Dunkettle EIAR

Non-Technical Summary (NTS)

Volume I

November 2024

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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1 Introduction

Article 5(1)(e) of the EIA Directive requires the project proponent to include a Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) and it is transposed into Irish law under article 94(c) of the Planning and Development Regulations 2001, as amended. The term 'non-technical' indicates that this summary should not include technical terms, detailed data and scientific discussion, that detail is presented in Volume II, the EIAR.

This Non-Technical Summary provides a concise, but comprehensive description of the Project, its existing environment, the effects of the project on the environment, the proposed mitigation measures, and the proposed monitoring arrangements, where relevant. The NTS highlights any significant uncertainties about the project. It explains the development consent process for the Project and the role of the EIA in that process.

It is important to highlight that the assessments that form part of the EIAR were undertaken as an iterative process rather than a one-off, post-design environmental appraisal. Findings from the individual assessments have been fed into the design process, resulting in a project which achieves a 'best fit' within the environment.

1.1 Brief Project Description

The development description is set out in Section 2.1.

The following is a summary of the proposed works for the three sub-areas with the EIAR Study area, with a total of 1036 no. residential units in the LRD Phase 1 and LRD Phase 2 areas.

LRD Phase 1 - Permission for 550 no. units, comprising a mix of semi-detached and terraced dwelling houses and duplex/apartment units, a childcare facility and commercial floorspace and the provision of landscaping and amenity areas and all associated infrastructure and services including vehicular and pedestrian/cycle access, roads, parking, lighting and drainage. Vehicular access will be provided from Dunkettle Road (east of the site), including pedestrian and cycling facilities. There will also be a connection to existing bicycle network connections to Glanmire in the north and to the existing urban Cycling network to the south.

LRD Phase 2 – Permission for 486 no. units comprising a mix of semi-detached and terraced houses, duplex and apartment units and the provision of landscaping and amenity areas and all associated infrastructure and services, vehicular and pedestrian/cycle access, roads, parking, lighting and drainage. A second access point from Dunkettle Road will be included.

Dunkettle House – This House will remain in its current traditional residential use. At the time of writing this EIAR, no detailed design proposals have been prepared but a feasibility study is being undertaken to identify potential future uses including the sympathetic re-use of the eighteenth- and nineteenth-century buildings. It is not envisaged that any future development at Dunkettle House would necessitate an assessment under EIA requirements on its own, but for completeness, the concept of the future development proposals is included in this EIAR.

The following is a general location plan of the sub areas identified above.

Figure 1-1 General Location of Sub Areas within EIAR Study Boundary

1.2 Site Description

The lands are located at Dunkettle (townland), Glanmire, Co. Cork, generally to the north of Dunkettle Interchange and south of Glanmire Village, with the Glashaboy River to the west and Dunkettle Road to the east. The overall landholding includes Dunkettle House, its outbuildings and historic landscape that surround it.

The site measures c.63.78HA.

The site has an undulating topography generally sloping towards the Glashaboy River.

Excluding Dunkettle House and its grounds (in private residential use), the lands are broken up into a number of separate agricultural fields, with hedgerows and a number of strong treelines, particularly to the southern portion of the lands acting as field boundaries. There are a number of woodland areas within the site, evident in the aerial image below. There are also a number of mature trees located in the attendant grounds of Dunkettle House.

Part of the study area adjoining Dunkettle Road, adjacent to Woodlands Cottage, was used as a construction compound for the Part Viii works on Dunkettle Road.

The survey drawings identify ruins/structures including a former dwelling on the northern part of the site.

Aside from lands in public ownership on Dunkettle Road at the proposed entrance to the development, the applicant owns all lands within the EIAR Study Area.

Figure 1-2 Aerial Image of Study Area

1.3 Screening for Environmental Impact Assessment

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

This development meets the threshold for a mandatory Environmental Impact Assessment with the development of greater 500 housing units and a site greater than 10 hectares.

1.4 Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters. The consultant firms and lead authors are listed in **Table 1-1**. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

Table 1-1 EIAR Chapters and Contributors

Chapter	Aspect	Contributor	Lead Consultant
1	Introduction	McCutcheon Halley Planning Consultants	Louise O'Leary
2	Development Description	McCutcheon Halley Planning Consultants	Louise O'Leary
3	Alternatives	McCutcheon Halley Planning Consultants	Louise O'Leary
4	Population & Human Health	McCutcheon Halley Planning Consultants	Louise O'Leary
5	Landscape & Visual	Doyle McDonogh Nash Architects John Cronin & Associates G-Net	Kieran McDonagh John Cronin Alan O'Neill
6	Material Assets: Traffic & Transport	MHL Consulting Engineers	Ken Manley
7	Material Assets: Built Services	JODA Engineering Consultants John Kelleher & Associates Building Services Engineers	Paul Murphy John Kelliher
8	Material Assets: Waste	Enviroguide	Laura Griffin
9	Land & Soils	Viridus Consulting Ltd.	Darragh Musgrave
10	Water & Hydrology	Viridus Consulting Ltd.	Darragh Musgrave
11	Biodiversity	Enviroguide	Tom Ryan Ben Lansbury
12	Noise & Vibration	AWN Consulting	Aoife Kelly Robert Holohan
13	Air Quality	AWN Consulting	Aisling Cashell
14	Climate	AWN Consulting	Aisling Cashell
15	Cultural Heritage	John Cronin & Associates	Tony Cummins John Cronin
16	Interactions of the Foregoing	McCutcheon Halley Planning Consultants	Louise O'Leary
17	Summary of Mitigation Measures	McCutcheon Halley Planning Consultants	Louise O'Leary

1.5 Methodology

In preparing the EIAR the following regulations and guidelines were considered:

- The requirements of applicable EU Directives and implementing Irish Regulations regarding Environmental Impact Assessment
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Reports (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, May 2022).
- Guidelines on Information to be Contained in Environmental Impact Statements (EIS) (Environmental Protection Agency, 2002)

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

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

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

The identified quality, significance, and duration of effects for each aspect is primarily based on the terminology set out in the EPAs Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) as summarised in the following table:

Table 1-2 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or the improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effect	An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.
Duration of Effects	
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of Effects	
Indirect (Secondary or Off-site)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
Do-Nothing	The environment as it would be in the future should the subject project not be carried out.
Worst-Case	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

2 Project Description

2.1 Proposed Development

The proposed development will function as a natural extension to the town of Glanmire by consolidating development in the area and ensuring the retention of a compact settlement. As outlined above, the development considered in this EIAR includes 3 development areas.

A description of the proposed provided in each of these areas is included in the following sections.

2.1.1 LRD Phase 1 (c.26 ha)

The development proposed in the LRD Phase 1 area, the subject of the accompanying current planning application, consists of a Large Scale Residential Development (LRD). This proposed development comprises the following: -

- The demolition/removal of existing ruins/structures (including a former dwelling on the northern part of the site).
- The construction of 550 no. residential units to include 394 no. dwelling houses comprising a mix of 2,3 and 4 bed semi-detached and townhouse/terraced units and 156 no. apartment/duplex units comprising a mix of 1 and 2 bed units in 10 no. blocks ranging in height from 2 to 6 storeys.
- 1 no. creche.
- 3 no. commercial units comprising a shop, cafe and medical/general practice facility.
- New vehicular access, new pedestrian access, a traffic signal controlled Toucan pedestrian crossing and upgrades to the road markings on the L2998 Road to the east
- new greenway through the development connecting to the L2998 to the north and to the existing (Dunkettle to Carrigtwohill) Greenway to the south,
- All associated ancillary development works including drainage (including attenuation pond), footpaths & cycle lanes, landscaping, amenity and open space areas, boundary treatments, bicycle and car parking, bin storage, 7 no. ESB substations, the undergrounding of the existing overhead electricity lines currently traversing the site, public lighting and all other ancillary development.
- An 8 year permission is sought for the above works.

This development is located on lands at the northern end of the study area in the townland of Dunkettle, with vehicular access from the east and pedestrian/cycle access to the east, north and south (via the proposed greenway). The application site boundary extends south along the western boundary of the site to provide for the greenway route and drainage infrastructure.

2.1.2 LRD Phase 2 (c.15 ha)

The development proposed in LRD Phase 2 consists of phase 2 of the proposed Large Scale Residential Development (LRD). This development, described below, will be subject to a future separate planning application but is included in this EIAR Assessment for completeness.

The proposed development will comprise of the following: -

- The construction of 486 no. units comprising a mix of 301 no. 2, 3 and 4 bed semi-detached and terraced dwelling houses and 185 no. 1 and 2 bed duplex/apartment units in blocks ranging in height from 3 to 5 storeys.
- All associated ancillary development works including drainage, footpaths & cycle lanes, landscaping, amenity and open space areas, boundary treatments, bicycle and car parking, bin storage, ESB substations, undergrounding of the existing overhead electricity lines currently traversing the site, public lighting and all other ancillary development.

A second access point from Dunkettle Road (L2998) is proposed in the LRD Phase 2 development. This access will utilise an existing access serving the applicants lands and a number of private dwellings on Woodlane. It is envisaged that the existing access will be upgraded to facilitate vehicular, pedestrian and cyclist movements. The design and specification of this second access are currently being developed in consultation with Cork City Council officials.

2.1.3 Dunkettle House

This House will remain in its current traditional residential use. The applicant is committed to the continued maintenance of the house, associated outbuildings and grounds.

At the time of writing this EIAR, no detailed design proposals have been prepared for Dunkettle House, the outbuildings or its grounds. The owners are embarking on a feasibility study to identify potential future uses including the sympathetic re-use of the eighteenth- and nineteenth-century buildings. It is not envisaged that any future development at Dunkettle House would necessitate an EIA Assessment on its own, but for completeness, the house and its associated grounds have been included within the EIAR Study area.

2.1.4 Development Overview

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

Table 2-1 Development Overview

Development Statistics	LRD Phase 1	Overall EIAR Study
Site Area	26.64 Ha gross (13.08 Ha net)	63.84 Ha study boundary (25.71 Ha net)
No. Units	550 no. units	1,036 no. new units 1 no. existing unit (Dunkettle House)
Non-Residential Uses	Childcare Facility (769.6 sqm, 118 child spaces) 3 no. Commercial Units (531.2 sqm total)	–
Density	42.05 uph	40.3 uph
Building Height	2-6 storeys	3-5 storeys
Unit Mix Summary	394 houses (71.64%) 104 2 bed (26.40%) 260 3 bed (65.99%) 30 4 bed (7.61%) 156 duplexes/apartments (28.36%) 75 1 bed (48.08%) 81 2 bed (51.92%)	695 houses (68.41%) 172 2 bed (24.75%) 463 3 bed (66.62%) 60 4 bed (8.63%) 321 duplexes/apartments (31.59%) 143 1 bed (44.55%) 178 2 bed (55.45%)

2.2 Drainage Strategy

2.2.1 Surface Water

There are 4 surface water catchments within the proposed site – flows will primarily follow the fall of the lands with 2 new outfalls to the Glashaboy River and connections to existing piped sewers on Dunkettle Road. Surface water from the site will be attenuated to the equivalent run-off from the existing greenfield site before entering the existing sewers. Surface water that is directed towards the Glashaboy river/tidal area will not be attenuated.

Sustainable Urban Drainage Systems (SuDS) are incorporated into the proposed design, including features which provide mitigation of surface water pollutants before discharge to the Glashaboy river/tidal area.

2.2.2 Wastewater

There is an existing wastewater sewer traversing the site, from north to south and onwards to the Carrigrenan Wastewater Treatment Plant. The proposed development will connect to this sewer and discharge to the Plant for treatment. Uisce Éireann has confirmed that there is capacity in the existing network to serve the proposed development.

The pipe will be diverted to facilitate the development within the Phase 1 LRD lands to the north.

This system will be completely separate from the surface water drainage network.

2.2.3 Water Supply

The site will be served by an existing water mains on Dunkettle Road. Uisce Éireann has confirmed that there is capacity in the existing network to serve the proposed development

2.3 Services

The development will be served by existing ESB and telecommunications infrastructure in the area. A gas connection is not proposed for the development.

2.4 Changes to Proposed Development Following LRD Meeting

This development was arrived at following detailed design and has evolved as an iterative process within the Design and Environment Team and in response to feedback from the Local Authority through the LRD process. Alternative designs considered for the proposed site and lead to the preferred design are described in Chapter 3 of this EIAR.

2.5 Demolition and Construction Phase

An **Outline Construction Environmental Management Plan** (OCEMP) and a **Resources and Waste Management Plan** have been prepared by JODA Engineering Consultants for the proposed LRD Phase

1 development which is the subject of the current planning application. The principles of these reports will apply to the LRD Phase 2 development also**.**

The construction phase of the proposed development (i.e. including LRD 1 and 2) is expected to take approximately 120 months. This equates to a 10 year construction programme for the overall development, with construction in some areas overlapping.

It is envisaged that c.125 dwellings will be constructed annually.

The current indicative phasing suggests that development will commence with the LRD Phase 1. The applicant envisages development will subsequently move to the LRD Phase 2 lands. There is no timeline for the potential future development at Dunkettle House, but for the purposes of the EIAR, worst case, it can be assumed that this would overlap with LRD Phase 2.

The sequence of phases may vary and will be subject to market demand, planning permission, funding, etc.

2.6 Site Facilities

Site facilities will be provided within the extent of the proposed development along with vehicular access routes from the public road. Initially it is proposed to provide facilities at a location adjacent to Dunkettle Road as shown in Figure below, with site access from Dunkettle Road. This is the same location previously used as a construction compound for the Part VIII works on Dunkettle Road.

2.7 Construction Hours

It is proposed that standard construction working hours will apply, i.e.:

- 7am to 6pm Monday to Friday,
- 8am to 2pm on Saturdays.

Any works proposed outside of these periods shall be strictly by agreement with the Local Authority in advance.

In order to mitigate any impact of construction activities, the following measures are proposed:

- Coordination of deliveries to site within working hours,
- Scheduling of noisier activities early in the working day,
- Noise and vibration mitigation measures will be implemented in line with Chapter 12.
- The delivery of materials to the site during the construction phase shall be organised so that deliveries are minimised and do not cause traffic hazards.
- Deliveries are not permitted at peak traffic times (8:00am to 9:00am and 5:00pm to 6:00pm) and
- all construction vehicles are parked within the site.

2.8 Construction Personnel & Parking

It is expected that there will be a typical average of approximately 120 no. construction employees on site during the development works.

Car parking spaces will be provided on site for use by the construction employees and visitors to the site.

2.9 Construction Traffic

The typical construction trips generated during site clearance and construction comprise:

- Construction Personnel arriving and leaving work.
- Deliveries and removal of machinery.
- Delivery and removal of materials.

Construction site staff travelling to the site typically arrive early in the morning and leave in the evening. Generally, workers travel by private vehicle and van. Based upon the number of construction employees envisaged, with an allowance for vehicle sharing and other modes of transport, an average of 90 vehicle movements to and from site per day is expected during the majority of the development period.

2.9.1 Deliveries and Removal of Machinery and Materials

Over the course of the construction programme the number of heavy vehicle movements is estimated as follows:

- **Building material delivery** – 7 vehicles per day during the house building phase.
- **Excavated soil removal (peak)** – 70 vehicle roundtrips per day during earthworks phase.
- **Waste removal** – 1 vehicle per day.
- **Machinery delivery/removal** – 1 vehicle per day expected during certain site activities (especially earthworks).

Parking of site vehicles shall be managed to ensure that there is no parking on the public road.

There will be designated areas on site for loading/unloading and a specified storage area for materials and machinery.

A **Construction Stage Traffic Management Plan** will be prepared and agreed with Cork City Council Transportation Department & An Garda Siochána by the Main Contractor(s) prior to the commencement of development. This Plan will build on the principles outlined in the CEMP submitted with the LRD Phase 1 Planning Application.

The **Construction Stage Traffic Management Plan** will be a live document and will be updated as development progresses, including LRD Phase 2 and at Dunkettle House, where relevant.

2.10 Demolition

There is no major demolition included in the proposed development.

The existing ruins/structures (including a former dwelling on the northern part of the site) will be removed as part of the works to facilitate the LRD Phase 1 development. Existing stonework from the walls of the house and ruins shall be recovered and reused in the landscaping/development works in accordance with the Architect's specifications.

2.11 Earthworks

The proposed development will involve excavation, stripping of topsoil and removal of material from site.

The development has been designed to work with the natural constraints of the site in as much as is practically feasible and consistent with the general site development requirement to achieve an accessible, integrated, permeable site layout and design.

There will be bulk earthworks cut and fill required throughout the site in order to facilitate the finished levels of the developed site. Cut and fill depths will generally be limited to less than 2m with the exception of certain specific parts of the site where substantially deeper excavation depths will be required.

Existing topsoil and subsoil onsite is uncontaminated and naturally occurring and considered suitable for re-use in the development. Excavated materials in excess of those required for the site development works will be treated as a by-product and exported off-site to be re-used at another suitable site in the first instance.

2.11.1 Ground Conditions

Site investigations were conducted to determine ground conditions, which generally comprised of:

- Topsoil 0.2m to 0.3 in depth, underlain by a mix of brown sandy gravelly SILT and silty GRAVEL to a depth of 1.0m to 3.5, underlain by rock.

Laboratory environmental tests were performed on a set of topsoil samples and subsoil samples to determine the suitability of the soil as inert waste at landfill and all samples were found suitable.

2.11.2 Invasive Species

Invasive species have been recorded within the study area. Within the area of Phase 1 LRD area, just sycamore and traveller's joy were recorded. During the construction stage, an IAS Specialist will treat and eradicate the invasive plants on site. Other measures to control the spread of invasive plant species will be applied.

2.11.3 Waste

A *Resources and Waste Management Plan* has been prepared by JODA for the proposed development and is submitted under separate cover. An inventory of the Waste composition estimated for the

proposed development is included in chapter 2 of this EIAR, including a percentage breakdown on the waste material to be reused, recycled, recovered or disposed.

2.11.4 Bulk Excavation, Foundations and Services

There will be excavation associated with the pouring of foundations and the digging of trenches for site services.

Excavation of rock will occur particularly at the eastern and western sides of the site where deeper excavations are required. The rock is typically red sandstone with mudstone and siltstone and is mostly excavatable using tracked excavators with toothed buckets. Isolated hard strata can occur in this rock type. It is estimated that approximately 1% of the overall rock excavation may be of sufficient hardness to require pneumatic hammering, equivalent to c.120 hours of rock hammering activity during the course of the works.

Rock excavated on site will be crushed and re-used on site for filling where suited, e.g. as a sub-base to footpath and cycle path areas. Existing topsoil and subsoil materials are uncontaminated and naturally occurring and are considered suitable for re-use in the development.

2.12 Health and Safety

Project supervisors for the construction phase will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013.

A Site Specific Health and Safety Plan for the development will be prepared.

2.13 Monitoring

2.13.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) is included with the Phase 1 LRD planning application. The CEMP will be updated by the Main Contractor(s) following a grant of permission, to address any changes required by planning conditions and will be agreed with the planning authority prior to the commencement of development.

The CEMP demonstrates the applicant's commitment to implement the proposed development so as to avoid or minimise the potential environmental effects resulting from construction activities.

Aspects addressed within the CEMP include but are not limited to: working hours; noise and vibration; dust and air quality; traffic and vehicle management; management of waste, pollution incident control; and protection of vegetation and fauna.

The mitigation and monitoring measures proposed in Chapters 4 to 16 of this EIAR will be implemented during the demolition, construction and operational phases, as relevant.

The appointed contractor will be required to implement this CEMP throughout the course of the construction phase. All personnel will be required to understand and implement the requirements of the plan.

The CEMP will be a live document and will be updated to include the Phase 2 LRD development, and its associated environmental requirements, following a grant of permission for same. The same principles will apply as outlined in the CEMP submitted with this planning application.

2.13.2 Community Liaison

The contractor will appoint a Liaison Officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the Contractor(s) CEMP.

2.13.3 Integrated Pest Management

The Main Contractor will take all necessary steps to ensure that pests - rodents, birds, insects and plants are controlled at all times.

Control measures will be undertaken prior to commencement of any works on the site. Poison where used, will comply with any relevant Health and Safety requirements and which eliminate any danger to children, household pets and other wildlife. Old and dis-used service pipes and voids will be removed or filled to avoid the potential pest to infest the site.

2.14 Commissioning

The testing and commissioning of services (drainage, watermain, gas, electricity) will be completed in accordance with relevant codes of practice as set out in Chapter 7 of the EIAR.

2.15 Property Management

A property management company would be appointed to manage the scheme and common areas to ensure that the scheme is well managed, and the development is maintained to an extremely high level. They will be responsible for inter alia cleaning, landscaping, refuse management, insurance, maintenance of mechanical/electrical lifts/ life safety systems, security etc.

2.16 Decommissioning

The development is considered permanent, and therefore a decommissioning phase is not considered in this report.

3 Alternatives Considered

The Planning and Development Regulations, 2001, as amended, require:

> *"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 requirement is elaborated at paragraph 2(b), which makes clear that 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 be presented in the EIAR.

The Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports states:

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

The Guidelines also state that the range of alternatives considered may include the 'do-nothing' alternative.

Accordingly, this chapter of the EIAR 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. The assessment of alternatives is considered under the following headings;

i. Do Nothing Alternative
ii. Alternative Locations
iii. Alternative Uses
iv. Alternative Project Design (3 no. alternative scenarios)
v. Alternative Processes

3.1 Do-Nothing Alternative

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

Each Chapter of this EIAR includes a description of the 'Do Nothing' alternative. In general, If the proposed development does not proceed, it is anticipated that the site will remain in its current condition and agricultural use in the short to medium term.

However, it is likely that another residential development proposal would be progressed on the site having regard to its location, its residential zoning and the critical need for housing.

3.2 Alternative Locations

As the development of this site for residential and local services has been identified the City Development Plan through its Settlement Strategy and land use zoning, and the development is in accordance with compact settlement objectives at a national level, no alternative sites were considered in this EIAR.

3.3 Alternative Uses

3.3.1 Cork City Development Plan (2022 – 2028)

The primary determinant of uses for a site is established by its land use zoning determined in the relevant Development Plan - Cork City Development Plan, 2022 – 2028 (CDP). The proposed development site is zoned *ZO 2 New Residential Neighbourhood*, with the greenway and some infrastructure to serve the development proposed on lands zoned *ZO 17 Landscape Preservation Zone.*

The CDP identifies the primary uses for residential zoned lands to include residential, creche, schools, home based economic activity, open space and places of public worship. In principle, an application on the residentially zoned lands for any combination of the uses listed above could be progressed on the site subject to compliance with other policies and objectives in the CDP.

The proposed greenway through the ZO 17 lands complies with the objective of ZO 17 zoning, but no alternative uses are proposed for these sites.

3.4 Alternative Design (including size & scale)

This development was arrived at following detailed design and has evolved as an iterative process within the Design and Environment Team and in response to feedback from the Local Authority through the LRD process.

3 Alternative Designs are presented in Chapter 3 of this EIAR, which vary in scale, size and extent. The final design chosen by the developer i.e. the project as presented is deemed to be the most suitable project for the site.

3.5 Alternative Processes

This is an urban residential development and therefore the consideration of alternative processes to be considered relates to the methods of construction. Alternatives have been considered, with the Construction Environmental Management Plan (prepared by JODA Engineering Consultants) detailing the construction processes likely to be employed and which have been assumed for the purposes of this EIAR.

3.6 Difficulties Encountered

Each Chapter of this EIAR includes a section on Difficulties Encountered and a description of same where encountered. In general, no significant difficulties were encountered which inhibited this EIA Assessment.

3.7 Proposed Preferred Alternative

On the basis of the foregoing, it is considered that all reasonable alternatives to the project are considered and no alternatives have been overlooked which would significantly reduce or further minimise environmental effects.

Having considered all alternatives, the final design chosen by the developer i.e. the project as presented is deemed to be the most suitable project for the site. This is the project described in Section 2 of the NTS (Vol I) and Chapter 2 of Volume II of the EIAR.

4 Assessment of Environmental Impacts

4.1 Population & Human Heath

The assessment of Population and Human Health is contained within Chapter 4 of Volume II.

4.1.1 Existing Environment

The overall subject site is located within the built-up area of Cork City and Suburbs, south of Glanmire, within the administrative area of Cork City Council.

The site is zoned for residential development (*ZO 02 New Residential Neighbourhoods*) and landscape preservation (*ZO 17 Landscape Preservation Zones*). The ZO 17 zoning is concentrated in the south of the site (around Dunkettle House) and at the western boundary of the site (adjacent to the Glashaboy River).

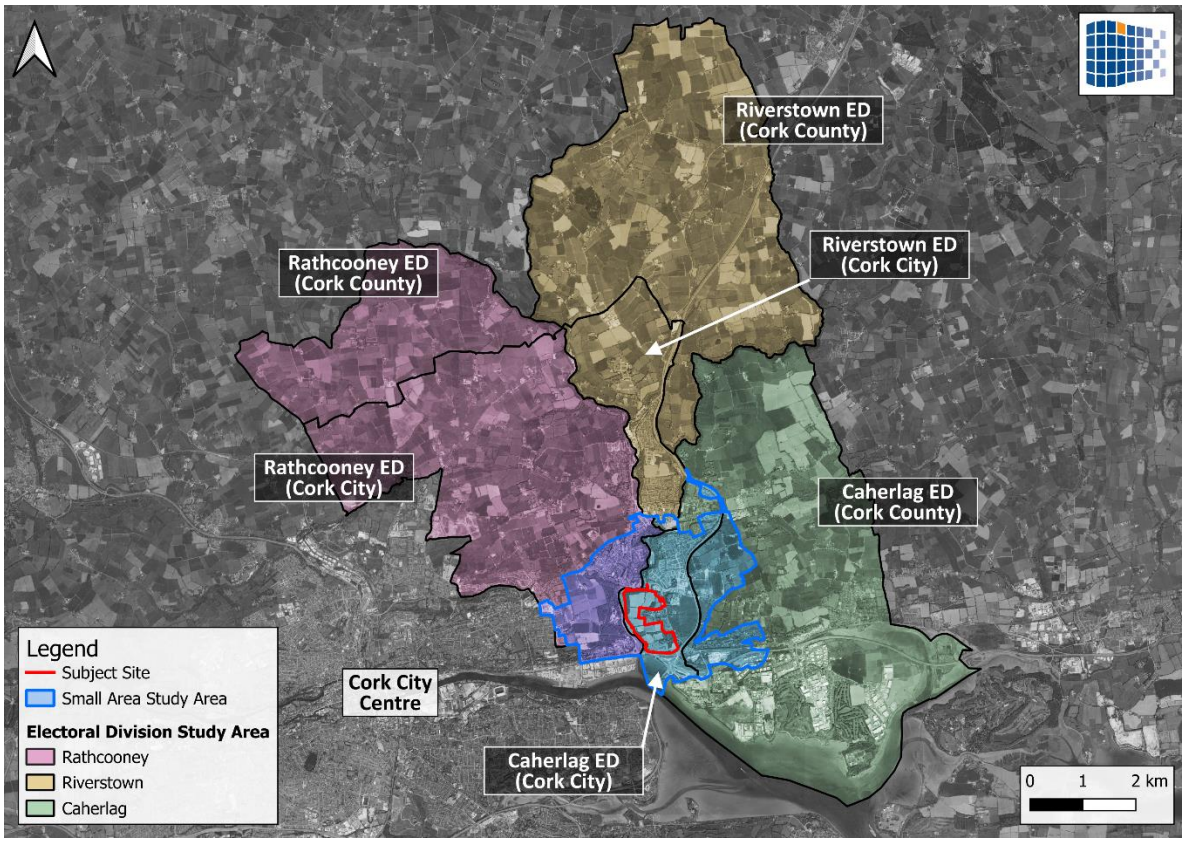

Figure 4-1 Census 2022 SA and ED Study Areas (Source: MHP GIS Team)

Two study areas were established for the assessment of potential effects on Population and Human Health (See Figure 4-1). A study area was defined using Census 2022 Small Areas (SAs) within a c.30-minute walk of the subject site. However, changes were made to the boundaries of these Small Areas between the 2016 and 2022 Censuses. As such, a second, larger study area was defined using the Census 2022 Electoral Divisions (EDs) in which these SAs are contained, comprising Rathcooney ED (Cork County Council), Rathcooney ED (Cork City Council), Riverstown ED (Cork County Council),

Riverstown ED (Cork City Council), Caherlag ED (Cork County Council) and Caherlag ED (Cork City Council).

4.1.1.1 Population

At Census 2022, the population of the SA study area was 6,423 people. This represents a 16.2% (896 person) increase in population between 2016 and 2022, significantly higher than the increase in the ED study area (6.7%), Cork City and County (7.6%) and the State (8.1%) in the same period. The average age of those residing in Howth ED was 45.3 in 2022, which represents an increase from an average of 44.2 in 2016.

4.1.1.2 Households

At Census 2022, there were 2,127 households in the SA study area; of these, c.42% (905) are identified as 1-2 persons households. This is notably lower than the proportion of 1-2 persons households in Cork City (c.55%) and the State (c.52%).

4.1.1.3 Housing Delivery

At Census 2022, there were 2,282 residential units recorded within the SA study area, which includes occupied and unoccupied dwellings. This represents a c.17% increase in housing stock between 2016 and 2022, slightly above the increase in population for the same period.

In contrast, the rate of housing delivery lagged behind population growth in both Cork City and the State; while Ireland saw an increase in population of c.8% between 2016 and 2022, housing stock increased by only c.5% over the same period.

At Census 2022, the vast majority of private households within the ED study area resided in a house or bungalow (c.91%), with just c.9% living within a flat or apartment. Considering the wider ED study area, the proportion of private households within flats or apartments is even lower (c.4%). This is a significantly lower level of apartment occupancy when compared to Cork City (c.17%) and the State (c.13%).

4.1.2 Sensitive Receptors

For the purpose of this chapter, the primary sensitive receptors are:

A. Current occupants of existing residential dwellings in the vicinity of the LRD Phase 1 development site, including dwellings along Dunkettle Road and north in Glanmire Village (mixed-use). Residents to east of Dunkettle Road are included.
B. Future occupants of 30-unit residential development at Glanmire Lodge (Reg. Ref. No. 20/39719) and the 608-unit residential development “Ballinglanna” (ABP Ref. SHD ABP-300543-18, Reg. Ref. No.’s 20/39179 and 23/42154).
C. Future occupants of nursing home to north of subject site (Reg. Ref. No.’s 19/38900 and 21/40423).
D. Current occupants of existing residential dwellings in the vicinity of the LRD Phase 2 development site. Residents to east of Dunkettle Road are included.
E. Existing hospitality business in vicinity of subject site (Vienna Woods Hotel and Holiday Homes).

F. Existing specialised medical and care facilities in vicinity of subject site (Lota Brothers of Charity, St. Laurence Cheshire Home and Lotamore House).
G. Current occupants of Dunkettle House (a protected structure) and existing residential dwellings to south east, including properties to east of Dunkettle Road.

The primary sensitive receptors are identified on Figure 4-15 of Chapter 4 of this EIAR.

4.1.3 Do Nothing Scenario

A 'do nothing' scenario, which is to say not developing these lands, would represent a lost opportunity to develop lands for residential use within the existing built-up area of Cork City and Suburbs. As such, the proposed development site would remain underutilised, and it would not contribute to increasing the provision of housing in this area.

In the absence of this development proceeding, it is likely that another residential proposal would be progressed on the site. This is due to the location of the proposed development site within the existing built-up area of Cork City and Suburbs, the Council's settlement strategy, their land use zoning and the need for additional housing.

4.1.4 Impact Assessment

4.1.4.1 Demolition and Construction Phases

Population

During peak construction, it is anticipated that there will be up to 120 staff required on site. Employees will travel from their existing place of residence, and so no temporary increase in the local population is anticipated. The likely effects on the population are **neutral, short term and not significant.**

Land Use

The lands are largely agricultural lands, with some wooded areas. These lands, and Dunkettle House and grounds, are privately owned and not open to the public. Lands which are under construction, or being utilised for construction activities including compounds and storage, will be hoarded off to the public. As such, the proposed development will a **neutral effect** on the use of the lands by the public.

Employment & Economics

The construction of the proposed development will take c.120 months and will generate direct employment within the local construction sector. There will also be off-site employment and economic activity associated with the provision of construction materials and professional services. The presence of construction workers will also generate additional spending in local shops and other local retail services. The likely effects on the local economy and employment are **positive, short-medium term,** and **not significant**.

Health

Construction sites pose potential risks to the health and safety of construction workers (through workplace accidents) and the public (through trespassing). In the absence of any mitigation measures, effects on the health of construction workers could be negative and such an effect may have a significance ranging from slight to profound, depending on the magnitude of the incident. Similarly, In

the absence of any mitigation measures to prevent access by the public and standard construction mitigation measures, effects on the health of the local population during the construction phase could be similar.

Indirect risks to the health and safety of the public (e.g., construction traffic, noise, dust or visual effects) are addressed under the more specific topics of the environmental media by which they might be caused (e.g., Landscape & Visual, Noise & Vibration, Air Quality, or Traffic & Transport).

Residential Amenity

The construction phase of the project will cause a certain amount of loss of amenity, disruption, nuisance and inconvenience to the local community including the residents closest to the project. The level of effect is predicted to be commensurate with the normal disturbance associated with construction activities where a site is efficiently and properly managed in accordance with best practice.

Due to the size of the study area and development lands, the level of significance and duration of the effect will vary for receptors during the course of the construction phase with those closest to a particular phase or activity being effected more than receptors at a distance. The negative effects will be short term and cumulatively significant.

4.1.4.2 Operational Phase

Land Use

The development will cause a permanent significant change in land use for the agricultural lands. This is a positive change in line with the land use zoning and national policy to increase housing supply.

Population

The proposed housing will increase the population of the local area. The houses proposed have the capacity to accommodate, in a mix of house sizes and types, a population of c. 2,400 persons, providing for existing and future housing demand in the area. Overall, the development will contribute to the continued growth and urbanisation of the local area and will have a positive, long-term and moderate effect on population.

Health

Energy efficiency measures integrated into the design of the proposed scheme will provide for healthier living standards for future occupants and a reduced dependence on fossil fuels for energy generation. Overall, the proposed development is expected to result in significant CO_2 savings and improved air quality through reduced energy consumption and a modal shift away from private motor vehicles.

The proposed greenway will promote active travel and reduced car dependency, as well as increased physical activity and amenity / recreational use. Overall, the proposed development will be a positive, permanent and significant benefit for residents.

Residential Amenity

The proposed development creates a high-quality living environment for future residents, with well-designed apartments, duplexes, and houses that meet or exceed housing standards.

The design carefully considers natural light and meets guidelines to ensure bright and comfortable interiors. Studies show that nearly all rooms will exceed recommended daylight levels. Future phases of the development will also aim for similarly high standards.

The site is naturally screened and buffered by the existing topography, mature trees and vegetation, and the Glashaboy River. Given this, no visual amenity or privacy impacts are anticipated for existing residents, as demonstrated by the *Verified View Photomontages* prepared by G-NET which accompanies the proposed development and the Landscape & Visual Chapter of this EIAR.

The overall effects on existing residents are neutral, permanent and slight.

Local Amenities

The proposed development will have an overall positive impact on local amenities. The LRD Phase 1 includes a large childcare facility and 3 commercial units, which will improve the variety and accessibility of the social infrastructure offerings in the area.

The *School Demand Assessment, Childcare Demand Report and Social Infrastructure Audit* reports by McCutcheon Halley Chartered Planning Consultants, which accompany the LRD Phase 1 application, demonstrate adequate capacity exists within the locality such that it is not anticipated that proposed development will have a negative impact on access for existing residents.

The proposed greenway will provide recreational (and commuting) opportunities for both existing and future residents, and the wider public, linking Glanmire Village to the Carrigtwohill to Midleton Inter-urban Cycle Route and the Glanmire to City Centre Cycle Route.

As such, the likely direct effects on local amenity during the operational phase are positive, permanent, and significant.

4.1.4.3 Cumulative Impact

The cumulative effects of plans and projects in the vicinity of the study area have been considered – these are listed in Chapter 1 of this EIAR.

It is noted that the housing currently under construction at by the applicant at “Ballinglanna”, north east of the site, is in its final phase of development. This will be completed or close to completion before works commence on the proposed development of the Dunkettle lands. It is therefore anticipated that no significant cumulative effects will occur between these projects. Further, the likely cumulative effects with other identified projects are neutral, temporary to short-term, and not significant, as the reduction in construction activities on the “Ballinglanna” development is balanced by the commencement of construction on the proposed development.

During the operational phase, the likely cumulative effects in terms of land use, population growth, housing supply and social infrastructure are positive, permanent and significant.

4.1.5 Mitigation

4.1.5.1 Incorporated Design

The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants.

The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability.

The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality.

The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme including segregated pedestrian entrances which is strategically located proximate to the village of Howth will encourage sustainable modes of outdoor access for a wide age group.

4.1.5.2 Construction Phase

Health and safety risks are the primary concern during the construction phase. These will be managed in accordance with Safety, Health, and Welfare at Work (Construction) Regulations, 2013. The design of the proposed development will be subject to safety design reviews to ensure that all requirements of the project are safe. A project supervisor for construction stage (PSCS) will be appointed and a contractor safety management program will be implemented to identify potential hazards associated with the proposed works. When issues are identified, corrective actions will be implemented to amend design issues prior to the issuance of final design for construction.

Temporary contractor facilities and areas under construction will be fenced off from the public with adequate warning signs of the risks associated with entry to these facilities. Entry to these areas will be restricted and they will be kept secure when construction is not taking place. Site lighting and camera security may be used to secure the site and any lighting will be set up with consideration of the adjoining property.

A **Construction Environmental Management Plan (CEMP)** included in the application documentation and a **Resource Waste Management Plan (RWMP)** for the proposed development are included in the application documentation. The CEMP & RWMP will be further updated by the contractor, agreed with the Council prior to commencement, and implemented by the selected contractor after any consent is received.

Measures to ensure public safety, with respect to construction traffic and the construction phase have been included in the included in the Construction Traffic Management Plan within the CEMP. A final CTMP will be agreed with the Council prior to commencement of development.

4.1.6 Operational Phase

The proposed development is of a high quality design that incorporates generously sized dwellings with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant negative environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.

4.1.7 Residual Impact Assessment

The residual effect of the proposed development for population and human health is determined to be significantly positive having regard to the delivery of much needed new homes in a location that has the carrying capacity in terms of both services and amenities to support the population generated by the scheme.

The likely residual effects on residential amenity, for existing residents in the area is neutral, permanent, and slight.

4.1.8 Monitoring

Measures to avoid negative impacts on Population and Human Health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.

No specific monitoring is proposed in relation to this section. Monitoring of standard construction mitigation measures as outlined in this EIAR will be undertaken by the appointed contractor.

4.2 Landscape & Visual Character

The assessment of Landscape & Visual Character is contained within Chapter 5 of Volume II.

4.2.1 Existing Environment

The site is located with the Glashaboy Estuary to the west and the Dunkettle Road to the east, with a range of existing residential development. Glanmire Village is situated to the north with the Dunkettle Interchange, Lough Mahon and the Lee River to the south. Dunkettle House and Parkland occupy a south facing hillside exposed to view from the city areas of Mahon, Blackrock and the Marina Walk. The west side of the site area has a band of ancient woodland with pNHA designation along the foreshore of the estuary, and this has Special Protection Area (SPA) status. A series of agricultural field areas; east of the woodland and north of the parkland are zoned for the creation of a new residential neighbourhood.

4.2.2 Impact Assessment

In a do-nothing scenario this property would continue to be managed as existing. Dunkettle House has been restored recently, the farmlands are in arable use and the woodlands would continue to be unmanaged as existing. This would in the medium to long term have a negative impact allowing the heritage assets such as the walled garden, courtyards and |Gate lodge to decay, and leaving the woodlands vulnerable to deterioration from invasive species and unexpected events.

In the construction phase the site area for the residential development has very little exposure from external viewpoints. It is enclosed by woodland and parkland areas and these are to be secured and protected from construction activity with the exception of two intrusions to provide stormwater outfalls to the estuary. A southern road access is to be designed as part of phase two of the development and this may impact on the northeast corner of parkland area with conservation protection. These may have temporary negative impacts during construction.

Once constructed the site will continue to benefit from the conservation areas of parkland and woodland. These will be managed for conservation and their status under such management should improve landscape and biodiversity value. The proposed structures and layout of the development as designed is scaled to minimise the presence of the new neighbourhood from external viewpoints. The overall impact will have a negligible negative to neutral impact.

The development of the Dunkettle lands to provide a new residential neighbourhood within the Glanmire area of the city, will expand the footprint of the suburb to infill the southeast quarter of the town as planned by Cork City Council. This expansion will incorporate the existing Woodville Estate and the existing ribbon development along the Dunkettle Road into the overall footprint and townscape of the settlement. The conservation of the historic House and parkland, the pNHA woodlands will maintain the existing landscape character. The overall impact will have a negligible negative to neutral impact.

4.2.3 Mitigation

The proposed development follows the guidance of the Cork City Development Plan 2022-2028, with its zonings for the conservation of the woodlands and parkland areas that enclose the lands with residential zoning from most external viewpoints. In addition to this there will be the retention of existing treelines and other woodland within the residentially zoned area. There will be extensive new woodland, open space area and street tree planting. The structures have been designed, scaled and distributed across the site to minimise visual impact from external viewpoints whilst creating a distinct new neighbourhood within the city overall.

During construction, encroachment into the existing pNHA woodland areas and the historic parkland is to be prevented with the use of fixed protective fencing to be maintained in place throughout the construction of the development. Exceptions to this are required to provide, two outfalls for stormwater to the estuary shoreline and an access to the development. The latter will encroach upon the northeast corner of the lands with the objective for conservation protection under the city development plan. These works will be strictly managed and supervised with ecology and conservation specialists included during onsite construction works. While the protective fencing will safeguard the heritage and biodiversity assets in general, the corridors proposed to provide for a second vehicular access and for drainage through the pNHA woodlands will have a moderate, significant negative impact. The proposed conservation management for the parkland and woodland areas will mitigate for these incursions.

Once complete it is intended that the historic landscape, the parkland and the woodland areas will be managed for conservation. Public access to the pNHA woodlands along the estuary will not be permitted. The existing historic walks within the woodlands will be conserved, vbut used only for maintenance access. This will ensure that their value contributing to landscape character and to biodiversity will be enhanced. The retention of the woodland area as a quiet buffer between the Estuary SPA area and the new residential neighbourhood will also serve to conserve the existing conservation value of the estuarine habitats.

4.2.4 Residual Impact Assessment

In terms of landscape character and visual impact. No residual impacts from the proposed development are anticipated. The design, scale and distribution of proposed structures, roads and cycleways, sit within an existing envelope of existing residential, woodland and parkland. The site is concealed from most external viewpoints and where visible it is only partially seen.

4.2.5 Monitoring

The Dunkettle lands will need to be monitored to ensure that the objectives for conservation as identified in the Cork City Development Plan 2022-2028 are achieved and maintained into the future. This includes the conservation management of the existing heritage assets and their historic landscape setting. It also includes the management of the existing and proposed new woodland areas solely for conservation purposes. In particular, it will be important to maintain the pNHA woodlands as a quiet zone where the public has no access in order to safeguard the conservation value of the Estuary SPA area.

4.3 Material Assets: Traffic & Transport

The assessment of Traffic and Transport is contained within Chapter 6 of Volume II.

4.3.1 Existing Environment

Figure 4-2 presents the local roads network including the critical junctions identified as being impacted by traffic generated from the proposed scheme.

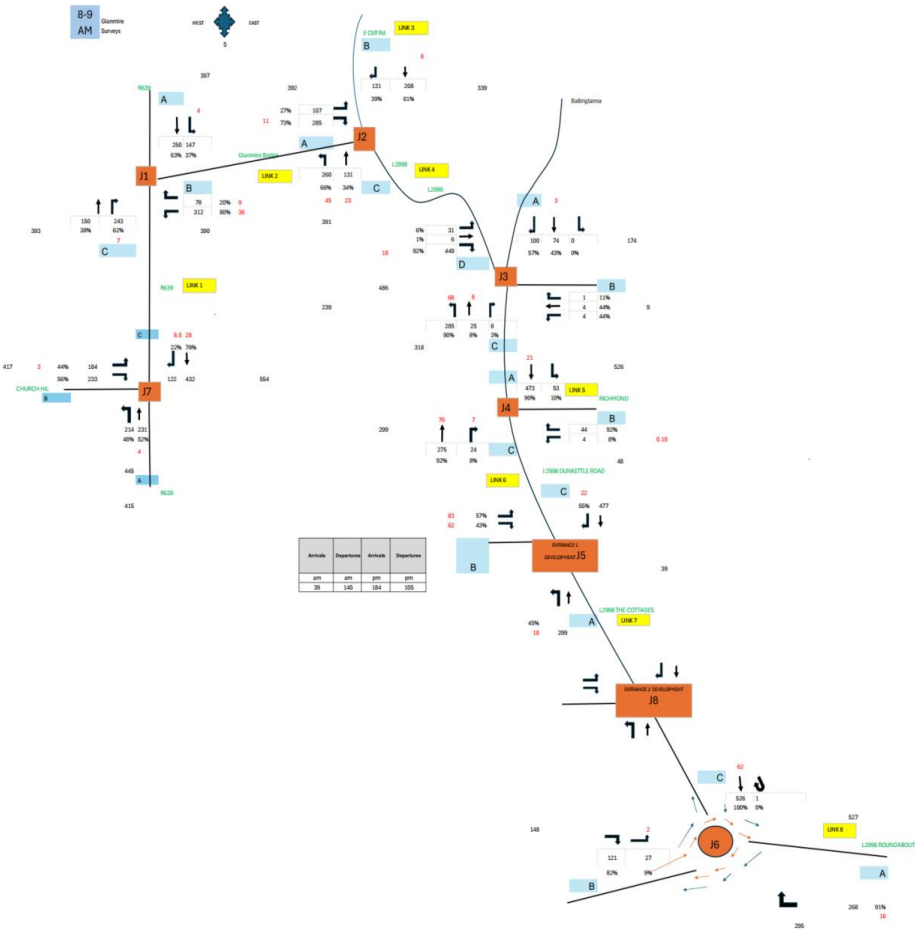

Figure 4-2 AM Peak (08:00-09:00) Junction Flows

Traffic models for each of the identified junctions were constructed and calibrated using recorded metrics such as queue length and time delay. The results of the modelling indicate that the following junctions are currently operating close to or above capacity:

- J1: R639 Glanmire Road and the L2999 Glanmire Bridge
- J2: East Cliff Road and the L2998
- J3: Balinglanna L2998 Junction
- J7: R639/Church Hill Signal Controlled Junction

The remaining junctions are seen to operate within capacity.

4.3.2 Impact Assessment

4.3.2.1 Do Nothing Scenario

The local roads network has been assessed for the Do-Nothing Scenario and is presented as the 'without dev' results for the modelled junctions for all future years. The results tables generated by the traffic modelling software have been constructed to make it easy to make a direct comparison between the with/without scenarios for each of the years and peak periods.

It should be noted that as the lands are zoned for development, in the absence of the proposed development proceeding, it is likely that a development of similar nature will proceed in the future in line with national policy and the Development Plan objectives. Therefore, the effects predicated are likely to occur in the future even in the absence of the current proposals.

4.3.2.2 Construction Phase

Construction stage traffic will result in an increase in HGV content on the local roads network with the potential for abnormal loads which will extend over the construction stage of the scheme.

Potential Direct effects of the construction phase on the Local Roads Network are:

- Uncontrolled and/or misdirected HGV's arriving via minor roads unsuitable to the task;
- Queuing at junctions due to slow moving vehicles;
- Mud attached to site vehicles will contaminate the existing road surface and road network drainage system with the potential to cause flooding and unsafe driving conditions for all road users;
- Excessive noise due to hilly nature of site

4.3.2.3 Operational Phase

The 'With Development' scenario of the LRD Phase 1 development has been assessed using the developed traffic models as previously described. Traffic Generation from the residential element of the site is based on recorded traffic generation from existing occupied residential units in the general area (Ballinglanna Housing Development comprising (484 apts/houses currently occupied)). These counts were carried out on the 02nd May 2024.

Traffic generation from the next Phase of residential development within the study area has been added to the developed traffic models and is assessed in the Cumulative Effects.

Traffic Generation from the creche and commercial elements of LRD Phase 1 were derived from the TRICS database. When assessing future traffic flows from the scheme the current modal shift was determined using the 2022 Census online SAP data, small area population. The current sustainable modal share in this area is 7% which is significantly lower than the CMATS Active Travel Mode Share of 33.3%. The future year target in 2040 is 50.7% which is an expected 50% increase over current levels. It was agreed with Cork City Council Traffic & Transportation Department that for the purpose of developing future year traffic models a 30% future modal share would be appropriate.

In addition to development traffic, recorded background traffic was factored using TII (Transport Infrastructure Ireland) Project Appraisal Guidelines (Unit 5.3 Travel Demand Projections, 2021) for use in future year scenarios. The combined traffic was distributed onto the modelled network and traffic flow matrices were developed for each of the affected junctions for the following years:

LRD Phase 1:

- 2026 AM/PM With/Without Dev (550 units + creche + retail)
- 2031 AM/PM With/Without Dev (550 units + creche + retail)
- 2041 AM/PM With/Without Dev (550 units + creche + retail)

4.3.2.4 Modelling Results

The Junction 10 Software Package was used to analyse each of the existing and proposed priority/roundabout junctions namely:

- Junction 1: The Glanmire Bridge/Glanmire Road Priority Junction
- Junction 2: Priority Junction of East Cliffe Road and the L2998
- Junction 4: Priority Junction of the L2998 and Richmond Hill
- Junction 5: Proposed Development Access 1 (Phase 1)
- Junction 6: Roundabout junction of the L2998/L3004 (Access to Dunkettle Interchange)
- Junction 8: Proposed Development Access 2 (Phase 2) (Refer Table 6.10 Cumulative Impact Results)

The following table describes the different LOS and the implications for the junction being assessed.

Table 4-1 LOS Definitions

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

LinSig modelling software was used to analyse the signalised junctions namely:

- Junction 3: Ballinglanna Cross-roads Signalised Junction
- Junction 7: Traffic Signal Controlled Junction of the R639 Glanmire Road/Church Hill Junction

Junction 1: R639 Glanmire Road/Glanmire Bridge

The modelling results indicate that currently this junction operates above capacity for the minor arm accessing on to the R639 for both morning and evening periods. A LOS F is modelled on this approach resulting in significant delay. The resulting queues are seen to dissipate relatively quickly once the peak period has passed (within a 5-10 min window).

Future year scenarios both with/without development traffic, shows the operation of this junction further deteriorating.

Junction 2: East Cliff Road and the L2998

Like Junction 1 the minor arm (East Cliffe Road) is seen to experience significant delay in accessing the L2998 (Glanmire Bridge) both with/without development traffic. The results are reflective of the observed operation of this junction which is linked to the operation of Junction 1 which is located just 50m away.

Junction 3: Ballinglanna Signalised Junction

The operation of this junction is currently restricted due to geometrical constraints which significantly reduces the capacity of the junction as evident in the results.

Junction 4: Priority 'T' Junction L2998 and Richmond Hill

The results show that this junction will operate within capacity both with/without development traffic for all future year scenarios.

Junction 5: Proposed Development Access (Phase 1)

The proposed junction is seen to operate within capacity up to an including the Design Year 2041.

Junction 6: Roundabout junction of the L2998/L3004 (Access to Dunkettle Interchange)

The proposed junction is seen to operate within capacity up to an including the Design Year 2041. Evening peak in 2041 with development traffic is seen to approach capacity.

Junction 7: Signal Controlled Junction of the R639 Glanmire Road/Church Hill Junction

The proposed junction is seen to operate within capacity up to 2031 where it begins to approach capacity both with/without development traffic.

4.3.2.5 Cumulative Impact

In developing future year models industry standard growth rates (Central Growth for the Southwest Region) have been applied to background traffic for future year assessments to account for further development within the area. These growth rates make allowance for modal shift targets as set by national policy but do not take account of site-specific measures that may be implemented to mitigate against traffic generation from a particular development. The schemes accounted for include;

Nursing home and childcare facility at the former Glanmire Rectory (Reg. Ref. No.'s 19/38900 and 21/40423) **-** This is a care facility on a site adjacent to the site of the proposed development. Construction of the facility is partially completed but at the date of writing of this document is paused. If this development does re-commence, the level of traffic associated with the completion of the nursing home is not considered to be significant and the local road network can accommodate the additional traffic.

Residential development at Glanmire Lodge, Glanmire (Reg. Ref. No. 20/39719) **-** This is a residential development of 30 dwellings that is currently under construction on a site adjacent to the northern extent of the study area boundary.

The following scheme is partially complete but as outlined in the description below is expected to be complete before works on the proposed site commence. The traffic from this site has been included

in addition to the standard growth rates. Figure 6-33 presents the quantum of traffic expected which has been distributed onto all future year models.

Ballinglanna residential development (ABP Ref. SHD ABP-300543-18, Reg. Ref. No.'s 20/39179 and 23/42154) - This is a large residential development at Ballinglanna that is currently under construction by the applicant. The permitted developments are located to the north-east of the site of the proposed project. The final phase of this development is currently under construction. The applicant has noted that construction of the permitted developments at Ballinglanna will be close to completion or completed before works commence on the proposed project with traffic volumes associated with these works added to Baseline Traffic Matrices and therefore the cumulative effect has been accounted for.

In this instance the development of strategic transport corridors in-line with the CMATS study and BusConnects as well as the provision of a direct link to the East Cork Greenway. The following are a list of current schemes at varying stages of development.

Glanmire Roads Improvement Scheme - This is a Part 8 scheme which involves a suite of projects to improve the accessibility, sustainability, capacity and safety of the transport network in the Glanmire, Riverstown and Sallybrook areas. The elements of the scheme planned and with funding secured in the vicinity of the study area are projects 1, 3, 9 I.e. Church Hill Junction, Glanmire Bridge / Village and Dunkettle Road upgrade respectively. Projects 1, 3, and 9A of this scheme commenced in Feb 2022, with substantial completion achieved in Q1 2023. Some works are currently continuing. Project 9B (Dunkettle Road South – Woodville to Dunkettle) has yet to commence but is at detailed design stage. The construction of this element of the scheme and other remaining approved projects has the potential to overlap with the construction of the proposed development.

Glanmire to City Centre Cycle Route – This is a Part 8 Scheme by the local authority to provide dedicated cycle tracks and improved pedestrian footpaths between Glanmire and the city centre. Phase 1A comprises improved pedestrian and cycling facilities along the Glashaboy River, from Glanmire village to the Dunkettle / Tivoli Roundabout. This development is located west of our site, separated by the Glashaboy River. Works commenced on Phase 1A of the scheme in January 2024 and is scheduled to be completed by Q4 2024

4.3.2.6 Full Development including Phase 2 (Combined total of c. 1036 residential units)

Traffic generation from the next Phase of this scheme and including Dunkettle House in its existing form has been added to the developed traffic models.

Traffic models for future year scenarios (2031 & 2041) have been developed to assess the cumulative impact of a fully completed scheme on the roads network.

Table 4-2 present the results both with/without development for these future years on the current network (no mitigation measures applied). (*Note: red highlighted figures imply that the junction is operating over capacity.)*

Table 4-2 Traffic Modelling Results for a fully completed site (1036 residential units)

			Without Development			With Phase 1 Development			With Phase 1 + 2 Development		
			DOS/RFC %	Queue (pcu)	Delay (s)	DOS/RFC %	Queue (pcu)	Delay (s)	DOS/RFC %	Queue (pcu)	Delay (s)
J1 Priority Junction	2031	AM	110	30.1	217.02	122	55.4	403.33	132	81.6	625.22
		PM	118	44.1	316.55	131	70	564.11	143	99.1	796.1
	2041	AM	126	61.8	471.6	139	98.4	757.01	149	135.4	1029.73
		PM	136	83	674.72	153	126.4	1036.89	170	166.5	1381.82
J2	2031	AM	109	26	218.61	116	36.02	296.6	121	44.9	376.04
		PM	91	10.5	48.79	102	26.5	118.19	109	46.4	194.7
	2041	AM	126	54.3	468.28	134	67.4	613.37	141	79.7	737.71
		PM	102	28	123.77	112	57.6	234.94	139	43.7	539.49
J3	2031	AM	94.4	18.4	110.3	103.4	28.2	206.9	110.7	43.5	218.8
		PM	99	24.1	118.6	114.1	68.5	290.1	125	101.9	432.9
	2041	AM	103.4	32.8	164.5	112.8	52.7	321.2	118.5	70.6	357.8
		PM	108.4	47.8	225	123.8	91	418.5	135.3	136	547.6
J4	2031	AM	21	0.3	16.79	23	0.3	18.58	25	0.3	20.21
		PM	17	0.2	11.56	19	0.2	12.76	22	0.3	14.07
	2041	AM	26	0.3	19.03	28	0.4	21.38	30	0.4	23.72
		PM	19	0.2	12.52	26	0.4	17.55	31	0.4	20.35
J5	2031	AM	N/A	N/A	N/A	38	0.7	15	40	0.7	16.33
		PM	N/A	N/A	N/A	37	0.6	18.15	42	0.8	22.82
	2041	AM	N/A	N/A	N/A	39	0.7	15.92	41	0.8	17.43
		PM	N/A	N/A	N/A	39	0.7	20.04	42	0.8	22.84
J6	2031	AM	54	1.3	7.08	59	1.6	8.07	64	1.9	9.15
		PM	72	2.7	13.81	81	4.4	20.19	88	7.4	31.76
	2041	AM	59	1.6	8.07	65	2	9.4	70	2.5	10.9
		PM	78	3.8	17.94	88	6.9	29.9	95	13.7	54.93
J7	2031	AM	83.4	13.9	46.2	84.2	13.4	49.6	85	14.3	50.5
		PM	96	23.7	96.2	98.9	28	116.3	102	22.4	142.1
	2041	AM	91.5	17.6	59.9	92.2	17.6	65.1	93.1	18.3	68
		PM	105.4	43	185.7	108.3	54.4	223.9	111	66.4	253.2
J8	2031	AM	N/A	N/A	N/A	N/A	N/A	N/A	19	0.3	10.06
		PM	N/A	N/A	N/A	N/A	N/A	N/A	28	0.8	7.52
	2041	AM	N/A	N/A	N/A	N/A	N/A	N/A	33	0.5	14.28
		PM	N/A	N/A	N/A	N/A	N/A	N/A	30	0.9	7.59

4.3.3 Mitigation

4.3.3.1 Incorporated Design

The proposed development's design includes multiple features aimed at promoting sustainable mobility choices and minimising risks associated with vehicle and people movements within the site. The proposed development's mobility features are noted to be compliant with Design Manual for Urban Roads and Streets (DMURS), with a detailed compliance statement included in the application package.

4.3.3.2 Construction Phases

As part of this application a Construction Environmental Management Plan (CEMP) has been developed which includes a Construction Traffic Management Plan. This traffic management plan has identified the optimum route for construction access and quantifies the expected maximum daily HGV movements to and from site (ie, 15 no. HGV's 30 trips). It is concluded, from a junction capacity assessment perspective, that the operational phase of the scheme will generate more traffic during the peak traffic periods than the construction stage. Operational phase junction models therefore present a worst-case scenario in terms of impact for the modelled network.

The developed CEMP proposes mitigation measures to minimise the impact of this increase:

- A Construction & Environmental Management Plan coupled with a Construction Stage Traffic Management Plan has been developed by the appointed engineers for the scheme. These plans seek to minimise the number of materials imported and exported from site as well as minimising construction stage traffic. These plans are to be updated by the appointed Main contractor(s).
- The Contractor's Construction Traffic Management Plan will identify suitable routes to accommodate HGV traffic and will include specific times of operation. These times will ideally avoid peak hour traffic times as identified in this assessment.

An on-site wheel wash facility will ensure no site material is brought on to the public roads network.

4.3.3.3 Operational Phase

It has been clearly demonstrated that the site the subject of this EIAR falls within the category of development where the use of sustainable transport solutions will be a real option. This premise is further supported by the Local Authority and the National Transport Authority's commitment to the delivery of CMATS measures in the coming years. The proposed development will impact on the surrounding roads network for both construction and operational phases. Public realm works necessary for the development have already been completed as part of earlier NTA Schemes, namely the upgrade of the L2998 to include a right turn lane to facilitate the development as well as the provision of dedicated off-road cycle and pedestrian facilities serving Glanmire.

To minimise disruption to the local roads network during the operational phase, the following mitigation measures are proposed.

- It is proposed to make the site permeable to the surrounding roads network ensuring it will be connected to existing and proposed cycle/pedestrian linkages to public transport offerings, schools, retail and amenity destinations.
- The proposed new access arrangement onto the L2998 is safe and suitable and is in accordance with the Design Manual for Roads & Bridges (DMRB) and the Design Manual for Urban Roads & Streets (DMURS).
- The traffic impact assessment carried out has included the re-distribution of traffic via Junction 3 when the Fernwood link road is open. This will facilitate traffic heading towards Glanmire Centre to use this route as an alternative to Junction 2 East Cliff Road.
- Junction 3 upgrade works will significantly improve the capacity of this junction which has the capacity to cater for all phases of development.
- The signalisation of Junction 1 R639/Glanmire Bridge is seen to improve traffic flows, specifically for the minor arm serving the development.
- The site benefits from being near regular public transport provision, within walking distance of the site, which enables journeys throughout Cork City to the west and Little Island, Carrigtwohill and Midelton to the East.
- The site is adjacent to the Dunkettle Interchange, accessed from the site via Junction 6, which has been recently upgraded to a free-flow interchange. This interchange provides direct access to the N40, M8 and the N25 reducing development traffic impacting on the local roads network (Glanmire Direction).
- The introduction of a new bus route to serve the area (Route 2A) which is an NTA funded scheme due to open Q4 2024

It is the intention of the applicant to develop all sustainable routes associated with the site as part of the first phase of the scheme implying that access to the East Cork Greenway, Little Island train station and the re-routed Bus 2A will be available for new residents. This infrastructure may also result in an improvement in the modal shift percentage in the wider area implying background traffic flows could reduce as opposed to grow.

Mitigation measures as outlined should only be implemented when necessary.

4.3.4 Residual Impact Assessment

The implementation of the mitigation measures detailed in the Construction Management Plan, as included in this planning application package, will ensure that the residual impact on the local receiving environment is both managed and minimised. There is no risk of the additional HGV movements associated with the construction to become a permanent feature on the local road network.

There will likely be an increase in traffic on the local road network in the vicinity of the application site as a result of the proposed development during its operational phase, however the mitigation measures implemented, including both “hard” design measures and soft measures set out in the MMP (as included in the application package), will ensure that the impact is minimised and continuously managed. As demonstrated by the numerical traffic impact analysis presented the forecast increase in network traffic volumes is manageable.

4.3.5 Monitoring

The following specific monitoring measures over and above expected normal construction and operational practices for such a development are proposed:

Construction Phase:

- HGV movements to from the site (dedicated routes);
- Operating times for deliveries to and from the site;

Operational Phase:

- On-going monitoring of modal shift patterns in the area (National Census timeline);
- On-going collection of traffic generation data from the site (once a year);
- Monitoring of the operational characteristics of junctions within the study area (annual review);

It is recommended that on-going monitoring of the critical junctions is carried out to determine the impact of the construction stage of the scheme as phases of the development become occupied.

4.4 Material Assets: Built Services

The assessment of Built Services is contained within Chapter 7 of Volume II.

4.4.1 Existing Environment

4.4.1.1 Water Supply

There is an existing 250 mm diameter watermain on Dunkettle Road that is served by the existing Caherlag water supply reservoir on the L-2970 road east of the site. There is an existing 500m diameter watermain on Dunkettle Road that is supplied by the Glashaboy water treatment plant on the L-2970 road east of the site.

4.4.1.2 Waste Water Drainage

An existing Uisce Éireann wastewater sewer traverses the study area from north to south, conveying discharge from an existing Uisce Éireann pumping station at Glanmire Bridge onwards to Carrigrenan Wastewater Treatment Plant. At the northern end of the site the sewer is pressurised and consists of twin 350mm diameter bores. There is a break-pressure chamber at a local high point on the site and the remainder of the sewer is a gravity pipe with a diameter of 525mm increasing to 600mm. There is an existing foul sewer gravity pipe on Dunkettle Road that serves houses in the locality and this pipe discharges to the Uisce Éireann pumping station at Glanmire Bridge.

There is a wastewater sewer on Dunkettle Road at the east side of the study area, installed as part of the Glanmire Road Improvement scheme upgrade of Dunkettle Road with a connection to the study area to accommodate wastewater discharge from the proposed development.

4.4.1.3 Surface Water Drainage

The site of the proposed development is greenfield in nature in respect of surface water drainage. There is no piped or built drainage system on the site, except for a minor local roof drainage system at Dunkettle House. There is no permanent or seasonal watercourse of significance on the site. Surface water drainage occurs primarily through infiltration into the underlying soils.

The majority of the site drains naturally towards the Glashaboy river adjacent to the site on the north, west and south sides. A small part of the site drains naturally eastwards towards Dunkettle Road adjacent to the eastern boundary of the site and onwards to the Glashaboy river via built drainage systems. An existing farmland access path connects the site at its north end with Glanmire village and associated excess overland surface water flows occur down this path towards Glanmire village.

The adjacent Glashaboy river forms part of the Cork Harbour Special Protection Area (Sitecode 004030).

A flood risk assessment of the site has been performed. The assessment concludes that the risk of flooding at the site is not significant.

4.4.1.4 Electrical Supply

The existing ESB infrastructure within this area is adequate to support the proposed development in this case. The design of the new electrical distribution and supply network will be carried out by ESB networks who will decide on the preferred location of sub stations, mini pillars and micro pillars. The construction of the ducting infrastructure for the site will be carried out by the developer in accordance with ESB Networks requirements and Regulations.

It is envisaged that the complete electrical distribution system within the development will be underground with the requirement for sub stations, transformers, mini pillars and micro pillars located overground in positions to be agreed with ESB Networks.

The existing ESB 38KV lines traversing our site will be re-routed underground as part of our works

4.4.1.5 Telecommunications

The existing Eir telecommunications infrastructure within this area is adequate to support the proposed development in this case. There is Eir fibre broadband available both in Glanmire Village and the nearby Ballinglanna development. The design of the new telecommunications distribution and supply network will be carried out by Eir who will decide on the preferred location of distribution kiosks to serve the proposed development. The construction of the ductwork infrastructure for the site will be carried out by the developer in accordance with Eir requirements and regulations.

4.4.2 Impact Assessment

4.4.2.1 Do Nothing Scenario

In the Do-Nothing Scenario, no likely significant effects will arise for water supply, wastewater, surface water, electricity, gas or telecommunications services and there will be no change in existing service provision or capacity.

4.4.2.2 Demolition & Construction Phase

Water Supply

In the absence of mitigation measures the **Direct** impact of the construction phase on water supply services is **Negative** in quality, **Moderate** significance, **Likely** probability, **Medium-term** in duration.

There are no likely Indirect, Secondary and Cumulative impacts of the construction phase on water supply services.

Wastewater Drainage

In the absence of mitigation measures the **Direct** impact of the construction phase on wastewater drainage services is **Negative** in quality, **Significant** significance, **Likely** probability, **Medium-term** in duration.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact on the construction phase on wastewater drainage services is **Negative** in quality, **Moderate** significance, **Unlikely** probability, **Medium-term** in duration.

Surface Water Drainage

In the absence of mitigation measures the **Direct** impact of the construction phase on surface water drainage services is **Negative** in quality, **Significant** significance, **Likely** probability, **Medium-term** in duration.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Negative** in quality, **Significant** significance, **Likely** probability, **Medium-term** in duration.

Electricity/Gas and Telecommunications

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Negative** in quality, **Significant** significance, **Likely** probability, **Medium-term** in duration.

4.4.2.3 Operational Phase

Water Supply

In the absence of mitigation measures the **Direct** impact of the operational phase on water supply services is **Negative** in quality, **Moderate** in significance, **Likely** probability, **Permanent** in duration.

In the absence of mitigation measures the **Indirect** impact of the operational phase on water supply services is **Negative** in quality, **Slight** in significance, **Likely** probability, **Permanent** in duration.

Wastewater Drainage

In the absence of mitigation measures the **Direct** impact of the operational phase on wastewater services is **Negative** in quality, **Significan*t*** in significance, **Likely** probability, **Permanent** in duration.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase of wastewater drainage services is **Negative** in quality with a **Slight** significance, **Likely** probability, **Permanent** in duration.

Surface Water Drainage

In the absence of mitigation measures the **Direct** impact of the operational phase on surface water drainage services is **Negative** in quality, **Moderate** significance, **Likely** probability, **Permanent** in duration.

Electricity

The predicted impact of the operational phase on electrical supply services is **Neutral** in quality, **Imperceptible** in significance, **Permanent** in duration and **Indirect** in type.

Telecommunications

The predicted impact of the operational phase on telecommunication supply services is **Neutral** in quality, **Imperceptible** in significance, **Permanent** in duration and **Indirect** in type.

4.4.2.4 Cumulative Impact

Water Supply

In the context of an orderly development of other consented sites the cumulative impact of the construction phase on water supply services is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, **Medium-term** in duration.

In the context of other consented developments operating in accordance with the conditions of planning consent and with appropriate Uisce Éireann connection, the cumulative impact of the operational phase on surface water drainage is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, Permanent in duration.

Wastewater Drainage

In the context of an orderly development of other consented sites the cumulative impact of the construction phase on waste water drainage services is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, **Medium-term** in duration.

In the context of other consented developments operating in accordance with the conditions of planning consent and with appropriate Uisce Éireann connection agreements, the cumulative impact of the operational phase on surface water drainage is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, Permanent in duration.

Surface Water Drainage

In the context of an orderly development of other consented sites the cumulative impact of the construction phase on surface water drainage services is likely to be **Direct** in type, **Negative** in quality, **Not significant** in significance, **Medium-term** in duration.

In the context of other consented developments operating in accordance with the conditions of planning consent, the cumulative impact of the operational phase on surface water drainage is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, Permanent in duration.

Electrical Supply

The cumulative impact of the operational phase on electrical supply services is **Neutral** in quality, **Imperceptible** in significance, **Permanent** in duration and **Indirect** in type.

Telecommunication

The cumulative impact of the operational phase on telecommunication supply services is **Neutral** in quality, **Imperceptible** in significance, **Permanent** in duration and **Indirect** in type.

4.4.3 Mitigation

4.4.3.1 Incorporated Design

Water Supply

The water supply system is designed in accordance with Uisce Éireann Code of Practice for Water Infrastructure. Uisce Éireann has issued a Confirmation of Feasibility regarding the capacity of the existing infrastructure to supply the development, subject to upgrading of parts of local water supply infrastructure.

Wastewater Drainage

The proposed wastewater infrastructure to serve the development is a conventional piped system, designed and constructed in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure.

Uisce Eireann has issued a Confirmation of Feasibility regarding the capacity of the existing infrastructure to accept wastewater from the development.

Surface Water Drainage

The proposed surface water drainage system has been designed in accordance with the Storm Water & Flood Risk Management Requirements of Cork City Council and in accordance with the technical guidelines of the Greater Dublin Strategic Drainage Study (GDSDS).

Sustainable drainage systems (SuDS) features incorporated in the design include green roofs, tree pits, swales, ponds, percolation areas, petrol interceptors and flow control devices in accordance with CIRIA publication C753 SuDS Manual. These design features will aid in managing rainwater close to where it falls, allow rainwater to soak into the ground, promote evapotranspiration, slow down and store runoff, treat runoff to reduce contamination through pollution prevention and controlling the runoff at source and reduce the risk of urban contaminants causing environmental pollution. Discharge from the development to existing urban drainage systems will be attenuated to the equivalent of greenfield runoff rates.

Electricity Network

It is envisaged that the complete electrical distribution system within the development will be underground with the requirement for sub stations, transformers, mini pillars and micro pillars located overground in positions to be agreed with ESB Networks.

Telecommunications Network

It is envisaged that the complete telecommunications distribution system within the development will be underground with the requirement for distribution kiosks located overground in positions to be agreed with Eir.

4.4.3.2 Demolition & Construction Phases

Built services, generally

The works shall be supervised by suitable competent personnel responsible for delivery of the built services as per the permitted development

A Construction Environmental Management Plan (CEMP) has been prepared for the construction stage and shall be adopted and executed during the construction phase.

The Resource and Waste Management Plan (RWMP) has been prepared for the construction stage and shall be adopted and executed during the construction phase.

Works in existing public roads and pedestrian paths shall be performed in accordance with Cork City Council requirements for the management and control of roadworks in Cork city.

Water Supply

Water supply services shall be constructed in accordance with Uisce Éireann Quality Assurance (QA) Field Inspection Requirements manual.

Uisce Éireann shall be consulted prior to commencement of works.

Existing water supply infrastructure shall be located and protected in accordance with Uisce Éireann requirements.

In respect of water supply services not to be adopted by Uisce Éireann, including temporary water supply, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable water supply system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document G – *Hygiene* (published 2008, Reprinted July 2011)

Wastewater Drainage

Waste water drainage services shall be constructed in accordance with Uisce Éireann Quality Assurance (QA) Field Inspection Requirements manual.

Uisce Éireann shall be consulted prior to commencement of works.

Existing waste water infrastructure shall be located and protected in accordance with Uisce Éireann requirements.

In respect of wastewater drainage services not to be adopted by Uisce Éireann, including temporary wastewater drainage, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable wastewater drainage system free of significant defects and in accordance with Building Regulations requirements.

Surface Water Drainage

A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted surface water drainage system free of significant defects.

Electricity Network

It is envisaged that the complete electrical distribution system within the development will be underground with the requirement for sub stations, transformers, mini pillars and micro pillars located overground in positions to be agreed with ESB Networks.

Telecommunications Network

It is envisaged that the complete telecommunications distribution system within the development will be underground with the requirement for distribution kiosks located overground in positions to be agreed with Eir.

4.4.3.3 Operational Phase

Water Supply

The overall water supply network when completed will be vested to Uisce Éireann who will have responsibility for the on-going maintenance and operation of the service.

Information on good household practices in relation to domestic water usage shall be supplied to purchasers at handover.

Wastewater Drainage

The overall wastewater network when completed will be vested to Uisce Éireann who will have responsibility for the on-going maintenance and operation of the service.

Information on good household practices shall be supplied to purchasers at handover.

Commercial premises who generate grease and oil and food residue will be required to install and maintain grease traps on premises.

Surface Water Drainage

A maintenance plan for the surface water drainage system prepared for the development shall be implemented.

Electricity Network

ESB Networks will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service.

Telecommunications Network

Openeir will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service.

4.4.4 Residual Impact Assessment

4.4.4.1 Water Supply, Foul and Surface Water Drainage

With consideration of mitigation measures the likely Construction Phase **Direct** and **Indirect** impact on water supply services, wastewater drainage services and surface water drainage services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Medium-term** in duration.

With consideration of mitigation measures the likely Operational Phase **Direct** and **Indirect** impact on water supply services, wastewater drainage services and surface water drainage services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

4.4.4.2 Electrical, Gas and Telecommunications Network

In the context of other consented developments operating in accordance with the conditions of planning consent and with appropriate connections, the cumulative impact of the operational phase on electricity and telecommunications is likely to be **Direct** in type, **Neutral** in quality, **Imperceptible** in significance, **Permanent** in duration.

4.4.5 Monitoring

In respect of water supply services, wastewater drainage services, surface water drainage services, no specific measures are proposed over and above monitoring as part of mitigation measures proposed for the construction phase and operational phase.

4.5 Material Assets: Waste

The assessment of Waste is contained within Chapter 8 of Volume II.

4.5.1 Existing Environment

Invasive species surveys were incorporated into the ecological walkovers carried out at the site. During the ecological walkovers conducted by Enviroguide on the 28th of August 2023. The invasive plant species survey primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be 'High impact' invasive species e.g., Japanese Knotweed (*Reynoutria japonica*). Incidental observations of other terrestrial plant species known to be potentially invasive, such as Butterfly Bush (*Buddleja davidii*), were also recorded, where found.

A total of two invasive plant species were recorded on the site, namely Sycamore (*Acer pseudoplatanus)* and Travellers Joy (*Clematis vitalba*). Both were observed in small quantities at the southern edge of the proposed development.

Field surveys carried out in August 2023 also recorded a number of invasive species within the landholding of the applicant, (O'Flynn Group) off -site. These include those listed below:

- **Cherry Laurel** (*Prunus laurocerasus*) - High Impact Invasive (Third Schedule, SI. 477)– c. 470m east of Phase 1 site boundary in the surrounds of Dunkettle House. It has been established also, that Cherry Laurel is present in areas within Glanmire Wood pNHA, at the northern edge of the site bordering the Glashaboy Estuary and Cork Harbour SPA.
- **Rhododendron** (*Rhododendron ponticum*) - High Impact Invasive (Third Schedule, SI. 477)– c. 470m east of Phase 1 site boundary in the surrounds of Dunkettle House.
- **Travellers Joy** (*Clematis vitalba*) – Medium Impact Invasive – c. 30m south of site boundary and also c. 470m east of Phase 1 site boundary in the surrounds of Dunkettle House.
- **Butterfly Bush** (*Buddleja davidii*) - Medium Impact Invasive – c. 30m south of site boundary.

4.5.2 Impact Assessment

4.5.2.1 Do Nothing Scenario

In the 'Do Nothing' scenario, the proposed development does not proceed and there would be no excavation, construction or operational waste generated at the site. There would, therefore, be no additional demand or loading on waste management infrastructure locally or nationally and thus there would be a neutral effect on the environment in terms of waste.

4.5.2.2 Demolition and Construction Phase

This is a greenfield site with no buildings or structures to be demolished except for the demolition/removal of existing ruins/structures (including a former dwelling) on the northern part of the site.

The Construction Phase will give rise to the requirement to remove and bring quantities of various materials to and from the site. Construction and excavation related wastes will be created during the Construction Phase, and this has the potential to impact on the local waste management network.

An outline Construction Environmental Management Plan (oCEMP) (JODA, 2024) and a Resource and Waste Management Plan (RWMP) (JODA, 2024) have been prepared for construction phase of the proposed development and will be submitted with the planning application.

There will be bulk excavation cut and fill required throughout the site in order to facilitate the finished levels of the developed site. Cut and fill depths will generally be limited to less than 2m with the exception of certain specific parts of the site where substantially deeper excavation depths will be required. Existing topsoil and subsoil onsite are uncontaminated and naturally occurring and thus are considered suitable for re-use in the proposed development.

Excavated topsoil and subsoils required for re-use on site will be temporarily stored on site for re-use, otherwise it will be exported. Rock excavated on site will be crushed and re-used on site for filling where suited. Topsoil will be stored in an appropriate manner on site for the duration of the construction works.

Excavated materials in excess of those required for the site development works will be treated as a by-product (production residue) and exported off-site to be re-used at another suitable site in the first instance in accordance with the Waste Framework Directive (2008/98/EC, as amended by Directive (EU) 2018/851) and as transposed in Ireland by the European Union (Waste Directive) Regulations 2011-2020.

Waste will also be generated from construction workers.

The potential impact from the Construction Phase on waste recovery and disposal is likely to be medium-term, negative, direct and slight in nature.

4.5.2.3 Operational Phase

The Operational Phase of the proposed development will result in an increase in the production of municipal waste in the region and will increase demand on waste collectors and treatment facilities, however, as the surrounding area is urban in nature, waste collection is commonplace.

Municipal waste is made up of household waste and commercial waste that is compositionally comparable to household waste. It includes residual, recyclables, organic, bulky, and waste electrical and electronic equipment. An outline Operational Waste Management Plan (OWMP) has been prepared by Engineering Consultants (2024) and is included as a standalone report with this planning application.

The potential impact from the Operational Phase on municipal waste disposal is likely to be long-term, negative, direct and slight in nature.

4.5.2.4 Cumulative Impact

The capacity of waste collection companies and waste management facilities in Cork City have been designed with forward planning and expansion in mind to cater for a growing population. It is

necessary that all the developments provide the infrastructure and services to assist residents to segregate domestic waste at source, in order to reduce the generation and disposal of non-recyclable mixed waste. Existing waste collections currently take place in the local area and during the Operational Phase, the proposed development will be added to an existing collection route. The likely effect will be neutral and not significant on waste management facilities in the area in the long term.

4.5.3 Mitigation

4.5.3.1 Incorporated Design

The following measures have been incorporated into the design:

- Buildings have been designed with material efficiency in mind;
- Opportunities to achieve on-site and off-site reuse and recycling of waste have been identified; and
- Dedicated, secure waste segregation areas have been selected for the duration of the enabling works.

4.5.3.2 Construction Phase

The following mitigation measures are recommended for the Construction Phase of the proposed development regarding waste management:

- Waste materials will be separated at source and will follow the Resource and Waste Management Plan (RWMP) and outline Construction Environmental Management Plan (oCEMP);
- Prior to the commencement of the Construction Phase detailed calculations of the quantities of topsoil, subsoil and green waste will be prepared, and soils will be tested to confirm they are clean, inert or non-hazardous;
- A policy of 'as needed' ordering and strict purchasing procedures will be implemented to prevent waste arisings as far as possible;
- The Contractor will vet the source of aggregate, fill material and topsoil imported to the site in order to ensure that it is of a reputable origin and that it is "clean" (i.e., it will not contaminate the environment);
- The Contractor and/or Council will implement procurement procedures to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance;
- The waste materials generated during the Construction Phase will be stored in suitably size receptables and transferred offsite for appropriate processing, recycling and recovery;
- Waste materials generated from the Construction Phase that are unsuitable for reuse or recovery will be separately collected;
- Disposal of construction generated wastes will be considered a last resort and only after recycling or recovery options have been ruled out;
- A suitably competent and fully permitted waste management company will be employed to manage waste arising for the Construction Phase. The appointed waste contractor must have the relevant authorisations for the collection and transport of waste materials, issued by the National Waste Collection Permit Office (NWCPO);

- All waste materials will be transported to an appropriately authorised facility, which must have the relevant authorisations for the acceptance and treatment of the specific waste streams, i.e., a Certificate of Registration (COR) or a Waste Facility Permit (WFP) as granted by a Local Authority, or a Waste/Industrial Emission Licence as granted by the Environmental Protection Agency;
- It is not envisaged that there will be any hazardous waste generated throughout the construction works however, in the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify Cork City Council and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s). Only authorised facilities will be used and as a result of this, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures;
- Waste generated by construction workers will be stored in wheelie bins on site and it will be collected by an appropriately authorised waste collector. All wastes generated on site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility; and
- All waste quantities and types will be recorded and quantified, and records will be retained onsite for the duration of the Construction Phase.

The Contractor will have the responsibility to record resource and waste management at the site in line with the Resource and Waste Management Plan (RWMP).

In terms of invasive species, an IAS Specialist will be contracted to treat and eradicate the Travellers Joy and Sycamore on site per TII Technical Guidance on 'Management of Invasive Plant Species on National Roads' published in December 2020. The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the site.

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

- Validation that all machinery / vehicles are free of IAPS, prior to their first introduction to site;
- Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS;
- A regular schedule of site inspections across the IAPS growing seasons, for the duration of the construction works programme;
- Validation that all machinery / vehicles are free of IAPS, prior to leaving the site; and
- Appropriate and effective site biosecurity hygiene to ensure that no IAPS are transmitted off-site for the duration of the proposed works.

4.5.3.3 Operational Phase

The Operational Waste Management Plan details the waste segregation and storage capacity requirements, as well as the plan which will be adopted to manage the residential and commercial

waste arising from the proposed development, one operational. Implementation of the Operational Waste Management Plan 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 contributing to the targets set out in the National Waste Management Plan for a Circular Economy (NWMPCE) 2024 -2030.

A separate Outline Operational Waste Management Plan will be developed for the subsequent phases of development at Dunkettle, as described in Chapter 2. These Plans will also include mitigation measures to ensure a high level of recycling, reuse and recovery at the proposed 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 National Waste Management Plan for a Circular Economy 2024-2030.

4.5.4 Residual Impact Assessment

The implementation of the mitigation measures outlined in Chater 8 Material Assets: Waste will ensure that high rates of reuse, recovery and recycling are achieved at the site during the Construction and Operational Phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for management of waste are achieved.

The residual effects on waste management are considered to be considered slight, neutral, direct and medium-term for the Construction Phase and neutral, direct and slight in the long-term for the Operational Phase.

4.5.5 Monitoring

Construction Phase

The site control measures to manage and minimise waste include:

- Signage on the site office/welfare bins to separate them as environmental/domestic waste bins; and
- Briefing for all sub-contractors via induction handouts.

The Resource Manager (RM) will be responsible for conducting ongoing resource audits at the site during the Construction Phase.

Operational Phase

The building management company and future residents will be required to maintain the bins and storage areas in good condition as required by the Cork City Council Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

4.6 Land & Soils

The assessment of Land & Soils is contained within Chapter 9 of Volume II.

4.6.1 Existing Environment

The land at Dunkettle is composed of undulating agricultural grassland in a mixed rural-urban setting with Dunkettle House, with associated out houses and gardens are located towards the southern end of the study area. The proposal is to build residential housing in the northern and central areas.

According to the Geological Survey of Ireland (GSI) and Teagasc Mapping the:

- Topsoil is described as "Well Drained Mineral Soils, (mainly acidic), derived from non-calcareous parent material", from the soil group of "Acid Brown Earths, Brown Podzolics".
- Subsoil is described as glacial "Till derived from Devonian Sandstones", (TDSs),
- The Generalised Bedrock under all of the site area is identified as Devonian aged Old Red Sandstones, (ORS)".
- The GSI Vulnerability Mapping, which is based on estimated subsoil depths, identifies Extreme Vulnerability (0 to 3m) in central eastern area and along the steep wooded slopes on the northern and western fringes of the study area. The other areas are classified as High Vulnerability (<5m).
- Site specific investigations comprising of 28 trial pits were completed across the site area which identified typical soil-subsoil depths of between 0.7m to 3m, with some locations showing soil depths of >3.5m. Subsoils consisted of brown, orange to beige very gravelly sandy clayey silt and/or gravelly sandy silt over sandstones and/or shaley bedrock.

The current land use and existing geology are very common in the Cork area and nationally and there is no intrinsic scientific value or geological heritage identified on or in the vicinity of the site.

4.6.2 Impact Assessment

4.6.2.1 Do Nothing Scenario

The 'Doing Nothing' Scenario would result in no residential development at the site and the continued use of the land for agricultural tillage and pastoral grassland.

Given the proximity of the lands to Cork City and Glanmire, their zoning and suitability for residential development, it is probable that they will be built on at some stage in the future.

4.6.2.2 Demolition and Construction Phases

The most significant effect of the proposed development on the land and soils/geology attribute is the removal of the topsoil cover and in some areas the excavation of the underlying subsoils and as necessary the excavation of the bedrock down to the required design levels. In other areas the ground level will be raised by the infilling of excavated subsoils and rock material. This will affect the nature of the soil and bedrock in terms of their depth profile and the topography of the development area.

The excavation work and soil/subsoil removal will create on and off site transport requirements and on-site sediment management issues in terms of potential dust generation and suspended sediment runoff to surface water. Removal of rock by breakers will increase potential on-site noise effects.

4.6.2.3 Operational Phase

There will be no operational phase activities as there will be no interaction with the land and soil/geology elements once the site areas are fully developed.

4.6.2.4 Cumulative Impact

The potentially most significant cumulative effect would relate to traffic effects if other projects in the local area are also moving soil, subsoil or rock material off site onto the local road network.

There could be cumulative dust generation and/or sediment runoff from adjacent sites that could effect local residences or the Glashaboy River system

4.6.3 Mitigation

4.6.3.1 Incorporated Design

The planning, timing and scheduling of the earth works across the site is important in limiting, as far as possible, the extent of ground being worked, as reducing the surface area of exposed soil will reduce the potential for the generation of dust and or sediment runoff.

Any deep excavations will be designed in such a way as to be supported both during the construction and operational phases of the site development. The site layout design has kept the extent and depth of retaining walls and supporting structures to a minimum. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time.

4.6.3.2 Construction Phases

Construction phase mitigations include the control of exposed soil areas, stock pile locations and scale, presence of designated internal roads, bunding, silt fencing and drainage controls as necessary. The establishment of contractor compounds with specific re-fuelling areas, spill kits, chemical storage and parking will help mitigate the risk of spills, sediment runoff and dust generation.

The re-grading, top soiling and seeding completed work areas as soon as possible will reduce the areas of potential dust or sediment generation. Good housekeeping and following the site specific CEMP and other environmental management guidelines will form an important mitigation action for the site.

4.6.3.3 Operational Phase

No mitigations are identified for the Operational Phase of the development.

4.6.4 Residual Impact Assessment

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. No significant residual effects are predicted for land and soils/geology aspects of the proposed development.

The mitigation measures described reduce the potential for any significant brief to temporary or short-term impacts occurring during construction. There are no residual operational phase impacts anticipated. All identified impacts have a residual environmental impact rating of Imperceptible.

4.6.5 Monitoring

All topsoil, soil and rock excavation work will be observed by a banks man. While there is no evidence of foreign fill or waste material on the site this operative will be instructed to lookout for any physical evidence, (discolouration, odour, sheen etc,), of potential contamination in the excavations.

Runoff from works, stockpile and compound areas will be observed to ensure that it is not impacting on the local watercourse. Both hydrocarbons and silt cause discolouration so are easy to visually monitor for their presence. If necessary water sampling and monitoring of the Glashaboy River can be completed to test for Total Suspended Solids (TSS) and Hydrocarbon concentrations.

In areas where temporary retaining structures are required then observations of the exposed face will help monitor for potential collapse. Ideally any retaining wall structures will be constructed promptly after the excavations are completed to ensure good ground stability.

4.7 Water & Hydrology

The assessment of Water & Hydrology is contained within Chapter 10 of Volume II.

4.7.1 Existing Environment

There are no streams, drainage ditches, springs or other water features on the proposed site.

The tidal reaches of the Glashaboy River system forms the northern and western boundaries of the site. The Glashaboy River is located in the South Western River Basin District (SWRBD), as defined by the Water Framework Directive, (WFD), in the Lee, Cork Harbour and Youghal Bay Catchment Hydrometric Area 19. The hydrometric area 19 is divided into a number of sub-catchments and the site is located at the southern end of the Glashaboy (L. Mahon)_SC_010 sub-catchment.

The Glashaboy (L. Mahon) sub-catchment area starts in the Nagle Mountains in north Cork and flows, through an undulating low hill-valley topography, in a southerly direction before entering the upper part of Cork Harbour at Lough Mahon, just downstream of Glanmire Village. The river is about 22km long and has a catchment of 141km^2 at its tidal limit. The lower reaches of the river, which the Dunkettle site is located adjacent to, forms the Glashaboy River Estuary, that is tidal up to Glanmire Village.

The catchment area is predominately underlain by sandstone bedrock overlain by free draining acid brown earth tills and is drained by a number of watercourses, the dominant one being the Glashaboy River which drains the land to the west of the catchment, while the Butlerstown Stream and Glenmore Stream form the eastern part of the catchment, before joining the Glashaboy River north of Glanmire.

All discharges from the site will be to the tidal reaches of the Glashaboy River Estuary. The transitional waters of the Glashaboy River Estuary below Glanmire Village, (catchment Ref SW_060_800), forms part of the Cork Harbour Special Protection Area (SPA).

The bedrock underlying the site is classified as a Locally Important (LI), Aquifer that is productive only in local zones. No public supply wells or other potable supplies have been identified by the GSI mapping and although not all private boreholes are recorded by the GSI it is considered that the local aquifer is not widely used as a potable water supply source.

4.7.2 Impact Assessment

4.7.2.1 Do Nothing

The 'Doing Nothing' Scenario would result in no residential development at the site and the continued use of the land for intensive agricultural tillage and pastoral grassland. Potential organic runoff from the agricultural activity on the site to the local groundwater and Glashaboy Estuary would continue.

Given the proximity of the lands to Cork City and Glanmire, their zoning and suitability for residential development it is probable that they will be built on at some stage in the future.

4.7.2.2 Demolition and Construction Phases

The main potential direct effect for the initial site establishment construction phase of the development is sediment runoff and/or dust generation from the cut and fill earth moving activities

that are required to establish the appropriate final floor level hights for building construction as well as the excavation and backfilling earth works that will be required for establishing the site surface water, waste water piping and internal roadway infrastructure. Fuel spills from machinery is also possible environmental risk at this stage of the development works.

For the building construction phase the main potential effects include chemical runoff in the form of extensive cement use and/or potential fuel spills from construction vehicles and machinery use on site, to the ground and potentially to the local Glashaboy River Estuary. While earth works are reduced during the construction phase there would still be potential for local sediment runoff and/or dust effects to arise.

4.7.2.3 Operational Phase

During the operation phase the main potential direct effect is the change in stormwater runoff volume to the local receiving surface water and indirect increase in waste water loading to the local WWTP infrastructure. There would be a potential risk of leaks from the waste water piping to occur which could affect local groundwater quality.

4.7.2.4 Cumulative Impact

There could be cumulative stormwater runoff effects from adjacent sites that could affect the Glashaboy River Estuary system in terms of water quality and flooding risk.

4.7.3 Mitigation

4.7.3.1 Incorporated Design

All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment. In particular design, choice and standard of materials for buried pipe work and interceptors shall be adequate for operating successfully without effecting the local environment for the long term.

The design seeks to mitigate potential negative effects with all new-build infrastructure to be designed in accordance with the Technical Guidance Documents of the Building Regulations and associated codes of practice, which require due cognisance of the receiving environment. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in potential waste material, machinery operation time and associated risks. Surface water drainage has been designed to, where necessary, mimic the site run-off characteristics with storm water run-off passing through the necessary treatment to prevent pollution. The design of the residential heating systems shall exclude the use of potentially polluting kerosene or fuel oils.

4.7.3.2 Construction Phases

The phased nature of the sites development will reduce the foot print of open ground and active earth work areas as the site is being prepared for construction works. The areas where the excavation of unconsolidated soil and subsoils is required within each building phase will be kept to a minimum and, as far as practicable, only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of

preventing the release of dust in dry weather and suspended sediments during or after wet conditions. Potential dust and suspended solids runoff impacts are therefore reduced or avoided.

Limiting excavation works and machinery activity during and immediately after periods of heavy rainfall will also be incorporated into the earth works management to help limit sediment generation.

Control of Soil Excavation and Export from Site using the Reduce, Reuse and Recycle approach with all excavation arisings to be reused on site where possible. The implementation of an appropriate earthworks handling protocol with adequate runoff control and dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping and general housekeeping will ensure that the surrounding environment are free of nuisance dirt on roads which will reduce sediment runoff and dust generation.

There will be a requirement for a Construction Management Plan to oversee the development; Earthwork operations will be carried out such that surfaces, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and suspended sediments from going off site.

4.7.3.3 Operational Phase

Mitigation measures proposed during the operation phase include routine maintenance of the site services; regular maintenance of the development's green roofs and interceptors and regular maintenance of landscaped areas, bio-retention and green roof areas as necessary.

4.7.4 Residual Impact Assessment

With the importance of the Surface Water attribute's being 'Extremely High' and the Groundwater attribute being 'Medium' and the potential Magnitude of Impact as 'Negligible' then the potential for significant effects arising from the Dunkettle development are rated as 'Imperceptible'.

4.7.5 Monitoring

Runoff from works, stockpile and compound areas will be observed during the construction phase to ensure that it is not impacting on the local watercourse. Both hydrocarbons and silt cause discolouration so are easy to visually monitor for their presence. If necessary water sampling and monitoring of the Glashaboy River can be completed to test for Total Suspended Solids (TSS) and Hydrocarbon concentrations for the construction phase. No operational monitoring is required.

4.8 Biodiversity

The assessment of Biodiversity is contained within Chapter 11 of Volume II.

4.8.1 Existing Environment

The EIAR study boundary abuts designated sites including the Cork Harbour SPA which has been considered in the AA (stage 1) and NIS (stage 2) assessment accompanying under separate cover for the LRD Phase 1 planning application.

Glanmire Wood pNHA which is a riparian woodland, is present within the Site boundary and separates the Proposed Developable area from the Glashaboy Estuary and Cork Harbour SPA to the west. Glanmire Wood, along with additional stands of natural woodland present further east within the study area, are of high biodiversity value and have been considered in detail during the assessment process.

The Site is interspersed with Treeline habitat which has been shown to be of importance to commuting and foraging bat species locally, following an extensive bat activity survey effort. The areas to the west of the Site spanning the length of Glanmire Wood pNHA and surrounding woodland further north and east have also shown high levels of usage by a range of bat species as would be expected in habitat that supports foraging and commuting. There are eight trees present within the study area that have potential to hold roosting bats, two of these trees were shown to have bats exhibiting roosting behaviour in August 2024. The surrounds of Dunkettle House contain two buildings which have moderate potential to hold roosting bats.

The study area was found to contain a range of common bird species as well as small numbers of birds designated as being of special conservation interest (SCI) under Cork Harbour SPA travelling through the western edge, adjoining Cork Harbour SPA. No significant usage of the Site was recorded by (SCI) birds during an extensive survey effort in 2023/2024. Two Red-listed bird species were recorded regularly on Site (Stock Dove and Swift). The Site also holds some schedule four (Wildlife Act 1976(2000)) raptor species including Buzzard and the ancient and natural woodland areas have the potential to support other species such as Kestrel and all three Irish Owl species.

The Site holds supporting habitat for small mammals such as pygmy shrew, hedgehog and pine marten as well as amphibians on the periphery of the Site within grass verges and within the treeline and woodland areas.

Invasive species have been identified within the study area including two high-impact flora species (Cherry Laurel and Rhododendron). These high impact species are present in the surrounds of Dunkettle House to the south and cherry laurel is also present within Glanmire Wood to the north.

4.8.2 Impact Assessment

4.8.2.1 Do Nothing

If the Proposed Development were not to go ahead, the intensively managed agricultural and arable lands occupying most of the land area on Site would remain of low ecological value overall to local wildlife.

The high ecological value habitats on Site including the riparian and mature woodlands would remain in their current state but with relatively limited connectivity (wildlife corridors) linking these habitats to one another, due to the sparse nature of the treelines on the current area, and the intensively managed fields within.

4.8.2.2 Demolition and Construction Phases

Construction phase impacts in the absence of mitigation measures are unlikely to have significant effects on the designated areas mentioned above, including Cork Harbour SPA and Glanmire Wood. The presence of pockets of high-impact invasive species could result in long-term significant effects on habitats on and off-Site in the absence of appropriate management measures. Bird assemblages on and off site and fauna of the Glashaboy Estuary are unlikely to be significantly affected during the construction phase. In line with the precautionary principle, mitigation measures are proposed to reduce effects on these receptors resulting from the construction phase from 'unlikely' or 'likely' to 'imperceptible'.

4.8.2.3 Operational Phase

The operational phase of the development poses less risk to the receiving environment overall. Operational phase impacts in the absence of mitigation measures are unlikely to have slight effects on the designated areas mentioned above, including Cork Harbour SPA and Glanmire Wood. Moderate effects on commuting and foraging areas for local bat assemblages are likely in the absence of adequate mitigation measures, including appropriate design of lighting in sensitive areas. Small mammals in the area including those supported by the riparian and natural woodland areas are unlikely to be permanently affected as a result of the presence of the Proposed Development. In line with the precautionary principle, mitigation measures are proposed to reduce effects on these receptors resulting from the construction phase from 'unlikely' or 'likely' to 'imperceptible'.

4.8.2.4 Cumulative Impact

The Proposed Development has been considered in combination with other plans and policies which could potentially cause in-combination effects. Plans and policies considered include

- Cork City Development Plan (2022-2028).
- Cork Biodiversity Action Plan (2021-2026).
- Cobh Municipal District Local Area Plan 2017.
- All Ireland Pollinator Plan (2021-2025).

On examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects that would cause any likely significant effects to nearby ecological sensitivities.

Also considered during the assessment process was the effects resulting from additional loading of the Carrigrennan Waste Water Treatment Plant (WWTP) at Little Island, Cork and the combination of existing planning permissions within the environs of the Proposed Development. It is not expected that foul waters generated by the Proposed Development or in-combination effects resulting from existing planning permissions will present any source of significant impacts to the receiving environment or biodiversity including effects to Lough Mahon transitional waterbody and associated SPA post treatment and discharge from the WWTP.

4.8.3 Mitigation

4.8.3.1 Incorporated Design

The design of the Proposed Development Is such that a range of sustainable features will be incorporated, including the use of Sustainable Urban Drainage Systems (SuDS), biodiversity enhancing landscape design and an appropriate lighting regime that is sensitive to nocturnal wildlife.

Surface water run-off will be adequately treated prerelease into the receiving water of the Glashaboy Estuary and existing piped networks on Dunkettle road, this includes the use of a settlement pond to the north of the study area which will be enhanced for biodiversity. Enhancement measures have been proposed by the project ecologist which include increasing the availability of nesting opportunities for birds (swift), amphibian and reptile hibernacula and bat boxes. Native planting is also incorporated including the creation of a new woodland area at the northeast of the study area, connecting, wildlife areas within the Site in the long-term post construction.

4.8.3.2 Construction Phases

Construction phase impacts will be mitigated through several measures, under supervision and monitoring of an Ecological Clerk of Works (EcOW) and through the responsibility of the contractor. Many of the mitigation measures are outlined in the Construction Environmental Management Plan (JODA, 2024) and include measures for the protection of bats and birds, dust emissions control and bird and construction waste management. Additional measures proposed by the project ecologist (Enviroguide, 2024) aimed to protect all sensitive receptors both on Site and within the zone of influence. These include the biosecurity measures to prevent the spread of invasive species, control of construction phase lighting and noise, timing of vegetation clearance, as well as mitigations to prevent wildlife entrapment.

4.8.3.3 Operational Phase

Prevention of more long term effects such as the spread of invasive species and effects arising from inappropriate lighting are mitigated through adherence to best practice design with wildlife at the forefront of planning. Permanent measures put in place for the operational phase include hedgehog highways to increase connectivity through the development for this species. A paladin style fence will be erected to protect the designated sites and woodlands on the edge of the study area from ongoing increases in human activity and recreational pressures associated with the operational phase. These areas will be excluded from the public via this fence and adequate signage, to be supervised by the EcOW during installation.

4.8.4 Residual Impact Assessment

Provided all recommended measures are implemented in full and remain effective throughout the life-time of the Proposed Development, no significant negative residual impacts on the local ecology, or on any designated nature conservation sites, will occur as a result of the Proposed Development.

4.8.5 Monitoring

Monitoring of the implementation of mitigation measures will be carried out during the construction phase of the Proposed Development where relevant and outlined in the Biodiversity Chapter. Further monitoring will take place during the operational phase, including woodland and invasive species monitoring in the years post construction.

4.9 Noise & Vibration

The assessment of Noise & Vibration is contained within Chapter 12 of Volume II. The chapter provides information on the assessment of noise and vibration impacts on the surrounding environment during the construction and operational phases of the project. The proposed development consists of LRD Phase 1 while the cumulative development consists of the LRD Phase 1 Proposed Development and LRD Phase 2, which includes a mix of residential dwellings and a second access point from Dunkettle Road (L2998) and Dunkettle House. At the time of writing detailed designs for Phase 2 and Dunkettle House were not available.

4.9.1 Existing Environment

The existing and future noise and vibration environments across the development site and in the vicinity of the nearest existing noise sensitive locations (NSLs) are dictated by transportation sources from the surrounding road network.

4.9.2 Impact Assessment

4.9.2.1 Do Nothing Scenario

The Do Nothing scenario includes retention of the current site without the proposed or cumulative development in place. In this scenario, noise levels at the site will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

4.9.2.2 Demolition and Construction Phase

The construction phase will involve rock excavation, site clearance, bulk excavation, road works, building construction works and landscaping. The assessment has determined that whilst there will be increased construction related noise at the closest noise sensitive locations to the proposed development, the majority of works can be controlled to within the adopted construction noise thresholds. The exceptions to this statement are during high noise level activities such as rock excavation with breakers when works are within 100m of the closest noise sensitive locations and during site clearance, bulk excavation, foundations, and road works which are within 50m of the closest noise sensitive locations.

There are no construction vibration sources that will give rise to any significant vibration impacts.

4.9.2.3 Operational Phase

Once operational there are no noise sources associated with the proposed development that will give rise to any significant noise impacts. Operational activities are those which form part of the existing surrounding 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.

Building Services Plant

Once the relevant noise criteria are not exceeded within the Proposed Development, the related noise impact to existing noise sensitive locations offsite will be **negative, not significant and long-term.**

Additional Traffic on Public Roads

During the operational phase, the predicted change in noise levels associated with additional traffic in the surrounding area is neutral to **negative, imperceptible to moderate and long-term.**

Creche Playground

Considering the distance and screening from existing boundary treatments, activities from the crèche will be well below the range of baseline noise levels recorded to the north of the site. The resultant noise impact is therefore **neutral, not significant and long-term.**

4.9.2.4 Cumulative Impact

Cumulative Construction Noise Assessment

Cumulative noise levels associated with the construction phase of the proposed development and the adjacent proposed developments have been considered. In the event that external developments are under construction at the same time, there is potential for elevated construction noise emissions due to cumulative noise as well as a potential increase in the length of time that the receptor will be exposed to construction noise. In a highly conservative cumulative assessment of construction noise, which is unlikely to occur, the significance of effects is expected to be negative, significant to very significant and temporary if the noisiest work activities were to occur simultaneously at the closest distances to the east of the site, if at all.

Cumulative Construction Traffic

The impact relating to construction traffic is determined to be **negative, not significant and short-term** at the closest receptors in the cumulative scenario.

Cumulative Construction Vibration

Any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Chapter 12. There are no significant cumulative vibration effects on buildings. The predicted cumulative vibration impact during the construction phase is **negative, slight to moderate and temporary** impact at the closest human receptors within 50m of the site boundaries.

4.9.3 Mitigation

4.9.3.1 Incorporated Design

The following mitigation measures are outlined for further review at the detailed design stage of the project:

The closest noise sensitive receptors to the operational building services and plant are within the development itself (i.e. they are much closer than off-site sensitive receptors). Therefore once the relevant internal noise criteria is achieved within the development at the detailed design stage, there are no additional mitigation requirements to control at off-site noise sensitive locations.

An assessment of inward noise levels from existing road traffic surrounding the proposed development has been undertaken. The building facades are expected achieve suitable internal noise

levels with standard double glazing and therefore no mitigation measures are required with the exception of the proposed duplexes and houses located at the immediate eastern edge of the development boundary, which require enhanced sound insulation specifications for glazing to achieve suitable internal noise levels.

Once detailed design is available on LRD Phase 2 and Dunkettle House, if residential development is proposed, a further review of the inward impact assessment would be required.

4.9.3.2 Demolition & Construction Phases

During the demolition and construction phases of the Proposed Development, the use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, strict construction noise limits will ensure impacts are controlled to within the adopted criteria. Similarly, vibration impacts during the construction phase will be well controlled through the use of low vibration generating equipment as standard for residential construction sites.

4.9.3.3 Operational Phase

During the operational phase of the development, noise mitigation measures with respect to the impact of traffic from the development are not deemed necessary.

4.9.4 Residual Impact Assessment

During the construction phase, the residual construction noise impact is **negative, not significant to moderate and temporary to short-term**. The human perception of vibration effects is **negative, not significant to moderate and temporary to short-term**.

During the operational phase, the predicted change in noise levels associated with additional traffic in the surrounding area is **neutral to negative, imperceptible to moderate and long-term**.

The resultant residual inward noise effect will be of **neutral, not significant and long term**.

Once cumulative construction noise impacts are considered and managed during the construction phase potential cumulative impacts on nearby sensitive receptors can operate within five decibels above the construction noise thresholds adopted. The residual significance of effects are **negative, moderate and temporary to short-term** at the closest noise sensitive locations to the east.

The human perception of cumulative vibration effects is **negative, not significant to moderate and temporary to short-term.**

Overall, no significant noise and vibration impacts are predicted during the construction or operational phases of the proposed development or cumulative development.

4.9.5 Monitoring

As outlined in Chapter 12, during the construction phase, the appointed contractor will be required to carry out noise and vibration monitoring at site boundaries to the east of the site. These monitors will be set up where is the potential to exceed the construction noise thresholds i.e. when works are occurring within 100m of the site boundary and within 50m of vibration sensitive locations for human perception to noise, rather than cosmetic damage for buildings.

4.10 Air Quality

The assessment of Air Quality is contained within Chapter 13 of Volume II. The air quality assessment has focussed on:

- Potential construction dust emissions and impacts to nearby sensitive receptors such as residential properties, schools, hospitals, etc.
- Potential vehicle emissions from traffic accessing the site for construction works and during operation.

4.10.1 Existing Environment

Baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$) and are generally well below the current National and European Union (EU) ambient air quality standards.

4.10.2 Impact Assessment

4.10.2.1 Do Nothing Scenario

In the Do Nothing scenario, the site will remain unchanged, and air quality will follow existing trends. These trends may be influenced by nearby developments and traffic. Since the site is zoned for development, a similar project is likely to be built in the future. As a result, air quality impacts are expected, even without the proposed development.

4.10.2.2 Demolition & Construction Phases

An assessment of the potential dust impacts as a result of the construction phase of the proposed development was carried out based on the UK Institute for Air Quality Management 2024 guidance document *'Guidance on the Assessment of Dust from Demolition and Construction'*. This established the sensitivity of the area to impacts from construction dust in terms of dust soiling of property, human health effects and dust-related ecological effects. The surrounding area was assessed as being of high sensitivity to dust soiling and dust-related ecological effects and of low sensitivity to dust-related human health effects.

The sensitivity of the area was combined with the dust emission magnitude for the site under three distinct categories: earthworks, construction and trackout (movement of vehicles) to determine the mitigation measures necessary to avoid significant dust impacts. It was determined that there is a high risk of dust related impacts associated with the proposed development. In the absence of mitigation there is the potential for ***direct, medium-term, localised, negative*** and ***slight*** impacts to air quality, which is an overall ***not significant*** impact in EIA terms.

In addition, construction phase traffic emissions have the potential to impact air quality, particularly due to the increase in the number of HGVs accessing the site. Construction stage traffic did not meet the scoping criteria for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2022 guidance document *'Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106'.* As a result a detailed air assessment of construction stage traffic emissions has been scoped out and

the construction stage traffic emissions will have a ***direct, medium-term, negative*** and ***imperceptible*** impact on air quality, which is an overall ***not significant*** impact in EIA terms.

4.10.2.3 Operational Phase

Operational phase traffic has the potential to impact air quality due to vehicle exhaust emissions as a result of the increased number of vehicles accessing the site. Operational stage traffic emissions were calculated at representative worst-case receptors in the area. It was determined that the proposed development will result in some 'neutral' to slight adverse' increases in NO_2 and PM_{10} concentrations. There are predicted to be some 'slight adverse' to 'moderate adverse' increase in $PM_{2.5}$ concentrations. However, the estimated pollutant background concentrations used in the assessment are the primary contributor to the predicted pollutant concentrations with the proposed development contributing minor amounts. It was determined that operational stage traffic emissions will have a ***direct, long-term, negative*** and ***slight to moderate*** impact on air quality but is considered an overall ***not significant*** impact in EIA terms.

4.10.2.4 Cumulative Impact

There is the potential for cumulative impacts to air quality should the construction phase of the proposed development coincide with that of other developments within 500m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken and relevant developments with the potential for cumulative impacts were identified.

There is at most a high risk of dust impacts associated with the proposed development. The dust mitigation measures outlined in Section 13.9 of Chapter 13 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development and the permitted cumulative developments are deemed ***direct, medium-term, localised, negative*** and ***imperceptible,*** which is overall ***not significant*** in EIA terms***.***

The traffic data used in the operational phase air quality assessment included cumulative traffic associated with other developments within the area. Cumulative impacts are considered ***direct, long-term, negative, slight to moderate*** but overall ***not significant*** in EIA terms***.***

Overall no significant cumulative impacts to air quality are predicted during the construction or operational phases of the proposed development.

4.10.3 Mitigation

4.10.3.1 Incorporated Design

There is no incorporated design mitigation required for the development.

4.10.3.2 Demolition & Construction Phases

Detailed dust mitigation measures are outlined within Section 13.9 of Chapter 13 to ensure that no significant nuisance as a result of construction dust emissions occurs at nearby sensitive receptors. Once these best practice mitigation measures, derived from the Institute for Air Quality Management 2024 guidance '*Guidance on the Assessment of Dust from Demolition and Construction'* as well as other relevant dust management guidance, are implemented the impacts to air quality during the

construction of the proposed development are considered, ***medium-term, direct, negative*** and ***imperceptible,*** which is overall ***not significant*** in EIA terms, posing no nuisance at nearby sensitive receptors (such as local residences).

4.10.3.3 Operational Phase

No site-specific mitigation measures are proposed for the operational phase. The significance of the impact of traffic emissions on air quality is assessed for the opening year only according to the TII guidance (2022) which results in some 'slight' to 'moderate' adverse increases in pollutant concentrations, however, the impact overall is considered not significant.

The measures set out in the Clean Air Strategy for Ireland (Government of Ireland 2023) aim towards solutions to ensure that air pollution concentrations are reduced in order to comply with the future changes in limit values. Ireland will need to continue to implement and develop measures to ensure improvements in air quality in future years to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to comply with the ambient air quality limit values set out in Directive 2024/xx/EC. These measures must be set at a national level. In relation to the proposed development, the inclusion of bike parking facilities and electric vehicle charging infrastructure as well as the availability of public transport routes will all help in promoting more sustainable modes of transportation and reducing private vehicle trips which will have the benefit of reducing air emissions from traffic.

4.10.4 Residual Impact Assessment

When the dust mitigation measures detailed in the mitigation section (Section 13.9) are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be ***medium-term, direct, localised, negative*** and ***imperceptible,*** which is overall ***not significant*** in EIA terms.

The impact to air quality during the operational phase of the proposed development as a result of emissions from vehicles accessing the site have been assessed as having a ***long-term, direct, localised, negative, slight to moderate*** but overall ***not significant*** impact on air quality.

4.10.5 Monitoring

Monitoring of the dust mitigation measures will be required as set out in Section 13.14 of Chapter 13 and the Construction Environmental Management Plan. The monitoring requirements will ensure that the dust mitigation measures are working satisfactorily.

4.11 Climate

The assessment of Climate is contained within Chapter 14 of Volume II. The climate assessment has focussed on:

- The potential greenhouse gas emissions during the construction and operational phases of the development.
- The vulnerability of the project to climate change, including considerations for increased rainfall and other projected climate impacts.
- The design measures to enhance the project's resilience to future climate risks, such as incorporating drainage systems for increased rainfall.

4.11.1 Existing Environment

The existing climate baseline can be determined by reference to data from the EPA on Ireland's total greenhouse gas (GHG) emissions and compliance with European Union's Effort Sharing Decision "EU 2020 Strategy" (Decision 406/2009/EC). The EPA state that Ireland had total GHG emissions of 60.6 Mt CO_2e in 2023. This is 2.27 Mt CO_2e higher than Ireland's annual target for emissions in 2023. EPA projections indicate that Ireland has used 63.9% of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025. Further reduction measures are required to stay within the budget requirements.

4.11.2 Impact Assessment

The potential impacts on climate have been assessed in two distinct ways – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA). The GHGA quantifies the GHG emissions from a project over its lifetime and compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude. The CCRA considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The impact of the construction and operation of the proposed development on Ireland's total national greenhouse gas emission is compared to Ireland's 2023 total greenhouse gas emissions, the relevant sectoral emissions ceilings and 2030 carbon budgets. Any adverse impacts are predicted to primarily occur during the construction phase, with the dominant sources of greenhouse gas emissions as a result of the development due to the construction traffic and embodied energy associated with the proposed development.

4.11.2.1 Do Nothing Scenario

Under the Do Nothing Scenario construction works associated with the proposed development will not take place. The site will remain unchanged, and the climate baseline will continue to develop in line with the identified trends. As the proposed site is zoned for development, in the absence of the proposed development it is likely that a development of a similar nature would be constructed in the future in line with national policy and the development plan objectives. As a result, the construction and operational phase impacts outlined in this assessment are likely to occur in the future even in the absence of the implementation of the proposed development.

4.11.2.2 Greenhouse Gas Assessment

4.11.2.2.1 Demolition & Construction Phases

Calculation of the GHG emissions associated with the construction of the proposed development was calculated using the online OneClick Carbon Designer for Ireland Carbon Calculator Tool and the online Transport Infrastructure Ireland Carbon Assessment Tool. The GHG emissions associated with the proposed development are predicted to be a small fraction of Ireland's Industry and Buildings (Residential) sector 2030 emissions ceilings of 4 Mt CO_2e each. The proposed development will incorporate some mitigation measures which will aim to reduce climate impacts during construction and once the development is operational.

4.11.2.2.2 Operational Phase

GHG emissions during the operational phase due to road traffic were assessed. The changes in traffic volumes associated with the operational phase of the development were substantial enough the meet the assessment criteria requiring a detailed climate modelling assessment, as per Transport Infrastructure Ireland (TII) 2022 guidance "*PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document"*. There will be a slight increase in the traffic on the local road network which will result in some minor increases in CO_2e emissions. These have been assessed as a small fraction of Ireland's transport sector 2030 emissions ceiling.

Impacts to climate are deemed ***direct, long-term, negative*** and ***slight,*** which is considered ***not significant*** with regard to the construction and operational phase.

4.11.2.3 Climate Change Risk Assessment

A CCRA was conducted to consider the vulnerability of the proposed development to climate change, as per the TII 2022 PE-ENV-01104 guidance. This involves an analysis of the sensitivity and exposure of the development to future climate hazards which together provide a measure of vulnerability. The hazards assessed included flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; drought; extreme wind; lightning, hail and fog; wildfire and landslides. The proposed development is predicted to have at most low vulnerabilities to the various climate hazards and therefore climate change risk is considered ***direct, long-term, negative*** and ***imperceptible***, which is considered overall ***not significant*** with regard to the construction and operational phase.

Overall, no significant impacts to climate are predicted during the construction or operational phases of the proposed development.

4.11.2.4 Cumulative Impact

With respect to the requirement for a cumulative assessment PE-ENV-01104 states that *"the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the*

potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative".

As a result, the cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

4.11.3 Mitigation

4.11.3.1 Incorporated Design

A number of mitigation measures have been incorporated into the design of the proposed development. This includes meeting and exceeding the new NZEB (Nearly Zero Energy Buildings) requirements set out in the revised Part L document. The proposed development will achieve an A rated energy certificate for all buildings. The project also aligns with various sustainability standards, such as BREEAM, LEED, WELL Building Standard, WIRED Score and Passive House. The project will also seek a HPI Certificate. Additionally, other measures have also been incorporated into the design of the proposed development to mitigate the impacts of future climate change. To address future climate change risks, the design includes mitigation measures such as adequate drainage systems to manage a 20% increase in rainfall, consistent with the 'Medium Risk' RCP4.5 scenario (2021-2050).

4.11.3.2 Demolition & Construction Phases

A number of best practice mitigation measures are proposed for the construction phase of the proposed development to ensure that impacts to climate are minimised. These mitigation measures include a demolition and construction program, determine material reuse and waste recycling opportunities (in compliance with the EU Taxonomy Regulation 2020/852) and identifying and implementing lower carbon material choices and quantities during detailed design.

4.11.3.3 Operational Phase

During the operational phase, emissions will be minimal. The primary focus will be on operational energy usage. The design intent at present for hot water, heating and cooling system designs are based on a combination of highly efficient air source and water to water heat pumps with no fossil fuels being consumed throughout the proposed development, avoiding the production of large amounts of local pollution within an urban environment. Sustainable travel modes will be encouraged through support facilities for cycling, minimal onsite parking and infrastructure for electrical vehicle charging points.

4.11.4 Residual Impact Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII 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 incorporated some measures to reduce climate change impacts. Once mitigation measures are put in place, the effect of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight,*** which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

4.11.5 Monitoring

There is no monitoring proposed during the construction or operational phase in relation to climate.

4.12 Cultural Heritage

The assessment of Cultural Heritage – Archaeology & Built Heritage is contained within Chapter 15 of Volume II.

4.12.1 Existing Environment

There are 14 recorded archaeological sites located within the study area and the Archaeological Survey of Ireland inventory descriptions of each of these sites are provided in Appendix 15.1 of the EIAR. There are 24 Protected Structures located within the study area and these include Dunkettle House, two of its associated outbuildings and a gateway. The remainder of the Protected Structures within the surrounding study area comprise country houses and associated structures, as well as mills, a bridge and smaller residential houses. The majority of these Protected Structures are also listed in the NIAH which also includes an additional 17 entries within the study area which are not listed as Protected Structures. The proposed development is not located within an Architectural Conservation Area. Location maps of all the identified archaeological and architectural heritage constraints located within the study area are provided within the chapter.

The potential for the presence of unrecorded, sub-surface archaeological remains within the proposed development site was noted and a non-intrusive geophysical survey, under a licence issued by the National Monuments Service, of suitable green field areas was carried out to inform the assessment. No potential features of archaeological origin were noted within the proposed development site during the geophysical survey. A program of archaeological test trenching was then carried out within the proposed development and this investigation also revealed nothing of archaeological significance. Full copies of the geophysical survey and test trenching reports are presented in Appendices 15.2 and 15.3.

4.12.2 Impact Assessment

4.12.2.1 Do Nothing Scenario

A 'Do Nothing Scenario' will see to the continued preservation of the known and potential cultural heritage resource, including any potential unrecorded, sub-surface archaeological remains, located within the study area.

4.12.2.2 Demolition Phase

The LRD Phase 1 development will require the demolition of ruined remains of three small structures within the northernmost portion of the LRD Phase 1 development. The structures are of negligible heritage interest. The structures will be recorded prior to demolition. A second access point from Dunkettle Road (L2998) is envisaged in the LRD Phase 2 development. At the time of writing this EIAR, the design and specification of this second access are currently being developed in consultation with Cork City Council officials – it does not form part of the LRD Phase 1 application. The proposals for the second access point may result in a direct moderate/significant adverse impact on the former walled garden however the effects will be reviewed in the making of the future LRD Phase 2 application when the detailed design has been completed and detailed mitigation measures appropriately developed.

4.12.2.3 Construction Phase

There are no archaeological sites listed in the SMR/RMP located within the boundary of the proposed development and the construction phase will, therefore, have no predicted direct adverse effects on the known archaeological resource. The programmes of geophysical survey and archaeological test trenching carried out to inform this assessment did not reveal any previously unrecorded, sub-surface archaeological remains within the boundary of the proposed development. The route of the amenity greenway is located outside the area of the lands that were subject to these site investigations. The potential exists for the presence of unrecorded, sub-surface archaeological sites or features within the footprint of this element of the proposed development and this will require mitigation.

The construction phase of the proposed LRD Phase 1 and LRD phase 2 residential developments will result in no predicted effects on any of the other recorded archaeological sites or architectural heritage constraints within the surrounding study area as these are also located in areas outside the development boundary where no construction works will occur. However, a second access point from Dunkettle Road (L2998) is envisaged in the LRD Phase 2 development. At the time of writing this EIAR, the design and specification of this second access are currently being developed in consultation with Cork City Council officials. The proposals for the second access point may result in a direct moderate/significant adverse impact on the former walled garden. However, the design and specification of this second access are being developed in consultation with Cork City Council officials – they do not form part of the LRD Phase 1 planning application.

4.12.2.4 Operational Phase

There are no recorded archaeological sites located within the boundary of the proposed development and no potential unrecorded archaeological sites or features were identified during the geophysical survey and test trenching investigations carried out to inform this assessment. No direct adverse effects on the archaeological resource are, therefore, predicted during the operational phase.

There are no designated architectural heritage structures located within the boundary of the proposed Phase 1 development, and it is not located within, or adjacent to, an Architectural Conservation Area. The operational phase of the proposed development will, therefore, not result in any direct, adverse effects on the architectural heritage resource.

Dunkettle House and a number of its associated outbuildings, which are also listed as Protected Structures, are located within the wider environs of the proposed development at distances of c. 600m and c. 200m to the south of the housing element for Phase 1 and 2 respectively and c. 290m to the east of the proposed amenity greenway. The operation phase of the proposed development will have the potential to result in permanent, indirect, residual adverse effects of a visual nature on the setting of Dunkettle House and this indirect effect is predicted to be negligible in significance. As noted, the design and specification of a second access are currently being developed in consultation with Cork City Council officials – they do not form part of the LRD Phase 1 planning application. The effects will be reviewed in the making of the future LRD Phase 2 application when the detailed design has been completed

4.12.2.5 Cumulative Impact

The proposed development will not result in any predicted significant adverse effects on the cultural heritage resource in combination with reviewed developments within the surrounding study area and, therefore, it is not predicted to contribute to any potential significant cumulative effects on the resource.

4.12.3 Mitigation

4.12.3.1 Incorporated Design

The design of the proposed development was informed by the desktop studies and site investigations carried out as part of this assessment and this included design inputs by the architectural heritage specialist in relation to the formulation of development proposals within the environs of Dunkettle House and its associated outbuildings.

4.12.3.2 Demolition & Construction Phases

The location of Dunkettle House and its associated structures will be excluded from construction activities including, but not limited to, traffic movement, equipment storage, compounds and spoil retention areas. The location of these cultural heritage constraints will be identified during contractor site inductions and will be clearly signed as no entry areas for the duration of the construction phase.

Prior to the commencement of development works, a written and photographic record shall be prepared by a suitably qualified historic building specialist of the ruined remains of three undesignated stone-built structures in the northernmost portion of the LRD Phase 1 development. The resultant report shall be submitted to Cork City Council.

A programme of geophysical survey followed by archaeological test trenching was carried out to inform this assessment and these revealed nothing of archaeological significance. Given the limited footprint of the proposed amenity greenway and two outlets to the Glashaboy River, these areas have not been subject to a programme of pre-development archaeological investigation. A programme of licensed archaeological monitoring of ground works along the route of the amenity greenway and the two outlets to the Glashaboy River will be carried out by a suitably qualified archaeologist during the construction phase. In the event that any archaeological sites or features are identified during monitoring, ground works will halt at that location, and they will be recorded and will be left to remain securely in situ within a cordoned off area. The National Monuments Service and the Cork City Council's Executive Archaeologist will be notified of the discovery and consulted to determine further appropriate mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a licensed archaeological excavation.

4.12.3.3 Operational Phase

Following the successful implementation of the construction phase archaeological mitigation measures, the operational phase of the proposed development will not result in any predicted direct effects on the archaeological resource that will require mitigation. The operational phase of the proposed development will also not result in any predicted effects on other elements of the cultural heritage resource within the study area that will require mitigation.

4.12.4 Residual Impact Assessment

No direct residual operational phase effects on cultural heritage constraints within the study area are predicted. The operational phase of the proposed development will have the potential to result in permanent, indirect, residual adverse effects of a visual nature on the setting of Dunkettle House and this indirect residual effect is predicted to be negligible in significance.

4.12.5 Monitoring

There are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service for licences to carry out archaeological monitoring of ground works, and these will allow for monitoring of the successful implementation of mitigation measures. A revised method statement for any further archaeological excavations that may be required, dependant on the results of archaeological monitoring of ground works, will be submitted to the National Monuments Service and National Museum of Ireland. Reports on all completed archaeological site works will be submitted to the National Monuments Service, the National Museum of Ireland and the Planning Authority which will clearly describe the results of all works in written, mapped and photographic formats.

4.13 Description of Significant Interactions

Likely significant interactions are set out in Chapter 16 of the EIAR. In practice many impacts have slight or subtle interactions with other disciplines. During the preparation of this EIAR each of the specialist consultants engaged with each other with respect to the likely interactions between effects predicted as a result of the proposed development. Mitigation measures to alleviate identified likely significant effects address identified interactions. This approach meets with the requirements of Part X of the Planning and Development Act 2000, as amended, and Part 10, and schedules 5, 6 and 7 of the Planning and Development Regulations 2001, as amended.

5 Summary of Mitigation & Monitoring Measures

A key objective of the Environmental Impact Assessment process is to identify likely significant environmental impacts at the pre-consent stage and where necessary to propose measures to mitigate or ameliorate such impacts. Monitoring Measures must be incorporated in the Development Consent for a Project if the Project is likely to have significant adverse effects Article 8a of the EIA Directive, requires that monitoring measures proposed (if appropriate) should be included in the EIA Report.

This section summarises the proposed mitigation and monitoring measures set out in Chapters 4 to 15 of Volume II of this EIAR.

It is proposed that the appointed contractor will develop a site-specific Construction and Environmental Management Plan (CEMP) prior to works commencing on-site. All the mitigation and monitoring measures proposed within the individual specialists' assessments will be incorporated into the plan.

Table 5-1 Incorporated Design Mitigation

Aspect	Mitigation
Population & Human Health	▪ The proposed development complies with the Building Regulations, to safeguard users of the buildings and the health of occupants. ▪ The proposed development complies with the requirements of Part M of the Building Regulations and incorporates the principles of universal design so that the development will be readily accessible to all, regardless of age, ability, or disability. ▪ The proposed design provides for a highly accessible layout across the scheme including segregated pedestrian and cyclist entrances strategically located proximate to Glanmire Village in the north and the Glanmire to City Centre Cycle Route and Carrigtwohill to Midleton Inter-urban Cycle Route to the south, via the new greenway through the site. This will encourage sustainable modes of outdoor access for a wide age group. ▪ The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. ▪ The preservation and management of the woodland areas, and the availability of on-the-doorstep public open spaces and amenity areas will provide a high-quality environment for the residents and will encourage sustainable modes of outdoor access for a wide age group
Landscape & Visual	▪ From the outset of the design process, site assessment and analysis has been undertaken to identify significant effects. Responding to those with the integration of mitigation measures addressing those potential Negative Visual and landscape impacts. ▪ Cork City Council's zonings on the Dunkettle lands mitigate by avoidance restricting the proposed residential development to within the agricultural field areas of the site. In the Cork City Development Plan 2022-2028, the objective is to preserve the existing heritage, green and blue biodiversity assets. This gives protection to existing pNHA designated Woodland, the Historic Dunkettle House complex and the Parkland.

Table 5-1 Incorporated Design Mitigation

Aspect	Mitigation
	▪ The residential development will have interactions with the pNHA woodlands, the estuary with its SPA designation and an area of the parkland. Mitigation by avoidance is provided with the site layout stepped back from the woodland edge. ▪ In LRD Phase 1 a greenway for pedestrians and cyclists is proposed along the west side of the site (within the western portion of the historic demesne of Dunkettle House) will not give rise to negative impacts on historic landscape quality or the integrity of the setting of Dunkettle House, a protected structure. This pushes the development back from the estuary and the woodland and this reduces the potential Negative Impact on the estuary and woodland avoiding diminishing its conservation status post development. ▪ Dwellings in all cases front on to the woodland area and this creates a buffer space. ▪ Within the residential zoned area mitigation by avoidance is proposed with the retention of existing mature tree lines where possible. ▪ Prevention mitigation strategies include the proposed exclusion of future residents from the pNHA woodland areas and thus keeping the eastern shore of the estuary a quiet zone. This will prevent the degradation of the conservation status of the PNHA and SPA areas. ▪ The scale of the buildings proposed has been carefully considered in terms of design and location so that this large-scale residential development into the existing landscape with minimum exposure from external viewpoints. ▪ Strategies to reduce Negative Impact include the minimisation of tree and hedgerow removal from the site. These are retained in most areas apart from the northern Phase I area of the development. This is achieved by designing one main route through the development that connects from north to south through each field area. The road network within each of the field areas connects to this through route with the mass of housing reduced to a series of pockets of development within the mature tree lines and woodland. ▪ Negative Impact is reduced through the decision to retain the existing 'Woodville' oak woodland on site which is on an area zoned residential. ▪ Proposing bat friendly lighting along the greenway on the woodland edge is also an important mitigation measure as the woodlands are an important commuting and foraging corridor for bats. ▪ The reduction in lighting intensity along the woodland edge will in turn minimise light pollution in the estuarine area and make the presence of the residential development less intrusive at night from the western shore of the estuary. ▪ There are two intrusions in the pNHA woodlands to provide for stormwater outfalls to the estuary; In the north the outfall follows the route of the historic walk path. The wayleave is 4 metres wide, and the path is narrow on steep terrain. It does require some loss of trees and disruption. In the south the route is taken where overhead lines already cross over the woodland, the position of the outfall requires the removal of diseased and dead elm and ash trees. Some woodland trees are to be removed in the northwest corner of the site to accommodate a stormwater attenuation pond. Mitigation measures to offset these identified Negative Impacts include the proposal to place the woodland areas into management with the sole objective of conservation. This will be done within the structure and guidance of the Native Woodland Conservation Scheme. The woodland areas are to be managed to ensure their conservation status is maintained and improved. The buffer zone along the

Table 5-1 Incorporated Design Mitigation

Aspect	Mitigation
	woodland is to be planted with appropriate woodland edge vegetation to increase it biodiversity value. ▪ The open space areas across the development (phase I & II) will feature native Irish Oaks integrating the woodland ambience into the development. Where earth remodelling works are undertaken to provide vehicular access from the Dunkettle Road in the north of the site, the regraded hillside will be planted under the Native Woodland Conservation Scheme, and this will compensate for the loss of existing tree lines by extending the 'Woodville' woodland and connecting it with the trees retained near to the Dunkettle Road. Extensive street tree planting will also occur across all phases of the development.
Material Assets: Traffic & Transport	None
Material Assets: Built Services	▪ The surface water drainage services, wastewater drainage services and water supply services for the development includes measures to mitigate by design.
Material Assets: Waste	• Buildings have been designed with material efficiency in mind. This involves reducing the amount of materials used in the building fabric and minimising the waste during construction; • Opportunities to achieve on-site and off-site reuse and recycling of waste have been identified;
Land & Soils	▪ The design seeks to mitigate potential negative effects with all new-build infrastructure to be designed in accordance with the Technical Guidance Documents of the Building Regulations and associated codes of practice, which require due cognisance of the receiving environment. ▪ Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time ▪ Any deep excavations will be designed in such a way as to be supported both during the construction and operational phases of the site development. ▪ The site layout design has kept the extent and depth of retaining walls and supporting structures to a minimum.
Water & Hydrology	▪ All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment. In particular design, choice and standard of materials for buried pipe work and interceptors shall be adequate for operating successfully without effecting the local environment for the long term. ▪ The design seeks to mitigate potential negative effects with all new-build infrastructure to be designed in accordance with the Technical Guidance Documents of the Building Regulations and associated codes of practice, which require due cognisance of the receiving environment. ▪ Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided and by association a reduction in potential waste material, machinery operation time and associated risks. ▪ The proposed development will be provided with a surface water management system that is designed in accordance with the principles of Sustainable Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS).

Table 5-1 Incorporated Design Mitigation

Aspect	Mitigation
	▪ The proposed surface water network for the development is arranged into individual systems that match the natural catchments of the site. Each system will operate independently of each other. ▪ The proposed surface water networks includes a train of SuDS features which collectively provide for interception, treatment and conveyance of surface water, including nature-based features, which will aid the reduction of runoff volumes by slowing surface water flows, both providing the opportunity for evapotranspiration and rainwater storage. Interception storage requirements of GDSDS will be sufficiently met through the provision of SuDS features. Discharges to existing drainage systems is controlled as necessary to ensure adequate flood protection. ▪ The SuDS features incorporated into the site scheme were chosen following an assessment using the guidance provided in the following documents: - SuDS Manual, CIRIA 753; - Nature-based Solutions to the Management of Rainwater and Surface Water Run-off In Urban Areas, Dept of Housing, Local Government and Heritage. ▪ SuDS features suitable for the site layout and site constraints have been identified and incorporated into the proposed surface water drainage scheme. Surface water drainage has been designed to, where necessary, mimic the site run-off characteristics with storm water run-off passing through the necessary treatment systems to prevent pollution. The design of the residential heating systems shall exclude the use of potentially polluting kerosene or fuel oils.
Biodiversity	The Proposed Development includes several embedded design features that may act to avoid or mitigate negative impacts that would likely occur in the absence of these features. However, as opposed to typical mitigation measures, the implementation of these features is integral to the design and completion of the Proposed Development, and as such the impact assessments are performed with consideration of these features as integrated parts of the Proposed Development. All considered embedded design features that may act to mitigate negative impacts on local ecology and environment are listed in Table 11-22 and include SUDS, Landscape Design and Lighting Design measures. <u>Biodiversity Enhancement by Design</u> The landscape plan incorporates native planting throughout the green spaces of the Proposed Development including the addition of native species on the periphery of the existing woodlands and the creation of a new woodland area to the east, connecting the eastern section of the Site to the riparian woodland and hedgerows already present (DMNA 2024). Additionally, as part of SuDS measures, an attenuation pond will be located to the north, close to the edge of the Glanmire Wood pNHA, eventually outfalling into the Glashaboy Estuary post settlement and treatment. The planting of native shrubs in the ground layer will provide cover and nesting opportunities for birds and small mammals. While the mixed planting of wildflowers, hedgerow, scrub, fruit trees and wildflower meadow will attract insects which act as food sources for the above species groups and pollinator species. The above measures are considered good for promoting pollinators and are considered to provide an overall enhancement of the biodiversity at the Site from the baseline due to the low value and extent of habitats that are to be lost to facilitate the Proposed Development.

Table 5-1 Incorporated Design Mitigation

Aspect	Mitigation
	The following enhancement measures are also recommended: ▪ Enhancement 1: Amphibian and Reptile Hibernacula ▪ Enhancement 2: Bird Box/ Swift Brick Scheme ▪ Enhancement 3: Bat Box Scheme ▪ Enhancement 4: Wildflower Meadows ▪ Enhancement 5: Native Planting ▪ Enhancement 6: Insect Hotels ▪ Enhancement 7: Log Piles for Invertebrates and Fauna ▪ Enhancement 8: Low Intervention Hedgerow/ Treeline Management
Noise & Vibration	None
Air Quality	None
Climate	None
Cultural Heritage	▪ The design of the proposed development was informed by the desktop studies and site investigations carried out as part of this assessment and this included design inputs by the architectural heritage specialist in relation to the formulation of development proposals within the environs of Dunkettle House and its associated outbuildings.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
Population & Human Health	▪ The appointed contractor(s) will update the CEMP submitted with the application after development consent is received, incorporating the environmental mitigation and monitoring measures included in this EIAR and relevant measures attached to a grant of permission. - The CEMP will comply with all appropriate legal and best practice guidance for construction sites. - The purpose of a CEMP is to provide a mechanism for the implementation of the various mitigation measures which are described in this EIAR and to incorporate relevant conditions attached to a grant of permission. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority. - All mitigation and monitoring measures included in the Summary of Mitigation and Monitoring Measures in Chapter 17 of this EIAR will be included in the CEMP and adhered to. - The CEMP will be submitted to the Planning Authority prior to the commencement of development. ▪ The Resource Waste Management Plan (RWMP) will be updated by the Main contractor(s) and implemented after development consent is received, incorporating the environmental mitigation and monitoring measures included in this EIAR and relevant measures attached to a grant of permission. ▪ All construction personnel will be required to understand and implement the requirements of the CEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites. ▪ Project supervisors for the construction phase will be appointed in accordance with the Health, Safety and Welfare at Work (Construction) Regulations 2021 (as amended), and a Preliminary Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phases. ▪ The *Construction Environmental Management Plan (CEMP)* and a *Resource and Waste Management Plan (RWMP)* will be live documents and will be updated in future for the LRD Phase 2 development, and Dunkettle House if relevant, and will accompany a future application for those lands. The same principles will apply. ▪ The contractor will appoint a community liaison officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the contractor's CEMP. ▪ Construction Working Hours will generally be limited to the hours 7am – 6pm Monday to Friday and 8am to 2pm on Saturday. Works proposed outside of these periods will be agreed with the Local Authority in advance. In order to mitigate any impact of construction activities, the following measures are proposed:

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	- Coordination of deliveries to site within working hours, - Scheduling of noisier activities early in the working day, - Noise and vibration mitigation measures will be implemented in line with Chapter 12. - The delivery of materials to the site during the construction phase shall be organised so that deliveries are minimised and do not cause traffic hazards. - Deliveries are not permitted at peak traffic times (8:00am to 9:00am and 5:00pm to 6:00pm) and - all construction vehicles are parked within the site. Note: Mitigation measures relating to those factors under human health which are relevant under other environmental factors, are included in the relevant chapters of this EIAR.
Landscape & Visual	▪ During the construction phase mitigation will be in place with the provision of tree protection fencing to all woodland areas and to treelines proposed for retention. The Parkland and Heritage assets in the southern area of the site are similarly to be excluded from any construction activity using secure protection fencing. ▪ The commencement of woodland management under the Native Woodland Conservation Scheme should begin in tandem or before the construction of the development. ▪ Where possible proposed tree planting should be undertaken as early as possible in the construction phase to allow for the vegetation to develop in advance of the construction and occupation of dwellings. ▪ When the proposed southern access road is under construction, extra care will need to be taken in the vicinity of the Walled Garden and the landscape areas closer to the parkland. The Construction Management Plan will include a specific section on works to / in the vicinity of the walled garden and other protected structures on site. This will be written in consultation with the project conservation architect. ▪ Works to road frontage areas on the Dunkettle Road should be undertaken at an early stage in the appropriate phase to minimise Negative Impact. ▪ Site hoarding, where natural screening is not available, will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. ▪ All required tree protection fencing is to be erected as planned for each phase of the development and is to be kept in place and regularly inspected throughout the construction phase of the development. ▪ Where construction work to provide for outfalls to the Glashaboy Estuary shoreline are proposed within woodland areas these works are to be supervised by the ecologist and forester appointed under the Native Woodland Conservation Scheme. Once in place the woodland areas concerned are to be secured from any further construction activity with secured gate access provided for maintenance access only. ▪ A freshwater ecologist is to periodically monitor the operation of the SUDs features on site; swales and attenuation pond to maximise their habitat value.
Material Assets: Traffic & Transport	▪ A Construction Environmental Management Plan coupled with a Construction Stage Traffic Management Plan has been developed by the appointed engineers for the

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	scheme. These plans seek to minimise the number of materials imported and exported from site as well as minimising construction stage traffic. These plans are to be updated by the appointed Main contractor(s). ▪ The Contractor's Construction Traffic Management Plan will identify suitable routes to accommodate HGV traffic and will include specific times of operation. These times will ideally avoid peak hour traffic times as identified in this assessment. ▪ An on-site wheel wash facility will ensure no site material is brought on to the public roads network
Material Assets: **Built Services**	<u>General</u> ▪ Works shall be performed in accordance with Statutory requirements, including Health, Safety and Welfare at Work (Construction) Regulations 2013 (S.I. no. 291 of 2013). ▪ The works shall be supervised by suitable competent personnel responsible for delivery of the built services as per the permitted development. ▪ Works in existing roads shall be performed in accordance with *Guidelines for Managing Openings in Public Road*, Dept of Transport Tourism and Sport, Second Edition (Rev 1), April 2017. ▪ Works in existing public roads and pedestrian paths shall be performed in accordance with Cork City Council requirements for the management and control of roadworks in Cork city. ▪ The Construction Environmental Management Plan (CEMP) prepared to accompany the planning application shall be updated with any and all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase. ▪ The Resource and Waste Management Plan (RWMP) prepared to accompany the planning application shall be updated with all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase. ▪ The locations of all existing on-site services (underground and overhead) shall be confirmed prior to the commencement of works and suitable protection measures put in place to minimise the risk of damage to existing services. ▪ The precise routing of electricity and telecommunications infrastructure on the site are to be agreed with the relevant service providers prior to the commencement of on-site works. ▪ Consultation with the relevant services providers shall be undertaken in advance of works. This will ensure all works are carried out to the relevant standards and ensure safe working practices are implemented. ▪ All reasonable precautions shall be taken to avoid unplanned disruptions to any services / utilities during the proposed works. ▪ There will be an interface established between the contractor(s) and the relevant utilities service providers / authorities during the construction phase of the proposed development. This interface will be managed in order to ensure a smooth construction schedule with no / minimal disruption to the local community. In addition to the General Mitigation Measures listed above, the following measures shall be implemented: -

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	Surface Water Drainage Services ▪ A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted surface water drainage system free of significant defects. Waste Water Drainage Services ▪ Uisce Éireann shall be consulted prior to commencement of works. ▪ Existing wastewater drainage infrastructure shall be protected in accordance with Uisce Éireann requirements. ▪ Wastewater drainage services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following: - *Code of Practice for Wastewater Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments*, Uisce Éireann, July 2020 (Revision 2); - *Wastewater Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments*, Uisce Éireann, July 2020 (Revision 2) - *Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers)*, Uisce Éireann, August 2020 (Revision 3) ▪ In respect of wastewater drainage services not to be adopted by Uisce Éireann, including temporary wastewater drainage, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable wastewater drainage system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document H – *Drainage and Waste Water disposal* (published 2010, re-printed 2016) Water Supply Services ▪ Uisce Éireann shall be consulted prior to commencement of works ▪ Existing water supply infrastructure shall be protected in accordance with Uisce Éireann requirements. ▪ Water supply services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following: - *Code of Practice for Water Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments*, Uisce Éireann, July 2020 (Revision 2); - *Water Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments*, Uisce Éireann, July 2020 (Revision 4) - *Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers)*, Uisce Éireann, August 2020 (Revision 3) ▪ In respect of water supply services not to be adopted by Uisce Éireann, including temporary water supply, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable water supply system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document G – *Hygiene* (published 2008, Reprinted July 2011)

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	Electrical Supply Services ▪ ESB Networks will be consulted prior to commencement of the works ▪ A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Electrical Supply System free of significant defects. Telecommunications services ▪ Openeir will be consulted prior to commencement of the works ▪ A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Telecommunications Supply System free of significant defects.
Material Assets: Waste	▪ Dedicated, secure waste segregation areas have been selected for the duration of the enabling works. The dedicated waste storage areas within the waste segregation points will house all bins and skips for the storage of segregated construction waste generated. All containers will be marked with clear signage which will identify which waste types are to be placed into each container. ▪ Waste materials will be separated at source and will follow the Resource and Waste Management Plan (RWMP) and Construction Environmental Management Plan (CEMP); ▪ Prior to the commencement of the Construction Phase detailed calculations of the quantities of topsoil, subsoil and green waste will be prepared, and soils will be tested to confirm they are clean, inert or non-hazardous; ▪ A policy of 'as needed' ordering and strict purchasing procedures will be implemented to prevent waste arisings as far as possible; ▪ The Contractor will vet the source of aggregate, fill material and topsoil imported to the site in order to ensure that it is of a reputable origin and that it is "clean" (i.e., it will not contaminate the environment). ▪ The Contractor and/or Council will implement procurement procedures to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance; ▪ The waste materials generated during the Construction Phase will be stored in suitably size receptables and transferred offsite for appropriate processing, recycling and recovery; ▪ Waste materials generated from the Construction Phase that are unsuitable for reuse or recovery will be separately collected; ▪ Disposal of construction generated wastes will be considered a last resort and only after recycling or recovery options have been ruled out; ▪ A suitably competent and fully permitted waste management company will be employed to manage waste arising for the Construction Phase. The appointed waste contractor must have the relevant authorisations for the collection and transport of waste materials, issued by the National Waste Collection Permit Office (NWCPO); ▪ All waste materials will be transported to an appropriately authorised facility, which must have the relevant authorisations for the acceptance and treatment of the specific waste streams, i.e., a Certificate of Registration (COR) or a Waste Facility Permit (WFP) as granted by a Local Authority, or a Waste/Industrial Emission Licence as granted by the Environmental Protection Agency; ▪ It is not envisaged that there will be any hazardous waste generated throughout the construction works however, in the event that hazardous soil, or historically

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	deposited waste is encountered during the site bulk excavation phase, the contractor will notify Cork City Council and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s). Only authorised facilities will be used and as a result of this, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures; ▪ Waste generated by construction workers will be stored in wheelie bins on site and it will be collected by an appropriately authorised waste collector. ▪ All wastes generated on site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility; ▪ All waste quantities and types will be recorded and quantified, and records will be retained onsite for the duration of the Construction Phase. ▪ The Contractor will have the responsibility to record resource and waste management at the site in line with the Resource and Waste Management Plan (RWMP). Some of the principal duties and responsibilities of this role include: - Report to Project Manager on the management of resources and waste at the site; - Identify all destinations for resources taken off-site; - Address end-of-waste and by-product notifications with the EPA, where applicable; - Maintain full records of all resources (both wastes and other resources) for the duration of the project; - Delegate responsibility to sub-contractors, where necessary; - Coordinate with suppliers, service providers and sub-contractors; and - Prioritise waste prevention and resource salvage. ▪ In terms of invasive species, an IAS Specialist will be contracted to treat and eradicate the Travellers Joy and Sycamore on site per TII Technical Guidance on 'Management of Invasive Plant Species on National Roads' published in December 2020. The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the site. - For the construction phase, the contractor will prepare a project specific Invasive Alien Plant Species (IAPS) standard operating procedure document, in advance of work commencement. The document should be prepared by an IAPS specialist and should cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS on-site, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite. The measures include: o Validation that all machinery / vehicles are free of IAPS, prior to their first introduction to site; o Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS; o A regular schedule of site inspections across the IAPS growing seasons, for the duration of the construction works programme; o Validation that all machinery / vehicles are free of IAPS, prior to leaving the site; and

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	○ Appropriate and effective site biosecurity hygiene to ensure that no IAPS are transmitted off-site for the duration of the proposed works.
Land & Soils	▪ The planning, timing and scheduling of the earth works across the site is important in limiting, as far as possible, the extent of ground being worked, as reducing the surface area of exposed soil will reduce the potential for the generation of dust and or sediment runoff. ▪ Control of Soil Excavation and Export from Site using the reduce, reuse and recycle approach with any excavation arisings to be reused on site where possible with the implementation of an appropriate earthworks handling protocol to be used, as per the sites CEMP. ▪ The areas where the excavation of unconsolidated soil and subsoils is required within each building phase will be kept to a minimum and only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of preventing the release of dust in dry weather and suspended sediments in wet conditions. Potential effects are therefore avoided. ▪ Limiting activities to designated work areas, thereby not allowing machinery or construction activity in proposed future green, open space and/or undeveloped areas will ensure that there is no dust or sediment runoff generated and no soil compaction will occur in those areas. ▪ Designated roadways and internal access/construction routes will be clearly designated and fenced off in order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. ▪ Dust can be reduced by damping down of the works areas and especially along roads and access tracks where vehicle activity increases the generation of dust and fine particulates. Vehicle wheel washes, road sweeping and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads. ▪ A number of designated contractor compounds, located in areas of level ground, will be established for the site. These compounds will enable the safe storage of building materials, car parking, waste skips and will include a designated refueling station and wash down areas. ▪ Designated stockpile areas for the temporary storage of topsoil, subsoils and rock material required for site use will be established in areas where the ground level is flat and well away (>20m) from surface water features and steep slopes. ▪ Sand and gravel stockpiles will be kept to a minimum, stored on leave ground, away (>20m) from water courses and covered if necessary. ▪ Shallow berms, silt fences and/or cut-off trenches can be established around compound, work and stockpile areas which will prevent clean surface water runoff from flowing across these areas and will also help contain any impacted runoff flowing away from these parts of the site. ▪ Any sediment laden runoff will be channeled through silt traps and ponds to allow, as far as possible, the settlement of suspended solids. The discharge of silty water over grass field areas will be considered if necessary.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ Runoff from machine service and/or concrete mixing areas will not be allowed to discharge to ground or enter watercourses. Dedicated service and concrete wash down bunded areas will be established. ▪ Any finished construction, landscaped and green areas will be finished and re-grassed as soon as possible to limit the potential for dust and surface water generation from those areas. ▪ Activity of plant equipment and machinery operating in the construction area could result in small scale fuel spills to ground - mitigating against accidental leaks and spillages during the development will involve implementing good practices including regular plant maintenance, use of drip trays, adequate bunding for storage containers, refuelling in designated areas etc. ▪ All fuel storage areas on the site are sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances. ▪ Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials. ▪ Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels and oils will be used. ▪ The construction contractor and design team will work to the Construction Environmental Management Plan (CEMP) prepared for the development works and this will be reviewed during the construction phase and be augmented with additional controls as required.
Water & Hydrology	▪ The phased nature of the sites development will reduce the foot print of open ground and active earth work areas as the site is being prepared for construction works. The areas where the excavation of unconsolidated soil and subsoils is required within each building phase will be kept to a minimum and, as far as practicable, only extended as already stripped ground has been built over. Keeping the surface area of exposed soils in the construction areas to a minimum is the most effective way of preventing the release of dust in dry weather and suspended sediments during or after wet conditions. Potential dust and suspended solids runoff impacts are therefore reduced or avoided. ▪ Limiting excavation works and machinery activity during and immediately after periods of heavy rainfall (>20mm/day) will also be incorporated into the earth works management to help limit sediment generation. ▪ Control of Soil Excavation and Export from Site using the Reduce, Reuse and Recycle approach with all excavation arisings to be reused on site where possible. The implementation of an appropriate earthworks handling protocol with adequate runoff control and dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping and general housekeeping will ensure that the surrounding environment are free of nuisance dirt on roads which will reduce sediment runoff and dust generation. ▪ There will be a requirement for a Construction Management Plan to oversee the development. The Main Contractor(s) will update the CEMP;

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ Earthwork operations will be carried out such that surfaces, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and suspended sediments from going off site. ▪ Construction methods used by the contractor are to be tailored to reduce, where possible, sediment runoff and leaks or spills to ground and to minimise effects on the local environment. ▪ Designated roadways and internal access/construction routes will be clearly designated and fenced off in-order to prevent uncontrolled tracking of construction vehicles across the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation. Similarly existing hedge rows and site features which are to be maintained will be fenced off. ▪ Any spoil or waste material generated from the construction process is to be temporarily stored on level ground at an approved location on site, and segregated from surface water runoff, before being either re-used on site or removed off-site to a suitably licenced waste management facility. ▪ All fill and aggregate for the project will be sourced from reputable suppliers. ▪ Designation of bunded refuelling areas on the site (as required) as well as the provision of spill kits across the site will reduce the potential for fuel or oil spills occurring or their extent. ▪ Fuel, oil and chemical storage should be sited within a bunded area. The bund must be able to take the volume of the largest container plus 10% and be located at least 10m away from drains, ditches, excavations and other locations where it may cause pollution. Bunds should be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. ▪ All bowsers to carry a spill kit and operatives must have spill response training; and portable generators or similar fuel containing equipment will be placed on suitable drip trays and/or absorbent fuel 'nappies'. In the case of drummed fuel or other potentially polluting substances (i.e. cement) which may be used during construction the following measures will be adopted: ▪ The use of a dedicated concrete truck washout areas and secure storage areas for the storage of concrete materials. All containers that contain potential polluting substances to be stored in dedicated internally bunded chemical storage cabinet units or inside concrete bunded areas. Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage. ▪ All works in the riparian corridor (<10m from the river) will be carried out in consultation with Inland Fisheries Ireland and the project ecologist following the best practice guidelines for construction in the vicinity of watercourses. Extra care needs to be taken when working in sloped areas which could have direct runoff to the local Glashaboy River Estuary System. ▪ All new infrastructure is to be installed and constructed to the relevant codes of practice and guidelines. Potable water supply networks and waste water infrastructure are to be pressure tested by an approved method during the construction phase and prior to connection to the public networks, all in accordance with the requirements of Uisce Eireann. ▪ Connections to the service providers are to be carried out to the approval and / or under the supervision of the Local Authority or relevant utility service provider, prior

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	to commissioning. All new sewers are to be inspected by CCTV survey post construction; to identify any possible physical defects for rectification prior to operational phase. ▪ All construction works will be completed in line with the recommendations of - The Construction Industry Research and Information Association (CIRIA) *Environmental Good Practice on Site 4th Ed (C741 - 2015) & Control of Water Pollution from Construction Site* (C532 - 2001). - The SuDs Manual (C752) Construction Industry Research and Information Association (CIRIA), 2015. - UK Environmental Agency Guidance Series for Pollution Prevention (GPP), including GPP5: Works and maintenance in or near water (NRW, NIEA, SEPA), January 2017 and GPP22: Dealing with Spills, (NRW, NIEA, SEPA), October 2018 ▪ Best practice environmental guidance will be incorporated into the Construction Environmental Management Plan (CEMP) for the development, an outline of which is part of the planning submission, prepared by JODA Engineering Consultants.
Biodiversity	▪ Best practice development standards and mitigation measures to be implemented during the Construction Phase of the Proposed Development, outlined in Table 11-23 of Chapter 11 and outlined in more detail in the CEMP (JODA, 2024). ▪ The CEMP should be reviewed and updated by the Main Contractor(s) / Project Manager in consultation with the Ecological Clerk of Works (ECoW) during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project's environmental commitments. The Contractor shall also designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). This Plan will be prepared upon appointment of the Main Contractor. Additional mitigation measures required are outlined below:- <u>Mitigation 1: Establish Storage, Cut and Fill Requirements</u> Prior to construction commencing the Contractor will be required to establish quantities of waste which will be generated by the excavation works for the substructure, roads and underground civil infrastructure, and how these will be stored, reused or exported from the Site. The contractor will be required to determine the number and size of settlement tanks and temporary surface water percolation areas required (more detail provided below). The Contractor will prepare Construction Method Statements for key construction activities, including but not limited to: ▪ Site set-up; ▪ Sequence of works – in particular, soil disturbance and reinstatement; ▪ Earthworks; ▪ Pouring of concrete; ▪ Construction of residential units; ▪ Construction of on-site waste water treatment plant; ▪ Construction of settlement ponds; ▪ Landscaping works, and; ▪ Emergency protocols for surface water management.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	The Employers Representative and ECoW will be required to review and sign off on all Construction Method Statements, including consultation with the Local Authority where relevant, prior to works commencing. Mitigation 2: Siting of Mitigation Measures, Site Compound, and Storage In advance of construction commencing, the ECoW, Employers Representative and Contractor will undertake a walkover of the Site. The locations of silt fencing, settlement tanks, lagoons, monitoring locations, site compounds and storage areas will be determined. It will be the responsibility of the Contractor to draw up a Construction Phase drainage and mitigation drawing which must be signed off by the ECoW and Employers Representative, this detail is outlined in the CEMP accompanying this chapter under separate cover. This drawing must include the following information: ▪ The location of all surface water features (springs, drains, watercourses on/adjacent to the Site; ▪ The location of silt fences; ▪ The location(s) of settlement ponds/tanks and standby silt buster equipment; ▪ The location(s) of surface water percolation areas; ▪ The location of site compounds; ▪ The location of site welfare facilities; ▪ The location(s) of storage areas (e.g., stockpile locations)(detailed further in the next section); ▪ The location of the wheel wash; ▪ The location of the haul route, and; ▪ The location of spill kits and refuelling areas. Mitigation 3: Ecological Clerk of Works (ECoW) Prior to the commencement of the Construction Phase, the Site Ecologist will be on Site to ensure that the silt fences and bunding are correctly positioned in the correct locations and are effectively managed to ensure any run-off from these areas is intercepted. Mitigation 4: Preparation of a Water Management System All water protection measures will be incorporated into a detailed Water Management System (WMS) which will be prepared by the contractor. The WMS will be drawn up in consultation with the ECoW and Employers Representative and will take into account any changes in the physical conditions of the Site e.g. river flows or ground conditions, which may have occurred subsequent to the submission of the application. Mitigation 5: Public Signage on all entrances to Glanmire Wood pNHA: In order to protect the rich ground flora and fauna within Glanmire Wood pNHA, a number of signs will be erected on all entrances to the area informing the public of access restrictions. Access to the woods will be strictly for maintenance purposes and this will be made clear to future residents to maintain the ecological integrity of the ancient woodland. Recreation and amenity opportunities for future residents will be confined to the external perimeter through the use of proposed greenways, without the need to enter into the woods directly. The woods will be protected from incursion by a Paladin style fence, as outlined in the landscape report accompanying this application under separate

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	cover (DMNA, 2024). Lighting will be minimised on the perimeter of the woodland in order to reduce/negate impacts on nocturnal wildlife, including bat species. Mitigation 6: Bat sensitive lighting To comply with Figure 11-35 - Lighting Plan showing proposed lux levels on the edge of Glanmire Wood pNHA. Mitigation 7: Tree Protection Protective tree fencing in compliance with BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' will be erected prior to any Construction works being undertaken to prevent damage to the canopy and root protection areas of existing trees at the Site. The fencing will be signed off by a qualified arborist prior to Construction to ensure it has been properly erected. No ground clearance, earthworks, stock-piling or machinery movement will be undertaken within these areas. Mitigation 8: Invasive Species Management Cherry laurel which is classed as a High-impact invasive species is present within the Glanmire Wood pNHA to the north of the Site, and also within the wider area within the applicant's landholding. A suitably qualified ISM specialist will be required to make provision for the control and adequate removal and monitoring of this species in order to protect the integrity of the protected area on Site, and the wider environs. All of the medium impact invasives and their respective distributions at the Site are not significant and their removal will not be an issue, however this will be placed at the discretion of the invasive species specialist with responsibility for invasive species management throughput the duration of the project. Transport Infrastructure Ireland (2020) guidance 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' will be consulted with regards the treatment, removal and disposal of invasive flora at the Site. Biosecurity Measures The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development site. ▪ For the Construction Phase the contractor will prepare a project specific IAPS standard operating procedure document, in advance of work commencement. The document should be prepared by an IAPS specialist and should cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS onsite, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite. These measures to include: - Removal of Cherry Laurel from the Site to be advised by an Invasive Species specialist. - Validation that all machinery / vehicles are free of IAPS, prior to their first introduction to site. - Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	- A regular schedule of site inspections across the IAPS growing seasons, for the duration of the construction works programme. - Validation that all machinery / vehicles are free of IAPS, prior to leaving the site. - Appropriate and effective site biosecurity hygiene to ensure that no IAPS are transmitted off-site for the duration of the Proposed Works. Mitigation 9: Aquatic and Surface Water Protection To ensure that no contaminated waters containing silt, fuel, cementitious materials etc., have the potential to enter the receiving surface water network during the Construction Phase of the Proposed Development, a suite of mitigation measures will be put in place, all of which have been outlined in the CEMP which accompanies the application, along with all other relevant measures recommended to protect environmental sensitivities during the Proposed Works (including those listed in the NIS report). Mitigation 10: Reduction of Noise Related Impacts Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction/Infill Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. To mitigate this disturbance, the following measures will be implemented: ▪ Selection of plant with low inherent potential for generating noise. ▪ Siting of plant as far away from sensitive receptors as permitted by Site constraints. ▪ Avoidance of unnecessary revving of engines and switch off plant items when not required. ▪ Keep plant machinery and vehicles adequately maintained and serviced. ▪ Proper balancing of plant items with rotating parts. ▪ Keep internal routes well-maintained and avoid steep gradients. ▪ Minimize drop heights for materials or ensure resilient material underlies. ▪ Where noise originates from resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate. ▪ Limiting the hours during which Site activities likely to create high levels of noise are permitted. ▪ Appointing a Site representative responsible for matters relating to noise. ▪ Monitoring typical levels of noise during critical periods and at sensitive locations. Mitigation 11: Timing of Vegetation Clearance To ensure compliance with the Wildlife Act 2000 as amended, the removal of areas of vegetation will not take place within the nesting bird season (March 1st to August 31st inclusive) to ensure that no significant impacts (i.e., nest/egg destruction, harm to juvenile birds) occur as a result of the Proposed Development. Where any removal of vegetation within this period is deemed unavoidable, a qualified Ecologist will be instructed to survey the vegetation prior to any removal taking place. Should nesting birds be found, then the area of habitat in question will be noted and suitably protected until the Ecologist confirms the young have fledged. Table 11-24 provides guidance for when vegetation clearance is permissible.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	The preferred period for vegetation clearance is within the months of September and October. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., Hedgehog). Where this seasonal restriction cannot be observed, a check for active roosts and nests, as well as signs of amphibians, will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist and repeated as required to ensure compliance with legislative requirements. Mitigation 12: Small Mammal and Fauna Protection The following general avoidance measures will be incorporated to minimise impacts to mammals during the Construction Phase: ▪ Hours of work - The hours of working will be limited to daylight hours where possible, so as to limit disturbance to nocturnal and crepuscular animals. ▪ Waste Management - As best practice, all construction-related rubbish on Site e.g., plastic sheeting, waste, wires, bags, netting in which animals can become entangled etc. will be kept in a designated area and kept off ground level so as to prevent small mammals such as hedgehogs from entrapment and death. ▪ Excavations & Pipes - Trenches/pits must be either covered when not in use/at the end of each working day with caps (especially at night) or include a means of escape for any animal falling in and getting stuck. If this is not possible, then a strategically placed plank or object should be placed in the corner of an excavation to enable animals to safely escape (Badgers will continue to use established paths across a Site even when construction work has started). Any temporarily exposed open pipe system will be capped in such a way as to prevent badgers from gaining access as may happen when contractors are off-site. Mitigation 13: Construction Phase Lighting Regime Where possible, Construction Phase lighting will be switched off during non-working hours. However, during use, directional lighting will be the lighting of choice as this will minimise light spill from the site, into any surrounding areas which may be in use by bats or other nocturnal animals that may be commuting/foraging in the area. It is recommended that LED luminaires possessing a warm white spectrum (2700k) be used so as to reduce the blue light component. LED lights are also ideal due to their sharp cut-off, lower intensity, and dimming capabilities. See Bat Activity results maps (Figures 11-24-35, Section 11.6.4.3.2.4) for detailed illustrations of core bat foraging and commuting areas within the overall EIAR study area. Mitigation 14: Ecological Clerk of Works (ECoW) A suitably qualified Ecological Clerk of Works (ECoW) will be present on-site for the duration of the works until monitoring for each construction element listed in the SOWOR is no longer required and has been signed off by the ECoW and the Employers Representative. The ECoW will ensure that all targeted ecological mitigation measures identified in this Chapter, the NIS and CEMP are adhered to in full.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	The ECoW will also ensure that the silt fences and bunding are correctly positioned in the correct locations as per the CEMP and are effectively managed to ensure any run-off from these areas is intercepted.
Noise & Vibration	▪ Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to: - Selection of quiet plant - Control of noise sources - Screening - Hours of work - Liaison with the public ▪ Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring. - <u>Selection of Quiet Plant</u> This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether said item can be replaced with a quieter alternative. - <u>Noise Control at Source</u> If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control at source. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. The following best practice migration measures will be considered: ▪ Site compounds will be located away from noise sensitive locations within the site constraints. ▪ The use of lifting bulky items, dropping and loading of materials within these areas will be restricted to normal working hours. ▪ For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant will be switched off when not in use and not left idling.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system. ▪ For percussive tools such as pneumatic breakers, a number of noise control measures include fitting muffler or sound reducing equipment to the breaker tool and ensuring any leaks in the air lines are sealed. ▪ Erecting localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. ▪ For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. ▪ For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. ▪ For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. ▪ All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. <u>Screening</u> ▪ The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the source. BS 5228 *-1:2009+A1* states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than 10kg/m^2 will give adequate sound insulation performance. ▪ Construction noise calculations have assumed a partial line of sight (-5dB) is achieved using a solid 2.4m high standard construction site hoarding. ▪ Annex B of *BS 5228-1:2009+A1:2014* (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials. ▪ In addition, careful planning of the site layout will also be considered. The placement of temporary site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening during the phasing of works. <u>Liaison with the Public</u> ▪ A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. <u>Vibration</u>

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period: - - A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars; - Appropriate vibration isolation shall be applied to plant, where feasible; - Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values. <u>Project Programme</u> The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. If piling / rock breaking/rock excavation works are in progress on another site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to ensure noise limits are not exceeded due to cumulative activities. This will be reviewed in relation to cumulative works within the site and at any other potential external sites with potential to generate significant noise effects in close proximity to noise sensitive locations.
Air Quality	<u>Site Management</u> ▪ The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies. ▪ The siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions to minimise the potential for significant dust nuisance (see Figure 13-1). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors. ▪ Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken to avoid dust nuisance occurring under unfavourable meteorological conditions: ▪ The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ The appointed contractor will provide a site hoarding along boundaries where works are taking place adjacent to ecological sensitive receptors and at the main construction compound which will assist in minimising the potential for dust impacts off- site. ▪ During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. ▪ 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. ▪ Community engagement will be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses. ▪ 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. ▪ It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein. ▪ At all times, the procedures put in place will be strictly monitored and assessed. ▪ The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below. <u>Preparing and Maintaining the Site</u> ▪ 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. <u>Operating Vehicles / Machinery and Sustainable Travel</u> ▪ Ensure all vehicles switch off engines when stationary to avoid idling of 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 20 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).

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ 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). <u>Operations</u> ▪ 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. <u>Waste Management</u> ▪ No bonfires and burning of waste materials. <u>Measures Specific to Earthworks</u> ▪ 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. <u>Measures Specific to Construction</u> ▪ 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 power materials ensure bags are sealed after use and stored appropriately to prevent dust. <u>Measures Specific to Trackout</u> Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80% (UK ODPM, 2002). ▪ A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles. ▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. 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 10m from receptors where possible. <u>Summary of Dust Mitigation Measures</u> The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be: ▪ The specification of a site policy on dust and the identification of the site management responsibilities for dust issues; ▪ The development of a documented system for managing site practices with regard to dust control; ▪ The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and ▪ The specification of effective measures to deal with any complaints received.
Climate	▪ The following best practice measures shall be implemented on: - Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled; - Materials will be reused on site where possible – the applicant has identified a goal of 50% of materials will be re-used on site; - 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; and

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	- Sourcing materials locally where possible to reduce transport related CO_2 emissions. ▪ There is also the potential to reduce carbon emissions through the use of alternative materials with lower embodied carbon emissions. For example, the developer has considered the use of concrete with a GGBS replacement and a recycled rebar type. The houses will all be constructed using timber frame. ▪ In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. ▪ All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. ▪ During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.
Cultural Heritage	▪ Demolition phase works proposed in the LRD Phase 1 development include the removal of three small ruinous structures in the northernmost portion of the development area. The structures are not of architectural or cultural heritage significance. However, it is proposed to prepare a written and photograph record of each structures prior to demolition. ▪ There is potential for localised demolition in the LRD Phase 2 development associated with a possible second access. When the detailed design of the LRD Phase 2 development has been completed, detailed mitigation measures will be proposed (including, but not restricted to, a programme of pre-construction architectural recording). ▪ For the proposed development, the location of Dunkettle House and its associated structures will be excluded from construction activities including, but not limited to, traffic movement, equipment storage, compounds and spoil retention areas. The location of these cultural heritage constraints will be identified during contractor site inductions and will be clearly signed as no entry areas for the duration of the construction phase. ▪ A second access point from Dunkettle Road (L2998) is envisaged in the LRD Phase 2 development. This access will utilise and upgrade an existing access serving the applicant's lands and a number of private dwellings, running adjacent to the walled garden. It is envisaged that the existing access from the L2998 will be upgraded to facilitate vehicular, pedestrian and cyclist movements and, it is possible that localised negative impacts will arise on the walled garden and the immediate setting of Dunkettle House. However as noted, the design and specification of this second access are currently being developed in consultation with Cork City Council officials – it does not form part of the LRD Phase 1 planning application. The effects will be reviewed in the making of the future LRD Phase 2 application when the detailed design has been completed and detailed mitigation measures appropriately developed.

Table 5-2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ A programme of licensed archaeological monitoring of ground works along the route of the amenity greenway and the two outlets to the Glashaboy River will be carried out by a suitably qualified archaeologist during the construction phase. This will include the compilation of a pre-works written, drawn and photographic record of the locations of revetment walling at the locations of the two drainage outlets. In the event that any archaeological sites or features are identified during monitoring, ground works will halt at that location, and they will be recorded and will be left to remain securely in situ within a cordoned off area. The National Monuments Service and Cork City Council's Archaeologist will be notified of the discovery and consulted to determine further appropriate mitigation measures, which may entail preservation *in situ* by avoidance or preservation by record through a licensed archaeological excavation.

Table 5-3 Operational Phase Mitigation Measures

Aspect	Mitigation
Population & Human Health	None Note: Mitigation measures relating to those factors under human health which are relevant under other environmental factors, are included in the relevant chapters of this EIAR.
Landscape & Visual	Visual None Landscape ▪ The woodland management should be ongoing under the Native Woodland Conservation Scheme and maintenance of the newly landscaped areas should be ongoing with an emphasis on broadening the biodiversity value across the Dunkettle lands. ▪ All woodland areas are to be managed solely for conservation under the Native Woodland Conservation Scheme, access to the estuary pNHA woodlands is to be restricted to maintenance personnel only, using the existing historic walk paths.
Material Assets: **Traffic & Transport**	▪ Implement Proposed junction upgrade works as follows: - - Junction 1: R639 Glanmire Road/Glanmire Bridge -a traffic signal controlled which will also facilitate the proposed new 2A Bus route - Junction 2: East Cliff Road and the L2998 - a 'Yellow box' junction be provided on the L2998 to facilitate some level of right turners from East Cliff Road. The option of including this junction as part of the signalisation of Junction 1 could be investigated. The operation of Junction 2 to be reconsidered when the link road through Ballinglanna Residential Development to Fernwood and the L3010 Glanmire Village is in operation. - Junction 3: Ballinglanna Signalised Junction - existing junction to be upgraded to facilitate the revised phasing which will significantly improve the capacity of Junction 3. ▪ To minimise disruption to the local roads network during the operational phase, the following mitigation measures are proposed. - It is proposed to make the site permeable to the surrounding roads network ensuring it will be connected to existing and proposed cycle/pedestrian linkages to public transport offerings, schools, retail and amenity destinations. - The proposed new access arrangement onto the L2998 is safe and suitable and is in accordance with the Design Manual for Roads & Bridges (DMRB) and the Design Manual for Urban Roads & Streets (DMURS). - The traffic impact assessment carried out has included the re-distribution of traffic via Junction 3 when the Fernwood link road is open. This will facilitate traffic heading towards Glanmire Centre to use this route as an alternative to Junction 2 East Cliff Road. - Junction 3 upgrade works will significantly improve the capacity of this junction which has the capacity to cater for all phases of development. - The signalisation of Junction 1 R639/Glanmire Bridge is seen to improve traffic flows, specifically for the minor arm serving the development.

Table 5-3 Operational Phase Mitigation Measures

Aspect	Mitigation
	- The site benefits from being near regular public transport provision, within walking distance of the site, which enables journeys throughout Cork City to the west and Little Island, Carrigtwohill and Midelton to the East. - The site is adjacent to the Dunkettle Interchange, accessed from the site via Junction 6, which has been recently upgraded to a free-flow interchange. This interchange provides direct access to the N40, M8 and the N25 reducing development traffic impacting on the local roads network (Glanmire Direction). - The introduction of a new bus route to serve the area (Route 2A) which is an NTA funded scheme due to open Q4 2024. ▪ It is the intention of the applicant to develop all sustainable routes associated with the site as part of the first phase of the scheme implying that access to the East Cork Greenway, Little Island train station and the re-routed Bus 2A will be available for new residents. This infrastructure may also result in an improvement in the modal shift percentage in the wider area implying background traffic flows could reduce as opposed to grow. Mitigation measures as outlined should only be implemented when necessary.
Material Assets: **Built Services**	<u>Surface water drainage services</u> ▪ The surface water services include various components to control and ensure the quantity and quality of surface water runoff in accordance with design requirements. Inspection and maintenance of components of the system shall be performed on a regular and scheduled basis to ensure the effective functioning of the system and the mitigation of risk to the receiving environment, for both adoptable and non-adoptable parts of the system. ▪ A maintenance plan for the surface water drainage system is included in the *Site Civil Infrastructure and Design Report* and accompanying drawings prepared by JODA Engineering Consultants and submitted under separate cover as part of the planning application. The maintenance schedule is also enclosed in Appendix 7-1 to this document for reference – *Surface Water drainage Scheme with SuDS Elements – Maintenance Plan*. <u>Wastewater drainage services</u> ▪ Wastewater drainage services not to be vested to Uisce Éireann consist of drainage systems within individual premises upstream of each Customer Connection Chamber to each premises. Wastewater drainage systems within individual premises are designed to operate without the need for maintenance. However, this depends on individual good practices. To this end, the following information and educational material will be distributed to purchasers at handover: - *A guide to Managing Your Household Waste & Domestic Water Usage*, produced by the Environmental Awareness & Research Unit of Cork County Council. - *Think Before You Flush* information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce. - *Think Before You Pour* information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce. - *The Dirty Dozen* information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.

Table 5-3 Operational Phase Mitigation Measures

Aspect	Mitigation
	▪ The sale or lease of commercial premises that generates grease and oil and food residue as part of its commercial output will include a requirement to install grease traps in accordance with EN 1825-1:2004 *Grease separators Principles of design, performance and testing, marking and quality control* and to enter an agreement with a suitably licenced operator to maintain and clean the grease traps on an appropriate maintenance schedule. <u>Water supply services</u> ▪ Water supply services not to be vested to Uisce Éireann consist of water supply pipework within individual premises downstream of the Customer Connection and Boundary Box to each premises. Water supply systems within individual premises are designed to operate without the need for maintenance. Each purchaser or lease holder will be informed of the location of the shutoff valve at the connection to each premises so that the user may shut off the water supply should the need arise.
Material Assets: Waste	▪ Implementation of the OWMP will ensure a high level of recycling, reuse and recovery at the development. ▪ A separate Outline Operational Waste Management Plan will be developed for the subsequent phases of development at Dunkettle, as described in Chapter 2. These Plans will also include mitigation measures to ensure a high level of recycling, reuse and recovery at the proposed 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 National Waste Management Plan for a Circular Economy 2024-2030.
Land & Soils	None
Water & Hydrology	Mitigation measures proposed include ▪ routine maintenance of the site services; ▪ regular maintenance of the development's green roofs and interceptors ▪ regular maintenance of landscaped areas, bio-retention, percolation and attenuation areas
Biodiversity	<u>Mitigation 15: Operational Phase Invasive Species Management</u> Any newly landscaped areas, particularly where infill materials and soils have been imported for soft landscaping, are assessed during the Operational Phase within the next botanical season for the presence of any inadvertently introduced invasive species, with particular focus on those listed on Schedule III of SI 477 of 2011. If invasive species are detected, an Invasive Species Management Plan will be prepared, agreed with the Local Authority and implemented at the earliest possibility to limit the potential for further spread by ongoing operations at the Proposed Mixed-use Development. <u>Mitigation 16: Operational Phase Lighting</u> In order to minimise disturbance to bats utilising the site in general, the lighting and layout of the Proposed Development will be designed to minimise light-spill onto habitats used by the local bat population foraging or commuting. See Bat Activity results maps (Figures 11-24-35, Section 11.6.4.3.2.4) for detailed illustrations of core bat foraging and commuting areas within the overall EIAR study area. This can be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust

Table 5-3 Operational Phase Mitigation Measures

Aspect	Mitigation
	& Institute of Lighting Engineers *'Bats and Lighting in the UK - Bats and Built Environment Series'*, the Bat Conservation Trust '*Artificial Lighting and Wildlife Interim Guidance*' and the Bat Conservation Trust *'Statement on the impact and design of artificial light on bats'*. Therefore, where possible, the lighting scheme will include the following: ▪ Lighting will only be installed where necessary for public safety in known Bat Foraging and Roosting locations (Riparian corridor/pedestrian greenway). These lights have been designed and selected with specific shutters and filters to minimise any potential for back spills into the sensitive locations while still providing the primary function of safely lighting the pedestrian routes. ▪ Lighting along the riparian woodland corridor and existing treelines, and woodland margins (notably to the west and east) will be avoided where possible and bat friendly; using low level bollards, motion sensors where applicable, once health and safety standards are met. ▪ Reflectance – Downward lighting can be reflected from bright surfaces. To minimize bat disturbance, the design avoids the use of bright surfaces and incorporates darker colour lamp heads and poles to reduce reflectance. Only luminaires with an upward light ratio of 0% and with good optical control to be used. ▪ Lighting controls and dimming shall be utilised for post-curfew times. ▪ Shielding of Luminaires & Light - To minimize bat disturbance, the design avoids the use of upward lighting by shielding or by downward directional focus. i.e., no upward tilt. ▪ Type of Light – To minimize bat disturbance, the design avoids the use of strong UV lighting. The lighting design is based on the use of LED lighting which has minimal or no UV output of significance. Warmer 2700°K LED lighting will be utilized for amenity areas, as the warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats. Mitigation 17: Hedgehog Highways By creating a number of separate private dwellings and gardens at a Site, the land becomes fragmented and largely inaccessible to species such as Hedgehog, which like to roam each night in search of food (garden pests e.g., slugs). This can easily be fixed by ensuring that the boundaries and barriers within and surrounding the Site i.e., garden fencing, railings and gates, are permeable for Hedgehogs. This can be achieved by: ▪ The use of fence panels with 13 x 13 cm holes at ground level (Hedgehog holes); ▪ Leaving a sufficient gap beneath gates, and; ▪ Leaving brick spaces at the base of brick walls. The inclusion of hedgehog highways will be considered as part of the landscape design of the Site, specifically the private garden boundary fencing. A variety of fence suppliers stock specific hedgehog-friendly fencing options, which can be easily incorporated at little or no additional cost. These simple measures will provide habitat connectivity at the Site for Hedgehogs and reduce the impact of the land-use change on this species. Including details of hedgehog-friendly features in the new home owner's welcome pack will raise awareness and prevent home owners from reversing these features, for instance blocking fence holes.

Table 5-3 Operational Phase Mitigation Measures

<table>
<tr><th>Aspect</th><th>Mitigation</th></tr>
<tr><td></td><td><u>Mitigation 18: Public Signage</u>
In order to mitigate against an increase in human traffic with pets (specifically pet dogs) to the Glanmire Wood pNHA, signage should be erected on the proposed Paladin style fencing surrounding the woodland, that clearly states all pet owners should be kept on leads at all times and not allowed to enter the woodland area encompassing Glanmire Wood.

<u>Mitigation 19: Woodland Monitoring</u>
In order to ensure the Proposed Development is not having an adverse effect on the adjoining Glanmire Wood, and to provide added mitigation measures (should they be required) monitoring of the integrity and structure of the woodland will take place every two years for the first ten years post construction.</td></tr>
<tr><td>Noise & Vibration</td><td>▪ Proprietary noise and vibration control measures will be employed as part of the detailed design in order to ensure that noise emissions from building services plant do not exceed the relevant internal noise criteria within Table 12-7 for residential dwellings within the proposed development. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements.

▪ Consideration will therefore be given to the provision of upgraded glazing to the northern, eastern and southern facades of the H1/H2 Duplexes and House Types Fb and G located within 60m of the Dunkettle Road, achieving the sound insulation performance outlined in the Table below (and further detailed in Appendix 12.1).
Table 12-19 Sound Insulation Performance Requirements for Glazing, SRI (dB)
<table>
<tr><th rowspan="2">Nominal R_w (Db)</th><th colspan="6">Octave Band Centre Frequency (Hz)</th></tr>
<tr><th>125</th><th>250</th><th>500</th><th>1k</th><th>2k</th><th>4k</th></tr>
<tr><td>35</td><td>23</td><td>23</td><td>30</td><td>39</td><td>36</td><td>43</td></tr>
</table>
▪ Test data should be sought from the supplier of the glazing at detailed design stage to ensure that the acoustic specification is met.
▪ It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. The over-riding requirement is that the internal noise criteria is achieved, other combinations of upgraded glazing may provide the same or better performance than those outlined in the Table above.</td></tr>
<tr><td>Air Quality</td><td>None</td></tr>
<tr><td>Climate</td><td>▪ The proposed development has been designed to minimise the impact to climate where possible during operation.
▪ The buildings are aspiring to meet a Net Zero Carbon strategy to align with the aspirations set out by Cork City Council within Chapter 6 (Visions, Goals and Objectives) of the CCC Development Plan 2022-2028.
▪ The design intent at present for hot water, heating and cooling system designs are based on a combination of highly efficient air source and water to water heat pumps with no fossil fuels being consumed throughout the proposed development, avoiding the production of large amounts of local pollution within an urban environment.</td></tr>
</table>

Table 5-3 Operational Phase Mitigation Measures

Aspect	Mitigation
	▪ The buildings will meet and exceed the new NZEB (Nearly Zero Energy Buildings) requirements set out in the revised Part L document. ▪ The proposed development will achieve an A rated energy certificate for all buildings. ▪ The proposed development has benchmarked itself against Sustainability Assessments including; BREEAM, LEED, WELL Building Standard, WIRED Score and Passive House. As a minimum, the scheme will adopt the principles of all and pursuing the formal rating and certification will be subject to cost / benefit feasibility post planning. The project will also seek a HPI Certificate. ▪ Due to the location of the proposed development within Cork City Centre the site has a number of sustainable travel options such as bus and cycling. Sustainable travel modes will be encouraged through support facilities for cycling, minimal onsite parking and infrastructure for electrical vehicle charging points. ▪ It is also proposed to retain high quality buildings and facades to reduce the environmental impact and embodied carbon of the development. With the inclusion of these sustainability measures the impact to climate during the operational phase will be reduced. ▪ Some measures have been incorporated into the design of the proposed development to mitigate the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated to avoid potential flooding impacts due to increased rainfall events in future years.
Cultural Heritage	LRD Phase 1 – None LRD Phase 2 - the design and specification of the second access are currently being developed in consultation with Cork City Council officials and it does not form part of the LRD Phase 1 planning. The effects will be reviewed in the making of the future LRD Phase 2 application when the detailed design has been completed and detailed mitigation measures appropriately developed.