual effects of the Proposed Development, as discussed within the main body of the assessment.

The design of the Proposed Development has considered in detail the opportunities to integrate the Proposed Development with the existing village. In this regard, the proposed development seeks to provide high quality areas of public open space, and recreational opportunities (such as looped trails) that were not previously available. Such a transformation, whilst notable, is a zoned objective for the site, and the proposed development is considered to represent a high-quality urban intervention that assimilates sensitively with its wider landscape/townscape and visual setting.

11.13.2 Biodiversity

Reference is made to Chapter 8 – Biodiversity. The Proposed Development seeks to provide a range of public and semi-public open spaces that will provide for a range of plant types and will encourage the development of local habitats.

Through the retention and enhancement of existing vegetation, including hedgerows and mature trees, and the planting of new vegetation, the long-term effects of the Proposed Development are considered to be positive, providing a successional tree stock that will enhance the long term character of the site, its relationship with the wider agricultural context and provide habitat value. Other areas of grassland and wildflower within the open spaces will further add to the diversity of native flora and provide biodiversity benefits.

11.13.3 Air Quality and Climate

Reference is made to Chapter 9 – Air Quality and Climate. It is widely considered that tree planting has a positive influence on air quality and climate as a result of the removal of air pollutants and the reduction in urban air temperatures. In this regard, the proposed development includes a notable amount of new planting.

11.13.4 Architectural, Archaeological and Cultural Heritage

Reference is made to Chapter 12 – Architectural, Archaeological and Cultural heritage. The site lies close to Tinakilly Country House, a listed building set in mature grounds comprising designed gardens with mature tree, hedgerow and shrub boundaries. The layout of the development occurs within the zoned area, and has considered the retention and augmentation of mature vegetation around the boundaries of the site, important in terms of screening the proposed development from the immediate curtilage of the listed property.

Together with the emerging residential development to the south of the formal Oak lined approach on Tinakilly Lane, the development will form part of the approach to the house, and generate a stronger physical relationship between the property and its wider urban area.

11.13.5 Material Assets

Reference is made to Chapter 15 – Material Assets. The Proposed Development is urban in character and has been designed to integrate with existing and emerging built services and infrastructure. The proposed development would result in new built services and infrastructure, and an increase in pedestrian and vehicle activity on the site and within the surrounding urban network, albeit this is considered consistent with its urban location, and in the context of being zoned for development.

Whilst new infrastructure and increased pedestrian and vehicular activity have the potential to result in townscape and visual impacts, this is not considered to be significant in the context of the existing road use and in light of that anticipated by the redevelopment of the site. Infrastructure has been designed to integrate with the existing context, and appropriate design responses have sought to avoid conflict with existing and proposed services.

11.14 Potential Cumulative impacts

Within a cumulative assessment, the baseline against which landscape and visual effects are assessed is extended to consider other relevant schemes that are not currently present in the landscape but that are subject to a valid planning application (or have been permitted) as being operational. Cumulative effects therefore represent any increased

effects that may be generated by the development in a scenario where other relevant schemes in the locality are operational.

In accordance with GLVIA3, schemes that are at feasibility and pre-planning are not generally considered to be appropriate in the context of a cumulative assessment due to a lack of certainty that they will come forward and because of an absence of detail that enable any meaningful judgements to be made. The cumulative assessment follows the same process with the exception that the baseline is extended to assume this development is built and is present in the baseline view.

Whilst it is acknowledged that there are numerous development projects underway and planned in the area surrounding Rathnew, and that much of the urban fringe landscape is subject to land use zoning objectives that promote targeted development activities (see **Error! Reference source not found.**), the primary cumulative scheme considered in relation to potential cumulative townscape and visual impacts relates to the adjacent development site to the south. This development is currently under construction, which to a substantial degree has informed the assessments made. Nonetheless, the cumulative baseline is extended to include as built and present in the landscape, this development, to which the proposed development constitutes a northern extension.

It is not considered that the Proposed Development would result in any additional townscape effects in light of a baseline that considers the adjacent residential development built and operational. Whilst it would alter the character of the site at the immediate level, it is of a similar character, scale, and quantum to the surrounding fabric of the village, and would assimilate as part of the village with limited wider influence.

The assessment viewpoints demonstrate that there are very few locations from where the developments would be seen in combination. Any combined visibility would be marginal in nature and would have limited influence on the visual experience of the townscape. Where visible, they would be seen as a collective development, consistent with the zoning objectives of this wider area.

11.15 **Summary**

The land between Wicklow Town and Rathnew has accommodated a number of housing and office / commercial development projects, that have gradually blurred the separation between the two settlements, and the site forms part of a wider action area, that is recognised in the development plan as being a strategic site to accommodate residential development.

The proposed development of this site is not considered to have the potential to generate any operational adverse townscape or visual effects greater than slight, and no effects that are considered to have the potential to be significant. Townscape and visual effects of the proposed development relate to a geographically restricted area, with negligible influence beyond approximately 500m.

Together with the adjacent site under construction, it is considered to have the potential to form a positive addition to the urban edge in this direction.

12 ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL HERITAGE

12.1 Introduction

IAC Archaeology has prepared this chapter on behalf of Keldrum Ltd to assess the impact, if any, on the archaeological and cultural heritage resource of a proposed residential development at Tinakilly, Co. Wicklow (ITM 729330, 695758, Figure 12.1).

This study determines, as far as reasonably possible from existing records, the nature of the archaeological, architectural and cultural heritage resource in and within the vicinity of the application area using appropriate methods of study. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (Chartered Institute for Archaeologists 2014).

This leads to the following:

- determining the presence of known cultural heritage sites that may be affected by the proposed development;
- assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- production of detailed mitigation measures based upon the results of the above research.



Figure 12.1 – Location of Proposed Development Area

The assessment has been informed by a programme of geophysical survey and archaeological testing.

12.2 Methodology

12.2.1 Guidance and Legislation

The following legislation, standards and guidelines were also consulted as part of the assessment.

- National Monuments Acts, 1930-2014
- The Planning and Development (Strategic Infrastructure) Bill, 2006
- Heritage Act, 1995
- EPA 'Advice Notes for preparing Environmental Impact Statements' (Draft 2015)
- EPA Guidelines on the information to be included in Environmental Impact Statements' (2022)
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands

12.2.2 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

'Cultural Heritage' where used generically, is an over-arching term applied to describe any combination of archaeological and cultural heritage features, where:

The term '*archaeological heritage*' is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places).

The term '*cultural heritage*', where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

12.2.3 Consultations

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

Department of Housing, Local Government and Heritage [DoHLGH] – the Heritage Service, National Monuments: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database and Preservation Orders.

National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland.

Wicklow County Council: Planning Section.

Trinity College Dublin, Map Library: Historical and Ordnance Survey Maps.

12.2.4 Desk Study

A study area of 500m was examined in order to inform this assessment. The following sources were examined:

- Record of Monuments and Places for County Wicklow;
- Sites and Monuments Record for County Wicklow;
- National Monuments in State Care Database;

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- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Wicklow County Development Plan (2022–2028);
- Wicklow Town and Rathnew Development Plan (2013–2019);
- Aerial photographs;
- Excavations Bulletin (1970–2023).

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Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as ‘un-located sites’ and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument. The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Topographical files of the National Museum of Ireland is the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development area.

Development Plans contain a catalogue of all the Protected Structures, Architectural Conservation Areas and archaeological sites within the county. The Wicklow County Development Plan (2022–2028) and Wicklow Town and Rathnew Development Plan (2013–2019) were consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey, Google Earth and Bing Maps.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970-2023.

12.2.5 Geophysical Survey

Geophysical survey is used to create ‘maps’ of subsurface archaeological features. Features are the non-portable part of the archaeological record, whether standing structures or traces of human activities left in the soil. Geophysical instruments can detect buried features when their electrical or magnetic properties contrast measurably with their surroundings. In some cases, individual artefacts, especially metal, may be detected as well. Readings, which are taken in a systematic pattern, become a dataset that can be rendered as image maps. Survey results can be used to guide excavation and to give archaeologists insight into the pattern of non-excavated parts of the site. Unlike other archaeological methods, the geophysical survey is not invasive or destructive.

A geophysical survey was undertaken to inform this assessment in February 2022 within the proposed development area in Tinakilly and Newrath townlands (Dowling 2022, Licence No. 22R0023). A summary of the geophysical report is presented in Section 12.3.7 and the full text included in Appendix 12A.

12.2.6 Archaeological Testing

Archaeological Test Trenching can be defined as ‘a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality’ (ClfA 2020a, 4). A programme of archaeological testing based on the results of the geophysical survey was carried out within the proposed development area in April 2022. This was undertaken by David McIlreavy of IAC under licence 22E0213 (McIlreavy 2022, Licence No. 22E0213, Figure 12.9). Detailed results of the archaeological testing are included in Section 12.3.8 and Appendix 12B of this report.

12.2.7 Impact Assessment Methodology

The quality and type of an effect can be classed as one of the following (as per the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports [EPA 2022]):

- negative effect: A change which reduces the quality of the environment, for example a change that will detract from or permanently remove an archaeological or cultural heritage site from the landscape;
- neutral effect: A change which does not affect the quality of the environment; or

- positive effect: A change which improves the quality of the environment, for example a change that improves or enhances the setting of archaeological or cultural heritage sites.

The below terms are used in relation to the archaeological, architectural and cultural heritage and relate to whether a site will be physically affected upon or not:

- direct effect: Where an archaeological/cultural heritage feature or site is physically located within the footprint of the proposed development and entails the removal of part, or all, of the monument or feature; and
- indirect effect: Where a feature or site of archaeological or cultural heritage merit or its setting is located in close proximity to the footprint of a development.
- Neutral: No effects (either negative or positive) are predicted.

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

Table 12.1: Significance of Effect Definitions (as defined by the EPA 2022 Guidelines, 50-52)

12.3 The Existing Receiving Environment: Archaeology and Cultural Heritage

12.3.1 Archaeology Background

The proposed development area is located within the townland of Tinakelly and Newrath, in the parish of Rathnew and the barony of Newcastle. The site is located partially within the former demesne lands associated with Tinakelly House. This is one recorded monument within the proposed development area. This site was first identified by geophysical survey (Dowling 2022) and confirmed by archaeological testing in 2022 (McIlreavy 2022), but was added to the SMR in July 2023. It is scheduled for inclusion in the next revision of the RMP as an enclosure; however, archaeological investigation has confirmed that the feature is likely a barrow of Bronze Age date. There are a further six archaeological sites within the 500m study area of the proposed development, all of which are scheduled for inclusion in the next revision of the RMP (Figure 12.2). The townland boundary between Newrath to the north and Tinakelly to the south traverses the proposed development area and is substantially intact as a field boundary.

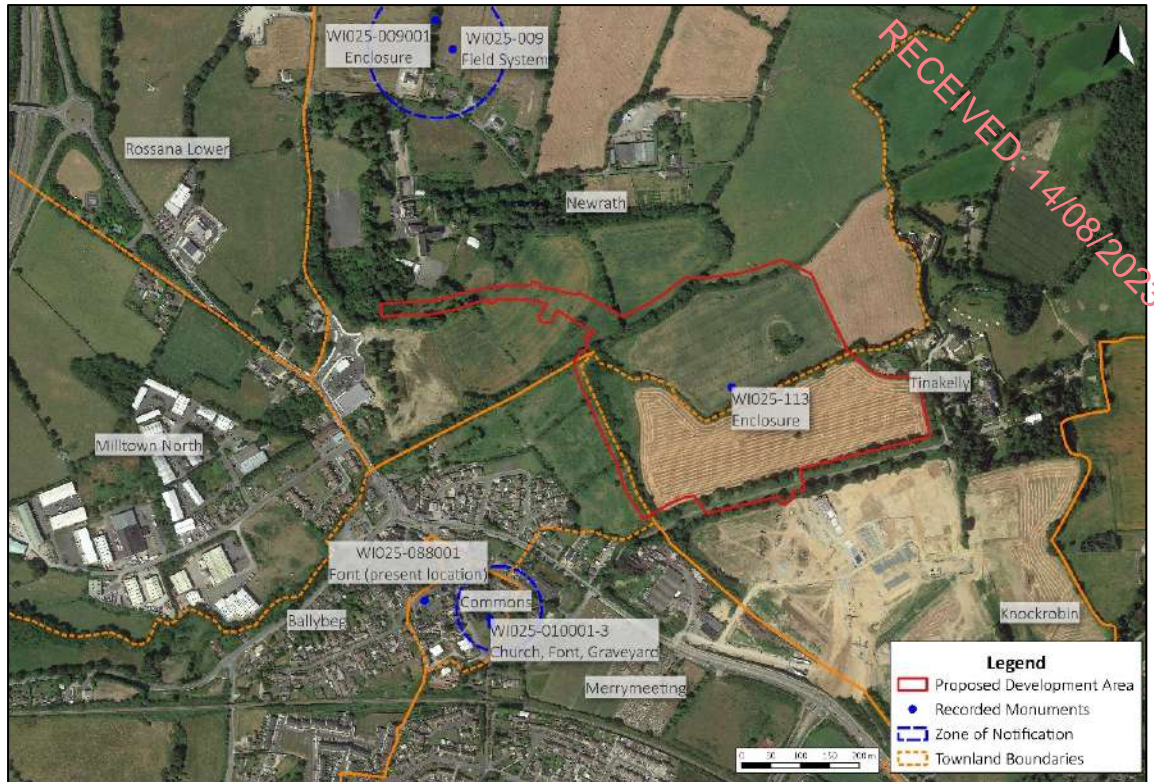


Figure 12.2 – Recorded monuments in the study area

Prehistoric Period

Mesolithic Period (c. 8000–4000 BC)

Although very recent discoveries may push back the date of human activity by a number of millennia (Dowd and Carden 2016), the Mesolithic period is the earliest time for which there is clear evidence of prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. This period of prehistory is characterised mainly by flint tools and the debris from their manufacture.

Evidence for settlement during this period is rare, although potential Mesolithic activity has been identified in County Wicklow, such as a lithic scatter (WI025-039) in Wicklow town, c. 3.4km southeast of the proposed development area. This consisted of a scatter of flint artefacts including some later Mesolithic elements. A further lithic scatter (WI019-038) located c. 3.2km north-northeast of the proposed development area in the townland of Clonmannan, contained similar elements. Mesolithic activity is also often identified in coastal areas or adjacent to waterways, as is the case with both of these recorded examples of a lithic scatter (WI025-039 and WI019-038). The proposed development area is located c. 1.3km from the current coastline to the east, however, it is believed the position of the coast line has changed since the Mesolithic period. There are no recorded sites of Mesolithic date within the study area of the proposed development area.

Neolithic Period (c. 4000–2500 BC)

During the Neolithic period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. This transition was accompanied by major social change. Agriculture demanded an altering of the physical landscape; forests were rapidly cleared and field boundaries constructed. There was a greater concern for territory, which saw the construction of large communal ritual monuments called megalithic tombs, which are characteristic of the period. Whilst there are no Neolithic sites recorded within the immediate landscape, a number of megalithic tombs are recorded along the coast in County Wicklow and within the mountains to the northwest,

indicating that there were Neolithic communities utilising the wider environs of the proposed development area.

Bronze Age (c. 2500–500 BC)

The Bronze Age in Ireland was marked by the use of metal for the first time. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. Megaliths were replaced in favour of individual, subterranean cist or pit burials that were either in isolation or in small cemeteries. Two ring-ditches (W1025-052/001) likely to represent Bronze Age burial monuments were excavated within the townland of Milltown North prior to the construction of the M11, c. 813m to the west of the proposed development area.

The *fulacht fia* or burnt mound is the most common Bronze Age and prehistoric site within the archaeological record with tens of thousands recorded in the country. Although burnt mounds of shattered stone occur as a result of various activities that have been practiced from the Mesolithic to the present day, those noted in close proximity to a trough are generally interpreted as Bronze Age cooking/ industrial sites. *Fulachtaí fia* generally consist of a low mound of burnt stone, commonly in horse-shoe shape and are found in low lying marshy areas or close to streams and rivers. Often these sites have been ploughed out and survive as a spread of heat shattered stones in charcoal rich soil with no surface expression in close proximity to a trough. Multiple *fulacht fia* and burnt mounds have been excavated within the landscape surrounding the proposed development, although the closest recorded example (W1025-055) is located c. 954m to the west. Most recently, suspected burnt mound deposits, a cremation pit, kiln and furnaces, and other habitation features were recorded in the adjacent field, c.30m south, during 2021 (Duffy & Lacey 2021a, Duffy and Lacey 2021b; Licence No. 21E0225). Most of the artefacts recovered have dated to the prehistoric period, primarily the Bronze Age.

A number of flint artefacts have been recovered from Tinakelly townland during field walking in 2006 (NMI files); however, the exact location of where the finds came from is not recorded within the files.

Archaeological testing carried out as part of this assessment identified three discrete pit features (AA1, 3 and 7) and two Bronze Age barrow features (AA4 and 5), within the proposed development area (McIlreavy 2022). These appears to suggest the proposed development area formed or formed part of a Bronze Age funerary landscape. Three pieces of flint recovered from the surface of subsoil across the proposed development site suggest previously unrecorded archaeological activity. The features identified in AA4 are now scheduled for inclusion in the next revision of the RMP under W1025-113. This feature was added to the record in July 2023; however, it is recorded as an 'enclosure'. Investigations have confirmed this feature is a barrow of probable Bronze Age date.

Iron Age Period (c. 800 BC – c. AD 500)

There is increasing evidence for Iron Age settlement and activity in recent years as a result of development-led excavations as well as projects such as Late Iron Age and Roman Ireland (Cahill Wilson 2014). Yet this period is distinguishable from the rather rich remains of the preceding Bronze Age and subsequent early medieval period, by a relative paucity within the current archaeological record. The Iron Age in Ireland is problematic for archaeologists as few artefacts dating exclusively to this period have been found and without extensive excavation it cannot be determined whether several monument types, such as ring-barrows or standing stones, date to the late Bronze Age or Iron Age. It is likely that there was significant continuity in the Iron Age, with earlier monuments re-used in many cases. There are no known monuments in the vicinity of the proposed development area that would suggest an active presence of Iron Age communities in this area.

Early Medieval Period (AD 400–1169)

The early medieval period is depicted in the surviving sources as entirely rural characterised by the basic territorial unit known as *túath*. Byrne (1973) estimates that there were probably at least 150 kings in Ireland at any given time during this period, each ruling over his own *túath*. During this period, enclosures known as ringforts were common throughout the country. These enclosed farmsteads were intimately connected to the division of land and the status of the occupant. A *bóaire*, for example, was a free farmer possessed of a plough team of oxen with household servants, workmen and dependants of various status, from free to unfree (MacCotter 2008). It is likely that many of the single univallate ringforts relate to residences of *bóaire*. Larger, more prominently placed ringforts, with more than one enclosing wall or bank are likely to have been the residences of local kings (Stout 1997). Extant dating evidence suggests they were primarily built between the 7th and 9th centuries AD (ibid, 22–31).

Ringforts are usually defined as a broadly circular enclosure delimited by an earthen bank and ditch (rath) or by a stone wall (cashel or caher). The space enclosed by the ditch or wall is known as the *lios* in early literature. The majority of ringforts represent individual defended family homesteads (O’Sullivan et al. 2014). Many sites recorded as enclosures may represent early medieval ringforts or similar sites, which are now denuded or do not meet the shape and size expectations for the ringfort classifications. Others may represent animal pens.

Evidence for early medieval burial was identified during excavations in 2006, c. 682m to the south-southeast of the proposed development area. A total of 191 burials were excavated, which were found in association with the remains of a medieval church. The burials that were excavated were thought to have been interred over a period from AD 600 to AD 1600 (W1025-011001/6).

A sherd of early-medieval pottery, as well as a key-hole shaped kiln (characteristic of the early medieval period), were identified during 2021 excavations c.30m to the south (Duffy & Lacey 2021a, Duffy and Lacey 2021b; Licence No. 21E0225).

Medieval Period (AD 1169–1600)

In 1169 the first of the Anglo-Norman landings and invasions took place in County Wexford, at the invitation of the former king of Leinster, Dermot MacMurrough Kavanagh. The Anglo-Normans, joined by 500 Uí Chennselaig men, took the Viking town of Wexford. Through a policy of military force and integration, the Anglo-Normans colonised much of the country. Marriages between Norman leaders and the women of Ireland’s great families aided this integration. The Norman feudal culture, techniques, language and legal systems were to have a profound effect in the county after 230 years of Norse influence.

The Anglo-Normans were an important influence in the creation of an urban network in medieval Ireland. In County Wicklow, they expanded and developed the settlements at Arklow and Wicklow and were responsible for the foundation of a number of new urban centres and boroughs (settlements which had the legal privileges of towns but seem to have functioned as large villages). These were located at Bray, Killickabawn, Mulsoes Court (Powerscourt) and Newcastle. With the possible exception of Bray, all of these settlements were to be abandoned or at least partly deserted in the 14th and 15th century.

The castle of Wicklow (W1025-013) was granted to Strongbow by Henry II in 1174 (SMR File). The context in which the reference appears suggests that the castle may have had a pre-Norman origin and it is unclear whether there was any settlement associated with the castle. Strongbow then granted the Cantred of Wicklow to Maurice Fitz Gerald in 1176, with burgages in the town confirmed to St. Mary’s Abbey, Dublin prior to 1199. Due to the town’s position on the estuary of the Vartry River, it was often subject to attack by the

native Irish and was captured and burned by the Irish in 1301. However, it continued to remain as an isolated outpost of the Pale until the 16th century. The castle (WI025-013) is recorded c. 1.51km to the southeast of the proposed development area.

The closest sites to the proposed development area that date to this period are located c. 682m to the south-southeast. They consist of a church and graveyard (WI025-011001 and 6) and a deserted medieval settlement (WI025-011004). Several phases of church construction were identified during an excavation in 2006, where the foundations were exposed and recorded. The SMR file for the site records that during the mid-20th century a Romanesque doorway and tub-shaped font were removed from the site and taken to the Protestant Church in Wicklow Town. This suggests that the church was medieval in date. However, the presence of early medieval burials on the site (mentioned above) may indicate that it replaced an earlier structure. During the same excavation, 191 burials were excavated from a graveyard associated with the church. This burial ground extended outside of the area proposed for development at that time.

To the east of the church and graveyard the possible remains of a deserted medieval settlement were identified in 2002 (WI025-004). The site had been subject to some post medieval and modern disturbance, but a number of pits and ditches were identified along with pottery and animal bone.

Post-Medieval Period (AD 1600–1900)

With the ending of the Williamite Wars, County Wicklow, like the rest of Ireland, entered an era of comparative political calm. Interest in Ireland was revived and it was during this period that Wicklow Town became an important port and garrison. Consequently, the county's landowners, now secure in their positions, commenced the building of new mansions. They were now in a position to experiment with the latest styles of architecture without the need to refer to defensive matters. At the outset many landowners were constrained by a lack of resources and therefore the first-generation mansions were of relatively modest scale and relatively plain in appearance. However, as the sense of security of the Irish aristocracy grew over the following decades, their greater access to wealth helped foster a shift towards more ostentatious buildings.

Palladianism was to dominate architecture in both Ireland and Britain in the half century after 1714. County Wicklow possesses two of the finest examples of large Palladian mansions to be seen anywhere in both countries, Powerscourt House (1731-40) and Russborough House (1741-48), both the work of the German-born architect, Richard Castle (1690-1751). Although few landowners could aspire to the exuberant grandeur of a Powerscourt or a Russborough, many of the succeeding generations of landowners were affluent enough to make important architectural statements. An example of Palladianism on a more modest scale, is the house at Clermont, which dates to the 18th century and is located c. 162m north of the proposed development area. The proposed development area extends within the former parkland of Clermont, at its northwestern extent. The house at Clermont endured a number of additions and alterations, which have somewhat denuded its character. It was used as a boarding school for girls from 1956 until 2006 and currently forms part of the Wicklow County Campus, which focuses on higher education and local enterprise.

An important element of an 18th or early 19th century country house was its setting. The earlier geometric landscapes favoured by continental Europe were replaced during the 18th and 19th centuries by designed parkland settings, which were intended to create a 'natural' backdrop for the country houses. These demesnes involved a great deal of landscaping, as earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the demesne. The proposed development area

is located partially within such a landscape, which was originally established in association with Tinakelly House (RPS 25-15).

The house at Tinakelly Upper, located to the north of the current house, was occupied in 1838 by the Rev. John Dixon, who by this time had acquired a substantial amount of the townland of Tinakelly, including this house and Tinakelly Lower, which he had let to a tenant. Tinakelly Upper was described by Lewis in 1837 as “Upper Tinakelly, of the Rev. Mr. Dixon, commanding an extensive view of the coast from Bray Head to Wicklow Head”. The situation may have provided a better view, being higher up than Tinakelly Lower, but the house was not as large. Griffith’s Valuation put an annual value of £20 on the house at Tinakelly Upper, while that at Tinakelly Lower was valued at £23-10s.

In the 1870s the property at Tinakelly was acquired by Captain Robert Halpin. Halpin had been born in the Bridge Tavern in Wicklow town, which was owned by his parents. He went to sea at the age of eleven and progressed rapidly to gain his first command at the age of 22. His career was eventful, culminating in his appointment as captain of the Great Eastern, which had been converted to cable laying. Robert Halpin successfully laid the first telegraph cable across the Atlantic from Valentia in Kerry to Newfoundland in 1866, following which he laid cables across the Atlantic from France, from Bombay to Aden and the Suez, from Australia and New Zealand to the East Indies, from Madras via Singapore to Penang and between Madeira and Brazil. In all, he is said to have laid approximately 37,000 kilometres of cables.

Among the many honours accorded to Captain Halpin was a sum of money voted by the government to fund the construction of a fine house – this was in recognition of the immense contribution he had made to the improvement of world communications, including communications between different parts of the empire, which improved administration and fostered trade. Halpin acquired the house and lands at Tinakelly Upper and built his own house on the lands adjacent to the eastern end of the fine avenue. The architect for the house was one of the best-known architects in Ireland at the time, James Franklin Fuller. The house was completed in 1883 and Captain Halpin died there at the age of 57. The original house at Tinakelly appears to have remained extant and in use into the early 20th century, but is no longer present today. A number of ruined stone outbuildings originally associated with this house are present.

12.3.2 Summary of Previous Archaeological Fieldwork

Geophysical survey and archaeological testing were carried out within the proposed development area to inform this assessment. Summaries of the results of these investigations are presented in Sections 12.3.7 and 12.3.8 and the full reports can be found in Appendices 12A and 12B.

Geophysical Survey was undertaken to the immediate south of the proposed development area in 2017 by Target Archaeological Geophysics (Nicholls 2017, Licence No.: 17R0126). No responses of definite archaeological activity were recorded within the surveyed area. Archaeological monitoring and excavation in 2021 were subsequently undertaken at the same site (Duffy & Lacey 2021a, Duffy and Lacey 2021b, Licence 21E0225). Fourteen areas of archaeological potential (AA1-AA14) were identified during the archaeological monitoring of topsoil stripping. Further investigation showed that the potential features in two of these areas (AA5 and AA12) were of no archaeological significance. Most of the areas contained a small number of archaeological features, with two areas (AA7 and AA10) containing more than 10 features. Most of the artefacts recovered – namely Bronze Age pottery sherds and flint artefacts – date to the prehistoric period. The exception to this was AA3, where a figure-of-eight-shaped kiln and two furnaces were identified. A rim sherd of medieval pottery, probably Leinster Cooking Ware, was recovered from the basal fill of the kiln and a quantity of metallurgical waste was recovered from the furnaces.

Two areas (AA2 and AA13) contained troughs and pits relating to burnt mound activity, which primarily date to the Bronze Age. In AA1 a hearth and a pit were recorded. Bronze Age pottery and flint debitage were recovered from the fill of the pit. AA6 contained a single pit. No immediately diagnostic material was recovered from this pit. The most interesting feature identified in AA7 was a cremation pit containing a token deposit of cremated human remains. The cremated bone was contained in a basal fill, which appears to have been capped with a granite stone before being infilled. In addition, to the cremation pit, AA7 contained two kilns, 12 pits, four postholes and four stakeholes. All finds recovered from the features in AA7 appear to be Bronze Age in date.

Two pits, two postholes and two stakeholes were recorded in AA8. Flint debitage recovered from the fill of one pit and one posthole indicate a prehistoric date for this activity. Three pits and a single stakehole were identified in AA9. Flint debitage recovered from the basal fill of one of the pits again indicates a prehistoric date for this activity. AA10 contained two kilns, seven pits and three postholes. All artefacts recovered, point to a Bronze Age/ prehistoric date. A single, large pit was recorded in AA11, with flint debitage recovered from the fill. Four pits were identified in AA14. A significant number of flint fragments recovered from one of the pits in AA14 could indicate that it was an area where flint knapping was carried out.

AA4 contained a keyhole-shaped kiln. The shape of the kiln is indicative of an early medieval date, but no immediately datable material was recovered from the fill of this kiln. Straw fragments identified in the upper fill indicate that it was disturbed by recent agricultural activity.

Archaeological testing identified a burnt mound, c.280 to the southwest at Merrymeeting in Rathnew town (Licence No. 15E0147 & 15E0147ext, Bennett 2015:309/ 2015:308). The burnt mound was preserved in situ.

12.3.3 Cartographic Analysis

William Petty's Down Survey Map of the Barony of Newcastle, c. 1654-56

The function of the Down Survey maps was to identify and record ownership of land throughout Ireland to facilitate the 'transfer' of the lands from Catholics to Protestants. The lands containing the proposed development area as 'unforfeited lands' and as such no detail is shown. This indicates that the lands were in the ownership of Protestants and were therefore not confiscated and redistributed.

Jacob Nevill's An Actual Survey of the County of Wicklow, 1760 (Figure 12.3)

This map shows the town of Wicklow, the village at Rathnew and a number of significant residences within the vicinity. A house is shown and labelled as 'Tinakelly' in the This house represents the earlier structure at Tinakelly, later known as Tinakelly Upper, as the extant Tinakelly House was built until the 19th century. Clermont House is also noted to the northwest.

Taylor and Skinner's Maps of the Roads of Ireland, 1777/83

There is little change by the time of this map. Tinakelly, (later known as Tinakelly Upper) is in the ownership of Radcliffe Esq. Clermont is also depicted and is annotated as in the possession of Prior Esq.

Arthur Neville's Map of the County of Wicklow, 1798 (Figure 12.4)

This map depicts three houses within the townland of Tinakelly, although they are not named. The eastern most house appears to represent Tinakelly Lower as it is close to the coast. It would appear that the central house represents Tinakelly Upper, with the house closest to the main road not shown on later maps. It is not clear as to whether this house was located within the proposed development area. A large house is shown at Clermont to the northwest.



Figure 12.3 – Extract from Nevill's map of 1760, showing the approximate location of the proposed development area

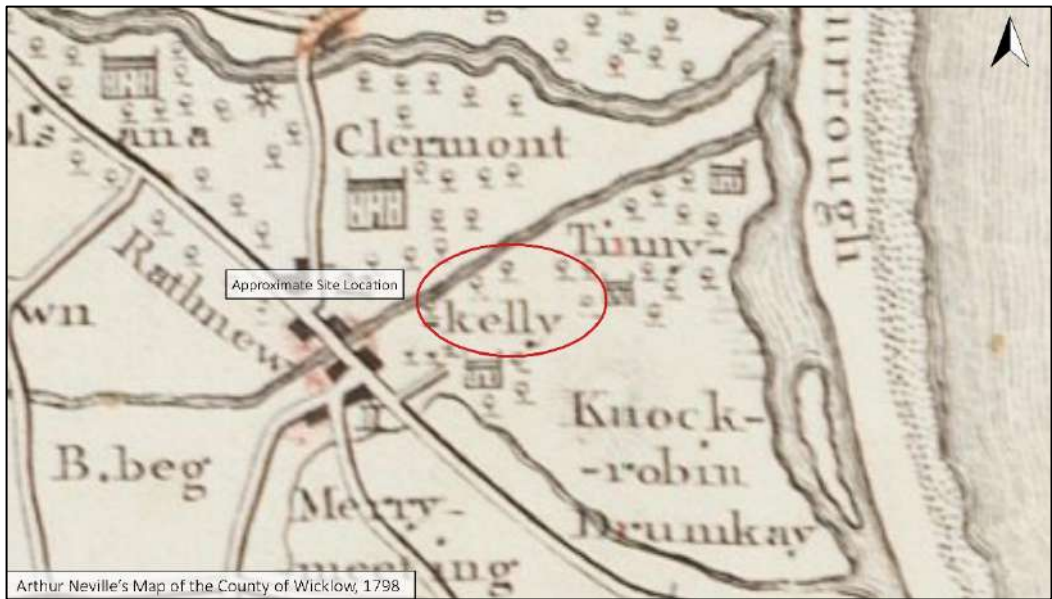


Figure 12.4 – Extract from Neville's map of 1798, showing the approximate location of the proposed development area

First Edition Ordnance Survey Map, 1838, scale 1:10560 (Figure 12.5)

This is the first accurate historic mapping coverage of the landscape that contains the proposed development. The townland boundary between Newrath to the north and Tinakilly to the south bisects the proposed development area. This boundary also acts as the boundary of the demesne of Tinakilly Upper. The areas of the proposed development south of the townland appear to form part of the former parkland, while the principal structure is depicted to the immediate east. The northern half of the proposed development area appears to be in use as agricultural land divided into three fields. An avenue leading to Tinakilly Upper borders the proposed development area to the south.

The proposed development area, where it extends to the northwest, also enters the former demesne for Clermont.

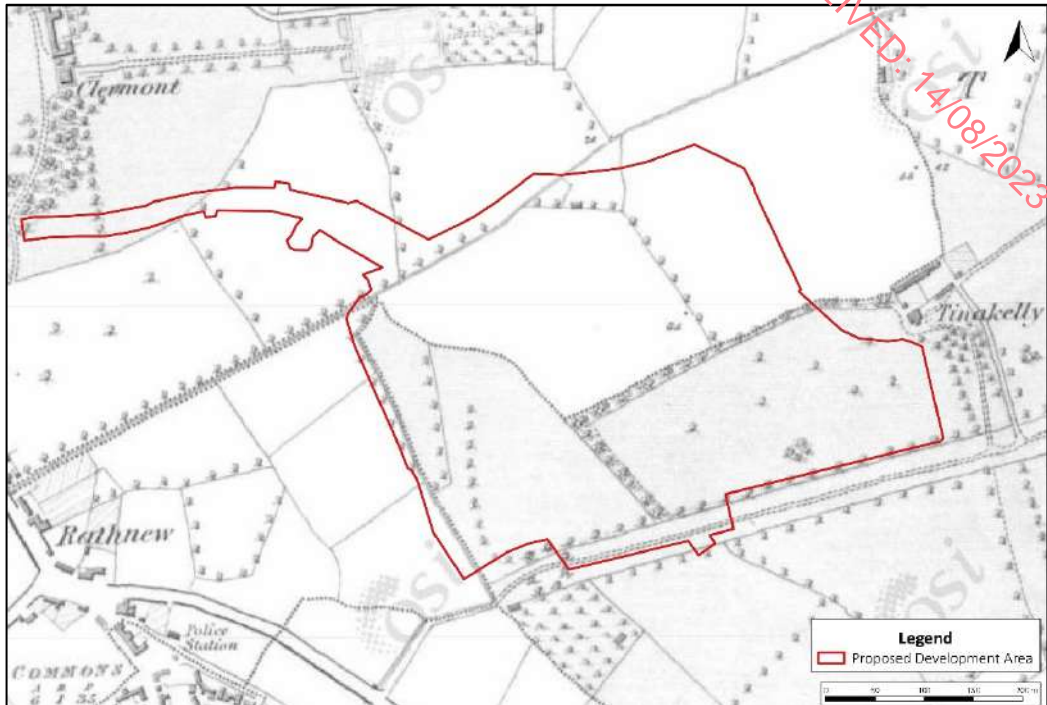


Figure 12.5 – Extract from the first edition OS map of 1840 showing the proposed development area

Ordnance Survey Map, 1885-7, scale 1:10560

There are no significant changes to the proposed development area by the time of this map.

Ordnance Survey Map, 1910, scale 1:2500 (Figure 12.6)

By the time of this map, the three agricultural fields shown on the first edition OS map have been amalgamated into a single large field north of the townland boundary. The southern and western portions of the site remain within the parkland of Tinakilly. Both Tinakilly Upper and the more recent Tinakilly House are shown and labelled to the east of the proposed development area. To the northwest, Clermont demesne has been developed further, particularly in the vicinity of its former avenue; however, there are no features shown within the small portion of the proposed development area which forms part of the former parkland of Clermont.

Ordnance Survey Map, 1937, scale 1:10560

There are no changes of note to the proposed development area or its immediate environs by the time of this map.

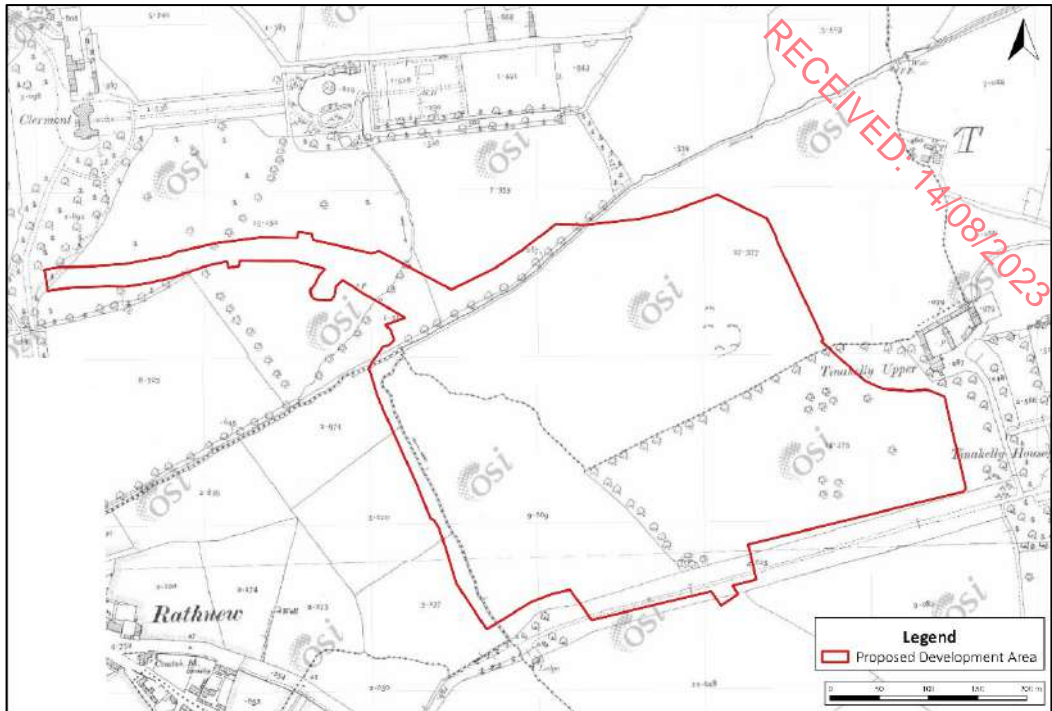


Figure 12.6 – Extract from the OS map of 1910 showing the proposed development area

12.3.4 Development Plan

The Wicklow County Development Plan (2022–2028) and the Wicklow Town-Rathnew Development Plan (2013–2019) recognise the statutory protection afforded to all Record of Monuments and Places (RMP) sites under the National Monuments Legislation (1930–2014). The development plan lists a number of aims and objectives in relation to archaeological heritage (Appendix 12D).

This is one recorded monument within the proposed development area, which was added to the SMR in July 2023. While this site is recorded as an enclosure (WI025-113), based on the cropmark visible in the aerial imagery of 2021, archaeological testing has confirmed this site represents the remains of a barrow of probable Bronze Age date (McIlreavy 2022). There are a further six archaeological sites within the 500m study area of the proposed development, all of which are scheduled for inclusion in the next revision of the RMP (Table 12.2; Figure 12.2; Appendix 12C).

None of the recorded monuments within the study area are further protected as National Monuments in State Care or subject to Preservation Orders.

RMP NO.	LOCATION	CLASSIFICATION	DISTANCE*
WI025-113	Tinakilly	Enclosure	0m
WI025-010003	Commons	Graveyard	290m southwest
WI025-010001	Commons	Church	312m southwest
WI025-010002	Commons	Font	312m southwest
WI025-088001	Commons	Font (present location)	390m west-southwest

RMP NO.	LOCATION	CLASSIFICATION	DISTANCE*
WI025-009	Newrath	Field system	411m north
WI025-009001	Newrath	Enclosure	464m north

Table 12.3: Archaeological monuments within the study area

12.3.5 Topographical Files of the National Museum of Ireland

Information on artefact finds from the study area in County Wicklow has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

A large number of prehistoric flint artefacts were recovered during a programme of field walking carried out in Tinakilly townland c. 2006. These are listed below.

MUSEUM NO	2006:17.1-33
TOWNLAND	Tinakilly
PARISH	Rathnew
BARONY	Newcastle
FIND	Flint Debitage
FIND PLACE	Found during field walking
DESCRIPTION	33 pieces of flint debitage
REFERENCE	NMI Topographical Files

MUSEUM NO	2006:18
TOWNLAND	Tinakilly
PARISH	Rathnew
BARONY	Newcastle
FIND	Flint Scraper
FIND PLACE	Found during field walking
DESCRIPTION	Flint flake. 3.9cm x 3.45cm x 2cm
REFERENCE	NMI Topographical Files

MUSEUM NO	2006:19
TOWNLAND	Tinakelly
PARISH	Rathnew
BARONY	Newcastle
FIND	Flint Flake
FIND PLACE	Found during field walking
DESCRIPTION	Flint flake. 5.15cm x 3.5cm x 1.6cm
REFERENCE	NMI Topographical Files

RECEIVED: 14/08/2023

MUSEUM NO	2006:20
TOWNLAND	Tinakelly
PARISH	Rathnew
BARONY	Newcastle
FIND	Flint Knife
FIND PLACE	Found during field walking
DESCRIPTION	Flint knife. 14.3cm x 2.10cm x 0.9cm
REFERENCE	NMI Topographical Files

MUSEUM NO	2006:21
TOWNLAND	Tinakelly
PARISH	Rathnew
BARONY	Newcastle
FIND	Plough Pebble
FIND PLACE	Found during field walking
DESCRIPTION	Flint plough pebble. 3.6cm x 2.2cm x 1.65cm

REFERENCE	NMI Topographical Files
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RECEIVED 17/08/2023

It is also of note, that while unrecorded, local information detailing a substantial number of musket balls recovered through illegal metal detecting in Tinakelly townland came to light while IAC staff were on site carrying out archaeological testing (McIlreavy 2022). The whereabouts of these finds are currently unknown.

12.3.6 Aerial Photography

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995, 2000, 2004, 2005, 2013), Google Earth (2008–2022) and Bing Maps was carried out as part of this assessment. A sub-circular crop-mark is visible within the proposed development area (Field 2), in the Google Earth imagery of 2021 (Figure 12.7). While this feature has proven on investigation to be a Bronze Age barrow feature (McIlreavy 2022, Licence No. 22E0213), based on the aerial imagery, it was classified as an enclosure and added to the SMR under WI025-113, in July 2023.

The Newrath-Tinakelly townland boundary and the Ballybeg-Tinakelly townland boundary are both substantially extant within the proposed development area. The most recent Google Earth imagery of 2022, shows the locations of the test trenches dug within the proposed development area by IAC (McIlreavy 2022, Licence No. 22E0213).



Figure 12.7 – Extract from the Google Earth coverage of 2021, showing the location of the WI025-113 (barrow) within the proposed development area

The north-western portion of the proposed development area comprises an access road (added to the development following completion of geophysical survey and archaeological testing). Phase 1 of this road has already been constructed to the immediate south of the proposed development area (Google Earth 2022). The western extent crosses an area of permitted development that has already been subject to extensive disturbance (as part of adjacent development), which is visible on the 2020 and 2021 coverage.

12.3.7 Geophysical Survey

A geophysical survey was undertaken to inform this assessment in February 2022 within the proposed development area in the townlands of Tinakelly and Newrath (Dowling 2022, Licence No. 22R0023, Figure 12.8) The results of this survey are summarised below.

A number of responses of potential archaeological origin were identified during the geophysical survey. Field 1 refers to the southern portion of the proposed development area, south of the townland boundary between Newrath and Tinakelly, and Field 2 refers to the northern field of the proposed development area. A faint semi-circular positive anomaly (1), possibly representing a ditch-type feature, was identified in Field 2. Further anomalies of interest in Field 2 included, a possible pit or kiln (2) and areas of burning (3). A number of pit-type anomalies (4) in Field 1 were tentatively interpreted as possible archaeological features. A linear response (5) in Field 1 was interpreted as a levelled field boundary. There are suggestions of further features (6) related to former land division or drainage.

The full geophysical survey report is included in Appendix 12A



Figure 12.8 – Geophysical Survey Results (after Dowling 2022)

12.3.8 Test trenching

A programme of test trenching was undertaken to inform this assessment in April 2022 within the proposed development area in Tinakilly and Newrath townlands, County Wicklow (McIlreavy 2022, Licence No. 22E0213, Figure 12.9). The results of the archaeological testing programme within the proposed development area are summarised below.

A total of 28 trenches were excavated and targeted geophysical anomalies (identified by Dowling 2022, Licence 22R0023) and open green space to fully investigate the archaeological potential of the site. Testing revealed seven areas of archaeological significance, which have been designated as Archaeological Areas (AA 1–7). These comprise three discrete pit features (AA1, 3 and 7), two probable Bronze Age barrow features (AA4 and 5), a possible post-medieval kiln feature (AA2) and a post-medieval field division (AA6). A linear feature identified within AA6 is of post-medieval interest due to the V shaped nature of its profile, and the strategic location which it occupies along the ridge line in this area of the site. This profile, taken together with local information of musket balls recovered from this vicinity could indicate that AA6 had a military function, and that some form of engagement took place here.

One of the discrete pit features, recorded as Test Trench 6 (AA3), contained a Bronze Age funerary urn. This vessel was block lifted under supervision of an Archaeological Conservator with the contents to be excavated under laboratory conditions.

The two probable barrow features (AA4 and 5) and the pit feature (AA3) containing a Bronze Age funerary urn, represent a significant focus of archaeological activity along the western portion of the proposed development site. The concentration of two barrows and at least one urn deposition may be representative of a previously unrecorded Bronze Age funerary landscape.

The full testing report is included in Appendix 12B.

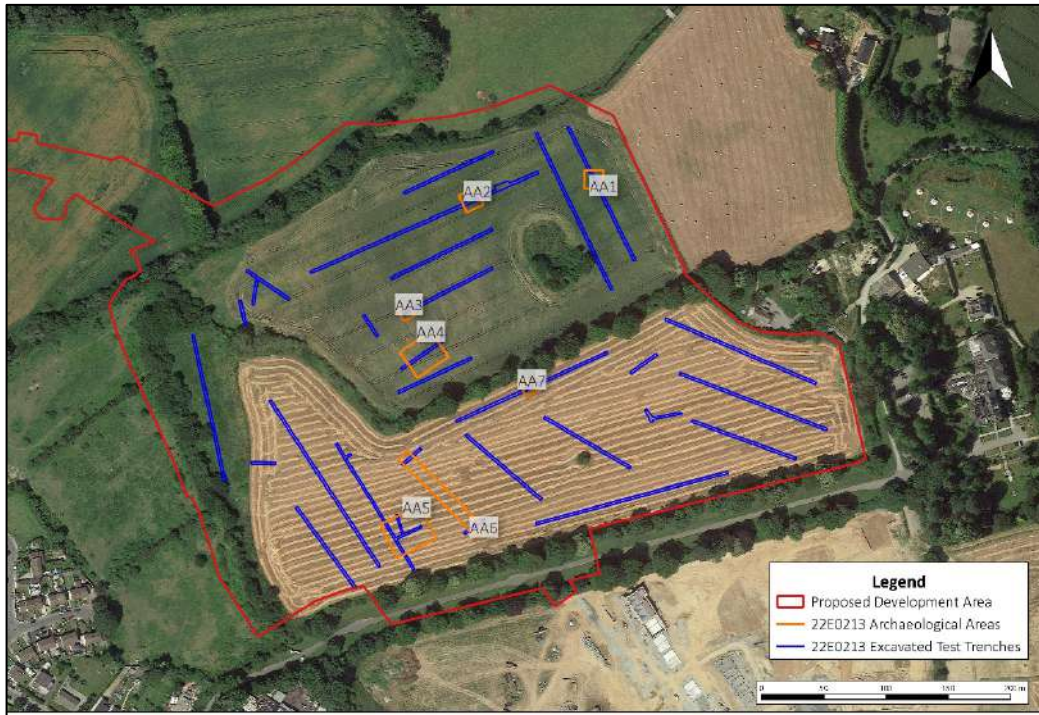


Figure 12.9 – Results of Archaeological Testing

12.4 Cultural Heritage

The term ‘cultural heritage’ can be used as an over-arching term that can be applied to both archaeology and architecture. It also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. The archaeological features discussed above also constitute cultural heritage features.

The demesne landscape originally established with Tinakelly Upper (and later part of the setting of Tinakelly House), is a cultural heritage feature. The landscape, as shown as a shaded area on Figure 12.5 occupies the southern portion of the proposed development area and is to the immediate north of the access avenue that travels to Tinakelly House. The field boundary that forms part of the north-western boundary to the demesne, will be retained as part of the development, as will the planting along the northern side of the avenue. The wider demesne to the south of the house, is subject to ongoing permitted residential development.

Tinakelly House (RPS 25-15) is located c. 70m east-northeast of the proposed development area. The site of the earlier Tinakelly Upper is located to the immediate northeast, along with some ruined outbuildings. The gardens immediate to Tinakelly House have been well maintained and contain mature demesne planting, as does the

landscape to the immediate west of the house. The main house and its immediate gardens are therefore not visible from the proposed development area. The house and immediate setting have become somewhat disconnected from the wider landscape, due to its operation under separate ownership within a smaller plot.

12.4.1 Placename Analysis

Topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They may also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830’s and 1840’s, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main references used for the place name analysis are Irish Local Names Explained by P.W Joyce (1870) and Logainm.ie. A description and possible explanation of each placename in the environs of the proposed development are provided in the below table.

PLACENAME	ORIGIN	DERIVATION	POSSIBLE MEANING
Tinakelly	Irish	<i>Tigh na Cille</i>	House of the Woods
Newrath	Irish	<i>An Iúrach/ Rath Nuadh</i>	The yew-land/ new fort
Knockrobin	Irish	<i>Cnoc Roibín</i>	Robin’s (little Robert) hill
Ballybeg	Irish	<i>An Baile Beag</i>	The small homestead/ townland
Rosanna Lower	Irish	<i>Ros Eanaigh</i>	Anna’s wood (likely subdivided into upper and lower at a later date)
Rathnew	Irish	<i>Ráth Naoi</i>	Naoi’s fort

Table 12.3: Placename Analysis

12.4.2 Townland boundaries

The townland is an Irish land unit of considerable longevity as many of the units are likely to represent much earlier land divisions. However, the term townland was not used to denote a unit of land until the Civil Survey of 1654. It bears no relation to the modern word ‘town’ but like the Irish word *baile* refers to a place. It is possible that the word is derived from the Old English *tun* land and meant ‘the land forming an estate or manor’ (Culleton 1999, 174).

Gaelic land ownership required a clear definition of the territories held by each sept and a need for strong, permanent fences around their territories. It is possible that boundaries following ridge tops, streams or bog are more likely to be older in date than those composed of straight lines (ibid. 179).

The vast majority of townlands are referred to in the 17th century, when land documentation records begin. Many of the townlands are mapped within the Down Survey of the 1650s, so called as all measurements were carefully ‘laid downe’ on paper at a scale of forty perches to one inch. Therefore, most are in the context of pre-17th century landscape organisation (McErlean 1983, 315).

In the 19th century, some demesnes, deer parks or large farms were given townland status during the Ordnance Survey and some imprecise townland boundaries in areas such as bogs or lakes, were given more precise definition (ibid.). Larger tracts of land were divided into a number of townlands, and named Upper, Middle or Lower, as well as Beg and More (small and large) and north, east, south and west (Culleton 1999, 179). By the time the first Ordnance Survey had been completed a total of 62,000 townlands were recorded in Ireland.

Although not usually recorded as archaeological monuments in their own right, townland boundaries are important as cultural heritage features as they have indicated the extents of the smallest land division unit in the country- the townland- which have been mapped since the 19th century. It remains unclear how old these land units actually are, although it has been convincingly argued that they date to at least the medieval period and may be significantly older than this (McErlean 1983; MacCotter 2008).

The proposed development area is bisected by the townland boundary between Newrath to the north and Tinakelly to the south. This boundary also forms the north-western boundary to Tinakelly House demesne. The townland boundary between Ballybeg and Tinakelly also borders the site to the west. Both of these boundaries are substantially extant, as visible in the aerial imagery and are shown on Figure 12.2.

12.5 Summary

The proposed development area is located within the townland of Tinakelly and Newrath, in the parish of Rathnew and the barony of Newcastle. The townland boundary between Newrath to the north and Tinakelly to the south also forms the north-western boundary of demesne lands originally established as part of Tinakelly Upper (no longer extant). Approximately half the development area occupies these former demesne lands.

There is one recorded monument within the proposed development area. This site was first identified by geophysical survey (Dowling 2022) and confirmed by archaeological testing in 2022 (McIlreavy 2022), but was added to the SMR in July 2023. It is scheduled for inclusion in the next revision of the RMP as an enclosure; however, archaeological investigation has confirmed that the feature is likely a barrow of Bronze Age date. There are a further six archaeological sites within the 500m study area of the proposed development, all of which are scheduled for inclusion in the next revision of the RMP.

A review of the Excavations Bulletin (1970-2023) and the available excavation reports has indicated that a large number of archaeological features were discovered at the site immediately south of the proposed development area. These included substantial archaeology which dated from the prehistoric period to the post-medieval period, with particularly evident Bronze Age activity.

Examination of the historic mapping confirmed that the proposed development area formerly formed parts of the Tinakelly and Clermont demesne landscapes, both of which are depicted in the cartographic sources as early as 1760. While the principal structures of these estates are located outside the proposed development area boundary, portions of the associated former parklands are included within the development area.

The available aerial imagery was examined as part of this assessment and confirmed that a sub-circular crop-mark is visible within the proposed development area (Field 2), in the Google Earth imagery of 2021. While this feature has proven on investigation to be a Bronze Age barrow feature (McIlreavy 2022, Licence No. 22E0213), based on the aerial imagery, it was classified as an enclosure and added to the SMR under WI025-113, in July 2023.

A programme of geophysical survey (Dowling 2022), followed by targeted test trenching (McIlreavy 2022) identified a number of features of archaeological significance within the proposed development area. These are listed below;

- AA1 Pit feature
- AA2 Post-medieval kiln feature
- AA3 Bronze Age funerary vessel within pit (currently undergoing conservation)
- AA4 Bronze Age penannular enclosure or barrow
- AA5 Bronze Age penannular enclosure or barrow
- AA6 Linear feature of possible post-medieval date
- AA7 Sub-circular pit feature

The northwestern part of the proposed development area is formed by an access road that will run from the R761 across two greenfields that slope slightly to the south, towards a watercourse, which the road will cross to then join the constructed phase 1 of the road. This area has been inspected, but no previously unrecorded sites of archaeological potential were noted. The presence of the watercourse lends general archaeological potential to the landscape. It is marked on the first edition OS map, although it is very straight indicating that it may have been canalised prior to the publication of the map.

The cultural heritage resource is characterised by the presence of the demesne landscape originally associated with Tinakelly Upper. The access avenue to the south of the development is the most visible component of the overall landscape. Tinakelly House is located c. 70m east-northeast of the proposed development and is located within mature gardens, screened from the proposed development. The original Tinakelly Upper is no longer extant, although some ruined outbuildings do survive to the northeast of the development area.

12.6 Characteristics of the Proposed Development

A full summary of the characteristics of the proposed development is included within chapter 2 – Description of Development of this EIAR.

12.7 Potential Effect of the Proposed Development

12.7.1 Construction Phase

Archaeology

Archaeological testing has identified seven archaeological areas within the proposed development area. Ground disturbances associated with the development will result in a direct, negative and permanent impact on the remains, which is considered to be very significant. Impacts upon the features could not be avoided due to the density requirements for the residential scheme and the fact that set back landscaped areas are required adjacent to the watercourses that border the site to the west and north. In addition c. 230m of the mature townland and demesne boundary is being retained as part of the development, which further constrains the layout, along with phase 2 of the access road.

The construction of the bridge across the watercourse that borders the site to the north may have a direct, negative and permanent impact on archaeological artefacts or deposits that have the potential to survive within the channel itself. Dependant on the nature, extent and significance of any such remains, impacts may range from moderate to very significant.

Ground disturbances associated with the construction on the development may have a direct, negative and permanent impact on small or isolated archaeological features or

deposits that have the potential to survive beneath the current ground level, outside of the footprint of the excavated test trenches. Dependant on the nature, extent and significance of any such remains, impacts may range from moderate to very significant.

Cultural Heritage

A section of the Newrath-Tinakelly townland boundary will be removed during construction of the proposed development. This represents a moderate direct negative permanent impact. Approximately 230m of the boundary will be retained within the layout.

The construction of the development will have a direct, negative and permanent impact on the north-western portion of the demesne landscape originally established as part of Tinakelly Upper. Phase 2 of the access road will also cross the access avenue. This represents a moderate negative impact on the cultural heritage resource. No impacts are predicted at this stage on Tinakelly House, c. 70m to the east, due to the mature screening between the house and development area.

12.7.2 Operation Phase

Archaeology

No impacts during operation are predicted upon the archaeological heritage resource.

Cultural Heritage

During the operation of the development, the access road will cross the main access avenue to Tinakelly House, resulting in a permanent impact on the setting and use of the feature. Access and use will be maintained to the avenue, so the impact is considered to be slight negative.

The townland boundary within the proposed development area will be maintained as part of the scheme and represents a direct, permanent moderate positive impact with regards to the cultural heritage resource.

No impacts are predicted upon Tinakelly House during the operation of the scheme, as the development will not affect the setting of the house, being heavily screened from the site with mature demesne planting.

12.7.3 Do-Nothing Impact

If the proposed development were not to proceed, there would be no negative impact on the archaeological or cultural heritage resource.

12.7.4 Cumulative

Construction Phase

All proposed and permitted developments within the study area of the proposed development have been reviewed. No cumulative impacts upon the archaeological or cultural heritage resource have been identified. This is due to the fact that all archaeological remains within the site will be preserved by record and no other impacts are predicted (from other developments) on the identified archaeological and cultural heritage resource in the study area.

Operation Phase

No cumulative impacts during operation are predicted upon the archaeological and cultural heritage resource.

Do-Nothing Impact

If the proposed development were not to proceed, there would be no cumulative impacts on the archaeological or cultural heritage resource.

12.8 Mitigation Measure (Ameliorative, Remedial or Reductive Measures)

Archaeology

It is acknowledged that preservation in-situ is the preferred method to conserve the archaeological resource. However, as laid out in section 12.7, it is not possible to preserve Archaeological Areas 1-7 within the proposed development area, As such, these areas will be subject to preservation by record (i.e., full archaeological excavation). This will be carried out by a qualified archaeologist under licence from the National Monuments Section, of the Department of Housing, Local Government and Heritage.

A wade survey will be carried out on the section of the stream to be impacted by the construction of a bridge. This will be carried out by a qualified archaeologist under licence from the National Monuments Section, of the Department of Housing, Local Government and Heritage. Dependant on the results of the assessment, further mitigation may be required such as preservation by record or in-situ and/or archaeological monitoring.

All topsoil stripping within the proposed development area will be monitored by a suitably qualified archaeologist. If any further features of archaeological significance are identified further mitigation may be necessary, such as preservation in situ or by record. Any further mitigation will be subject to approval from the National Monuments Section of the DoHLGH.

Cultural Heritage

During the monitoring of all topsoil stripping, the removal of the section of the Newrath-Tinakilly townland boundary will also be monitored. A written and photographic record describing the form of the townland boundary will be included in the monitoring report.

12.9 Residual Effect of the Proposed Development

Following the completion of all mitigation measures, there will be no significant residual impacts upon the archaeological or cultural heritage resource.

12.10 Monitoring

The mitigation measures recommended above will also function as a monitoring system during construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

12.11 Reinstatement

Not applicable.

12.12 Difficulties Encountered

No difficulties were encountered during the compilation of this chapter.

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www.geohive.ie – Ordnance Survey Ireland National Townland and Historical Map Viewer (including Aerial imagery 1995, 2000, 2004, 2005 and 2013).

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13 TRAFFIC AND TRANSPORTATION

13.1 Introduction

This chapter assesses and evaluates the likely operational-phase impact of a proposed 352-unit Large-scale Residential Development (LRD) at Tinakilly, Rathnew, Co. Wicklow on the operation of the surrounding road network, as well as identifying proposed mitigation measures to minimise any identified impacts.

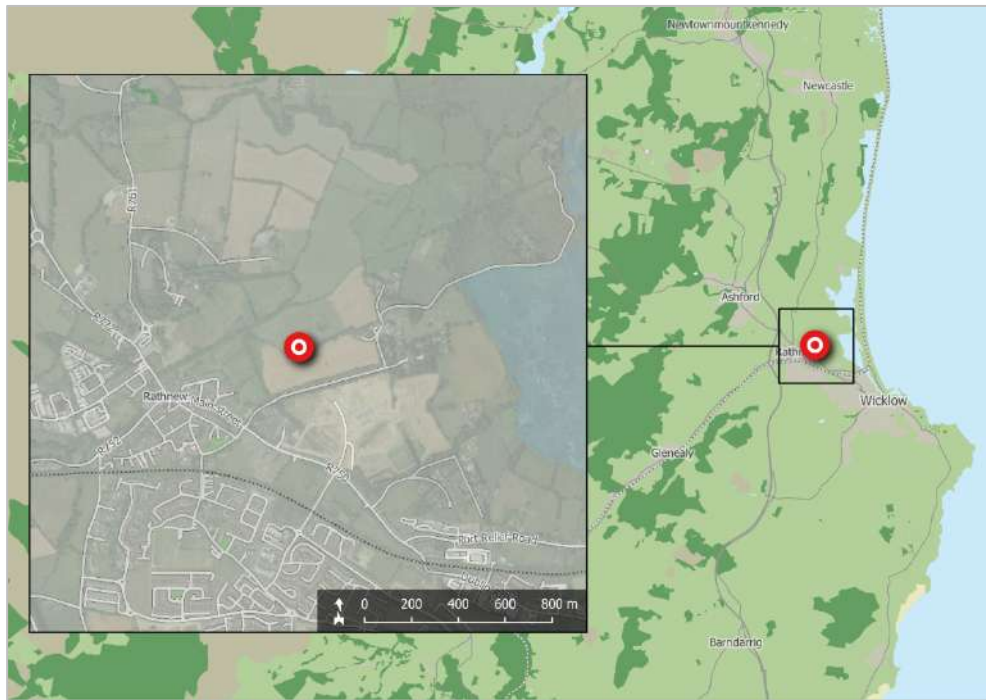


Figure 13.3 – Development site location (sources: EPA, OSM Contributors, Google)



Figure 13.4 – Site extents and transport infrastructure (sources: NTA, OSM Contributors, Google)

This chapter has been prepared by Gordon Finn, Roads and Traffic Engineer with Cronin & Sutton Consulting Engineers (CS Consulting). Gordon holds BA/BAI and MAI degrees in Civil, Structural, and Environmental Engineering from the University of Dublin, and is a member of the Institute of Engineers of Ireland. His relevant professional experience includes the preparation of Traffic and Transport Assessments, Travel Plans, and Environmental Impact Assessment Report chapters for a broad range of residential, commercial, and institutional developments.

This chapter presents an analysis of the proposed development’s traffic impact, which is also presented in the Traffic and Transport Assessment (TTA) report submitted separately in support of this planning application. While the content of this chapter is common to both documents, the TTA provides a more exhaustive range of junction assessment scenarios, as well as examining certain further aspects of the proposed development (e.g. internal layout) that are not pertinent to an EIAR.

13.2 Adjacent Committed Development

As shown in **Figure 13.3**, a committed development is currently under construction immediately to the south of the proposed development. This development was first approved under WCC ref. 17/219 (ABP Ref. PL27. 301261); minor amendments to residential unit types were subsequently approved under WCC refs. 20/1000 and 21/411. The permitted residential development now comprises a total of 355no. residential units.

The permitted development also includes the initial eastern section of the Rathnew Inner Relief Road, extending approx. 400m north from the R750, and the upgrade of the existing Merrymeeting Interchange junction (where the new relief road joins the R750 and Hawkstown Road) to a 4-arm signal-controlled junction. Most of the permitted section of the Relief Road has been constructed and the permitted upgrade works to the

Merrymeeing Interchange junction have been completed. All vehicular access to the permitted development is to be via the Rathnew Inner Relief Road.

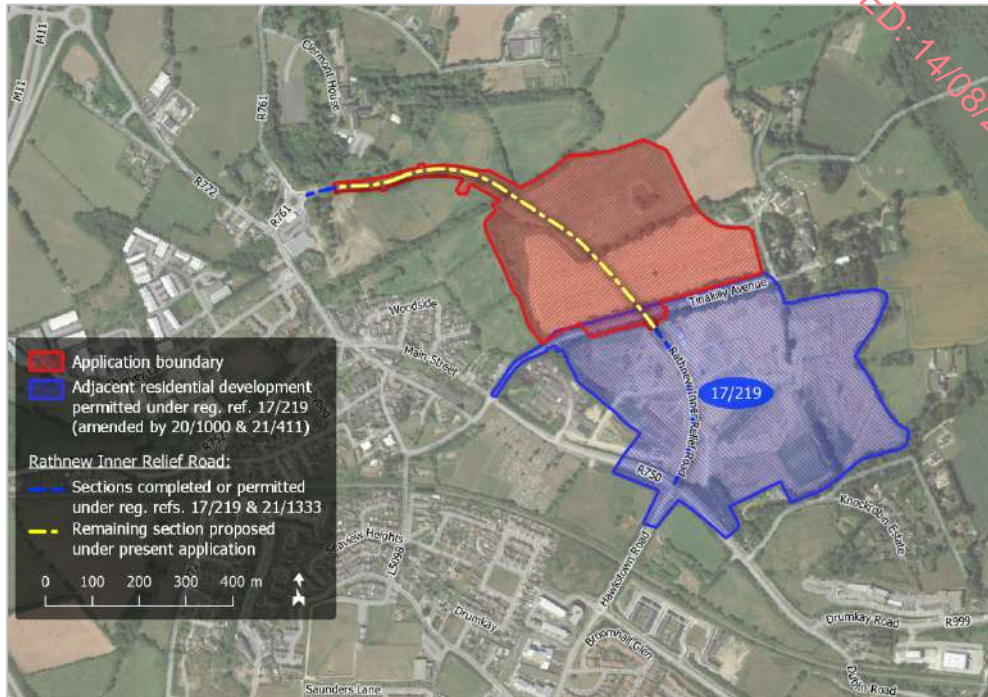


Figure 13.5 – Adjacent committed development (sources: OSM Contributors, Google)

13.3 Characteristics of the Proposed Development

13.3.1 Development Description

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

Briefly summarised, the development comprises a total of 352no. residential units, in the following general categories:

- 2no. 2-bedroom detached houses
- 29no. 2-bedroom mid-terrace houses
- 114no. 3-bedroom houses (semi-detached)
- 72no. 4-bedroom houses (detached and semi-detached)
- 3no. 5-bedroom houses (detached and semi-detached)
- 8no. 1-bedroom maisonette units
- 14no. 2-bedroom duplex units
- 14no. 3-bedroom duplex units
- 48no. 1-bedroom apartment units
- 48no. 2-bedroom apartment units

The development shall include:

- 592no. car parking spaces
- 358no. bicycle parking spaces

13.3.2 Car Parking

The proposed development shall include:

- 411no. car parking spaces within house curtilages
- 7no. on-street car parking spaces allocated to houses
- 114no. on-street car parking spaces allocated to apartment units
- 55no. on-street car parking spaces allocated to duplex and maisonette units
- 5no. additional on-street car parking spaces for visitor use

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Table 13.3 - Overall Car Parking Provision

Use Class	Car Parking Standard	Quantum	Standard Provision	Proposed Provision
2-bedroom houses	1.2 spaces per unit	31 units	37 spaces	40 spaces
Houses with 3+ bedrooms	2 spaces per unit	189 units	378 spaces	378 spaces
1-bedroom maisonette units	1.2 spaces per unit	8 units	10 spaces	10 spaces
2-bedroom duplex units	1.2 spaces per unit	14 units	17 spaces	17 spaces
3-bedroom duplex units	2 spaces per unit	14 units	28 spaces	28 spaces
Apartment block 1 (1- & 2-bedroom apts)		32 units	38 spaces	38 spaces
Apartment block 2 (1- & 2-bedroom apts)		32 units	38 spaces	38 spaces
Apartment block 3 (1- & 2-bedroom apts)		32 units	38 spaces	38 spaces
Additional visitor parking	n/a	n/a	n/a	5 spaces
Totals			584 spaces	592 spaces

A total of 592no. car parking spaces is therefore provided for the development, equating to an overall provision of 1.7 spaces per dwelling. 2016 CSO census data indicate that the average rate of car ownership in the established residential areas surrounding the subject site varies between 1.0 and 1.7 cars per household.

This proposed car parking provision has been assessed with respect to the *Wicklow County Development Plan 2022–2028*, which defines the requirements for car parking provision in new residential developments. **Table 13.1** shows the car parking standards applicable to the proposed development.

The *Wicklow County Development Plan 2022–2028* sets out the minimum requirement for the provision of disabled-accessible parking in new developments, as a proportion of the

total development car parking provision. **Table 13.2** applies this requirement to the proposed development.

Table 13.4 – On-Street Accessible Car Parking Provision

Total On-Street Car Parking Provision	Minimum Required Proportion	Accessible Spaces Required	Accessible Spaces Proposed
181 spaces	5%	9 spaces	9 spaces

9no. on-street car parking spaces within the proposed development shall be disabled-accessible. In addition to these, numerous houses within the development shall have at least 1no. in-curtilage car parking space with sufficient surrounding clear space for use by people with impaired mobility. The development’s provision of disabled-accessible car parking is therefore deemed to meet Development Plan requirements.

13.3.3 Bicycle Parking

The *Wicklow County Development Plan 2022–2028* requires that bicycle parking be provided for residential units at a rate of one space per bedroom (long-term storage), and 1 space per 5 units (short-stay parking).

Table 13.5 - Bicycle Parking Provision – Apartment/Duplex/Mid-Terrace Units

Use Class	Cycle Parking Standard	Quantum	Standard Provision	Proposed Provision
Long term bicycle storage				
1-bedroom apartments	1 space per bedroom	48 units	48 spaces	56 spaces
2-bedroom apartments		48 units	96 spaces	112 spaces
2-bedroom duplex units		14 units	28 spaces	28 spaces
3-bedroom duplex units		14 units	42 spaces	42 spaces
Mid-terrace houses (2-bedroom)		29 units	58 spaces	58 spaces
Sub-Total			272 spaces	296 spaces
Short-stay bicycle parking				
Apartments	1 space per 5 units	96 units	19 spaces	20 spaces
Duplex units		28 units	6 spaces	7 spaces
Mid-terrace houses		29 units	6 spaces	7 spaces
Additional short-stay bicycle parking			n/a	28 spaces
Sub-Total			31 spaces	62 spaces
Total apartment/duplex/mid-terrace bicycle parking				
TOTAL			349 spaces	358 spaces

The majority (191no. or 87%) of the houses within the proposed development are detached or semi-detached, with direct access to rear gardens. The 8no. maisonette units also have direct access to rear gardens. Ample space for the secure storage of residents’ and visitors’ bicycles shall therefore be available within the curtilage of each such dwelling. **Table 13.3** applies the Development Plan requirements to the proposed

development’s remaining residential units (apartments, duplex units, and mid-terrace houses), which do not have direct access to a rear garden.

Long-term bicycle parking to serve the development’s 3no. apartment buildings is provided in the form of 5no. secure sheltered bicycle storage enclosures adjacent to these buildings. Long-term bicycle parking associated with the 28no. duplex units and 29no. mid-terrace houses has been provided in secure stores to the front of each unit. Short-stay (visitor) bicycle spaces for the apartment buildings, duplex units and mid-terrace houses are provided externally at suitable locations within the landscape.

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13.3.4 Electric Vehicle Charging Facilities

The Wicklow County Development Plan 2022–2028 requires that facilities for the charging of battery electric vehicles (BEVs) be provided in new residential developments on the following basis:

- Single-unit dwelling with car parking space located within the property boundary: installation of external recharging point for electric vehicles in each dwelling.
- Multi-unit buildings: installation of 1 recharging point for every 10 car parking spaces (with a minimum of 1 for developments under 10 spaces) and installation of ducting infrastructure for every parking space within property boundary.

Table 13.6 – Electric Vehicle Charging Provision

Dwelling Type	BEV Charging Standard	Quantum	Required Provision	Proposed Provision
Single-unit buildings with in-curtilage parking	1 charge point per unit	220 units	220 charge points	220 charge points
Multi-unit buildings	1 charge point for every 10 spaces	176 spaces	18 charge points	20 charge points
Totals			238 charge points	240 charge points

As shown in **Table 13.4**, all 220no. houses within the proposed development have at least one in-curtilage car parking space; 1no. BEV charging point shall be provided within the curtilage of each of these dwellings. A total of 176no. on-street car parking spaces shall be allocated to apartment, maisonette, and duplex units, which do not have any in-curtilage car parking; BEV charging points shall be provided at 20no. of these spaces. All remaining on-street car parking spaces within the development shall be ‘future-proofed’ by the inclusion of ducting and/or cabling to permit the rapid future installation of additional BEV charging points.

13.3.5 Development Servicing and Waste Collection

All servicing of the residential units shall be conducted on the internal road network of the proposed development. Non-recyclable, recyclable, and organic waste (black, green, and brown bins) generated by dwellings within the development shall be collected directly by an authorised waste collector, in common with existing residential developments, subject to the requirements of Wicklow County Council.

13.4 Assessment Methodology

13.4.1 Traffic Survey and Background Peak Hour Identification

Full turning movement classified traffic counts were carried out by Nationwide Data Collection (NDC), on behalf of CS Consulting, over a 14-hour period (06:00–20:00) on each of seven consecutive days between Tuesday the 7th of February 2023 and Monday the 13th of February 2023 (inclusive). Count information was obtained at the following 6no. sites (see **Figure 13.4**):

1. R750 / Hawkstown Road / Rathnew Inner Relief Road (RIRR) [Merrymeeting Interchange; 4-arm signalised junction]
2. R750 / R752 / R772 [Rathnew Village Roundabout; 3-arm roundabout junction]
3. R772 / R761 [3-arm signalised junction]
4. R761 / ALDI Access / Rathnew Inner Relief Road (RIRR) [4-arm roundabout junction]
5. R750 / Tinakilly Avenue / L5098 [4-arm priority-controlled junction]
6. L5098 / Commons [3-arm priority-controlled junction]



Figure 13.6 – Surveyed road junction sites (sources: OSM Contributors, Google)

Peaks in background traffic flows across these six survey sites were found to occur at the following times:

- Average weekday AM peak hour of 08:15-09:15
- Average weekday PM peak hour of 16:30-17:30
- Saturday peak hour of 11:45-12:45
- Sunday peak hour of 13:30-14:30

These peak hour flows, as well as Annual Average Daily Traffic (AADT) flows, are included in the traffic flow matrices given in **Appendix 13C** and a summary is given in **Table 13.5**. Peak hour flows are given in Passenger Car Units (PCU), while AADT flows are given as light vehicles (LV) and heavy vehicles (HV). Raw traffic survey data are provided in **Appendix 13A**.

Table 13.7 – Surveyed Total Traffic Flows Summary

Time Period	Total Vehicular Movements at Survey Junction Site:						
	J1	J2	J3	J4	J5	J6	
Weekday AM Peak (PCU, 08:15-09:15)	1730	1964	1781	185	1618	212	
Weekday PM Peak (PCU, 16:30-17:30)	1613	1983	1806	423	1563	259	
Saturday Peak (PCU, 11:45-12:45)	1596	1883	1616	351	1550	198	
Sunday Peak (PCU, 13:30-14:30)	1380	1674	1569	353	1338	158	
Average 24-hr Day (AADT)	LV	18612	22191	20204	3875	17990	2596
	HV	628	955	918	104	639	43

13.4.2 Background Traffic Growth

The operational impact of traffic on the road network within the proposed development’s area of influence has been assessed for the following years:

- 2023 Baseline year
- 2026 Construction phase assessment year
- 2028 Assumed opening year (full completion and occupation)
- 2033 5 years after opening
- 2043 Design year (15 years after opening)

Unit 5.3 of the TII Project Appraisal Guidelines (PE-PAG-02017 Travel Demand Projections) has been used to apply growth factors to the 2016 surveyed background traffic flows, to obtain traffic flows for the baseline year and for future year junction assessments. The TII annual growth rates applied are given in **Table 13.6**, and the resultant cumulative growth in background traffic for each assessment year is given in **Table 13.7**.

Table 13.8 – TII Central Growth Rates (Light Vehicles)

Geographic Area	Background Traffic Growth per Year		
	2016-2030	2030-2040	2040-2050
NTpM Zone 5562	+ 1.21%	+ 0.25%	+ 0.32%

Table 13.9 – Predicted Background Traffic Growth (cumulative increases over 2023 levels)

2026 Construction phase assessment	2028 Year of full completion	2033 Full completion +5 years	2043 Full completion +15 years
+ 3.7%	+ 6.2%	+ 9.6%	+ 12.6%

13.4.3 Subject Development Trip Generation – Operational Phase

The proposed development comprises 352no. residential units (220no. houses, 28no. duplex units, and 104no. apartments). Trip generation factors from the Trip Rate Information Computer System (TRICS) database of traffic surveys have been used to predict the vehicular trip generation to and from the proposed development, once completed, for all peak hour periods and for an average 24-hour day. The TRICS database is maintained by a consortium of English County Councils but covers the entirety of Great Britain and Ireland. Full details of the TRICS information used in the assessments are provided in **Appendix 13B**.

Table 13.10 – TRICS Trip Generation Rates

Time Period	Trips per Hour per Dwelling				
	Houses		Flats		
	Arrivals	Departures	Arrivals	Departures	
Weekday AM Peak (PCU, 08:15-09:15)	0.157	0.318	0.067	0.148	
Weekday PM Peak (PCU, 16:30-17:30)	0.314	0.184	0.204	0.145	
Saturday Peak (PCU, 11:45-12:45)	0.191	0.201	0.126	0.140	
Sunday Peak (PCU, 13:30-14:30)	0.198	0.187	0.131	0.131	
Average 24-hr Day (AADT)	LV	2.737	2.737	1.809	1.809
	HV	0.034	0.034	0.049	0.049

Table 13.11 – Proposed Development Trip Generation – by Unit Type

Time Period	Vehicular Trips Generated		
	Houses and Duplex Units	Apartments	Combined

Arrivals				
Weekday AM Peak (PCU, 08:15-09:15)		39	7	46
Weekday PM Peak (PCU, 16:30-17:30)		78	22	100
Saturday Peak (PCU, 11:45-12:45)		48	13	61
Sunday Peak (PCU, 13:30-14:30)		49	14	63
Average 24-hr Day (AADT)	LV	679	188	867
	HV	9	5	14
Departures				
Weekday AM Peak (PCU, 08:15-09:15)		79	15	94
Weekday PM Peak (PCU, 16:30-17:30)		45	15	60
Saturday Peak (PCU, 11:45-12:45)		50	14	64
Sunday Peak (PCU, 13:30-14:30)		47	14	61
Average 24-hr Day (AADT)	LV	679	188	867
	HV	9	5	14
Total Trips				
Weekday AM Peak (PCU, 08:15-09:15)		118	22	140
Weekday PM Peak (PCU, 16:30-17:30)		123	37	160
Saturday Peak (PCU, 11:45-12:45)		98	27	125
Sunday Peak (PCU, 13:30-14:30)		96	28	124
Average 24-hr Day (AADT)	LV	1358	376	1734
	HV	18	10	28

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The following TRICS sub-categories have been employed, being the most appropriate to the proposed development:

- 03 Residential / A – Houses Privately Owned
- 03 Residential / C – Flats Privately Owned

The TRICS trip rates for the proposed development have been selected from the above categories, restricted insofar as possible to similar outer urban or suburban locations, and further refined with reference to 2016 CSO census data on the basis of:

- the population within 1 mile of the development site (5,000 approx.);
- the population within 5 miles of the development site (20,000 approx.);
- the aggregate mean car ownership rate within 5 miles of the development site (1.5 cars per household).

The TRICS trip rates selected for the peak hour periods and for an average 24-hour day are given in **Table 13.8**. The proposed development’s predicted vehicular trip generation is given in **Table 13.9**; this has been calculated as a function of the selected TRICS trip rates and the numbers of residential units within the proposed development. All houses and duplex units (248no. in total) have been treated as houses, while all apartment units (104no.) have been treated as flats.

The development layout is divided spatially into two sections, separated by the proposed Rathnew Inner Relief Road. These are:

- An eastern section with vehicular access to/from the RIRR via proposed junction no. 7 (see **Figure 13.5**), comprising 185no. houses, 12no. duplex units, and 8no. apartments (maisonettes).
- A western section with vehicular access to/from the RIRR via proposed junction no. 8, comprising 35no. houses, 16no. duplex units, and 96no. apartments.

Table 13.12 – Proposed Development Trip Generation – by Layout Section

Time Period	Vehicular Trips Generated			
	Eastern Section	Western Section	Combined	
Arrivals				
Weekday AM Peak (PCU, 08:15-09:15)	32	14	46	
Weekday PM Peak (PCU, 16:30-17:30)	64	36	100	
Saturday Peak (PCU, 11:45-12:45)	39	22	61	
Sunday Peak (PCU, 13:30-14:30)	40	23	63	
Average 24-hr Day (AADT)	LV	553	314	867
	HV	7	7	14
Departures				
Weekday AM Peak (PCU, 08:15-09:15)	64	30	94	
Weekday PM Peak (PCU, 16:30-17:30)	37	23	60	
Saturday Peak (PCU, 11:45-12:45)	41	23	64	
Sunday Peak (PCU, 13:30-14:30)	38	23	61	

Average 24-hr Day (AADT)	LV	553	314	867
	HV	7	7	14
Total Trips				
Weekday AM Peak (PCU, 08:15-09:15)		96	44	140
Weekday PM Peak (PCU, 16:30-17:30)		101	59	160
Saturday Peak (PCU, 11:45-12:45)		80	45	125
Sunday Peak (PCU, 13:30-14:30)		78	46	124
Average 24-hr Day (AADT)	LV	1106	628	1734
	HV	14	14	28

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13.4.4 Subject Development Trip Distribution – Operational Phase

Vehicular traffic arriving to or departing from the proposed development is expected to leave or enter the immediate surrounding area via one of the following six points on the local road network (see **Figure 13.5**):

- (A) R750 to/from the south-east
- (B) Hawkstown Road to/from the south
- (C) L5098 to/from the south
- (D) R752 to/from the south-west
- (E) R772 to/from the north-west
- (F) R761 to/from the north-west

The predicted distribution of vehicular trips to and from the subject development has been established following the proportions of the surveyed inbound and outbound traffic flows at these six points on the local road network, in each of the time periods considered; these are given in **Table 13.11** to **Table 13.13**.

Table 13.13 – Distribution of Existing Network Traffic – Weekday Peak Hours

Network Point	Road Name and Direction	AM Peak Flow (PCU)	PM Peak Flow (PCU)	% of Total AM Peak Flow	% of Total PM Peak Flow
Inbound Traffic (towards Rathnew village centre)					
A	R750 (from SE)	582	688	24.9%	31.7%
B	Hawkstown Rd (from S)	429	202	18.4%	9.3%
C	L5098 (from S)	93	101	4.0%	4.7%
D	R752 (from SW)	441	269	18.9%	12.4%
E	R772 (from NW)	742	810	31.8%	37.4%

F	R761 (from NW)	49	97	2.1%	4.5%
Outbound Traffic (away from Rathnew village centre)					
A	R750 (to SE)	718	568	31.8%	24.8%
B	Hawkstown Rd (to S)	220	332	9.7%	14.5%
C	L5098 (to S)	108	149	4.8%	6.5%
D	R752 (to SW)	234	452	10.4%	19.8%
E	R772 (to NW)	902	721	39.9%	31.5%
F	R761 (to NW)	77	64	3.4%	2.8%

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Table 13.14 – Distribution of Existing Network Traffic – Weekend Peak Hours

Network Point	Road Name and Direction	SAT Peak Flow (PCU)	SUN Peak Flow (PCU)	% of Total SAT Peak Flow	% of Total SUN Peak Flow
Inbound Traffic (towards Rathnew village centre)					
A	R750 (from SE)	717	585	34.5%	32.0%
B	Hawkstown Rd (from S)	230	215	11.1%	11.8%
C	L5098 (from S)	96	82	4.6%	4.5%
D	R752 (from SW)	304	262	14.6%	14.3%
E	R772 (from NW)	677	632	32.6%	34.6%
F	R761 (from NW)	54	52	2.6%	2.8%
Outbound Traffic (away from Rathnew village centre)					
A	R750 (to SE)	569	530	28.2%	29.1%
B	Hawkstown Rd (to S)	256	196	12.7%	10.8%
C	L5098 (to S)	90	67	4.5%	3.7%
D	R752 (to SW)	333	246	16.5%	13.5%
E	R772 (to NW)	728	718	36.1%	39.5%
F	R761 (to NW)	42	63	2.1%	3.5%

Table 13.15 – Distribution of Existing Network Traffic – AADT

Network Point	Road Name and Direction	Light Vehicle Flow	Heavy Vehicle Flow	% of Total LV Flow	% of Total HV Flow
Inbound Traffic (towards Rathnew village centre)					
A	R750 (from SE)	7,566	256	30.5%	25.1%
B	Hawkstown Rd (from S)	2,972	66	12.0%	6.5%
C	L5098 (from S)	1,210	20	4.9%	2.0%
D	R752 (from SW)	3,744	221	15.1%	21.7%
E	R772 (from NW)	8,587	425	34.7%	41.7%
F	R761 (from NW)	687	30	2.8%	2.9%
Outbound Traffic (away from Rathnew village centre)					
A	R750 (to SE)	7,130	251	28.8%	24.8%

B	Hawkstown Rd (to S)	2,973	68	12.0%	6.7%
C	L5098 (to S)	1,253	21	5.1%	2.1%
D	R752 (to SW)	3,740	215	15.1%	21.2%
E	R772 (to NW)	9,010	429	36.4%	42.3%
F	R761 (to NW)	630	29	2.5%	2.9%

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The arrival and departure proportions in both weekday peak hour periods (as given in **Table 13.11**) are illustrated in **Figure 13.5**, together with the predicted routes to be followed by vehicular traffic to and from the proposed development.

Table 13.14 and **Table 13.15** summarise the distribution of the subject development’s projected weekday peak arrival and departure trips according to the network point from which they arrive or to which they depart. These tables indicate the proportions and numbers of trips from/to each network point, as well as the surveyed and proposed junctions through which they will pass.

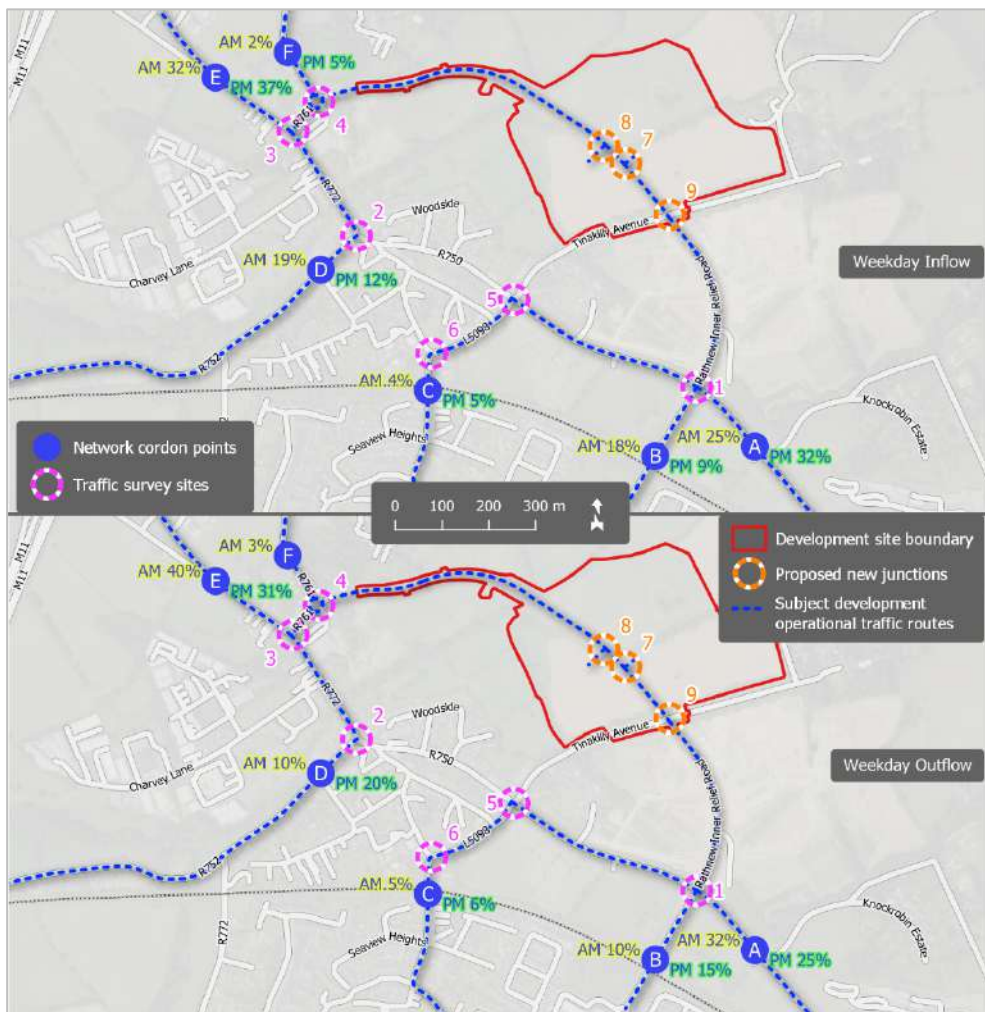


Figure 13.7 – Weekday origin/destination proportions (sources: OSM Contributors, Google)

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Table 13.16 – Subject Development Weekday Peak Arrivals Distribution

Network Entry Point	Junctions Passed Through	% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
Eastern section of development					
A	1,9,7	24.9%	31.7%	8	20
B	1,9,7	18.4%	9.3%	6	6
C	6,5,1,9,7	4.0%	4.7%	1	3
D	2,3,4,8,7	18.9%	12.4%	6	8
E	3,4,8,7	31.8%	37.4%	10	24
F	4,8,7	2.1%	4.5%	1	3
Western section of development					
A	1,9,7,8	24.9%	31.7%	3	11
B	1,9,7,8	18.4%	9.3%	3	3
C	6,5,1,9,7,8	4.0%	4.7%	1	2
D	2,3,4,8	18.9%	12.4%	3	4
E	3,4,8	31.8%	37.4%	4	13
F	4,8	2.1%	4.5%	0	2

Table 13.17 – Subject Development Weekday Peak Departures Distribution

Network Exit Point	Junctions Passed Through	% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
Eastern section of development					
A	7,9,1	31.8%	24.8%	20	9
B	7,9,1	9.7%	14.5%	6	5
C	7,9,1,5,6	4.8%	6.5%	3	2
D	7,8,4,3,2	10.4%	19.8%	7	7
E	7,8,4,3	39.9%	31.5%	26	12
F	7,8,4	3.4%	2.8%	2	1
Western section of development					

A	8,7,9,1	31.8%	24.8%	10	6
B	8,7,9,1	9.7%	14.5%	3	3
C	8,7,9,1,5,6	4.8%	6.5%	1	1
D	8,4,3,2	10.4%	19.8%	3	5
E	8,4,3	39.9%	31.5%	12	7
F	8,4	3.4%	2.8%	1	1

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13.4.5 Subject Development Trip Generation and Distribution – Construction Phase

Construction of the proposed development is provisionally expected to commence in 2024 and to be completed by 2028. The routing of construction traffic and operational traffic to and from the site during the construction phase shall vary as works progress. The following scenario has been taken as generally representative of average traffic loading effects during the development’s construction phase, and used for the evaluation of traffic impact:

Table 13.18 – Construction traffic evaluation scenario

Year	Development elements completed & operational	Construction activity ongoing	Vehicular traffic generated by development	Background vehicular traffic redistributed due to development
2026	<ul style="list-style-type: none"> • Full RIRR link between R750 and R761. • New hotel access junction on RIRR (J9). • Development Phase 1 complete and fully occupied (244no. units). 	<ul style="list-style-type: none"> • Development Phases 2 and 3 (108no. units). 	<ul style="list-style-type: none"> • Heavy construction traffic via R761/R772 only. • Light construction traffic via RIRR in both directions. • Operational traffic to/from 244no. occupied residential units, via RIRR in both directions. 	<ul style="list-style-type: none"> • Existing hotel traffic redirected via completed RIRR, in both directions. • Some traffic to/from adjacent committed development redirected via northern section of RIRR. • Some existing mainline traffic along R750 and R772 redirected via RIRR.

For the purposes of the present assessment, the following assumptions have been made and are considered generally representative of typical conditions on similar construction sites:

- Site working hours shall be 07:00-19:00, Monday to Friday, and 08:00-14:00 on Saturdays.
- The maximum frequency of HGV trips to and from the site shall be 6 vehicles per hour.
- The maximum frequency of LGV trips to and from the site (excluding commuting personnel) shall be 6 vehicles per hour.
- A maximum of 125no. construction operatives will be employed full time on the site.

- 50no. car parking spaces will be provided on-site for construction personnel, and all of these shall be used (i.e. 50no. car trips shall be made to and from the site each day by personnel commuting).
- At most 50% of weekday construction personnel commuting trips to the site shall be made during the AM peak hour, and at most 50% of weekday return commuting trips from the site shall be made during the PM peak hour.
- All construction personnel commuting trips to and from the site on a Saturday shall be made outside the Saturday peak hour.

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The maximum potential construction traffic vehicular trip generation calculated from these assumptions is given in **Table 13.17**.

Table 13.19 – Maximum Construction Vehicle Traffic Trip Generation

Time Period	Vehicular Trips Generated		
	Light Vehicles	Heavy Vehicles	Combined Trips (as PCU)
Arrivals			
Weekday AM Peak (08:15-09:15)	31	6	45
Weekday PM Peak (16:30-17:30)	6	6	20
Saturday Peak (11:45-12:45)	6	6	20
Sunday Peak (13:30-14:30)	0	0	0
Average 24-hr Day (AADT)	96	57	227
Departures			
Weekday AM Peak (08:15-09:15)	6	6	20
Weekday PM Peak (16:30-17:30)	31	6	45
Saturday Peak (11:45-12:45)	6	6	20
Sunday Peak (13:30-14:30)	0	0	0
Average 24-hr Day (AADT)	96	57	227
Total Trips			
Weekday AM Peak (08:15-09:15)	37	12	65
Weekday PM Peak (16:30-17:30)	37	12	65
Saturday Peak (11:45-12:45)	12	12	40
Sunday Peak (13:30-14:30)	0	0	0
Average 24-hr Day (AADT)	192	114	454

All heavy construction traffic at this stage of construction will be required to follow a designated route to and from the M11 motorway, via the final north-western section of the R1RR, the R761 regional road, and the R772 regional road. This route has been selected to minimise heavy vehicle flows along smaller country roads or residential streets.

The predicted distribution of light construction traffic across the local road network has been determined in the same manner as that of operational traffic to and from the proposed development (see **section 13.4.4**).

The construction-phase traffic impact assessment scenario also includes operational traffic to/from 244no. completed and occupied residential units. These are:

- 109no. houses, 12no. duplexes, & 8no. maisonettes in eastern section.
- 35no. houses, 16no. duplexes, & 64no. apartments in western section.

Vehicular trips generated by these occupied residential units have been distributed across the local road network in the same manner as the light construction traffic for this assessment scenario, which is also the same distribution as the post-completion operational traffic to and from the proposed development (see **section 13.4.4**).

Table 13.20 – Trip Generation of Occupied Units in Construction Phase Assessment Scenario

Time Period	Vehicular Trips Generated			
	Eastern Section	Western Section	Combined	
Arrivals				
Weekday AM Peak (PCU, 08:15-09:15)	20	12	32	
Weekday PM Peak (PCU, 16:30-17:30)	40	29	69	
Saturday Peak (PCU, 11:45-12:45)	24	18	42	
Sunday Peak (PCU, 13:30-14:30)	25	18	43	
Average 24-hr Day (AADT)	LV	345	256	601
	HV	4	5	9
Departures				
Weekday AM Peak (PCU, 08:15-09:15)	39	25	64	
Weekday PM Peak (PCU, 16:30-17:30)	23	18	41	
Saturday Peak (PCU, 11:45-12:45)	25	19	44	
Sunday Peak (PCU, 13:30-14:30)	24	18	42	
Average 24-hr Day (AADT)	LV	345	256	601

	HV	4	5	9
Total Trips				
Weekday AM Peak (PCU, 08:15-09:15)		59	37	96
Weekday PM Peak (PCU, 16:30-17:30)		63	47	110
Saturday Peak (PCU, 11:45-12:45)		49	37	86
Sunday Peak (PCU, 13:30-14:30)		49	36	85
Average 24-hr Day (AADT)	LV	690	512	1202
	HV	8	10	18

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Table 13.21 – Total Vehicular Trip Generation in Construction Phase Assessment Scenario

Time Period	Vehicular Trips Generated (PCU)		
	Arrivals	Departures	Total Trips
Weekday AM Peak (08:15-09:15)	77	84	161
Weekday PM Peak (16:30-17:30)	89	86	175
Saturday Peak (11:45-12:45)	62	64	126
Sunday Peak (13:30-14:30)	43	42	85
Average 24-hr Day (AADT)	849	849	1698

13.4.6 Committed Development and Trip Generation and Distribution

As currently permitted, the adjacent committed development described in **section 13.2** comprises 355no. residential units. Applying this development quantum to the TRICS trip rates given in **Table 13.8** produces the following peak hour trip generation figures:

Table 13.22 – Committed Development Trip Generation

Time Period	Vehicular Trips Generated			
	Arrivals	Departures	Total Trips	
Weekday AM Peak (PCU, 08:15-09:15)	56	113	169	
Weekday PM Peak (PCU, 16:30-17:30)	111	65	176	
Saturday Peak (PCU, 11:45-12:45)	68	71	139	
Sunday Peak (PCU, 13:30-14:30)	70	66	136	
Average 24-hr Day (AADT)	LV	972	972	1944

	HV	12	12	24
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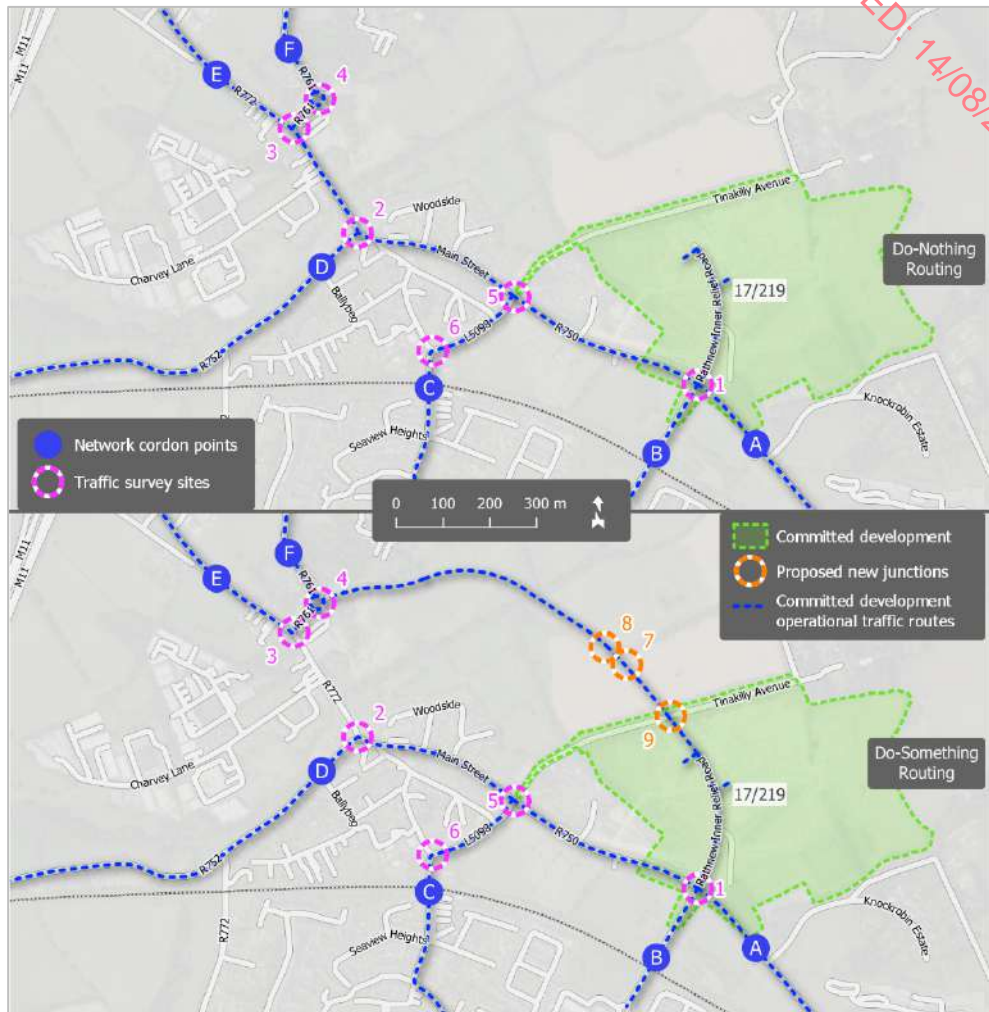


Figure 13.8 – Committed development traffic routing (sources: OSM Contributors, Google)

For the purposes of the present assessment, vehicular traffic to and from the adjacent committed development has been distributed across the local road network using the same methodology employed for the subject proposed development’s operational phase (see **section 13.4.4**). Two distinct routing patterns are used for this committed development traffic:

- Do-Nothing routing – with the existing road network structure, such that all committed development traffic must travel via junction J1.
- Do-Something routing – identical to that employed for the subject proposed development in its operational phase.

The Do-Something routing of committed development traffic is used for all assessment scenarios that include the subject proposed development (and therefore the completion of the Rathnew Inner Relief Road), while the Do-Nothing routing is used for all other scenarios. The resultant trip distributions are given in **Table 13.21** and **Table 13.22** and are represented graphically in **Figure 13.7**.

Vehicular traffic generated by this committed development has been applied to all projected traffic flows from the year 2026 onward.

Table 13.23 – Committed Development Weekday Peak Arrivals Distribution

Network Entry Point	Junctions Passed Through		% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
	Do-Nothing	Do-Something				
A	1	1	24.9%	31.7%	14	35
B	1	1	18.4%	9.3%	10	10
C	6,5,1	6,5,1	4.0%	4.7%	2	5
D	2,5,1	2,5,1	18.9%	12.4%	11	14
E	3,2,5,1	3,4,8,7,9	31.8%	37.4%	18	42
F	4,3,2,5,1	4,8,7,9	2.1%	4.5%	1	5

Table 13.24 – Committed Development Weekday Peak Departures Distribution

Network Exit Point	Junctions Passed Through		% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
	Do-Nothing	Do-Something				
A	1	1	31.8%	24.8%	36	16
B	1	1	9.7%	14.5%	11	9
C	1,5,6	1,5,6	4.8%	6.5%	5	4
D	1,5,2	1,5,2	10.4%	19.8%	12	13

E	1,5,2,3	9,7,8,4,3	39.9%	31.5%	45	21
F	1,5,2,3,4	9,7,8,4	3.4%	2.8%	4	2

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13.4.7 Redistribution and Mainline R750/R772 Traffic Flows

The proposed development shall include the completion of the Rathnew Inner Relief Road (RIRR), providing a link between the R750 and R761/R772 regional roads that bypasses the centre of Rathnew village. It is expected that the completion of this relief road shall result in the partial reallocation of the following existing background traffic, which at present must pass through the village centre:

- Vehicular traffic between the R750 (to/from the east) and the R772 (to/from the north-west).
- Vehicular traffic between the R750 (to/from the east) and the R761 (to/from the north).
- Vehicular traffic between Hawkstown Road (to/from the south) and the R772 (to/from the north-west).
- Vehicular traffic between Hawkstown Road (to/from the south) and the R761 (to/from the north).

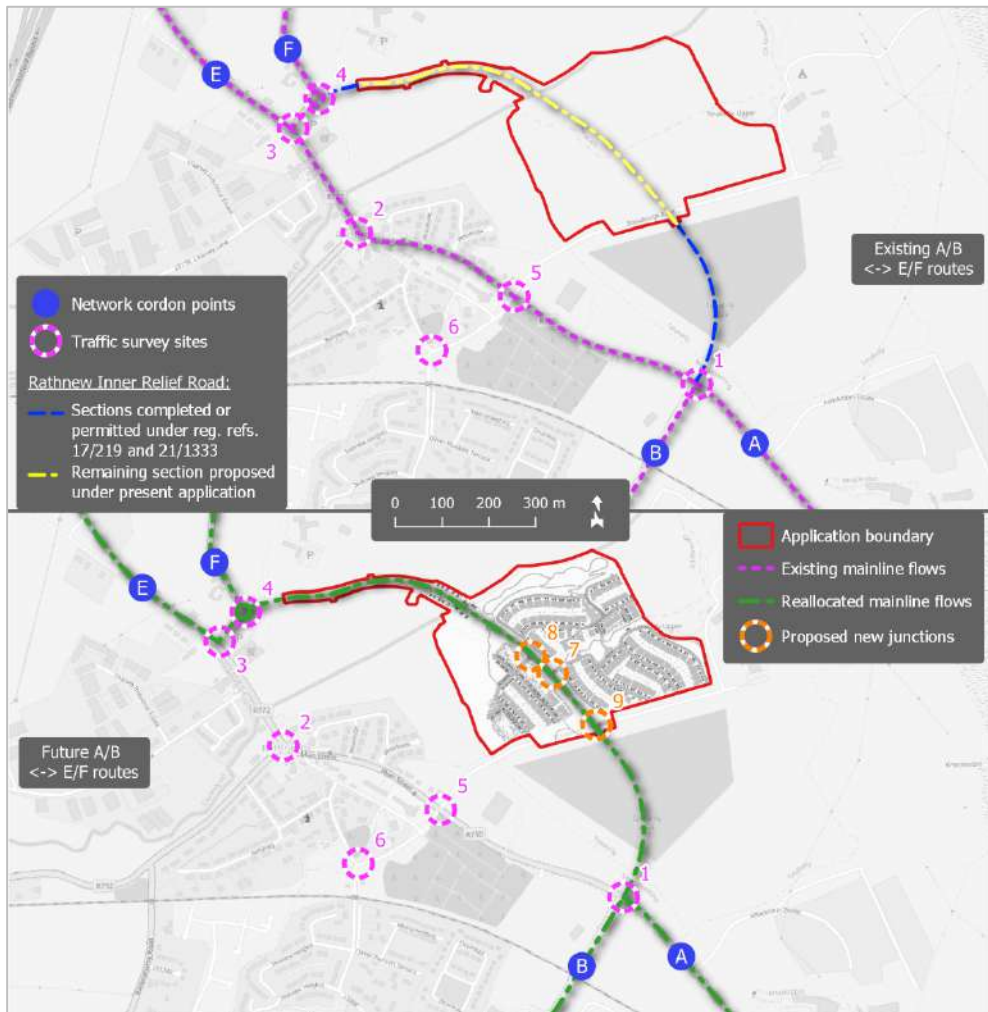


Figure 13.9 – Mainline traffic reallocated via RIRR (sources: OSM Contributors)

The volumes of existing traffic for each of the above origin-destination pairs have been determined through analysis of the existing inbound and outbound traffic flows at network points A, B, E, and F (at survey junctions J1, J3, and J4). The relevant existing peak hour and AADT traffic flow volumes are given in **Table 13.23**.

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Table 13.25 – Existing Mainline R750/R772 Traffic Flows

Time Period	Vehicular Trips by Direction			
	Northbound	Southbound	Total Trips	
Between R750 (point A) and R772 (point E)				
Weekday AM Peak (PCU, 08:15-09:15)	229	232	461	
Weekday PM Peak (PCU, 16:30-17:30)	252	207	459	
Saturday Peak (PCU, 11:45-12:45)	255	188	443	
Sunday Peak (PCU, 13:30-14:30)	232	184	416	
Average 24-hr Day (AADT)	LV	2755	2474	5229
	HV	108	105	213
Between R750 (point A) and R761 (point F)				
Weekday AM Peak (PCU, 08:15-09:15)	20	16	36	
Weekday PM Peak (PCU, 16:30-17:30)	20	25	45	
Saturday Peak (PCU, 11:45-12:45)	15	15	30	
Sunday Peak (PCU, 13:30-14:30)	20	15	35	
Average 24-hr Day (AADT)	LV	193	198	391
	HV	7	7	14
Between Hawkstown Road (point B) and R772 (point E)				
Weekday AM Peak (PCU, 08:15-09:15)	169	71	240	
Weekday PM Peak (PCU, 16:30-17:30)	74	121	195	
Saturday Peak (PCU, 11:45-12:45)	82	85	167	
Sunday Peak (PCU, 13:30-14:30)	86	68	154	
Average 24-hr Day (AADT)	LV	1082	1032	2114
	HV	28	29	57
Between Hawkstown Road (point B) and R761 (point F)				
Weekday AM Peak (PCU, 08:15-09:15)	15	5	20	
Weekday PM Peak (PCU, 16:30-17:30)	6	15	21	
Saturday Peak (PCU, 11:45-12:45)	5	7	12	
Sunday Peak (PCU, 13:30-14:30)	7	6	13	

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Average 24-hr Day (AADT)	LV	76	83	159
	HV	2	2	4

For assessment purposes, it has been assumed that **50%** of this existing mainline traffic shall divert away from Rathnew village centre and instead follow the new RIRR. The existing and reallocated routes of this mainline traffic are shown in **Figure 13.7**. The assumed redistributed peak hour and AADT traffic flow volumes are given in **Table 13.24**.

This reallocation of mainline traffic flows to the RIRR has been applied to the projected future traffic flows for all assessment scenarios that include completion of the subject proposed development.

Table 13.26 – Redistributed Mainline R750/R772 Traffic Flows

Time Period		Vehicular Trips by Direction		
		Northbound	Southbound	Total Trips
Between R750 (point A) and R772 (point E)				
Weekday AM Peak (PCU, 08:15-09:15)		115	116	231
Weekday PM Peak (PCU, 16:30-17:30)		126	104	230
Saturday Peak (PCU, 11:45-12:45)		128	94	222
Sunday Peak (PCU, 13:30-14:30)		116	92	208
Average 24-hr Day (AADT)	LV	1378	1237	2615
	HV	54	53	107
Between R750 (point A) and R761 (point F)				
Weekday AM Peak (PCU, 08:15-09:15)		10	8	18
Weekday PM Peak (PCU, 16:30-17:30)		10	13	23
Saturday Peak (PCU, 11:45-12:45)		8	8	16
Sunday Peak (PCU, 13:30-14:30)		10	8	18
Average 24-hr Day (AADT)	LV	97	99	196
	HV	4	4	8
Between Hawkstown Road (point B) and R772 (point E)				
Weekday AM Peak (PCU, 08:15-09:15)		85	36	121
Weekday PM Peak (PCU, 16:30-17:30)		37	61	98
Saturday Peak (PCU, 11:45-12:45)		41	43	84
Sunday Peak (PCU, 13:30-14:30)		43	34	77
Average 24-hr Day (AADT)	LV	541	516	1057
	HV	14	15	29
Between Hawkstown Road (point B) and R761 (point F)				
Weekday AM Peak (PCU, 08:15-09:15)		8	3	11
Weekday PM Peak (PCU, 16:30-17:30)		3	8	11
Saturday Peak (PCU, 11:45-12:45)		3	4	7
Sunday Peak (PCU, 13:30-14:30)		4	3	7

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Average 24-hr Day (AADT)	LV	38	42	80
	HV	1	1	2

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13.4.8 Redistribution of Hotel Trips

It is proposed as part of this development to restrict vehicular access along Tinakilly Avenue between the R750 and the Rathnew Inner Relief Road (RIRR). Vehicular access to the Tinakilly Country House hotel shall therefore no longer be directly from the R750 via Tinakilly Avenue but shall instead be provided via a proposed new junction (J9) on the RIRR.

Table 13.25 gives the survey-derived peak hour and AADT values for vehicular trips to and from the Tinakilly Country House hotel (including trips generated by the 8no. residential properties accessed via the lane that extends past the hotel). **Figure 13.8** shows the existing routing of this traffic between the hotel and each of the 6no. surrounding network points (the ‘Do-Nothing’ routing), as well as the routes that this traffic will take upon completion of the Rathnew Inner Relief Road (the ‘Do-Something’ routing).

For all assessment scenarios that include the subject proposed development (and completion of the RIRR), the existing hotel traffic has been redistributed to follow the ‘Do-Something’ routing.

Table 13.27 – Surveyed Vehicular Trips to/from Tinakilly Country House Hotel

Time Period	Vehicular Trips Generated			
	Arrivals	Departures	Total Trips	
Weekday AM Peak (PCU, 08:15-09:15)	10	16	26	
Weekday PM Peak (PCU, 16:30-17:30)	12	11	23	
Saturday Peak (PCU, 11:45-12:45)	16	26	42	
Sunday Peak (PCU, 13:30-14:30)	27	16	43	
Average 24-hr Day (AADT)	LV	204	201	405
	HV	5	5	10

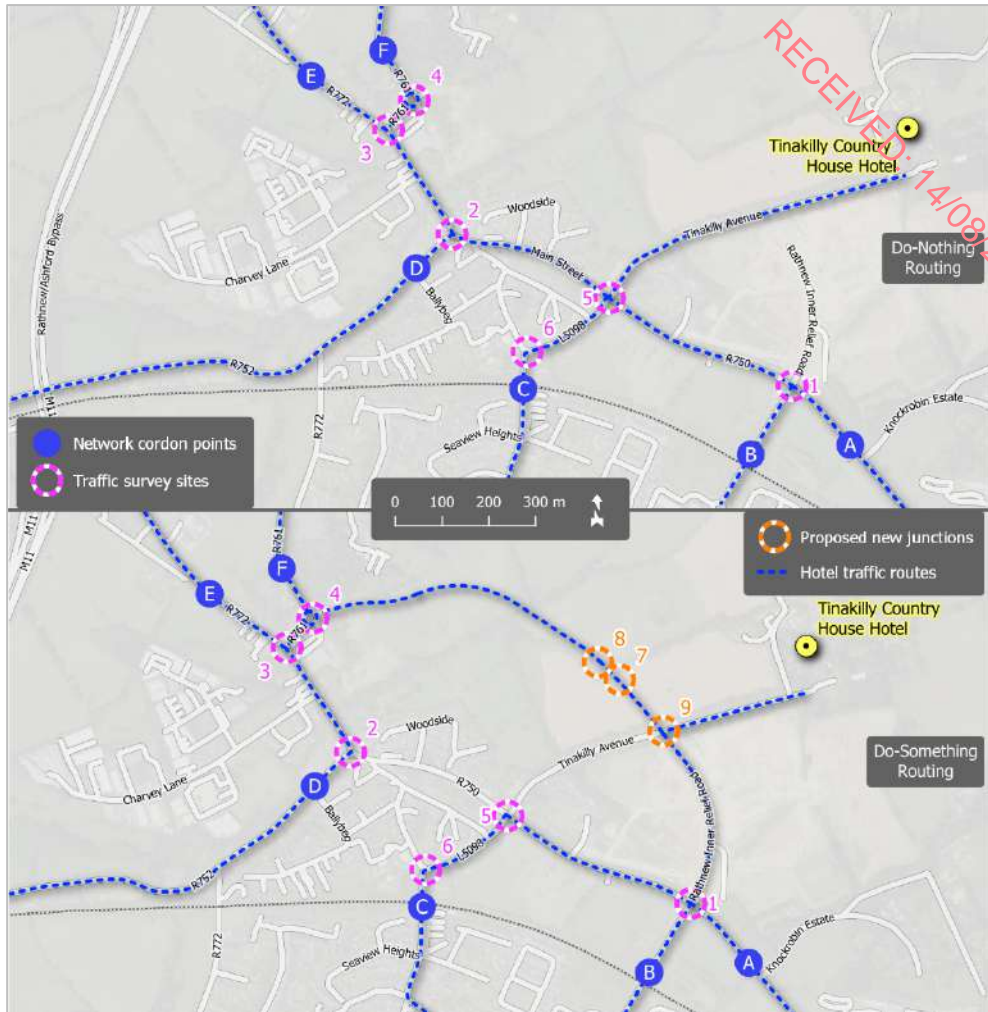


Figure 13.10 – Tinakilly Country House hotel traffic routing (sources: OSM Contributors)

13.4.9 Proportional Changes in Junction Traffic Flows – Operational Phase

Table 13.26 shows the absolute and proportional changes in Annual Average Daily Traffic (AADT) flows at each of the 6no. surveyed junctions shown in Figure 13.4 that shall be produced by the following combined effects:

- Vehicular traffic generated by the proposed development, once completed and fully occupied.
- The redistribution of existing and committed background traffic as a result of completing the Rathnew Inner Relief Road (as described previously).

Table 13.28 – Changes in Traffic Flows at Surveyed Junctions (AADT)

AADT Flows (all vehicle movements)	Survey Junction Site:					
	J1	J2	J3	J4	J5	J6
2023 Surveyed	19240	23146	21122	3979	18629	2639

Baseline Flows						
Effect of Traffic Redistribution via RIRR	-670	-5002	-347	+4655	-5200	0
Traffic Generated by Proposed Development	+817	+268	+896	+942	+86	+86
Combined Change in AADT Flows	+147	-4734	+549	+5597	-5114	+86
Change in AADT Flows as Proportion of Baseline	+0.8%	-20.5%	+2.6%	+140.7%	-27.5%	+3.3%

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The TII *Traffic and Transport Assessment Guidelines* (PE-PDV-02045) advise that Transport Assessments should generally be applied where traffic to and from a development is predicted to exceed 10% of the existing background traffic on the adjoining road (or 5% at sensitive locations). As shown in **Table 13.26**, the subject development shall result in an increase of more than 5% in total traffic flows at only one surveyed junction: the R761 roundabout to which the western end of the Rathnew Inner Relief Road connects (J4). The existing junction J1 (Merrymeeting Interchange, at the eastern end of the RIRR) is however considered a particularly sensitive location in the context of these development proposals and of the RIRR more generally.

Within the scope of this analysis, therefore, only the existing junctions J1 and J4 have been subjected to detailed operational assessment (as described in **section 13.4.10**). The other existing surveyed junctions are considered at negligible risk of detrimental effects due to the proposed development, given that this shall result in only minor net increases (or indeed net reductions) in AADT flows at these locations.

The proposed development also entails the creation of 3no. new junctions on the Rathnew Inner Relief Road, the locations of which are shown on the preceding images in this section:

7. Rathnew Inner Relief Road (RIRR) / Eastern Development Access
[3-arm priority-controlled junction]
8. Rathnew Inner Relief Road (RIRR) / Western Development Access
[3-arm priority-controlled junction]
9. Rathnew Inner Relief Road (RIRR) / Tinakilly Avenue
[3-arm priority-controlled junction]

As these junctions are not yet in operation, it is not possible to determine proportional increases in traffic that shall result from the proposed development and completion of the RIRR. To ensure a complete assessment, therefore, all three proposed new junctions have been included in the construction phase and operational phase assessment scenarios.

Table 13.29 – Future Traffic Flows at Proposed Junction Locations (AADT)

AADT Flows	Proposed Junction Site:
------------	-------------------------

(all vehicle movements)	J7	J8	J9
Effect of Traffic Redistribution via RIRR	5002	5002	5255
Traffic Generated by Proposed Development	1416	1240	817
Combined Resultant AADT Flows	6418	6242	6072

13.4.10 Junction Performance Assessment

To determine the potential traffic impact of the proposed development, in conjunction with the effect of completing the Rathnew Inner Relief Road, industry standard TRANSYT software has been used to undertake AM peak hour and PM peak hour capacity assessments of the following existing and proposed junctions (see **Figure 13.9**):

1. R750 / Hawkstown Road / Rathnew Inner Relief Road (RIRR)
[Merrymeeting Interchange; existing 4-arm signalised junction]
 - Arm A: R750 (south-east)
 - Arm B: Hawkstown Road (south-west)
 - Arm C: R750 (north-west)
 - Arm D: Rathnew Inner Relief Road (north-east)

4. R761 / ALDI Access / Rathnew Inner Relief Road (RIRR)
[existing 4-arm roundabout junction]
 - Arm A: ALDI Access (south-east)
 - Arm B: R761 (south-west)
 - Arm C: R761 (north-west)
 - Arm D: Rathnew Inner Relief Road (north-east)

7. Rathnew Inner Relief Road (RIRR) / Eastern Development Access
[proposed 3-arm priority-controlled junction]
 - Arm A: Rathnew Inner Relief Road (north-west)
 - Arm B: Development Access (north-east)
 - Arm C: Rathnew Inner Relief Road (south-east)

8. Rathnew Inner Relief Road (RIRR) / Western Development Access
[proposed 3-arm priority-controlled junction]
 - Arm A: Rathnew Inner Relief Road (south-east)
 - Arm B: Development Access (south-west)
 - Arm C: Rathnew Inner Relief Road (north-west)

9. Rathnew Inner Relief Road (RIRR) / Tinakilly Avenue
[proposed 3-arm priority-controlled junction]
 - Arm A: Rathnew Inner Relief Road (north-west)
 - Arm B: Tinakilly Avenue (east)
 - Arm C: Rathnew Inner Relief Road (south-east)

Full TRANSYT outputs are provided in **Appendix 13D**. Junction performance is assessed based upon the following four metrics:

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Degree of Saturation

The ratio of current traffic flow to ultimate capacity (also known as RFC) on a link or traffic stream. Effective capacity for a junction approach (or a junction as a whole) is reached at a DoS of 90%, beyond which a junction will not operate efficiently. A DoS of 100% represents ultimate capacity, beyond which significant operational problems will be experienced.

Mean Maximum Queue (MMQ)

The highest estimated mean number of Passenger Car Units (PCU) queued in any lane of a junction approach, averaged over the entire analysis period.

Mean Delay per Vehicle

The average delay incurred by a vehicle on a junction approach link or traffic stream, as a result of having to wait at signals or having to give way at a priority junction.

Practical Reserve Capacity

The percentage by which the arrival rate on a traffic stream could increase before the stream would be at practical capacity (i.e. 90% saturation).

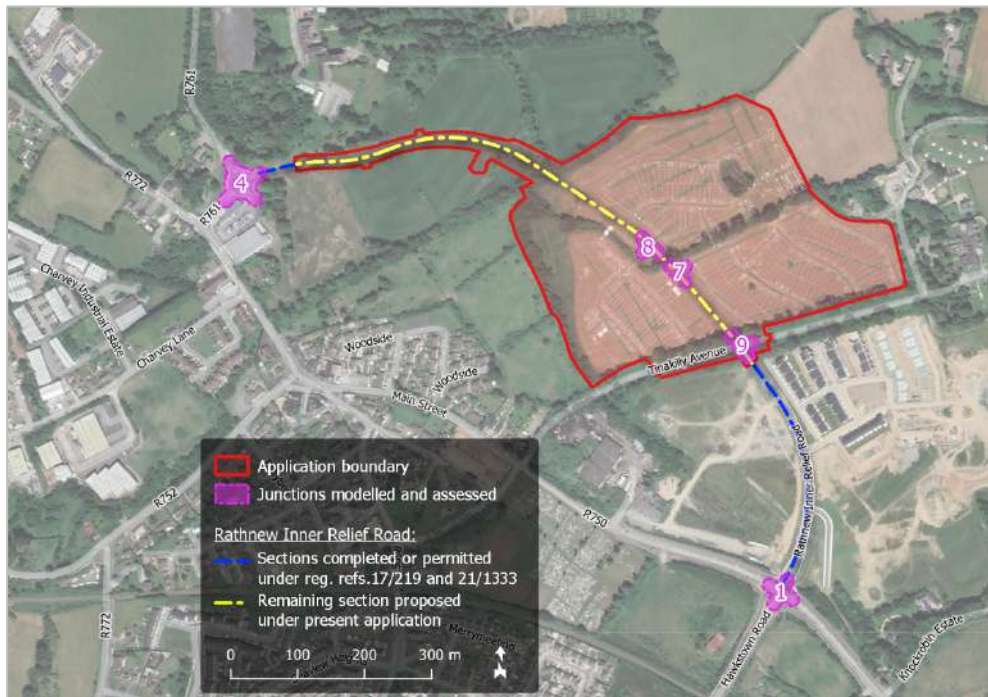


Figure 13.11 – Assessment junction locations (sources: OSM Contributors, Google)

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13.5 Receiving Environment

13.5.1 Existing Land Use

The subject site is greenfield and currently generates no vehicular traffic.

13.5.2 Existing Road Network Characteristics

Relevant elements of the existing road network surrounding the development site are described below.

Rathnew Inner Relief Road (RIRR)

- Partially constructed single carriageway road with a typical total pavement width of 6.0m, increasing to 8.0m locally at junctions where a raised cycle track transitions to an on-street cycle lane.
- Link road with a SE-NW alignment overall, connecting (once complete) to the R750 regional road in the south-east and to the R761 regional road in the north-west.
- To be subject to a 60km/h speed limit along its full extent.
- Raised footpaths and cycle tracks provided (or to be provided) along both sides of the RIRR, along its full extent.
- An initial south-eastern section of RIRR, extending northward approx. 300m from the R750, has been constructed as permitted under planning ref. 17/219.
- An initial small north-western section of the RIRR, extending eastward approx. 70m from the R761 roundabout, has been permitted under planning refs. 16/1444 and 21/1333, and is currently under construction.

R750

- Single carriageway road with a pavement width of approximately 15m at its junction with Hawkstown Road and the RIRR.
- Regional road with an east-west alignment, connecting Wicklow Town in the east (approx. 2km from the development site) to the M11 in the West.
- Subject to a 60km/h speed limit generally, reducing to 50km/h on approach to Rathnew village centre.
- Raised and segregated footpaths are in place along both sides of the R750 in the vicinity of its junction with Hawkstown Road and the RIRR.
- Segregated cycle lanes are present along both sides of the R750 in the vicinity of its junction with Hawkstown Road and the RIRR. No bus lanes are present.

Hawkstown Road

- Single carriageway road with a width of between 7.5m and 10m to the south of the development site.
- Link road with a North-South alignment, connecting Rathnew in the North to the R751 in the South (approx. 3km from the development site)
- Subject to a 60km/h speed limit generally.
- Raised and segregated footpaths and cycle tracks are in place along both sides of Hawkstown Road. No bus lanes are present.

R772

- Single carriageway road with a pavement width of approximately 9.5m at its junction with the R750 and R752, and approximately 9.0m at its junction with the R761.
- Regional road with a north-south alignment overall, connecting Rathnew village in the south to Newtownmountkennedy in the north (via Ashford) and giving access to several junctions on the M11 motorway and N11 national road.
- Subject to an 80km/h speed limit generally, reducing to 50km/h on approach to Rathnew village centre.
- A raised footpath is in place along at least one side of the R772 in and around Rathnew village. No cycle tracks or bus lanes are present.

R761

- Single carriageway road with a pavement width of approximately 9.5m generally at its junction with the R772.
- Regional road with a north-south alignment overall, connecting Rathnew village in the south to Bray in the north (via Newcastle, Kilcoole, and Greystones).
- Subject to an 80km/h speed limit generally, reducing to 50km/h on approach to Rathnew village centre.
- In the vicinity of Rathnew village, footpaths are in place along the R761 only at its junction with the R772. No cycle tracks or bus lanes are present.

R752

- Single carriageway road with a pavement width of approximately 6.4m generally within Rathnew village.
- Regional road with a north-south alignment overall, connecting Rathnew village in the north to Avoca in the south (via Glenealy and Rathdrum).

- Subject to an 80km/h speed limit generally, reducing to 50km/h on approach to Rathnew village centre.
- A raised footpath is in place along the southern side of the R752 within and on approach to Rathnew village. No cycle tracks or bus lanes are present.

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13.5.3 Public Transport Services

The subject development site is located within a 25-minute walk (or 8-minute bicycle journey) of Wicklow Rail Station. Trains serve Wicklow Rail Station at intervals of approximately 60 minutes at peak times.

Bus stops on the R750 and in Wicklow Town, within a 5-minute and 20-minute walk of the subject site, are served by 3no. bus routes and variants operated by Bus Éireann and other operators.

13.5.4 Planned Local Infrastructure Improvements

Objective RP2 of the *Wicklow – Rathnew Local Area Plan 2013-2019* provides for an inner relief road to the north-east of Rathnew village, connecting the old N11 (at the R761 / R772 priority junction) to the Merrymeeting Interchange (R750 / Hawkstown Road junction). The *Wicklow – Rathnew Local Area Plan 2013-2019* states that the provision of such a link will “facilitate access to new developments from the existing road network, prevent congestion at the Rathnew mini roundabout due to committed development and achieve good traffic circulation in the area”.

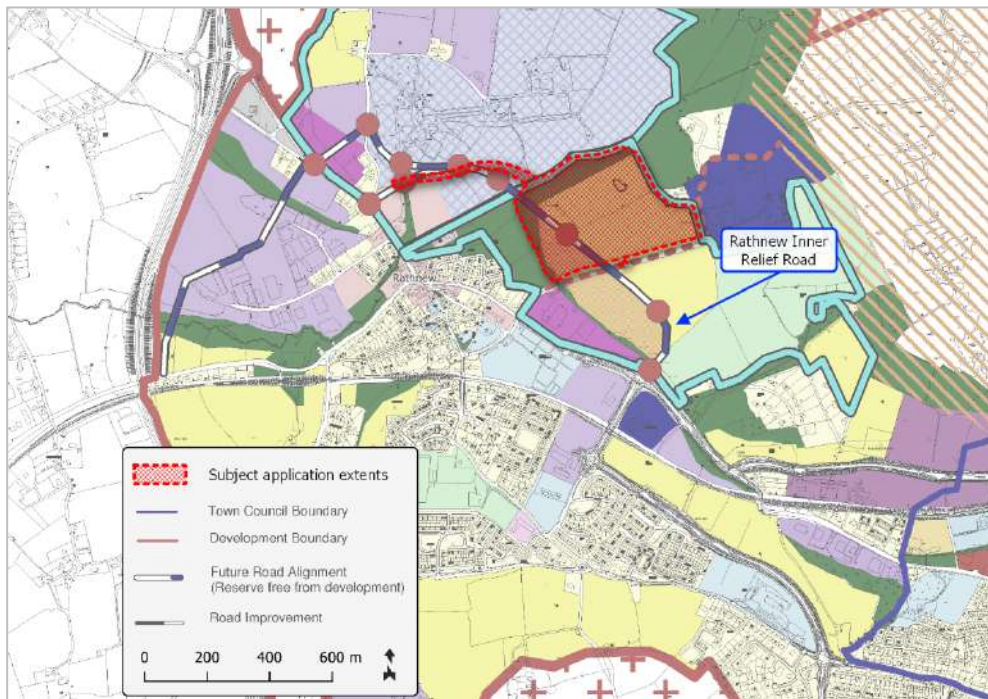


Figure 13.12 – Extract of Local Area Plan mapping (source: Wicklow County Council)

An initial eastern section of the Rathnew Inner Relief Road, extending northward approx. 300m from the R750 (at the Merrymeeting Interchange junction) has been constructed

as permitted under planning ref. 17/219 (see **Figure 13.2**). An additional 100m of the RIRR is also permitted under this same grant, extending up to the boundary of the present application. To the west, an initial small section of the RIRR is currently under construction as permitted under planning ref. 16/1444 (amended under ref. 21/1333). This extends eastward approx. 60m from the R761/ALDI roundabout (traffic survey site J4).

Under the present application, it is proposed to construct the remaining section of the Rathnew Inner Relief Road, completing the road link between the Merrymeeting Interchange junction (traffic survey site J1) and the R761/ALDI roundabout (traffic survey site J4).

No further relevant transport-related infrastructure objectives in the vicinity of the development site are given in either the *Wicklow County Development Plan 2022–2028* or the *Wicklow Rathnew Local Area Plan 2013-2019*.

13.6 Baseline Assessment

Table 13.28 gives the TRANSYT modelling results, for the 2no. existing junctions assessed, under the recorded weekday AM peak and PM peak traffic flows for the baseline year of 2023. These results show that both existing modelled junctions currently operate at or within effective capacity on all approaches during both the AM and PM peak periods.

Junction 1 (Merrymeeting Interchange) experiences significant but acceptable vehicle queue lengths and delays on the two approaches along the R750 regional road, in both of the peak hour periods. Significant delays are also experienced on the Hawkstown Road approach. No measurable average queues or delays are experienced on any approach to the Junction 4 roundabout (R761/ALDI).

Table 13.30 – 2023 Baseline Assessment Results

Approach Arm and Traffic Stream *		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									
A	S/L	83	90	20	25	45	50	8	1
	R	44	1	6	0	39	32	107	14750
B	L	12	17	2	3	21	24	671	423
	S/R	53	40	5	3	55	56	70	125
C	S/L	61	64	12	14	32	31	48	40
	R	26	37	3	5	36	37	248	143
D	L	0	0	0	0	0	0	n/a	n/a



	S / R	0	0	0	0	0	0	n/a	n/a
Junction 4 (existing)									
A	All	1	11	0	0	0	0	8565	708
B	S / L	5	6	0	0	0	0	1762	1467
	R / B	5	12	0	0	0	0	1591	640
C	All	5	9	0	0	0	0	1871	853
D	All	0	0	0	0	0	0	n/a	n/a

* S = straight ahead; L = left turn; R = right turn; B = back (reverse direction)

13.7 Do Nothing Scenario

13.7.1 Construction Assessment Year Do- Nothing Scenario

Table 13.29 gives the TRANSYT modelling results for the Do-Nothing assessment scenario in the year selected for assessment of construction phase impact (2026), for the 2no. existing junctions assessed. The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2026 levels using TII growth factors, and with the addition of traffic generated by the adjacent development currently under construction (via the RIRR to/from the south).

Under this assessment scenario, Junction 1 (Merrymeeting Interchange) is shown to exceed effective capacity on its south-eastern approach (Arm A) during the PM peak hour, though it remains within ultimate capacity. All other junction approaches operate within effective capacity in both peak hour periods.

Junction 4 (R761/ALDI roundabout) continues to operate well within effective capacity on all approaches, in both peak hour periods. No measurable average queues or delays are experienced on any approach to this junction.

Table 13.31 – 2026 Do-Nothing Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
		AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									
A	S / L	68	91	16	26	28	52	33	-1
	R	7	8	0	1	46	33	1171	1037
B	L	48	18	8	3	35	25	87	392
	S / R	50	47	5	3	49	58	80	93

C	S / L	71	73	17	17	28	34	27	23
	R	49	40	4	5	55	39	85	127
D	L	0	0	0	0	0	0	n/a	n/a
	S / R	0	0	0	0	0	0	n/a	n/a
Junction 4 (existing)									
A	All	1	12	0	0	0	0	8554	677
B	S / L	5	6	0	0	0	0	1605	1385
	R / B	5	13	0	0	0	0	1550	609
C	All	5	10	0	0	0	0	1757	778
D	All	0	0	0	0	0	0	n/a	n/a

13.7.2 Opening Year Do – Nothing Scenario

Table 13.30 gives the TRANSYT modelling results for the Do-Nothing assessment scenario in the development’s projected opening year of 2028, for the 2no. existing junctions assessed. The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2028 levels using TII growth factors, and with the addition of traffic generated by the adjacent development currently under construction (via the RIRR to/from the south).

Under this assessment scenario, Junction 1 (Merrymeeting Interchange) is shown to exceed effective capacity on its south-eastern approach (Arm A) during the PM peak hour, though it remains within ultimate capacity. All other junction approaches operate within effective capacity in both peak hour periods.

Junction 4 (R761/ALDI roundabout) continues to operate well within effective capacity on all approaches, in both peak hour periods. No measurable average queues or delays are experienced on any approach to this junction.

Table 13.32 – 2028 Do-Nothing Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									
A	S/L	68	93	16	28	27	58	32	-4
	R	7	8	0	1	46	33	1171	1037
B	L	51	19	8	3	36	25	78	381
	S/R	54	48	5	3	52	59	68	89
C	S/L	71	75	17	18	27	35	27	20
	R	50	40	4	5	56	39	80	123
D	L	0	0	0	0	0	0	n/a	n/a
	S/R	0	0	0	0	0	0	n/a	n/a
Junction 4 (existing)									
A	All	1	12	0	0	0	0	7933	655
B	S/L	5	6	0	0	0	0	1565	1354
	R/B	6	13	0	0	0	0	1511	601
C	All	5	11	0	0	0	0	1721	752
D	All	0	0	0	0	0	0	n/a	n/a

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13.7.3 Design Year Do – Nothing Scenario

Table 13.31 gives the TRANSYT modelling results for the Do-Nothing assessment scenario in the year 2043, for the 2no. existing junctions assessed. The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2043 levels using TII growth factors, and with the addition of traffic generated by the adjacent development currently under construction (via the RIRR to/from the south).

Table 13.33 – 2043 Do-Nothing Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									

A	S / L	74	97	18	34	30	73	22	-7
	R	7	8	0	1	46	35	171	966
B	L	52	20	9	3	36	25	72	344
	S / R	54	47	6	3	51	57	66	93
C	S / L	76	78	20	19	31	35	18	16
	R	53	46	4	6	57	41	70	97
D	L	0	0	0	0	0	0	n/a	n/a
	S / R	0	0	0	0	0	0	n/a	n/a
Junction 4 (existing)									
A	All	1	13	0	0	0	0	7387	614
B	S / L	6	7	0	0	0	0	1472	1282
	R / B	6	14	0	0	0	0	1403	560
C	All	5	11	0	0	0	0	1621	705
D	All	0	0	0	0	0	0	n/a	n/a

Under this assessment scenario, Junction 1 (Merrymeeting Interchange) is shown to exceed effective capacity on its south-eastern approach (Arm A) during the PM peak hour, though it remains within ultimate capacity. All other junction approaches operate within effective capacity in both peak hour periods.

Junction 4 (R761/ALDI roundabout) continues to operate well within effective capacity on all approaches, in both peak hour periods. No measurable average queues or delays are experienced on any approach to this junction.

13.8 Predicted Impacts

13.8.1 Construction Phase Assessment Scenario

Table 13.32 gives the TRANSYT modelling results for the development’s construction phase assessment scenario in the year 2026, for the 2no. existing junctions assessed and for the 3no. proposed new junctions on the RIRR.

Table 13.34 – 2026 Construction Phase Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM

Junction 1 (existing)									
A	S/L	67	72	14	16	35	33	34	26
	R	56	64	5	7	54	56	61	40
B	L	27	16	4	2	25	31	232	468
	S/R	67	67	9	5	51	68	35	34
C	S/L	68	52	14	10	35	26	31	73
	R	27	38	2	4	47	47	233	136
D	L	41	28	5	4	40	32	117	222
	S/R	76	72	4	6	92	72	19	25
Junction 4 (existing)									
A	All	1	13	0	0	0	0	7360	595
B	S/L	10	14	0	0	0	0	771	536
	R/B	22	30	0	0	1	1	315	203
C	All	6	12	0	0	0	0	1489	633
D	All	25	21	0	0	0	0	262	325
Junction 7 (proposed)									
A	S/L	12	16	0	0	0	0	624	469
B	L/R	10	10	0	0	0	0	782	821
C	S/R	19	15	0	0	0	0	383	485
Junction 8 (proposed)									
A	S/L	18	14	0	0	0	0	414	559
B	L/R	7	9	0	0	0	0	1118	938
C	S/R	15	18	0	0	0	0	503	387
Junction 9 (proposed)									
A	S/L	12	15	0	0	0	0	644	496
B	L/R	3	2	0	0	0	0	2505	4068
C	S/R	17	14	0	0	0	0	421	541

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The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2026 levels using TII growth factors, and with the application of:

- construction traffic to and from the development site (via the RIRR to/from the north-west),
- operational traffic to and from the development's first 244no. residential units (via the RIRR in both directions),
- traffic generated by the adjacent development currently under construction (via the RIRR in both directions), and
- R750/R772 mainline traffic redistributed via the RIRR.

Under this assessment scenario, both Junction 1 (Merrymeeting Interchange) and Junction 4 (R761/ALDI roundabout) operate within effective capacity on all approaches, in both peak hour periods. Negligible vehicle queues and delays are experienced at the 3no. proposed new junctions on the RIRR (the two proposed development access junctions and the proposed new Tinakilly Avenue junction).

13.8.2 Opening Year Do- Something Scenario

Table 13.33 gives the TRANSYT modelling results for the development's operational phase assessment scenario in its projected opening year of 2028, for the 2no. existing junctions assessed and for the 3no. proposed new junctions on the RIRR.

The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2028 levels using TII growth factors, and with the application of:

- operational traffic to and from the entire development (via the RIRR in both directions),
- traffic generated by the adjacent development currently under construction (via the RIRR in both directions), and
- R750/R772 mainline traffic redistributed via the RIRR.

Under this assessment scenario, both Junction 1 (Merrymeeting Interchange) and Junction 4 (R761/ALDI roundabout) operate within effective capacity on all approaches, in both peak hour periods. Negligible vehicle queues and delays are experienced at the 3no. proposed new junctions on the RIRR (the two proposed development access junctions and the proposed new Tinakilly Avenue junction).

Table 13.35 – 2028 Operational Phase Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									
A	S/L	69	74	14	17	36	34	30	22
	R	54	63	5	7	54	55	67	42
B	L	28	16	5	2	25	30	221	464
	S/R	67	68	9	5	51	68	34	32
C	S/L	70	54	15	11	36	27	28	67
	R	28	38	2	4	47	46	221	140
D	L	43	27	6	4	40	32	109	229
	S/R	77	75	5	6	94	78	17	19
Junction 4 (existing)									
A	All	1	13	0	0	0	0	6831	583
B	S/L	10	14	0	0	0	0	834	540
	R/B	20	30	0	0	1	1	342	203
C	All	6	13	0	0	0	0	1510	602
D	All	25	19	0	0	0	0	264	364
Junction 7 (proposed)									
A	S/L	12	16	0	0	0	0	653	474
B	L/R	13	7	0	0	1	0	602	1120
C	S/R	18	17	0	0	0	0	405	439
Junction 8 (proposed)									
A	S/L	17	13	0	0	0	0	416	581
B	L/R	6	5	0	0	0	0	1315	1805
C	S/R	12	18	0	0	0	0	639	406
Junction 9 (proposed)									
A	S/L	13	15	0	0	0	0	614	516

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B	L/R	3	2	0	0	0	0	2499	4079
C	S/R	17	15	0	0	0	0	436	519

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13.8.3 Design Year Do- Something Scenario

Table 13.34 gives the TRANSYT modelling results for the development’s operational phase assessment scenario in the year 2043 (the design year; 15 years after development completion), for the 2no. existing junctions assessed and for the 3no. proposed new junctions on the RIRR. The weekday AM and PM peak hour traffic flows applied for this assessment are those surveyed in 2023, scaled up to 2043 levels using TII growth factors, and with the application of:

- operational traffic to and from the entire development (via the RIRR in both directions),
- traffic generated by the adjacent development currently under construction (via the RIRR in both directions), and
- R750/R772 mainline traffic redistributed via the RIRR.

Under this assessment scenario, both Junction 1 (Merrymeeting Interchange) and Junction 4 (R761/ALDI roundabout) operate within effective capacity on all approaches, in both peak hour periods. Negligible vehicle queues and delays are experienced at the 3no. proposed new junctions on the RIRR (the two proposed development access junctions and the proposed new Tinakilly Avenue junction).

Table 13.36 – 2043 Operational Phase Assessment Results

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 (existing)									
A	S/L	72	76	16	19	36	34	26	18
	R	57	70	5	7	56	60	58	29
B	L	32	18	5	2	27	32	182	391
	S/R	72	70	10	6	55	71	24	28
C	S/L	72	56	16	12	35	26	24	62
	R	32	45	3	4	49	50	179	99
D	L	45	29	6	4	41	34	101	210
	S/R	79	76	5	6	98	80	14	18
Junction 4 (existing)									

A	All	1	14	0	0	0	0	6356	545
B	S/L	10	14	0	0	0	0	804	522
	R/B	21	30	0	0	1	1	330	196
C	All	6	14	0	0	0	0	1422	564
D	All	25	20	0	0	0	0	262	360
Junction 7 (proposed)									
A	S/L	12	16	0	0	0	0	650	474
B	L/R	13	7	0	0	1	0	602	1120
C	S/R	18	17	0	0	0	0	405	439
Junction 8 (proposed)									
A	S/L	17	13	0	0	0	0	416	581
B	L/R	6	5	0	0	0	0	1314	1805
C	S/R	12	18	0	0	0	0	635	406
Junction 9 (proposed)									
A	S/L	13	15	0	0	0	0	611	516
B	L/R	3	2	0	0	0	0	2498	4079
C	S/R	17	15	0	0	0	0	436	519

13.8.4 influence of the Proposed Development – Construction Phase

The impact of the proposed development’s construction phase vehicular traffic on the operation of the surrounding road network may be represented quantitatively by the differences in TRANSYT modelling results between the 2026 Do-Nothing assessment scenario and 2026 construction phase assessment scenario. This comparison is given in **Table 13.35**.

At Junction 1 (Merrymeeting Interchange), the addition of the proposed development’s construction phase traffic, in conjunction with the completion of the RIRR, is predicted to result in:

- Average increases in mean maximum vehicle queues of 1 PCU during the AM peak hour and 0 PCU during the PM peak hour.
- Average increases in mean delay per vehicle of 17 seconds during the AM peak hour and 16 seconds during the PM peak hour.

At Junction 4 (R761/ALDI roundabout), the addition of the proposed development's construction phase traffic, in conjunction with the completion of the RRR, is predicted to result in:

- No increase in mean maximum vehicle queues during either the AM peak hour or the PM peak hour.
- Average increases in mean delay per vehicle of 0 seconds during the AM peak hour and less than 1 second during the PM peak hour.

Table 13.37 – Proposed Development Influence – Construction Phase 2026

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1									
A	S / L	-1	-19	-2	-10	+8	-19	+1	+27
	R	+49	+56	+5	+6	+8	+23	-1110	-997
B	L	-21	-2	-3	-1	-9	+6	+145	+76
	S / R	+17	+20	+4	+2	+2	+9	-45	-59
C	S / L	-3	-21	-3	-7	+7	-8	+4	+50
	R	-22	-2	-2	-2	-9	+9	+148	+9
D	L	+41	+28	+5	+4	+40	+32	n/a	n/a
	S / R	+76	+72	+4	+6	+92	+72	n/a	n/a
Junction 4									
A	All	0	+1	0	0	0	0	-1194	-82
B	S / L	+5	+8	0	0	0	0	-834	-849
	R / B	+17	+17	0	0	+1	+1	-1235	-406
C	All	+1	+2	0	0	0	0	-268	-145
D	All	+25	+21	0	0	0	0	n/a	n/a

During its construction stage, the proposed development is therefore predicted to result overall in a **short-term slight adverse impact** on the operation of the surrounding road network.

13.8.5 Influence of the Proposed Development – Operational Phase

The impact of the proposed development on the operation of the surrounding road network in the opening year 2028 and in the design year 2043 may be represented quantitatively by the differences in TRANSYT modelling results between the Do-Nothing and Operational assessment scenarios for those years. These comparisons are given in **Table 13.36** and **Table 13.37**.

In the opening year of 2028, at Junction 1 (Merrymeeting Interchange), the addition of the proposed development's operational phase traffic, in conjunction with the completion of the RIRR, is predicted to result in:

- Average increases in mean maximum vehicle queues of 1 PCU during the AM peak hour and 0 PCU during the PM peak hour.
- Average increases in mean delay per vehicle of 17 seconds during the AM peak hour and 15 seconds during the PM peak hour.

In the opening year of 2028, at Junction 4 (R761/ALDI roundabout), the addition of the proposed development’s operational phase traffic, in conjunction with the completion of the RIRR, is predicted to result in:

- No increase in mean maximum vehicle queues during either the AM peak hour or the PM peak hour.
- Average increases in mean delay per vehicle of 0 seconds during the AM peak hour and less than 1 second during the PM peak hour.

Table 13.38 – Proposed Development Influence – Operational Phase – Opening Year 2028

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1									
A	S / L	+1	-19	-2	-11	+9	-24	-2	+26
	R	+47	+55	+5	+6	+8	+21	-1104	-995
B	L	-23	-3	-4	-1	-11	+6	+143	+83
	S / R	+13	+20	+3	+2	0	+10	-34	-57
C	S / L	-1	-21	-3	-7	+8	-8	+1	+47
	R	-22	-2	-2	-2	-9	+8	+141	+17
D	L	+43	+27	+6	+4	+40	+32	n/a	n/a
	S / R	+77	+75	+5	+6	+94	+78	n/a	n/a
Junction 4									
A	All	0	+1	0	0	0	0	-1102	-72
B	S / L	+5	+8	0	0	0	0	-731	-814
	R / B	+14	+17	0	0	0	+1	-1169	-398
C	All	+1	+2	0	0	0	0	-211	-150
D	All	+25	+19	0	0	0	0	n/a	n/a

In the design year of 2043, at Junction 1 (Merrymeeting Interchange), the addition of the proposed development’s operational phase traffic, in conjunction with the completion of the RIRR, is predicted to result in:

- An average increase in mean maximum vehicle queues of 1 PCU during the AM peak hour and an average decrease of 1 PCU during the PM peak hour.
- Average increases in mean delay per vehicle of 19 seconds during the AM peak hour and 15 seconds during the PM peak hour.

In the design year of 2043, at Junction 4 (R761/ALDI roundabout), the addition of the proposed development's operational phase traffic, in conjunction with the completion of the RIRR, is predicted to result in:

- No increase in mean maximum vehicle queues during either the AM peak hour or the PM peak hour.
- Average increases in mean delay per vehicle of 0 seconds during the AM peak hour and less than 1 second during the PM peak hour.

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Table 13.39 – Proposed Development Influence – Operational Phase – Design Year 2043

Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1									
A	S / L	-2	-21	-3	-15	+6	-39	+4	+25
	R	+50	+62	+5	+6	+10	+26	-113	-937
B	L	-20	-2	-3	-1	-8	+6	+110	+47
	S / R	+18	+23	+4	+2	+5	+14	-42	-65
C	S / L	-4	-22	-4	-7	+5	-10	+6	+46
	R	-21	-1	-2	-2	-8	+9	+109	+2
D	L	+45	+29	+6	+4	+41	+34	n/a	n/a
	S / R	+79	+76	+5	+6	+98	+80	n/a	n/a
Junction 4									
A	All	0	+1	0	0	0	0	-1031	-69
B	S / L	+4	+7	0	0	0	0	-668	-760
	R / B	+15	+16	0	0	+1	+1	-1073	-364
C	All	+1	+3	0	0	0	0	-199	-141
D	All	+25	+20	0	0	0	0	n/a	n/a

These comparisons shows that the effects of the proposed development’s operational phase, in conjunction with the completion of the RIRR, do not cause the surrounding road network’s operation to deteriorate. At Junction 4 (R761/ALDI roundabout), these effects are negligible, causing no change in average vehicle queue lengths and increasing average delay by at most 1 second per vehicle in either peak hour period.

At Junction 1 (Merrymeeting Interchange), the redistribution of traffic via the RIRR results in a more balanced operation of the junction. While some increases in vehicle queue lengths and delays are experienced on certain junction approaches in the peak hours, these are accompanied by reductions in queues and delays on other approaches. The overall effect is to bring all junction approaches back within effective capacity.

During its operational stage, the proposed development (including completion of the RIRR) is therefore predicted to result overall in a **long-term moderate positive impact** on the operation of the surrounding road network.

13.9 Cumulative Impacts

In the evaluation of traffic impact, the future year junction performance assessments conducted in respect of the proposed development typically also include traffic flows to be generated by any other relevant nearby committed development, such that the predicted impacts (as outlined in the previous section of this EIAR chapter) also represent the potential cumulative impacts.

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13.10 Worst Case Scenario

In the evaluation of the proposed development's traffic and transport impact in the operational stage, the worst-case scenario is generally assumed by default. For this reason, trip generation calculations employ the maximum appropriate trip rates, and junction performance assessments are conducted in respect of the AM and PM peak hours with the heaviest background traffic flows on the surrounding road network. During the development's operational stage, the preceding impacts described should therefore be considered as the worst-case scenario.

13.11 Mitigation Measures

13.11.1 Construction Phase

The following measures for minimising construction traffic and mitigating its effects are to be implemented as part of the site-specific Construction Traffic Management Plan (CTMP) to be prepared by the lead contractor appointed for the construction of the development:

- Restricting all heavy construction traffic to designated routes to and from the M11 motorway via the R750, R761, and R772 regional roads, minimising heavy vehicle flows along smaller country roads or residential streets.
- Conducting all loading and unloading operations within the site.
- Scheduling deliveries outside of peak hour periods to avoid disturbance to surrounding pedestrian and vehicular traffic.
- Staggering HGV movements to/from site to avoid site queues.
- Preventing haulage vehicles travelling in convoys of more than two vehicles at any time and spacing haulage vehicles by a minimum of 250m at all times.
- Installation of a wheel wash at exit from the site to prevent any dirt being carried out onto surrounding roads.
- Deployment of a road sweeper as necessary to keep roads around the site clean.

The following specific traffic control and marshalling measures are to be included in the CTMP, to minimise the potential for obstruction of surrounding roads:

- At no time will construction associated vehicles be stopped or parked along haulage routes.
- Haulage vehicles will not travel in convoys of greater than two vehicles at any time.
- Haulage vehicles will be spaced by a minimum of 250m at all times.
- At no time will haulage vehicles be parked or stopped at the entrance to the site.
- All loading of excess material will occur within the site boundary.
- All off-loading of deliveries will take place within the site, away from the public road and will access via the construction site access.

Construction vehicle movements will be minimised through:

- Consolidation of delivery loads to/from the site and management of large deliveries on site to occur outside of peak periods.
- Use of precast/prefabricated materials where possible.
- Reuse on site of 'cut' material generated by the construction works, where possible, through various accommodation works.
- Provision of adequate storage space on site.
- Development of a strategy to minimise construction material quantities as much as possible.

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13.11.2 Operational Phase

The development shall incorporate several design and management elements intended to mitigate the impact of the development on the surrounding road network during its operational stage. These include:

- A conservative car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips to the development (by residents and visitors).
- A high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both development occupants and visitors.

13.12 Monitoring and Reinstatement

13.12.1 Construction Phase

The site-specific Construction Traffic Management Plan (CTMP) to be prepared by the lead contractor appointed for the construction of the development shall outline measures for monitoring the impact of construction traffic on the operation and condition of the surrounding road network, including remedial actions to be taken in the event of construction traffic causing damage to road infrastructure.

No reinstatement works of relevance to traffic and transport are proposed as part of the subject development, with the exception of any repair works made necessary by the passage of construction traffic.

13.12.2 Operational Phase

Post-development monitoring of the surrounding street network's performance is not required or proposed in this case.

No reinstatement works of relevance to traffic and transport are proposed as part of the subject development in its operational stage.

13.13 Difficulties Encountered

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

13.14 References

- Environmental Protection Agency (EPA): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022)
- Transport Infrastructure Ireland (TII): *Traffic and Transport Assessment Guidelines* (2014)
- Transport Infrastructure Ireland (TII): *Project Appraisal Guidelines* (2011)
- Wicklow County Council (WCC): *Wicklow County Development Plan 2022–2028* (2022)
- Wicklow County Council (WCC): *Wicklow Town – Rathnew Development Plan 2013-2019* (2013)
- Department of Transport, Tourism and Sport (DTTS): *Design Manual for Urban Roads and Streets* (2019)
- National Transport Authority (NTA): *National Cycle Manual* (2011)
- TRICS Consortium: Trip Rate Information Computer System (TRICS) database
- Central Statistics Office (CSO): 2016 Census data

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14 WASTE MANAGEMENT

14.1 Introduction

This chapter considers matters pertaining to waste management that may potentially affect a proposed 352-unit Large-scale Residential Development (LRD) at Tinakilly, Rathnew, Co. Wicklow. This chapter has been prepared jointly by CS Consulting (construction phase matters) and AWN Consulting (operational phase matters). It should be read in conjunction with the Resource and Waste Management Plan prepared by CS Consulting and the Operational Waste Management Plan prepared by AWN Consulting, both of which are submitted separately as part of this application.

14.2 Baseline Environment

14.2.1 Site Location

The site of the proposed development is located at Tinakilly, Rathnew, Co. Wicklow, in the operational area of Wicklow County Council. The area enclosed by the planning application boundary extends to approximately 16.8ha.

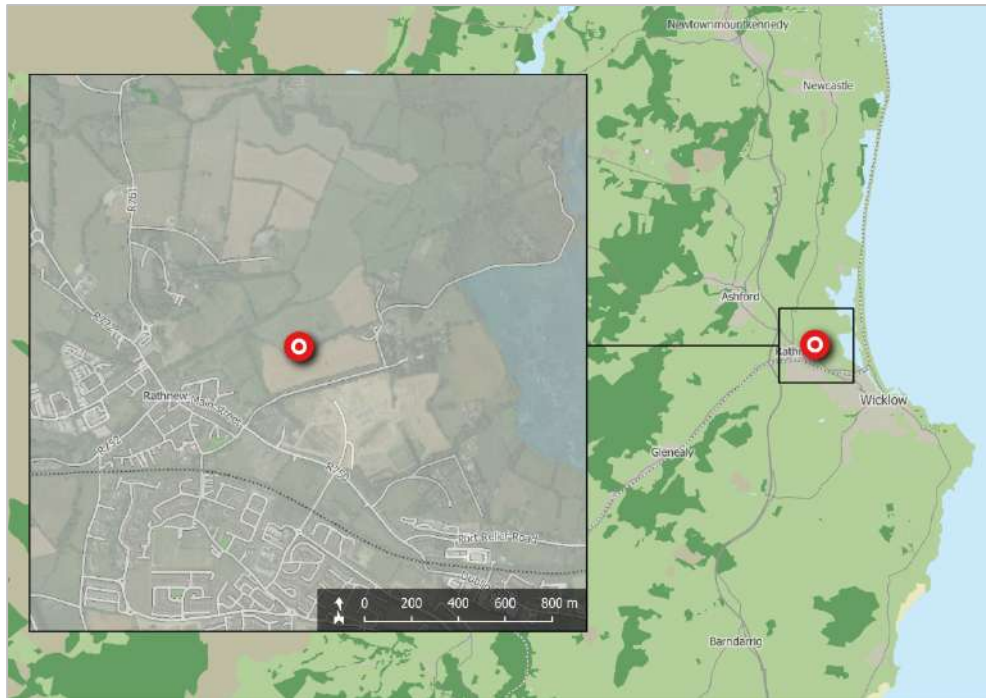


Figure 14.5 – Development Site Location (sources: EPA, OSM Contributors, Google)



Figure 14.6 – Site Extents and Environs (sources: NTA, OSM Contributors, Google)

14.2.2 Nearby Waste Disposal Facilities

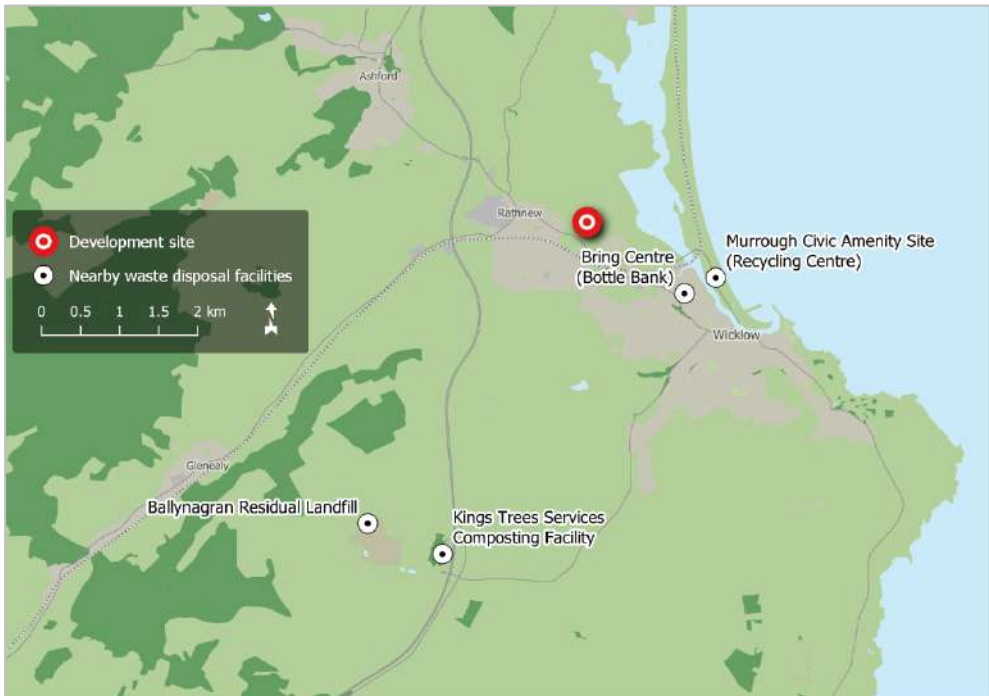


Figure 14.7 – Nearby Waste Disposal Facilities (sources: EPA, OSM Contributors)

- Ballynagran residual landfill (EPA licence W0165-02) is located approximately 4.8km south-west of the development site. This is a large-scale landfill facility that accepts residual non-hazardous, commercial, and industrial waste.
- The Greenking composting facility (EPA licence W0218-01), operated by King Tree Services, is located at Coolbeg, Co. Wicklow, approximately 4.6km south-south-west of the development site. This has the capacity to accept and process 40,000 tonnes of green waste per annum.

- A WCC Recycling Centre is located c. 2.5km to the east of the site. This can accept a wide variety of waste streams.
- The closest bring bank to the development is located c. 2.2km to the south-east, adjacent the WCC buildings in Wicklow Town. The bring bank has receptacles for clear, green and brown glass, as well as aluminium cans.

14.3 Characteristics of the Proposed Development

A full description of the proposed development is provided in the statutory notices and in Chapter 2 of the EIAR. Briefly summarised, the proposed development comprises the construction of 352no. residential units:

- 220no. 2-4 bedroom houses
- 132no. 1-3 bedroom apartments and duplex units

The proposed development includes the completion of the Rathnew Inner Relief Road (RIRR), connecting the R750 and R761 regional roads, and the provision of 3no. new junctions on this road.

14.3.1 Proposed Operational Phase Waste Storage Arrangements

Residents in the duplex units and houses will be required to segregate their waste into the following waste categories within their own units:

- Dry Mixed Recyclables (DMR);
- Organic waste;
- Glass; and
- Mixed Non-Recyclable (MNR).

Provision will be made in the houses and duplex units to accommodate 3no. bins to facilitate waste segregation at source. Residents in units with external access to the rear of the property will store waste in bins at the back of the house. Residents in units where external access to the rear of the property is unavailable will store waste at the front of the unit, shielded from view of the road. These shielded waste storage areas (WSAs) have been sized to accommodate 2no. 240L bins and 1no. 120L bin. Residents will be required to place their segregated waste materials into these bins as necessary. The location of all WSAs can be viewed on the drawings submitted with planning.

One (1no.) shared communal WSA has been allocated for each apartment block. All shared communal WSAs are located externally at ground floor level. The WSA for Block 1 is located externally to the north of Block 1, adjacent to the bike stores. The WSA for Block 2 is located externally to the south-east of Block 2, adjacent to the bike stores. The WSA for Block 3 is located externally to the west of Block 3, adjacent to the bike stores.

Residents of the apartment blocks will be required to take their segregated waste materials to their designated WSA and deposit their segregated waste into the appropriate bins. The locations of the shared communal WSAs are illustrated on the drawings submitted with the planning application under separate cover and in **Appendix 14A** of the EIAR.

Each bin/container in the shared communal WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin.

Access to the shared communal WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access.

14.3.2 Proposed Operational Phase Refuse Collection Arrangements

It is anticipated that DMR, MNR and organic waste will be collected on a weekly basis. Glass waste will be required to be brought to the nearest bottle bank for disposal. Other waste materials such as textiles, batteries, printer toner/cartridges, textiles, lightbulbs, furniture / bulk items and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own residences and dispose of them appropriately.

There are numerous private contractors that provide waste collection services in the WCC area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered/permitted/licensed facilities only. Residents should be made aware of the waste collection arrangements and all waste receptacles must be clearly identified as required by waste legislation and the WCC Waste Bye-Laws. Waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter.

Residents in houses and maisonette apartment units with their own individual WSAs will be responsible for moving their bins to the kerb for collection. Bins will be collected from the kerb by the waste contractor. Bins will be returned to their respective waste storage areas by the residents.

Bins from shared communal WSAs will be brought to a staging area by facilities management or the waste contractor prior collection. The staging area for each shared communal WSA is located adjacent to the WSA for each apartment block. The location of each staging area is shown on the drawings submitted with the planning application under separate cover, and in **Appendix 14A** of the EIAR. Bins will be staged adjacent to the road immediately prior to collection and will then be returned to their respective WSAs immediately after collection, either by facilities management or the waste contractor. A vehicle tracking exercise for a refuse truck is included as Appendix 2 of this report.

The staging areas are such that they will not obstruct traffic or pedestrians (allowing a footway path of at least 1.8m, the space needed for two wheelchairs to pass each other) as is recommended in the *Design Manual for Urban Roads and Streets* (2022). A trolley/tug or suitable vehicle may be required to convey the bins from the shared communal WSAs to and from the staging areas. Suitable access and egress has been provided to enable the bins to be moved easily from the WSAs to the staging areas on the appropriate days. Waste will be collected at agreed days and times by the nominated waste contractors.

Waste will be collected at agreed days and times by the nominated waste contractors. It is recommended that bin collection times are staggered to reduce the number of bins

required to be emptied at once and the time the waste vehicle is required to service the site. This will be determined during the process of appointment of a waste contractor.

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14.4 Potential Impacts of the Proposed Development

14.4.1 Potential Construction Phase Impacts

Construction waste shall be generated during development. Waste generated during construction at a typical site includes the following:

- Concrete, bricks, tiles, and cement
- Wood
- Glass
- Plastics
- Bituminous mixtures, coal tar, and tarred products
- Metals (including their alloys)
- Soil and stones
- Insulation materials (possibly including asbestos-containing materials)
- Gypsum-based construction material
- Materials containing mercury
- PCB-containing materials (e.g. sealants, resin-based floorings, capacitors, etc.)
- Waste electrical and electronic equipment
- Oil wastes and waste of liquid fuels
- Batteries and accumulators
- Packaging (paper/cardboard, plastic, wood, metal, glass, textile, etc.)

The EPA issued the European Waste Catalogue in January 2002 and this system was used to classify all wastes and hazardous wastes into a consistent waste classification system across the EU. The EWC for typical waste materials to be expected to be generated during the construction of the existing buildings are as given in **Table 14.40**.

Table 14.40 - European Waste Catalogue – Construction Waste Materials

Waste Material	EWC Code
Non-Hazardous Materials	
Concrete, bricks, tiles, ceramics	17 01
Wood, glass and plastic	17 02
Bituminous mixtures, coal tar and tarred products	17 03
Metals (including their alloys)	17 04
Soil, stones and dredged spoil	17 05
Gypsum-based construction material	17 08
Hazardous Materials	
Electrical and Electronic Components	16 02
Batteries	16 06
Wood Preservatives	03 02
Liquid Fuels	13 07
Soil and stones containing dangerous substances	17 05 03
Insulation materials containing asbestos	17 06 01
Other insulation materials consisting of or containing dangerous substances	17 06 03
Construction materials containing asbestos	17 06 05

Construction and demolition waste containing mercury	17 09 01
Construction and demolition waste containing PCBs	17 09 02
Other construction and demolition wastes containing dangerous substances	17 09 03

In the absence of any mitigation measures, construction of the proposed development may potentially have very significant long-term adverse effects on the receiving environment. In particular, the improper disposal of hazardous waste materials generated during construction could result in threats to human health, contamination of local soils and water bodies, and degradation of local flora and fauna.

For this reason, the mitigation measures described hereafter will be strictly adhered to throughout the development’s construction phase. Compliance with these measures will be monitored, and comprehensive records kept of all construction waste materials.

14.4.2 Potential Operational Phase Impacts

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

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

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green/garden waste may be generated from gardens, internal plants and external landscaping;
- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges/toners;
- Chemicals (paints, adhesives, resins, detergents, etc.);
- Light bulbs;
- Textiles (rags);
- Waste cooking oil (if any generated by the residents);
- Furniture (and from time to time other bulky wastes) and;
- Abandoned bicycles.

Table 14.41 - European Waste Catalogue – Operational Waste Materials

Waste Material	EWG Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02

Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.)*	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

* Individual waste type may contain hazardous materials

In the absence of mitigation measures (in the form of a waste management strategy), the proposed development may potentially have significant long-term adverse effects on the receiving environment in its operational phase. The improper disposal of operational waste materials (and in particular those containing hazardous materials) could result in threats to human health, contamination of local soils and water bodies, and degradation of local flora and fauna.

14.5 Mitigation Measures

14.5.1 Construction Phase mitigation Measures

The following measures are proposed to ensure effective management of construction waste at the development site, to maximise recycling of construction waste, and to minimise the environmental impact of construction waste.

All waste materials will be segregated on site into appropriate categories, including:

- top-soil, sub-soil, bedrock
- concrete, bricks, tiles, ceramics, plasterboard
- asphalt, tar, and tar products
- metals
- dry recyclables (e.g. cardboard, plastic, timber)

All waste material will be stored in skips or other suitable receptacles in a designated waste storage area on the site.

Wherever possible, left-over material (e.g. timber cut-offs) and any suitable demolition materials shall be reused on or off site.

Uncontaminated excavated material (top-soil, sub-soil) will be reused on site in preference to the importation of clean fill, as soil to be reused or removed from site must be tested to confirm its contamination status and subsequent management requirements.

All waste leaving the site will be transported by a suitably licensed/permitted contractor and taken to a licensed/permitted facility.

All waste leaving the site will be recorded and copies of relevant documentation retained.

These measures are intended to ensure that the waste arising from construction of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996 (as amended), the Litter Act of 1997, and the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021, achieving optimum levels of waste reduction, re-use and recycling.

14.5.2 Operational Phase Mitigation Measures

Operational phase measures for the mitigation of waste impacts take the form of a waste management strategy that complies with all legal requirements, waste policies, and best practice guidelines (refer to the accompanying Operational Waste Management Plan prepared by AWN Consulting). In particular, it is ensured that the required waste storage areas have been incorporated into the design of the development and that the development's layout facilitates the efficient collection of waste materials.

Implementation of the OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021. Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the WCC Waste Bye-Laws.

The waste strategy presented in the OWMP document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated area for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

Residents will be made aware of the waste collection arrangements and all waste receptacles will be clearly identified as required by waste legislation and the WCC Waste Bye-Laws. Waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter. The development shall be serviced only by waste contractors holding a valid waste collection permit for the specific waste types collected, and all waste collected shall be transported to registered/permitted/licensed facilities only.

As previously noted, the majority of operational waste to be produced by the development shall consist of dry mixed recyclables, organic waste, glass, and mixed non-recyclable (general waste). In addition to these typical waste streams that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. The OWMP outlines the means by which several of these additional waste types should be disposed of.

Batteries

A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place in order to comply with the Waste Management Batteries and Accumulators Regulations 2014 as amended. In accordance with these regulations consumers are able to bring their waste batteries to their local civic amenity centre or can return them free of charge to retailers which supply the equivalent type of battery, regardless of whether or not the batteries were purchased at the retail outlet and regardless of whether or not the person depositing the waste battery purchases any product or products from the retail outlet.

Waste Electrical and Electronic Equipment (WEEE)

The WEEE Directive 2002/96/EC and associated Waste Management (WEEE) Regulations have been enacted to ensure a high level of recycling of electronic and electrical

equipment. In accordance with the regulations, consumers can bring their waste electrical and electronic equipment to their local recycling centre. In addition consumers can bring back WEEE within 15 days to retailers when they purchase new equipment on a like for like basis. Retailers are also obliged to collect WEEE within 15 days of delivery of a new item, provided the item is disconnected from all mains, does not pose a health and safety risk and is readily available for collection.

Printer Cartridge/Toners

Waste printer cartridge/toners generated by residents can usually be returned to the supplier free of charge or can be brought to a civic amenity centre.

Chemicals (solvents, paints, adhesives, resins, detergents etc)

Chemicals (such as solvents, paints etc) are largely generated from building maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated. Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents should be brought to a civic amenity centre.

Light Bulbs (Fluorescent Tubes, Long Life, LED, and filament bulbs)

Waste light bulbs may be generated from building maintenance works. Such works are usually completed by external contractors or facilities management who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated. Light bulbs generated by residents should be taken to the nearest civic amenity centre for appropriate storage and recovery/disposal.

Textiles

Where possible, waste textiles should be recycled or donated to a charity organisation for reuse.

Waste Cooking Oil

If the residents generate waste cooking oil, this can be brought to a civic amenity centre or placed in the organic waste bin.

Furniture (and other bulky wastes)

Furniture and other bulky waste items (such as carpet etc.) may occasionally be generated by the residents. If residents wish to dispose of furniture, this can be brought to a civic amenity centre.

Abandoned Bicycles

Bicycle parking areas are planned for the development. As happens in other developments, residents sometimes abandon faulty or unused bicycles and it can be difficult to determine their ownership. Abandoned bicycles should be donated to charity if they arise.

It is noted that significant elements of the development's waste management strategy require residents to actively comply with the provisions set out for waste management, for instance by correctly segregating waste at source and by not carelessly discarding waste materials. This is however the case in any residential development, and residents have an interest in maintaining a clean environment within the site. Furthermore, the higher disposal costs of general (non-recyclable) waste in comparison to mixed dry recyclables and other recyclable waste streams provide an incentive to segregate waste appropriately.

14.6 Residual Impacts

14.6.1 Construction Phase Residual Impacts

Waste materials will be generated during the construction of the proposed development, including the initial site clearance and excavation. Careful management of these, including segregation at source, will help to ensure maximum recycling, reuse and recovery is achieved, in accordance with current local and national waste targets. It is expected, however, that a certain amount of waste will still need to be disposed of at landfill.

Given the provision of appropriate facilities, environmental impacts (e.g. litter, contamination of soil or water, etc.) arising from waste storage are expected to be minimal. Particular attention will be given to the appropriate management of any construction waste containing contaminated or hazardous materials. The use of suitably licensed waste contractors will ensure compliance with relevant legal requirements and appropriate off-site management of waste.

With a high level of due diligence carried out on site and with the implementation of the proposed mitigation measures, the proposed development's demolition and construction phases are not expected to have a significant environmental impact with respect to waste management. Any such environmental impact shall be limited to the period during which construction works take place on site.

14.6.2 Operational Phase Residual Impacts

Waste materials will be generated on an ongoing basis during the proposed development's operational phase; these will for the most part consist of municipal waste and recyclable materials. Careful management of these, including segregation at source, will help to ensure a high level of waste recycling, reuse, and recovery at the

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development. A certain proportion of operational waste will nevertheless need to be disposed of at landfill.

Given the provision of appropriate facilities, and their correct use by residents, environmental impacts (e.g. litter, contamination of soil or water, etc.) arising from operational waste storage and removal are expected to be minimal. The use of suitably licensed waste contractors will ensure compliance with relevant legal requirements and appropriate off-site management of waste.

With the implementation of the proposed operational waste management measures, the proposed development is not expected to have a significant environmental impact with respect to operational waste.

14.7 Monitoring

14.7.1 Construction Phase Monitoring

A suitably competent and experienced representative of either the client or the lead contractor will be nominated as Construction & Demolition (C&D) Waste Manager for the project. The function of the C&D Waste Manager is to effectively communicate the aims and objectives of the Waste Management programme for the project to all relevant parties and contractors involved in the project, for the duration of demolition and construction works on site.

The C&D Waste Manager will be assisted in this role by the external Safety Consultant. Site Inspections will be carried out on a weekly basis and will incorporate inspection and monitoring of the requirements of the Waste Management Plan.

Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling, recovery, or disposal. A recording system will be put in place to record the C&D waste arisings on site. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste/IED Licences will be maintained on site at all times.

The Waste Manager or delegate will record the following:

- Waste taken for reuse off-site
- Waste taken for recycling
- Waste taken for disposal

For each movement of waste off-site, a signed docket will be obtained by the Waste Manager from the waste contractor, detailing the weight and type of the material and the source and destination of the material. This will be carried out for each material type removed from site.

The system will allow the comparison of these figures with targets established for the recovery, reuse and recycling of construction waste and to highlight the successes or failures against these targets.

14.7.2 Operational Phase Monitoring

No operational phase monitoring of waste generation, storage, or removal is required or proposed.

14.8 Reinstatement

It is envisaged that no reinstatement works shall be required outside of normal site works.

14.9 Interactions

As previously noted, construction and operation of the proposed development have the potential to impact upon human health, local soils and water bodies, and local flora and

fauna. Mitigation measures will however be put in place to minimise the risk of such interactions.

14.10 Cumulative Impacts

As shown in **Figure 14.4**, a committed development is currently under construction immediately to the south of the proposed development. This development was first approved under WCC ref. 17/219 (ABP Ref. PL27. 301261); minor amendments to residential unit types were subsequently approved under WCC refs. 20/1000 and 21/411. The permitted residential development now comprises a total of 352no. residential units.

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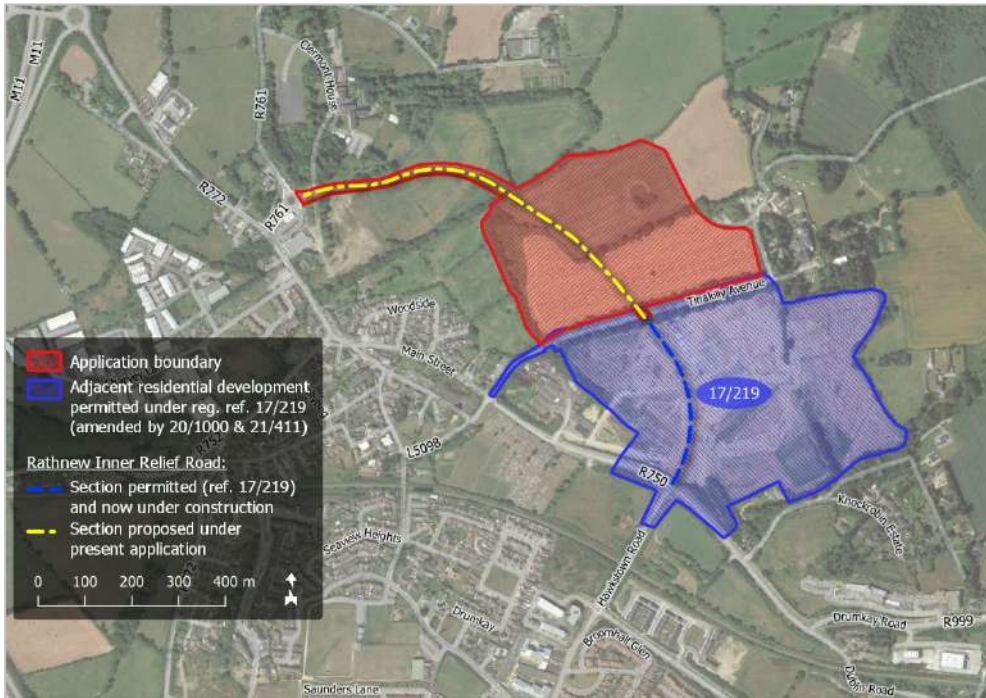


Figure 14.8 – Nearby Committed Development (sources: OSM Contributors, Google)

This committed development is expected to be substantially complete and occupied during construction of the subject development. The committed development’s operational phase will therefore overlap with the subject development’s construction phase, as well as its operational phase. The cumulative impact of these two developments in terms of waste management is therefore represented by adding the committed development’s projected residual operational impact to the subject development’s residual impacts.

As for the subject development, with the implementation of the proposed operational waste management measures, the committed development is not expected to have a significant environmental impact with respect to operational waste. The cumulative impact of the two developments will therefore not be significantly greater than the residual impacts of the subject development.

14.11 Do nothing Impact

Under a 'Do-Nothing' scenario, it is assumed that the subject site shall remain in its current greenfield state. There will therefore be no environmental impact in terms of waste generation and disposal.

14.12 References

- Environmental Protection Agency (EPA): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022)
- EPA: *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects* (2021)
- EPA: National Waste Database Reports 1998 – 2019
- EPA: European Waste Catalogue and Hazardous Waste List (2002)
- EPA: Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
- Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021 (2015)
- Department of the Environment and Local Government (DoELG): *Waste Management – Changing Our Ways, A Policy Statement* (1998)
- DoELG: *Preventing and Recycling Waste - Delivering Change* (2002)
- DoELG: *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002)
- Department of the Environment, Heritage and Local Government (DoEHLG): *Taking Stock and Moving Forward* (2004)
- Department of Communications, Climate Action and Environment (DCCAE): *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (2020)
- DCCAE: *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021)
- Wicklow County Council (WCC): *Wicklow County Development Plan 2016 – 2022* (2016)
- WCC: *Draft Wicklow County Development Plan 2022 – 2028* (2021)
- Department of Housing, Local Government and Heritage (DoHLGH): *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (2020)
- BS 5906:2005 Waste Management in Buildings – Code of Practice
- Waste Management Act 1996 (S.I. No. 10 of 1996) (as amended by the Waste Management (Amendment) Act 2001)
- Waste Management (Facility Permit & Registration) Regulations 2007
- 2002 European Landfill Directive [2003/33/EC]
- Environmental Protection Agency Act 1992 (Act No. 7 of 1992) as amended
- Litter Pollution Act 1997 (Act No. 12 of 1997) as amended
- Wicklow County Council (WCC): *County of Wicklow (Segregation, Storage & Presentation of Household & Commercial Waste) Bye-Laws* (2018)
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended 2010 (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015)
- European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC)
- Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC)

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15 MATERIAL ASSETS

15.1 Introduction

This chapter prepared evaluates the potential impacts, from the proposed development, on Material Assets as defined in the EPA Guidelines 'Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), Advice Notes Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015), and European Commission Guidance on Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017)'. RECEIVED 14/01/2023

As the nature of the potential for impact on material assets is derived from the cumulative impact of both the residential development as a whole, this chapter assesses the potential impacts of the development on site.

This chapter will evaluate the following economic assets of the site and environs:

- Materials Assets of Natural Origin
 - Agriculture
 - Natural resources
- Material Assets of Human Origin
 - Local settlement
 - Property Prices
 - Gas Supply
 - Electricity supply
 - Telecommunications
 - Transport
 - Water supply and sewerage
 - Municipal Waste
 - Tourism

Where relevant several of these assets have been addressed in other chapters within this EIAR and therefore, they are not discussed in detail in this chapter. References are provided to these other chapters where appropriate.

15.2 Material Assets of Natural Origins

15.2.1 Agriculture

The proposed development site has most recently been used for agriculture activities; however, the lands upon which the proposed development is to be located are zoned as residential. It is not anticipated that the operation of the proposed development will have any significant impact on agriculture in the wider environs of the site. Emissions from the proposed developments with the potential to impact on local agriculture are addressed in the respective EIAR chapters including Chapter 5: Population and Human Health, Chapter 6: Land, Soils, Geology and Hydrogeology, Chapter 7: Hydrology, Chapter 8: Biodiversity, Chapter 9: Air Quality & Climate and Chapter 10: Noise and Vibration.

15.2.2 Planting

Chapter 11 Landscape and Visual Impact report assesses trees on site and provide an analysis of any potential impact on the existing trees and hedgerows. The chapter also provides recommendations for remedial works, preservation and or removal of trees and hedgerows.

15.2.3 Use of Natural Resources (Energy/ Fuel)

During construction, fuel for construction related machinery will be one of the main resources used. Use of natural resources, especially water, will be kept to a minimum during the construction phase.

During the operational phase, there will be on-going resource requirements which will reflect the residential nature of the development. Refer Chapter 9: Air Quality and Climate for details on potential emissions from the proposed development.

15.3 Material Assets of Human Origins

15.3.1 Local Settlement

Rathnew Village is located approximately 0.8 km to the west of the site and is the closest significant settlement to the proposed development. Tinakilly House is located to the east of the site, as is the Knockrobin glamping site. Further details of the nature of local settlements are presented in Chapter 5: Population and Human Health.

15.3.1.1 Property Prices

The proposed scheme consists of the completion of the Rathnew Inner Relief Road and 352 no. new dwelling units consisting of houses/ apartments/ duplexes and maisonettes.

It is anticipated that the proposed development will have no negative impact on property prices. The proposal for 352 no. new units, which range from 1 bed apartments and maisonettes to 5 bed houses, will significantly increase the housing supply in the Wicklow – Rathnew area and contribute towards supplying the current demand for housing in this area.

The completion of the construction of the Rathnew Inner Relief Road will facilitate further expansion of the village of Rathnew into the future and allow the removal of through traffic from the centre of the village hence improving the public realm experience within the village during peak commuting hours.

15.3.2 Gas Supply

There is an existing gas pipeline located on the R750 road network. However, gas is not being proposed for this development. In the event that gas is selected at a later stage as

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an energy source, Gas Networks Ireland will be contacted and an existing gas map for the area surrounding the proposed development would be obtained.

15.3.3 Electricity Supply

ESB Networks have been contacted and an existing ESB network map for the area surrounding the proposed development has been obtained. A system of modular unit substations will be installed to provide power to the development.

Electricity Services will be brought from the existing MV network via underground ducting to the unit substation to be located on the site.

4 no. Modular unit substations will connect the residential houses and link road to the electricity network. Allowances of 2 no. modular substations would be allocated for the residential development on the east side of the link road and 2 no. modular substation will be dedicated to the residential area to the west of the link road.

15.3.4 Broadband/ Telco Providers

There are existing Telco Networks infrastructure in the vicinity of the site. A formal application cannot be made at this stage but will be made should planning permission be granted.

Each of the TELCO, being EIR and Virgin Media, providers have been contacted and existing services maps for the area surrounding the proposed development has been obtained.

The Site Infrastructure will allow for multiple broadband providers. It is envisaged Telco services will connect into the development from the existing Tinakilly Lane.

Provision for 2 No 110mm communication ducts will be made to provide the telecom services to the new development along Tinakilly Lane and will be distributed within the proposed development as indicated. A 50mm EIR and Virgin Media (VM) duct shall be provided from the nearest chamber to the home (a maximum of 12No houses per chambers). EIR and VM Services shall terminate within the EIR and VM ETU box positioned on the external walls of each house.

15.3.5 Transport

Chapter 13: Traffic and Transportation examine the traffic implications associated with the proposed development, in terms of integration with existing traffic in the area. The chapter presents a detailed review of the proposed development on the existing road network, through the operational assessment of the New Rathnew inner Relief Road/R750 junction in the vicinity of the development site.

It also examines the proposed development's vehicular access arrangements, car parking provision, site layout and facilities for pedestrians and cyclists.

15.3.6 Water Resources

Chapter 7: Hydrology deals with water resources associated with the proposed development.

The development's water demand has been calculated at the following rates for wastewater services and potable water:

- 8.268 l/sec peak wastewater flow
- 6.260 l/sec peak potable water demand

The proposed development will generate the following:

- 8.163 l/sec peak wastewater flow
- 8.245 l/sec peak potable water demand

Their combined peak wastewater flow and potable water demand are therefore:

- 16.431 l/sec peak wastewater flow
- 14.505 l/sec peak potable water demand

It is proposed to supply the development from an existing 315mm diameter public watermain is located along the northern side of the R750, approx. 300m to the south of the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), new watermains connecting to this are under construction within the permitted southern section of the Rathnew Inner Relief Road:

- a 225mm diameter watermain along the eastern side of the Rathnew Inner Relief Road.
- a 160mm diameter watermain along the western side of the Rathnew Inner Relief Road.

An existing 2" (51mm approx.) diameter watermain is also in place in Tinakilly Avenue, running along the development site's southern boundary.

A pre connection enquiry was made to Irish Water for a Water & Wastewater connection for a development of 350 units on the subject lands. The pre-connection enquiry reference assigned was CDS20007402. Irish Water confirmed that the subject development could connect to the existing water network without upgrades. A Wastewater connection for the development was considered Feasible subject to upgrades. Irish Water noted that they:

'plan to carry out upgrades to the Bollarney pumping station and there is also an LNRP for the network downstream of Bollarney PS which will be sized and designed to accommodate additional load from this development'. Some local network upgrades and extensions may

be required depending on the connection point, these will be determined at connection stage. This may be subject to change’.

The applicant has also received a Statement of Design Acceptance from Irish Water. This was issued to the project engineer CS Consulting on the 28th of June 2023 under Connection Reference No. CDS20007402.

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15.3.7 Sewerage

Chapter 7: Hydrology deals process and foul effluent associated with the proposed developments. No existing public foul drainage infrastructure is present within or adjacent to the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), a new 225mm diameter foul sewer is however under construction within the permitted southern section of the Rathnew Inner Relief Road. This shall commence in proximity to the development site’s southern boundary and shall outfall to the foul drain at the junction of the new Relief Road and the R750.

The proposed development will require a new separate foul drainage network to collect and convey the effluent generated by the proposed development. The drainage network for the proposed development has been designed in accordance with:

- British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
- the Irish Water Code of Practice for Wastewater Infrastructure

Given the topography of the site, the development’s gravity foul drainage network shall comprise two distinct parts:

- a northern section, which shall fall to the south and outfall into a new foul pumping station located at the site’s southern boundary; and
- a southern section, which shall fall to the south and outfall into a foul manhole located at the site’s southern boundary in the Rathnew Inner Relief Road (RIRR).

The proposed pumping station shall pump the collected foul effluent via 80mm and 150mm diameter rising mains to an approved standoff manhole in the new section of the RIRR to be built as part of this development, close to the development’s southern boundary. From this point, the effluent shall discharge to a 225mm diameter foul sewer to be laid in this new section of the relief road; this in turn shall connect to the new 225mm diameter foul sewer currently under construction within the southernmost section of the RIRR (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118).

The proposed pumping station will be located within a secure compound, with 2.4m high paladin fencing and a 5m wide access gate. The pump chamber will contain duty and assist pump sets and 24-hour storage will be provided in the form of a concrete tank with a high level overflow and low level return. The control panel will be fitted with a high level alarm and text/web alert system to ensure prompt response in the event of an emergency.

15.3.8 Municipal Waste

The construction phase of the proposed development works will give rise to the requirement to remove or to bring on to the site significant quantities of construction materials.

All these measures are in compliance with the provisions of the Waste Management Act 1996 (as amended), the litter Act of 1997, and the Eastern-Midlands Region (EMR) Waste management Plan 2015-2021, achieving optimum levels of waste reduction, re-use and recycling.

With a high level of due diligence carried out on site and with the implementation of the proposed mitigation measures, the proposed development's demolition and construction phases are not expected to have a significant environmental impact with respect to waste management. Any such environmental impact shall be limited to the period during which construction works take place on site.

With the implementation of the proposed operational waste management measures, the proposed development is not expected to have a significant environmental impact with respect to operational waste.

15.3.9 Tourism

The proposed developments are located in agricultural lands. In terms of tourism, the village is served by two hotels, Hunter's Hotel, one of Ireland's oldest coaching inns, and Tinakilly Country House which is located to the north of the site. As such, there will be some impact on Tinakilly County House hotel during the construction phase due to traffic and noise. In order to reduce the negative impact various mitigation measures have been addressed in Chapter 10 – Noise and Vibration.

During the operation phase of the development, access will be improved to Tinakilly Country House Hotel through the provision of a new gated entrance way from the proposed section of Rathnew Inner Relief Road crossing Tinakilly Avenue. Hunters Hotel to the north of the development site will be unaffected by the scheme.

15.4 Mitigation Measures

- Chapter 11: Landscape and Visual Impact analyses that the proposed development will have minimal impact on the existing tree cover on the site. It also suggests that the additional replanting will work in mitigating any loss of trees as a result of the development and will be a net positive to the tree cover in the particular location.

The proposed landscape plan details the planting of a significant number of new native broadleaf trees.

- As outlined mitigation measures in Chapter 12: Archaeological, Architectural and Cultural Heritage is carried out, then there will be no significant negative residual impacts on the archaeological, architectural, or cultural heritage resource.

- Chapter 10: Noise & Vibration deals with a schedule of mitigation measures that has been proposed for both the construction and operational phases to reduce, where necessary, the outward noise and vibration from the development.
- Chapter 9: Air Quality and Climate deals with appropriate mitigation measures to prevent fugitive dust emissions which will ensure the prevention of significant emissions during the construction stage. These measures have been incorporated into the overall Construction Environmental Management Plan (CEMP) prepared in respect of the proposed development.

The chapter also incorporates various good practice measures which would ensure the potential impacts to climate during the construction stage are lessened.

There are no mitigation measures required during the operational phase of the proposed development to improve development impact on Air Quality and Climate given the developments minimal impact on same.

- Chapter 7: Hydrology outlines various mitigation measures which are included during construction to minimize the potential for any accidental releases off site. During operation, the potential for an impact to ground or storm water is negligible and there are design measures incorporated within the proposed development to manage stormwater run-off quality.

15.5 Residual Assessment

The proposed development will not have any significant impact on material assets including, most notably, public utilities and natural resources. The overall predicted impact of the proposed developments can be classed as long term and negligible with respect to material assets. The proposed development has been designed for, and the infrastructure constructed for, a residential development of this nature.

16 CUMULATIVE IMPACTS

16.1 Introduction

This chapter considers the cumulative impact of the proposed development with any future development, as far as is practically possible, on the site and the cumulative impacts with both planned and permitted developments in the immediate surrounding area. As described in chapter 2 Description of Development, the development will consist of the construction of a new residential estate consisting of 352 new residential dwellings, including 220 no.1-2.5 storey houses and 132 new apartment/duplex/maisonette units.

Cumulative impacts are the impacts that relate to the incremental/additive impacts of the planned development to historical, present, or foreseeable future actions within reason. Cumulative impacts generally arise through the following:

- Persistent additions or losses of the same material or resource,
- Compounding effects due to the coming together of two or more effects.

16.2 Methodology

Cumulative Impacts as relevant to the subject proposal have been assessed regarding the following relevant guidance, including but not limited to:

- EIA Directive (2011/92EU) as amended by EIA Directive (2014/52EU);
- Planning and Development Regulations 2001 (as amended);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018);
- Guidelines on the Information to be included in Environmental Impact Assessment Reports (EPA 2022);
- Guidance on the Preparation of Environmental Impact Assessment Report (European Union 2017); and
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, European Commission, 1999.

The EPA Guidelines (2022) define cumulative effects as *'The addition of many minor or insignificant effects, including effects of other projects, to create larger more significant effects.* The guidance clearly outlines that this assessment is required as while a single activity may have a minor impact, the impact may be more significant when combined with impacts from other projects, current or future. It could also be relevant to consider the potential environmental loadings that may arise from the development of lands in the vicinity of the subject project.

This chapter considers the potential for cumulative impacts of the development that may arise from the proposed development with any future development that related to the application as identified within Chapter 2 Description of Development and permitted development in the vicinity of the development site.

16.3 Receiving Environment

16.3.1 Permitted Development and Existing Local Land Uses

The site is generally bounded by Tinakilly Country House Hotel and avenue to the east/south east; Knockrobin Glamping to the east; agricultural lands and residential development to the immediate west; green-field areas to the north of the landholding; and Tinakilly Avenue and a site currently under development as granted by Wicklow County Council Reg Ref. 17/219 (ABP Ref.310261-18) and amended by WCC Reg Refs. 20/1000, 21/411 and 22/837 to the south.

The subject site is on the northern periphery of Wicklow Town, with Wicklow town main street approximately 2 km to the south. This location is suited for a large residential development, outside of the town centre but proximate to services and facilities. Wicklow Town offers nearby amenities such as local schools, large supermarkets, schools a library and restaurants.

Aside from availing of the many amenities that Wicklow Town has to offer, the development site is located adjacent to Rathnew, a small village, approximately 350 metres to the west of the subject site and features a small main street, providing local shops that are located a short walk from the development site.

While the site is within comfortable walking distance of Wicklow town centre it also benefits from a variety of nearby transport links. The site is well served by a variety of frequent bus services offering connections to the IFSC and Gardiner Street in Dublin and Glendalough and Bray in Wicklow. The closest bus stop to the development is located adjacent to the sites southwest corner, approximately 175 metres from the proposed site entrance. The site is located approximately a 20-minute walk to Wicklow Rail Station to the south which offers a frequent commuter train service to Dublin and Waterford.

The sites eastern boundary runs for approximately 400 metres. This comprises of the boundary in the northeast running adjacent to agricultural lands for approximately 160 metres and the remainder of this boundary adjacent to the Tinakilly Country House Hotel Lands (Protected Structure RPS 25-15). The entire length of this boundary is characterised by an existing medium density hedgerow and some tree cover, separating the subject lands from the lands to the east of the site. There is currently an entrance point to the site along this boundary for vehicular/ pedestrian access/egress.

The sites northern boundary runs for approximately 320 metres. It is noted that the redline boundary of this section of the site extends northwest to include a section of the proposed distributor road linking to the existing constructed roundabout on the R761. The 'Rathnew Stream' runs the entire length of this site boundary. This site boundary is categorised by a dense tree row running along the length of the stream. There is currently no access or egress point along this boundary.

The sites western boundary runs for approximately 300 metres. The lands to the immediate west of the development site are currently unused greenfield lands. There is residential development within Rathnew Village located approximately 120 metres to the west of the site boundary at this location. The length of the sites western boundary is

characterised by dense mature hedgerow and a dense tree row running the length of the boundary. There is currently no access or egress point along this boundary.

The sites southern boundary runs for approximately 470 metres. The site bounds the existing Tinakilly Avenue at this location, a single lane stretches of tarmacadamed road giving access to the Tinakilly County House and Hotel from the R750. The site boundary is characterised by a dense hedgerow and a row of existing mature trees running the length of the avenue. There is currently no site access point along this boundary. It is proposed to close the western portion of Tinakilly Avenue off to vehicular traffic as part of the subject application, with vehicular access to be maintained to Tinakilly House from the western portion of the Avenue, which will be accessed from the Rathnew Inner Relief Road. A new gate associated with Tinakilly House will be provided along the western portion of the Avenue.

It is noted that an Area Action Plan for lands included in the Tinakilly Action Area was submitted by Ardale property group to Wicklow County Council and approved on the 20th of September 2021. The agreed Area Action Plan provides additional detail regarding how the wider lands in the Clermont – Tinakilly area can be developed. The approved plan does not contradict or preclude development occurring as outlined in the current Development Plan and allows for the subject lands to be developed in a phased and integrated manner. The action plan submitted makes minor adjustments to the zoning objectives on the site to allow for ease of sustainable development on the lands. The Area Action Plan as agreed governs the zoning of the lands. The site features a number of zoning objectives as follows:

- **R1** “New Residential: To provide for new residential development at densities up to 40 units per hectare.”
- **R2** “New Residential: To provide for new residential development at densities up to 28 units per hectare.”
- **Active Open Space** “To preserve, improve and provide for recreational public and private open space.”
- **Passive Open Space** “To preserve, improve and provide for parks, recreational public and private open space, green corridors and ecological buffer zones.”

The residential zoning of R1 and R2 extends upwards to the north and includes the active open space zoning to the south, south-west and north-western portion of the site and the passive open space zoning to the north. The subject site surpasses Tinakilly House to the south-east, and it is envisioned that future development will consolidate the entirety of the Tinakilly lands as a new residential area in Rathnew.

This assessment of the cumulative impacts of the proposed development has taken into account any relevant developments that are currently permitted, under construction, or developments for which plans have been submitted for the consideration of Wicklow County Council live in the planning system not yet granted.

Permitted developments in the immediate surrounding area which have the potential for cumulative impacts with the proposed development within the immediate vicinity of the site are as follows:

WCC Reg Ref. 22/837 – Permission was granted on the 19 October 2022 for a Large-Scale Residential Development. The proposed development will consist of amendments to permitted development Reg. Ref 17/219 (ABP Ref. 301261-18) for 271 units, as amended by permission granted under Reg. Ref 20/1000 and Reg Ref 21/411, to include for amendments to the layout, changes to house designs/types and 94 additional residential units (of which 84 no. units were refused under Reg. Ref 17/219 / ABP Ref 301261-18). The total number of units will consist of 365 no. units comprising 98 no. units permitted under Reg. ref 17/219 (ABP Ref 301261-18) as amended by permission granted under Reg. Ref 20/1000 and 21/411 (currently under construction) and 267 no. units proposed under the subject application. The proposed development will consist of the following: a) Construction of 267 no. residential units b) Provision of a new public park in accordance with the Action Area Plan for lands at Clermont-Tinakilly c) The park facilitates active recreation and passive recreation in the form of a woodland trail. The active public space includes adventure play areas for structured and natural play, fitness station points, looped fitness trails and an area identified as future GAA playing grounds d) All associated vehicular and pedestrian accesses from the Rathnew Inner Relief Road including carriageways, paths and junctions permitted under Ref 17/219 (ABP PL27.301261) and revised under Ref 20/1000 and Ref 21/411 (under construction) and all internal residential access roads and cyclist/pedestrian paths serving the proposed development e) No changes to development permitted under Refs 20/1000 and 21/411 f) No proposed works to Tinakilly Country House Hotel (a protected structure reference no. 25-15) g) All associated site development works, services provision, infrastructural and drainage works, provision of substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

WCC Reg Ref. 21/411 - Permission was granted on the 3rd of August 2021 for revisions to development permitted under WCC Reg Ref 17/219 ABP Ref 301261-18 to provide for layout reconfiguration and replacement of 62 no. previously permitted units. All associated site development works, services provision, reconfiguration of internal access roads and footpaths to facilitate house type changes, associated amendments to boundary treatments, landscaping and car parking areas. All other site development works, services provision, vehicular and pedestrian access, landscaping and boundary treatment works will remain as permitted under WCC Reg Ref 17/219/ABP Ref 301261-18 and WCC Reg Ref 20/1000.

WCC Reg Ref. 20/1000 - Permission was granted on 14 January 2021 for house type revisions to 36 no. units permitted under parent permission WCC Reg. Ref. 17/219 / ABP Ref. 301261-18. All associated site development works, services provision, amendments to boundary treatments and car parking areas and adjustment of the northern hammerhead/access road resulting from house type changes. Landscaping revisions to the permitted area of open space and provision of an ESB substation unit.

WCC Reg Ref. 17/219/ ABP Ref. 301261-18 - Permission was granted on the 18 January 2019 for 271 residential units, the first phase of the new Rathnew Inner Relief Road and associated road upgrades, passive and active open space, creche and all associated site development works and services provision. The Board's split decision included the refusal of 84 residential units to the southeast of the site.

As part of this assessment of the cumulative impacts that could arise from the proposal in combination with other projects, account has been taken of relevant developments currently permitted, under construction and currently live within the planning system for the consideration of Wicklow County Council. Existing surrounding land uses have also been considered, as indicated on figure 16.1 below:



Figure 16.1 – Overview of surrounding land uses

When reviewing existing and permitted development in the surrounding area, it was noted that there was a number of established constructed permissions, permissions for small alterations to single residential dwellings and extensions. As these permissions were relating to established developments surrounding the site, they have been considered to not have a significant impact in relation to the overall development at Tinakilly.

It is noted that all permitted projects in the vicinity of the site are subject to an appropriate level of environmental assessment or planning conditions which include measures intended to minimise the potential for environmental impacts in the area. Any new development proposed on the lands that follows the subject development should be subject to an appropriate level of environmental assessment that will take into consider the subject development on the lands.

16.3.2 Concurrent Development

It is noted that since the granting of permission under WCC Reg Ref 17/219 (ABP Ref. 301261-18), a section of the permitted Rathnew Inner Relief Road running north/south through the subject lands and house type changes to 98 no. units as amended under WCC Reg Ref. 20/1000, Reg. Ref.21/411 and 22/837 are currently under construction. 62 no. units are being constructed as part of the permission granted under WCC Reg. Ref. 20/1000, 36 no. units are being constructed as part of the permission granted under WCC Reg Ref 21/411 and 267 no. residential units are being constructed under WCC Reg Ref 22/837.

As the construction of the units granted under WCC Reg Refs. 20/1000, 21/411 and 22/837 is currently at advanced stages, it is considered that the proposed development works will not overlap with the construction works currently taking place on site. However, it is submitted that the timeline of the construction currently taking place on site may be subject to change due to factors outside of the control of the applicant. In the event of a construction overlap, it is considered that any potential overlap would only occur for a temporary duration.

The permissions currently being constructed on the subject site have been subject to appropriate levels of environmental assessment and planning conditions associated with

the grants of permission. This, in combination with the environmental assessments that have been conducted in respect of the subject development, means that all applications on the site have been subject to robust assessment to ensure that they represent the most suitable and sustainable form of residential development on the Tinakilly lands.

Therefore, due to the similar nature of the residential development being constructed currently on the site to the subject proposal, and the appropriate level of environmental assessment that has been conducted with respect of the previously granted permissions on the site and the subject development, it is considered unlikely that concurrent permissions being constructed on the lands will cumulatively create any potential impacts during the operational stage of the proposed development.

There is no creche facility proposed as part of the subject development. We refer to WCC application Reg. Ref. 19/853 for a mixed-use development including a creche and offices located at Broomhall Business and Enterprise Park, Merrymeeting Co. Wicklow. The creche facility provided as part of this development will be 576 sq.m and is a purpose built – dedicated facility that will provide childcare services for future occupants of the overall subject development. This permitted creche facility is located approximately 300 metres from the site entrance to the west, suitably located to cater for the childcare needs of future residents of development on the Clermont – Tinakilly Action Area lands.

16.3.3 Future Development

Any future application for residential development in proximity to the subject site of similar characteristics will be subject to an Environmental Impact Assessment as required. Any Environmental Impact Assessment prepared in respect of future residential development proximate to the subject lands should consider the subject proposal as part of any impact assessments.

16.4 Assessment of Potential Cumulative Impacts

16.4.1 Human Health and Population

The proposed development has been carefully designed to ensure that there are no significant effects on human health and population during the construction and operational phases, considering the surrounding land uses in the vicinity of the development site as well as the population in the relevant electoral divisions. It is considered that no significant effects will occur once appropriate mitigation measures are correctly implemented.

It is considered that the proposed development, concurrent developments currently under construction on the lands and any future envisioned residential development proximate to the site will have a positive short-term impact on the area during the construction phase. Short term employment is created in the area during the construction phase of a large residential development, which can have a short-term positive impact on the local economy.

The development currently being constructed on the site, the proposed development, and any future development surrounding the site will be required to implement mitigation measures during the construction period such as noise management, traffic management and dust management etc, to ensure that the cumulative impacts of any development will not have a significant impact on human health.

It is considered that development currently being constructed on site, the proposed development, and any future development surrounding the site will have a long-term positive impact on Human Health and Population. Residential developments on the R1 and R2 zoned lands on site will significantly increase the population of Tinakilly/ Rathnew and will have a positive impact on the local economy and possible job creation and business growth in the area.

It is considered that the impact on Human Health and population in the short term will be short term positive in terms of population and short-term negative in terms of human health. It is considered that the impact on Human Health and population in the long term will be long term positive in terms of human population and long term neutral in terms of environmental factors.

16.4.2 Land, Soils, Geology and Hydrogeology

As the site development is being constructed on the existing ground level, excavations are limited to shallow excavations into the made ground under the site. There are no significant potential cumulative impacts from these external developments to the site on the land, soils and groundwater.

16.4.3 Hydrology

As previously noted, a committed development is currently under construction immediately to the south of the proposed development. This development was first approved under WCC ref. 17/219 (ABP Ref. PL27.301261); minor amendments to residential unit types were subsequently approved under WCC refs. 20/1000 and 21/411. The permitted residential development now comprises a total of 355no. residential units

This committed development is expected to be substantially complete and occupied during construction of the subject development. The committed development's operational phase will therefore overlap with the subject development's construction phase, as well as its operational phase.

The long-term cumulative impact of these two developments in terms of waste management is therefore represented by adding the committed development's projected residual operational impact to the subject development's residual impacts.

Both development sites (the committed and proposed development) have been zoned for residential development and as such the current zoning would have taken into consideration the predicted effluent volumes to be generated on site by residential development, as well as the predicted increase in potable water demand. The cumulative effects of these two developments in terms of water supply and foul drainage are therefore not deemed to be significant.

The current zoning would have further taken into consideration the predicted effluent volumes to be generated on site by residential development, as well as the predicted increase in potable water demand. The cumulative effects of these two developments in terms of water supply and foul drainage are therefore not deemed to be significant.

Additionally, it is assumed that under a 'Do-Nothing' scenario that the subject site shall remain in its current greenfield state. There will therefore be no change to its existing natural drainage patterns, and no demand placed on the public potable water supply system or foul drainage system.

16.4.4 Biodiversity

It is considered that potential impacts arising from the proposed development are as follows: Habitat loss, accidental pollution events contaminating surface water in the receiving environment during the construction or operational phases, introduction of non-native invasive species causing habitat degradation, reduction in water quality with direct or indirect impacts on otter or other mammals, birds, fish and aquatic invertebrates, and disturbance/ mortality impacts to mammal or birds during construction or operation. A comprehensive suite of mitigation measures will be implemented to protect the biodiversity on the site during construction and operation, which when implemented will ensure that no residual impacts on flora or fauna are experienced.

It is noted that there is no possibility of any other plans or projects acting in combination with the proposed development to undermine the conservation objectives of any of the qualifying interests or European sites, or associated with, Dublin Bay as a result of water quality effects. The proposal will not have an impact on the water quality of Broad Lough or the Irish Sea to the east of the site. Broad Lough is considered to have intermediate water quality according to the EPA, and the Irish Sea is currently considered unpolluted. The proposed development is not considered to have an impact on the water quality of either of these waterbodies.

The Greater Dublin Drainage Strategy Study, and all development plans within the catchment area of the Ringsend Wastewater Treatment Plant note that all new developments should feature Sustainable Urban Drainage Systems. The relevant development plans feature protective policies and objectives to protect water quality in fresh water and marine environments, and to implement the Water Framework Directive in achieving good water quality in the Irish sea.

It is therefore considered that there is no possibility of the proposed development acting in combination with other plans and projects to undermine the qualifying interests or special conservation interests of National Heritage Areas or European Sites in or associated with Dublin Bay because of water quality effects.

It is noted that there is the potential for temporary impacts on the fauna in the area because of habitat loss, if further trees, hedgerows and woodland are removed, or areas of semi natural grassland are replaced by hardstanding or buildings and artificial surfaces. It is considered that due to the extensive planting plan for the development, no significant cumulative impacts are predicted which would increase the magnitude of the residual impacts associated with the proposal as a result of habitat loss in combination with other projects.

There is potential for cumulative impacts to arise with other local developments that would also result in the increased noise, vibration, human presence and lighting. Any disturbance effects from other such local developments are likely to be relatively minor nature, temporary, localised and over a similarly short duration, they are not likely to cumulatively affect the bird or bat populations in conjunction with the proposed development considering that they have to adhere to the same policies and objectives of the Wicklow County Council Development Plan as the proposed development.

Any effects on biodiversity that are potentially long term will be monitored by environmental protective policies as outlined in the Wicklow County Development Plan 2022-2028, which provide the relevant statutory planning policies for Wicklow for the next 6 years.

The predicted impacts associated with the proposed development, the mitigation measures proposed to protect local biodiversity and the receiving environment and the protective polices outlined in the county Development Plan will direct future local development. Significant cumulative negative impacts on biodiversity are not predicted.

We refer to Chapter 8 for a full detailed analysis of the potential for cumulative impacts on Biodiversity.

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16.4.5 Air Quality and Climate

It is considered that the potential for impacts to air quality and climate will arise from the construction phase of a development and are therefore considered short term and not significant assuming that dust mitigation measures are implemented on site. The cumulative impact from the proposed development and any other development that is being constructed within the immediate vicinity of the subject site concurrently will be short term and non-significant.

Any future developments on the site or in the area surrounding the site will be subject to similar dust mitigation measures and therefore no long-term negative impacts on Air Quality and Climate are predicted.

16.4.6 Noise and Vibration

During the construction period of the proposed development, construction work from the site will be the dominant noise source for surrounding sensitive receptors for the duration of the construction period within the site operation hours as conditioned by Wicklow County Council. Any construction that takes place within the vicinity of the subject site during the same construction period will be potentially significant and should be assessed as such. Mitigation measures as described in chapter 10 when implemented will ensure that there should be no significant cumulative impacts with permitted, future, or existing development because of the proposed development.

It is expected that once operational, the noise associated with day-to-day operation is minimal. The residential element of the development is not considered to generate any significant noise levels over and above those which form the general environment surrounding the site in nearby residential areas. It is considered that the traffic noise levels at residential properties immediately adjacent to the phase 2 link road are determined to be not significant and do not require any type of noise mitigation measures.

Whilst there is the potential for a short-term negative impact increase in noise levels on the site during the construction phase, it is considered that once operational, the noise level increase on the site will be not significant.

Any future developments on the site or in the area surrounding the site will be subject to similar noise mitigation measures as outlined in chapter 10 during the construction phase.

16.4.7 Landscape and Visual Impact

It is considered that additional cumulative impacts could possibly arise from the combined effects of the subject proposal and the committed development to the south of the subject site.

Effects to townscape character will naturally occur as a result of the change to the site's agricultural use, and due to the intensity of built development on the site. This change is moderated by the evolving urban context, to which the proposals form a northwards

extension, and its scale and form is considered appropriate to both this adjoining context and the underlying zoning objectives.

The proposed development has sought to complement the character and quality of the wider urban area, and sensitively round off the northern urban edge in this direction. Through a considered design, the proposals also work with, and augment, the framework of vegetation within the site and along its boundaries, embedding mature vegetation within areas of positive open space that deliver wider townscape benefits, whilst delivering the underlying land use objectives.

The proposed development will also only be visible from a small number of proximate locations in the surrounding landscape/townscape, locations that are influenced by features associated with the urban edge of Rathnew such as highways infrastructure, residential development, commercial/retail developments, and large scale urban development projects. Where visible, this would generally only be partially in nature, where new built form seen above and through existing tree lines and any foreground built form that does not preclude views.

The extensive landscape proposals incorporated into the proposed layout would further assimilate built form into the visual context and progressively provide a degree of screening.

Overall, the land between Wicklow Town and Rathnew has accommodated a number of housing and office / commercial development projects, that have gradually blurred the separation between the two settlements, and the site forms part of a wider action area, that is recognised in the development plan as being a strategic site to accommodate residential development.

The proposed development of this site is not considered to have the potential to generate any operational adverse townscape or visual effects greater than slight, and no effects that are considered to have the potential to be significant. Townscape and visual effects of the proposed development relate to a geographically restricted area, with negligible influence beyond approximately 500m.

Together with the adjacent site under construction, it is considered to have the potential to form a positive addition to the urban edge in this direction.

16.4.8 Archaeology and Cultural Heritage

All proposed and permitted developments within the study area of the proposed development have been reviewed. No cumulative impacts upon the archaeological or cultural heritage resource have been identified. This is due to the fact that all archaeological remains within the site will be preserved by record and no other impacts are predicted (from other developments) on the identified archaeological and cultural heritage resource in the study area.

As the features on the site and surrounding lands will be appropriately recorded and excavated, it is considered that there will be a neutral and not significant cumulative impact on Archaeology and Cultural Heritage expected as a result of the construction and operation phase of the subject development and any other surrounding plans and projects as assessed appropriately and individually.

16.4.9 Traffic and Transportation

During the proposed development's operational phase, in conjunction with the completion of the Rathnew Inner Relief Road, do not cause the surrounding road network's operation to deteriorate. At Junction 4 (R761/ALDI roundabout), these effects are negligible, causing no change in average vehicle queue lengths and increasing average delay by at most 1 second per vehicle in either peak hour period.

At Junction 1 (Merrymeeting Interchange), the redistribution of traffic via the Rathnew Inner Relief Road results in a more balanced operation of the junction. While some increases in vehicle queue lengths and delays are experienced on certain junction approaches in the peak hours, these are accompanied by reductions in queues and delays on other approaches. The overall effect is to bring all junction approaches back within effective capacity.

During its operational stage, the proposed development (including completion of the Rathnew Inner Relief Road) is therefore predicted to result overall in a long-term moderate positive impact on the operation of the surrounding road network.

16.4.10 Material Assets

The proposed development is not considered to have any significant impact on public utilities or natural resources. It is predicted that there will be a minimal use of material assets during the construction phase of the proposed development. Throughout the construction process there will be coordination between the project team and relevant services providers such as Irish Water and ESB to ensure that works are not impacting services in the locality of the development site.

Regarding the site currently under development to the south of the subject site (phase 1), the development works contractor is obliged to ensure that best practice measures are in place on site to avoid any potential interruptions to services from the existing telecommunications network, watermains, sewers and electrical grid. The proposed development and any future developments on the site will also be subject to best practice measures to ensure that the potential for service interruptions is minimised. Any interruption to services arising from developments on the site or in the vicinity of the site should be planned and communicated with the relevant services provider.

Therefore, the cumulative impact of the proposed development in combination with other permitted and planned projects is considered to be short term and not significant during the construction phase if any planned service interruptions are necessary, and long term not significant during the operational phase of the development.

16.4.11 Waste Management

This committed development to the south of the subject site is expected to be substantially complete and occupied during construction of the subject development. The committed development's operational phase will therefore overlap with the subject development's construction phase, as well as its operational phase. The cumulative impact of these two developments in terms of waste management is therefore represented by adding the committed development's projected residual operational impact to the subject development's residual impacts.

As for the subject development, with the implementation of the proposed operational waste management measures, the committed development is not expected to have a significant environmental impact with respect to operational waste. The cumulative impact of the two developments will therefore not be significantly greater than the residual impacts of the subject development.

Under a 'Do-Nothing' scenario, it is assumed that the subject site shall remain in its current greenfield state. There will therefore be no environmental impact in terms of waste generation and disposal

17 INTERRELATIONSHIPS BETWEEN THE ASPECTS

17.1 Introduction

The chapter has been prepared under the guidance within the EIA Directive, the Planning and Development Act 2000 (as amended), the Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017) and the EPA Guidance on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

In accordance with the guidance not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

The majority of the EIA report chapters have already included and described assessments of potential interactions between aspects, considered by the various specialists contributing to this impact assessment. This chapter presents a summary and assessment of the identified interactions.

Section 171A of the Planning and Development Act requires that the interactions between the following be assessed:

- Population and Human Health
- Land, Soil, Water, Air and Climate
- Biodiversity, with particular attention to species and habitats protected under the habitats Directive and the Birds Directive
- Material assets, cultural heritage and the landscape

17.2 Discussion – Positive Impacts

The reasoning behind the interactions that are considered to have a positive effect (i.e., a change which improves the quality of the environment) is outlined in this section.

Population and Human Health

The proposed development will create permanent full-time and temporary jobs during the construction phase, which will have a long-term positive and short-term, positive effect on employment in the local area.

Material Assets, Cultural Heritage & Landscape

The proposed energy efficiency options listed below will have long-term positive effect on the population and environment.

- Energy efficient heat pumps are being proposed to provide the heating and hot water requirement for each dwelling in the development. An external unit will be located at the rear gardens and connected to a cylinder located within the dwelling.
- The use of photovoltaics systems could potentially provide energy in the form of heat energy; as means of providing a complementary heating source for the building hot water requirement or, as a renewable electricity source to provide a complementary source to the proposed mains infrastructure to the building.

- Smart metering will be considered for all residential consumer points of supply, with the function of interfacing and communicating to future PV embedded generation.
- All residential houses will be future ready for Electric Vehicle (EV) charging points of supply in terms of consumer distribution board and containment allowances.

17.3 Discussion – Neutral Impacts

The reasoning behind the interactions that are considered to have a neutral effect (i.e., no effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error) is outlined in this section.

Material Assets, Cultural Heritage & Landscape

Archaeological assessment for the proposed development has identified features of archaeological interest on the site. Further, aspects of the proposed development have the potential to impact on unidentified archaeological features during the construction works.

Potential Mitigation strategies for archaeology and cultural heritage are detailed in Chapter 12 Architectural & Cultural Heritage which will ensure the effect is **long-term, imperceptible, and neutral**.

The construction stage traffic outlined in Chapter 10 has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 10.2.2. The construction stage traffic has the potential for a **neutral, imperceptible, and short-term impact** on air quality.

Land, Soil, Water, Air & Climate

The air Quality and climate chapter provides various mitigation measures that will be put in place during construction of the proposed development which will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. It is determined that the impact of construction of the proposed development is likely to be **neutral, short-term, localised, and imperceptible** with respect to human health.

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. It is determined threat predicted impact is **neutral, short-term, and imperceptible**.

Biodiversity

It is considered that potential impacts arising from the proposed development are as follows: Habitat loss, accidental pollution events contaminating surface water in the receiving environment during the construction or operational phases, introduction of non-native invasive species causing habitat degradation, reduction in water quality with direct or indirect impacts on otter or other mammals, birds, fish and aquatic invertebrates, and disturbance/ mortality impacts to mammal or birds during construction or operation. A comprehensive suite of mitigation measures will be implemented to protect the biodiversity on the site during construction and operation, which when implemented will ensure that no residual impacts on flora or fauna are experienced. It is determined that the predicted impact on biodiversity is **long term, imperceptible and neutral**.

17.4 Discussion – Negative Impacts

Land, Soil, Water, Air & Climate

The best practice dust mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be **short-term, localised, negative, and imperceptible** with respect to human health.

Potential impacts to air quality and climate during the operational phase of the proposed development are as a result of change in traffic flows and volumes on the local road network. The changes in traffic flows were assessed against the UK Design Manual for Roads and Bridges screening criteria for an air quality and climate assessment. It can be therefore determined that the impact to air quality and climate as a result of altered traffic volumes during the operational phase of the proposed development is **localised, negative, imperceptible and long-term**.

As the National and EU standards for air quality are based on the protection of human and concentrations of pollutants in the operational stage of the proposed development are predicted to be significantly below these standards, the impact to human health is predicted to be **imperceptible, negative, and long term**.

Noise & Vibration

Potential Construction phase impact - The inclusion of a standard height hoarding, construction noise levels are reduced to within the significance thresholds at distance where the closest NSLs are positioned. The construction phase activities can operate within and below the construction noise significant thresholds at the closest NSLs within the inclusion of a standard site hoarding. The impact is **negative, moderate, and short-term**.

Based on the planned activity and trip related traffic during the construction phase, the additional traffic introduced onto the local road network due to construction phase of the proposed development is significantly less than 25% along the local road network, hence no significant increase in traffic noise levels will occur. The impact is therefore determined to be **negative, short term and not significant**.

17.5 Conclusion

In accordance with EPA 'Guidelines on the Information to be contained in Environmental Impact Statements' (2022) all environmental factors are inter-related to some extent. A synergistic effect occurs when:

'The resultant effect is of greater significance than the sum of its constituents'

All environmental topics are interlinked to a degree such that interrelationships exist on numerous levels as outlined as per each topic above. In summary, it is concluded that the proposed development will not result in any significant synergistic effects on the environment.

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	Planning & Alternatives		Population & Human Health		Biodiversity		Noise & Vibration		Land, Soil, Water, Air & Climate		Material Assets, Cultural Heritage & Landscape		Traffic & Transportation	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Planning & Alternatives			+	+	X	X	X	X	O	-	X	X	X	X
Population & Human Health					-	X	-	-	O	X	O	X	-	X
Biodiversity							-	-	-	-	X	X	X	X
Noise & Vibration									-	X	X	X	-	-
Land, Soil, Water, Air & Climate											X	X	-	X
Material Assets, Cultural Heritage & Landscape														X
Traffic & Transportation														
	X	No Interaction			-	Negative	Con.	Construction						
	+	Positive			O	Neutral	Op.	Operation						

Table 17.1 – Comparison of Interrelationships