



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME 1: WRITTEN STATEMENT INCL. NON-TECHNICAL SUMMARY

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

FEBRUARY 2026



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NON-TECHNICAL SUMMARY

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1 NON TECHNICAL SUMMARY

1.1 Screening for Environmental impact assessment

This Environmental Impact Assessment Report (EIAR) has been commissioned by Columbia Estates Management (IE) Limited (the prospective applicant), in respect of an Large-scale Residential Development on lands at Monaleen Road, Castletroy, Limerick.

The EIAR reports the environmental impact assessment (EIA) undertaken. An EIA is an assessment and analysis of potential impacts on the receiving environment that may arise as a result of the proposed development. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning and Development Regulations 2001 which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning and Development Regulations 2001 defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

'(B) (i) Construction of more than 500 dwelling units..'

In summary the proposed development exceeding 500no. units so therefore an EIA has been carried out.

This Non-Technical Summary describes the proposed development and summarises the key environmental impacts arising from each of the environmental assessments carried out by a panel of experts in accordance with best practice.

1.2 Non-Technical Summary

The EU Directive requires the production of a Non-Technical Summary as part of the production of an EIAR. The Non-Technical Summary ensures that the public is made aware of the environmental implications of any decisions on new developments to take place. The Non-Technical Summary is laid out in a similar, but summarised format to the main EIAR, describing the project, existing environment, impacts and mitigation measures.

Assessments have been conducted in an integrated, collaborative and analytical process in accordance with the Guidelines on the environmental topics to be examined. This seeks to identify the potential for significant adverse environmental impacts arising from the proposed project. Where significant adverse environmental impacts have been identified as potentially occurring during the construction and operational phases of the development, specified ameliorative, remedial or reductive measures are identified.

1.3 Preparation of the EIAR

The objective of this EIAR is to identify and predict the likely environmental impacts of the proposed development as well as to describe the means and extent by which they can be reduced or ameliorated, to interpret and communicate information about the likely impacts; and to provide an input into the decision making and planning process.

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

- The requirements of applicable EU Directives and The Planning and Development 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).

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR the table below sets details the relevant chapters and the team of qualified specialists were engaged to prepare the EIAR The consultant firms and lead authors are listed

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Chapter		Consultant	Project Lead
	Non Technical Summary	Genesis Planning	R Woods
1	Introduction	Genesis Planning	R Woods
2	Project Description	Genesis Planning	R Woods
3	Alternatives Considered	Genesis Planning with Input from AL Architects on alternative layouts considered	R Woods
4	Population & Human Health	Genesis Planning	R Woods
5	Landscape & Visual	CSR Landscape Architects Shove Media - CGI/Wire Frame for View Analysis	Keith Mitchell
6	Material Assets: Traffic & Transport	Roadplan	Richard Frisby
7	Material Assets: Built Services	Garland Consulting Engineers	Brian Lahiff
8	Material Assets: Waste	Garland Consulting Engineers	Brian Lahiff
9	Land and Soils	JBA Consulting	Bernadette O'Connell
10	Water and Hydrology	JBA Consulting	Bernadette O'Connell
11	Biodiversity	JBA Consulting	Bernadette O'Connell
12	Noise & Vibration	AWN	Mike Simms
13	Air Quality	AWN	Niamh Nolan
14	Climate	AWN & Digital Dimensions	Avril Chaloner
15	Cultural Heritage (Archaeology)	Rose Cleary	Rose Cleary
16	Interactions of the foregoing	Genesis Planning	R Woods & Niall Carr
17	Summary of Mitigation	Genesis Planning	R Woods & Niall Carr

Table 1.1 EIAR project team

2 OVERVIEW OF THE PROPOSED DEVELOPMENT

2.1 Project description

The applicant is seeking a 10 year planning permission for a total of 523 no. residential units and crèche comprising the following particulars:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g)Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of associated ESB substations.
- (l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

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2.2 Site Location

The application area comprises 9.7 hectares and is located on Monaleen Road in the Castletroy area of Limerick. It is strategically positioned with the R445 regional road forming its northern boundary and the Castletroy Golf Club situated directly to the south.



Figure 2.2.1 Aerial photo of project site

In terms of the site itself it comprises a greenfield parcel of lands measuring 9.7 hectares.

In terms of access a new vehicular entrance to the site will be established from Monaleen Road, providing convenient connectivity. In addition, a dedicated pedestrian access point is proposed from the R445 on the northern boundary to support active travel.

Existing bus services run along R445 Road, and pedestrian connections to local facilities will be enhanced through integrated footpaths and safe crossing points.

Foul sewer and mains water infrastructure services are also existing along the local road with existing capacity to service the site.



Figure 2.2.2 Site Location

2.3 Construction Phase

The proposed development will be carried out to complete each warehouse unit prior to use. It is anticipated that the construction works will take circa 10 years to complete given the scale of development proposed.

A preliminary programme for the overall development has been prepared by the applicant and a copy of the programme is shown below for reference.

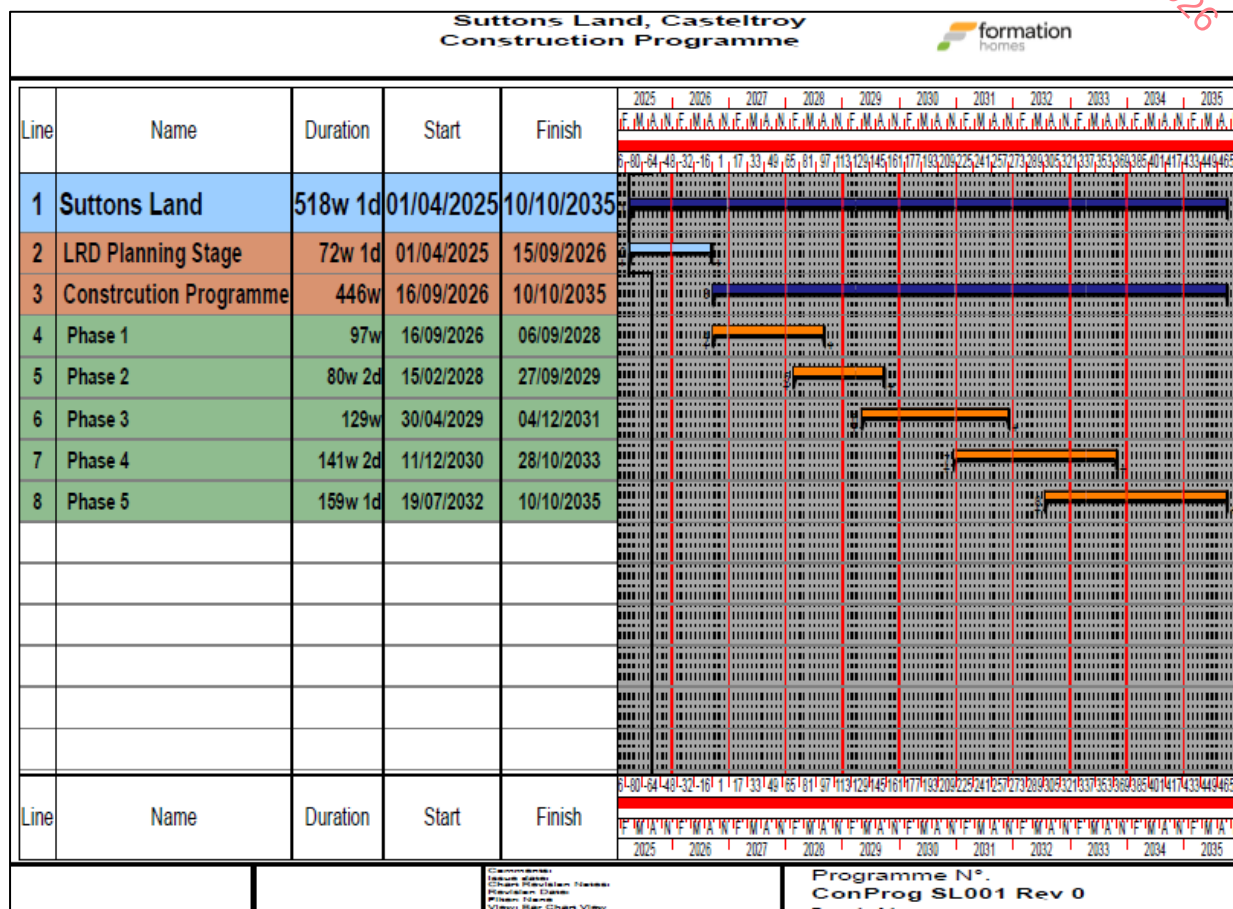


Figure 2.3.1 Extract from Construction Programme

Each phase is planned to be fully completed, including roads and landscaping, ensuring that minimal additional work is required once a phase is occupied.

2.4 Operational Phase

Once completed the proposed development will operate as typical residential development with a creche alongside Monaleen Road.

3 PLANNING AND POLICY

The planning and policy context gives an overview of the relevant legislation that supports the proposed Development at a local, regional and national level, and sets out the strategic and statutory context governing the planning and development of the proposed development. The accompanying planning statement describes how the proposed development complies with the zoning and relevant planning policy context.

4 ENVIRONMENTAL IMPACTS

The potential environmental impacts of the proposed development are addressed under the following headings as prescribed under the EIA Directive:

- Alternatives Considered
- Population and Human Health;
- Landscape and Visual
- Material Assets: Traffic & Transport
- Material Assets: Built Services
- Material Assets: Waste
- Land and Soils
- Water and Hydrology
- Biodiversity
- Noise and Vibration
- Biodiversity
- Air Quality
- Climate
- Cultural Heritage (Archaeology)
- Interactions of the foregoing

Additionally risk management and interactions between environmental factors have been examined, and a programme of mitigation and monitoring measures have been set out.

4.1 Alternatives Considered

The Planning and Development Regulations (as amended) require:

'A description of the reasonable alternatives studied by the person or persons who prepared the EIA, 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.'

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics.

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

'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.'

In this context potential alternatives to the proposed development were considered as the scheme progressed. The 'do-nothing' alternative was explored, with a conclusion that a do-nothing approach would be contrary to the development plan objectives for this site to deliver development at this highly accessible location.

A number of site layout and alternative designs were considered during the iterative design process.

The development as now proposed is considered to have arrived at an optimal solution in respect of making efficient use of zoned, serviceable lands whilst also addressing the potential impacts on the environment relating to residential, visual, natural and environmental amenities and infrastructure.

It is considered that the proposed development is consistent with relevant planning policy and minimises the potential for environmental impacts.

4.2 Population and Human Health

The assessment of Population and Human Health is contained within Chapter 4 of the EIAR.

Human beings are an important element of the environment to be considered. One of the principal concerns in any proposed development is that the local population experiences no reduction in the quality of life as a result of the proposed development on either a permanent or temporary basis. The impacts of the proposed development on the population and human health have been examined with a focus on population, employment and human health impacts.

For this assessment Electoral Divisions (EDs) in the wider environs of the site have been analysed. While no specific guidelines define the zone of influence for such studies, this radius was selected based on professional judgment to assess the local demographic and employment capacity effectively.

Within this zone of influence, there are three EDs:

- Ballysimon ED, where the project site is located;
- Ballyvara ED, which the ED neighbours;
- Limerick South Rural ED, neighbouring the site.

A baseline assessment of the population of the study area was carried out using data obtained from the Central Statistics Office and also the Pobal database to gain an informed position on the demographic and socio economic profile of the study area.

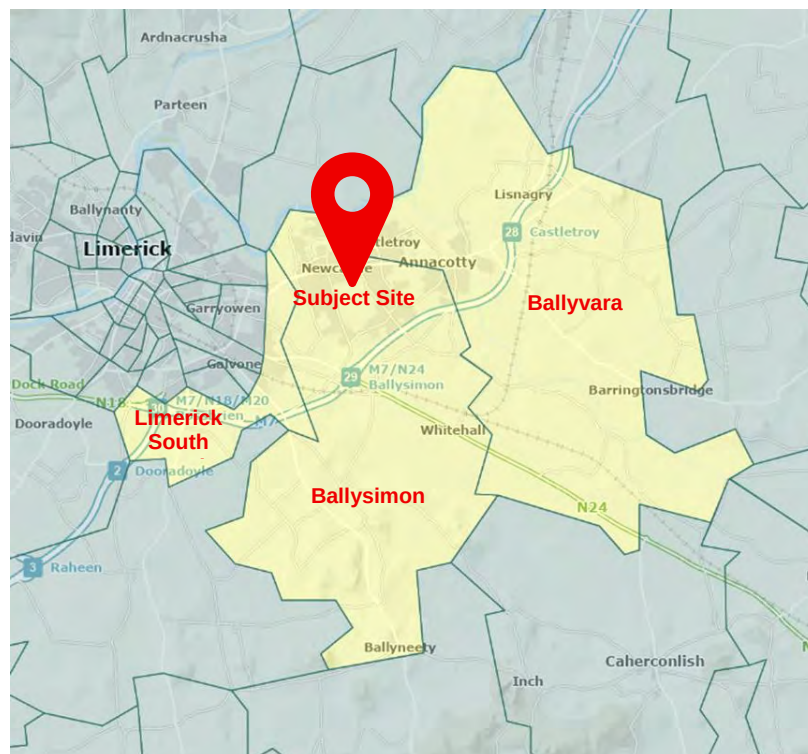


Figure 4-1: Map of the Population and Health study area

According to the adopted Limerick City & County Development Plan 2022-2028 (LCCDP) the subject lands are zoned as New Residential, which supports the proposed development for 523no. residential units and provision of a creche.

The proposed development site is not at risk of any major accidents, hazards of natural disasters.

Potential Impacts of the Proposed Development

- **Do Nothing Scenario**

If the proposed development is not fulfilled, it is anticipated that in the short to medium term the site itself will remain vacant and greenfield. In the absence of the proposed development, the impact is determined to be negative with significant effects for the delivery of new and much needed residential units in an urban area.

- **Construction Phase**

The construction phase related activities have the potential to positively impact the local population by the creation of new employment. It is anticipated that up to approximately 50 no. construction staff will be employed during the peak of the construction phase.

Chapter 13 (Air Quality) of this EIAR has concluded that there will be no significant impacts on air quality as a result of the proposed development and as such there will be no significant impact on human health.

The impact of the construction phase will at least extend to the county in terms of the requirement for labor, goods and services. The effect is likely and will be significant and positive in the short term.

- **Operational Phase**

Columbia Estates Management (IE) Limited (the prospective applicant) have confirmed that during operation, the development will generate up to 20no. full time jobs for the creche. It is not anticipated that this will generate any marked increase in population locally, as it is envisaged that employees will likely travel to the site from their existing place of residence. The likely impact on population is thus neutral.

The greatest potential effect on air quality during the construction phase of the proposed development is from traffic- related air emissions, which will be subsequently reduced during operational. An air quality assessment has been carried out as part of this EIAR which concluded that the impact of the proposed development on NO2 concentrations in the locality is likely to be long-term, negative and imperceptible. As such the impact of air quality and climate on human health will be neutral, long term and not significant.

No specific mitigation or monitoring measures are required during the construction or operational phase. The overall effect on employment locally is **significantly positive and permanent**.

Cumulative Impact of the Proposed Development

In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust, and noise.

The implementation of mitigation measures within the Construction Environmental Management Plan by Garland Consulting Engineers as well as the compliance of other local developments with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The cumulative impact is considered to be neutral and imperceptible.

Overall, the operational phase of the proposed development in terms of human health for future employees and occupants of the proposed buildings is anticipated to be **moderate, positive, and permanent in duration**.

4.3 Landscape and Visual

The assessment of Landscape & Visual Character is contained within Chapter 5 of the EIAR.

The purpose of the landscape assessment is to evaluate the existing landscape character of the site and surroundings, to assess the landscape and visual impact of the proposed development and to identify landscape designations and planning policies that may concern the subject site and its environs.

In terms of landscape context the immediate landscape environment is characterized by the urban nature of the site with residential and commercial developments defining the area, with exception of Castletroy Golf Club to the south.

Impact Assessment

- **Do Nothing**

In this scenario the land is likely to continue to be unmanaged and would not contribute to the Castletroy development.

- **Construction phase**

Potential visual effects during the construction phase are related to earthworks and removal of hedgerows, temporary works, site activity, and vehicular movement within and around the subject site. Ancillary compounds and construction equipment such as cranes are temporary. Intervening vegetation and topography ensure any effects during this stage to the broader Limerick area including Monaleen Road and R445 are of a more limited being of a ***slight to negligible nature***.

- **Operational Phase**

The design rationale aims to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- adopting a layout and building form that responds appropriately to the site's topography and surrounding residential context;
- positioning buildings and open spaces to ensure a coherent and visually integrated layout within the existing suburban landscape; and
- architectural design and detailing to assist in the integration of the external building facades.

Aside from the area aside and on the Application Site, intervening vegetation and topography ensure any effects to the wider Limerick area will ***not be of a significant nature***.

- **Cumulative Impact**

For the purposes of this EIAR we have examined proposals within 0.5km of the development being proposed. In that context the developments in the environs are considered under the receiving environment.

In terms of cumulative impact an important aspect to this will be the relationship with adjacent land and developments, so that surrounding development(s) will reinforce the character of both the Castletroy and wider environs.

The cumulative assessment considers the existing development within the Castletroy in the context of the existing environment, along with the zoned lands, and residential developments outside of the Castletroy. Overall the area is undergoing a change in the environment to consolidated leisure, civic and residential uses with defined boundaries and linkages. In summary these likely effects are considered to be ***negative, moderate and long term***.

- **Mitigation**

Construction Stage

The key consideration in landscape terms during the construction period is ensuring the provision of a suitable top surface growing medium (i.e. soil) to enable the establishment and colonisation of natural planting habitats.

Operational Stage

The appearance of the development is a major influence on how the site is perceived by the public, so the proposed development includes for landscape and planting works with the overall objective of providing a layout that integrates the development into the surrounding landscape and visually blends it into this area. The overall objective is to provide a high standard landscape and design that ensures the warehouse and associated parking area have a clean, tidy and neat landscape character.

The landscape works includes planting for visual integration and screening. The additional woodland and hedge planting to the north and south will, as they mature, assist in merging the proposed development into the surrounding landscape and views.

The design of the scheme produces a **neutral to positive quality** in this context.

4.4 Material Assets: Traffic and Transport

The assessment of Material Assets (Traffic and Transport) is contained within Chapter 6 of the EIAR.

The purpose of this chapter is to assess the traffic implications associated with the proposed development in terms of its integration with existing traffic in the area have been explored which quantifies the extent of additional trips generated by the development and determines the impact on operational performance of such trips on the local road network.

Impact Assessment

- **Do Nothing**

In this scenario the site generates no traffic.

- **Construction phase**

Potential visual effects during the construction phase are related to earthwork, temporary works, site activity, and vehicular movement within and around the subject site. Ancillary compounds and construction equipment such as cranes are temporary. During its construction phase, the proposed development is therefore predicted to result generally in a **short-term insignificant negative impact** on the operation of the surrounding road network. This impact will be confined to the duration of construction activity on site and will therefore be entirely reversible.

- **Operational Phase**

This has been modelled in the accompanying Traffic and Transport Assessment by Roadplan. The junction capacity analysis results for the scheme confirms that the results indicate that all the junctions shall operate within effective capacity during its operational stage.

During its operational phase, the proposed development is therefore predicted to result overall in a long-term, slight impact on the operation of the surrounding road network. During its operational phase the proposed development is therefore predicted to result overall in a **long-term, insignificant negative impact** on the operation of the surrounding road network.

- **Cumulative Impact**

There are a number of existing and permitted residential and mixed-use developments within the wider Castletroy area, and these have been taken into account in assessing the cumulative context for the proposed scheme.

Cumulative impacts have been examined in the accompanying Traffic and Transport Assessment prepared by Roadplan Consulting. The junction capacity analysis for the key junctions along Monaleen Road and the R445 Dublin Road confirms that all assessed junctions are projected to operate within capacity in both the opening year and future design year. The modelling incorporates background growth as well as committed and permitted developments in Castletroy, ensuring that cumulative traffic scenarios are fully reflected in the assessment.

In summary these likely effects are considered to be a **long term, insignificant negative impact**.

- **Mitigation**

Mitigation measures proposed are utilizing the existing road network to avoid conflicting junctions, utilizing existing footpaths for pedestrians, trees and planting designed to not compromise visibility for road users.

Also the traffic modelling analysis undertaken has shown that the proposed development will have an imperceptible effect on the surrounding road network. As such, no mitigation measures are required to facilitate the proposed development.

The design of the scheme is considered to not result in significant adverse effects.

4.5 Material Assets: Built Services

The assessment of Material Assets (Infrastructure and services) is contained within Chapter 7 of the EIAR.

The purpose of this chapter is to assess the proposed development in terms of existing surface water drainage, foul drainage, and water supply infrastructure serving the development site area, and provides an assessment of the proposed development's likely impact on these services during the project's construction and operational phases.

Impact Assessment

- **Do Nothing**

In this scenario the site does not impact on existing services.

- **Construction phase**

The implementation of the mitigation measures described in Section 7.4.1 will ensure that the development's construction-phase residual impacts on surrounding infrastructure will be **neutral in nature, short-term in duration, and imperceptible**.

- **Operational Phase**

Potential impacts from the proposed development range are imperceptible and mitigation measures proposed to manage and control potential impacts during operation will further reduce the magnitude and significance of impacts. Therefore, the cumulative operational impact of the proposed development is considered to be **neutral in nature, long-term in duration, and imperceptible**.

- **Cumulative Impact**

There is currently permission for a number of residential schemes in the Castletroy environs with an application under consideration for a further development by An Coimisiun Pleanála. Accordingly the wider Castletroy area has been considered as the Castletroy consolidates.

The potential cumulative impact of the Proposed Development and other consented developments is considered to be **not significant in the long term**, assuming all developments in the area and associated infrastructure are constructed and operated in accordance with industry standards and best practice.

- **Mitigation**

As outlined in section 7.4 mitigation measures proposed to manage and control potential impacts during construction of the proposed development will reduce the magnitude and significance of impacts from these developments to a minimum.

The proposed surface water arrangement and design takes into consideration the best practices for this type of development. As such the avoidance, remedial and mitigation measures, where required are minimum and will conform to the industry norm for such works.

The potable water system and foul drainage network have been designed to Irish Water standards and prior to any construction work commencing on site the proposed designs will be required to be vetted and approved by Irish Water. This requirement will ensure that any adverse effects which maybe experienced during or following completed can be mitigated against.

4.6 Material Assets: Waste

The assessment of Waste is contained within Chapter 8 of the EIAR.

Garland Consulting undertook the waste management assessment. The receiving environment is largely defined by Limerick City & County Council (LCCC) as the local authority responsible for setting and administering waste management activities in the area through regional and development zone specific policies and regulations.

Baseline Environment

There is currently no waste generated at the proposed development site.

Potential Impacts of the Proposed Development

Construction Phase

During the construction phase the mismanagement of waste , including the inadequate storage of waste, inadequate handling of hazardous waste, the use of inappropriate or insufficient segregation techniques, and the use of non-permitted waste contractors, would likely lead to negative impacts such as waste unnecessarily being diverted to landfill, litter pollution which may lead to vermin, runoff pollution from waste, fly tipping and illegal dumping of waste. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

Operational Phase

The potential impacts on the environment during the operational phase of the proposed development would be caused by improper, or lack of waste management. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

Mitigation and Residual Effects (Post-Mitigation)

Construction Phase

During the construction phase, typical construction waste materials will be generated which will be source segregated on-site into appropriate skips/containers, within designated waste storage areas and removed from site by suitably permitted waste contractors as required, to authorised waste facilities, by appropriately licensed waste contractors. While the accurate keeping of waste records will be undertaken. All waste leaving the site will be recorded and copies of relevant documentation maintained.

This will all be overseen by the main contractor, who will appoint a construction phase Resource Manager to ensure effective management of waste during the excavation and construction works. All construction staff will be provided with training regarding the waste management procedures on site.

A carefully planned approach to waste management and adherence to the site-specific Resource and Waste Management Plan (Appendix 8.1) and Chapter 8 during the construction phase, this will ensure that the effect on the environment will be **short-term, imperceptible and neutral**.

Operational Phase

During the operational phase, waste will be generated by residents and by the creche. Dedicated waste storage areas have been incorporated into the scheme, including bin stores serving the apartment buildings and individual bin storage provisions for houses and duplex units. These areas have been appropriately sized to accommodate expected waste arisings and are designed to facilitate convenient and efficient source segregation in accordance with current waste management guidelines.

Waste will be collected from the designated storage areas by permitted waste contractors and removed off-site for re-use, recycling, recovery and/or disposal.

An Operational Waste Management Plan has been prepared and accompanies this application. The proposed development will give rise to a range of domestic waste streams during the operational phase, including dry mixed recyclables, mixed residual waste, glass, food waste, and small household WEEE items generated by residents.

All recyclable materials will be segregated at source where possible, in line with the OWMP, to maximise diversion from landfill and to reduce waste contractor costs. The implemented strategy will be kept under review and updated by the management company as required to reflect evolving best practice in segregation, storage, re-use and recycling initiatives.

Provided the mitigation measures in the development OWMP (Appendix 8.2) and in Chapter 8 are implemented, and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term, imperceptible and neutral**.

Cumulative Impact of the Proposed Development

Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors in the LCCC region, as provided from the National Waste Collection Permit Office and the EPA, there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all of the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the cumulative effect will be **short-term, imperceptible and neutral**.

Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate any potential cumulative impacts associated with waste generation and waste management. As such the cumulative effect will be a **long-term, imperceptible** and **neutral**.

4.7 Land and Soils

The assessment of Land and Soils is contained within Chapter 9 of the EIAR.

This Chapter assesses and evaluates the potential impacts of the Proposed Development on the land, soils, geological and hydrogeological aspects of the site and surrounding area. In assessing likely *potential* and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects. The impact on hydrology is addressed in Chapter 10 (Hydrology).

The assessment was carried out following appropriate national guidelines and standards for Environmental Impact Assessment using data collected from a detailed desk study, results of the ground investigation, a site walkover survey and review of all relevant drawings and documents pertaining to the proposed development. The results of the assessment provided information on the baseline conditions at the Site. A detailed assessment of the potential impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the proposed development.

Impact Assessment

- **Do Nothing**

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment.

The site is zoned for development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment. The site is zoned for development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal.

- **Construction phase**

Construction Phase

Land, soils, Geology, Hydrogeology

The implementation of the mitigation measures outlined in Section 9.6 of this chapter will ensure that targeted rates of impact to land, soils and ground water are achieved at the site of the Proposed Development during construction and operational phases. When mitigation measures are implemented throughout construction the

predicted impact on the environment will be **short-term, imperceptible, and neutral**. With the measures outlined in the EIAR and CEMP, the predicted impact will be **long-term, imperceptible, and neutral**.

Human Health and Population

The implementation of the mitigation measures outlined in Section 9.6 of this chapter will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated. The residual effect on during the construction phase is considered to be **neutral, imperceptible, and short-term**.

Water Framework Directive

Effects on water quality or hydrology can have further effects on biodiversity and ecology, through the mobilisation of silts, dusts, suspended solids, oils, or chemicals. On entering watercourses, these can negatively affect fish and aquatic ecology, as well as have an effect on Natura 2000 sites further downstream. These effects are further discussed in the Biodiversity Chapter of this EIAR, and the NIS. Following implementation of mitigation measures outlined in this chapter, including the use of silt fences and settlement trains during construction, in Chapter 6, and in the NIS, effects on habitats, flora, and fauna from water and hydrology will be **temporary, imperceptible, neutral**.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of groundwater bodies long-term and as such will not impact on trends in water quality and over all status assessment.

The residual effect on human health and populations during the construction phase is considered to be **neutral, imperceptible and short-term**.

- **Operational Phase**

Once operational, silt traps and hydrocarbon interceptors will be visually inspected on a regular or annual basis. Any spillages onsite will be acted upon immediately. No other monitoring measures are required during the operational phase

Surface water effects are directly linked with hydrogeology or groundwater effects, with surface water pathways leading to groundwater and vice versa. Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids influencing soil fertility, aeration and contamination. These effects are further discussed in the Land and Soils chapter of this EIAR. Without mitigation measures, the interaction of these two elements could lead to a short-term significant negative effect. With the proposed mitigation measures outlined in this chapter and in the Land and Soils chapter of the EIAR, the potential interaction between these is reduced to a **short-term, imperceptible, neutral effect**.

- **Mitigation**

The design has taken account of the potential impacts of the development on the hydrological environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding water bodies.

- **Difficulties Encountered**

No difficulties were encountered in relation to the preparation of the Water and Hydrology chapter of the EIAR.

4.8 Water and Hydrology

The assessment of Water and Hydrology is contained within Chapter 10 of the EIAR.

This chapter assesses and evaluates the likely significant effects of the development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

The assessment was carried out taking following appropriate national guidelines using data collected from a detailed desk study, a site walkover survey and review of all relevant drawings and documents pertaining to the proposed development. The results of the assessment provided information on the baseline conditions at the proposed development site. A detailed assessment of the potential impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

Impact Assessment

- **Do Nothing**

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment. The site is zoned for development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal.

- **Construction phase**

Surface Water Quality

The implementation of the mitigation measures detailed in Section 10.6, will ensure that the potential impacts on surface water quality during the construction phase are adequately mitigated. The residual effect on surface water quality during the construction phase is considered to be **imperceptible and short-term**.

Surface Water Flow and Quantity

The implementation of the mitigation measures detailed in Section 10.6, will ensure that the potential impacts on surface water flow and quantity during the construction phase are adequately mitigated. The residual effect on surface water flow and quantity during the construction phase is considered to be **neutral, imperceptible and short-term**.

Human Health and Populations

The implementation of the mitigation measures detailed in Section 10.6, will ensure that the potential impacts on human health and populations (and material assets) during the construction phase are adequately mitigated. The residual effect on human health and populations during the construction phase is considered to be **neutral, imperceptible and short-term**.

Water Framework Directive Status

Even in the absence of the mitigation measures detailed in Section 10.6, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

The residual effect on the WFD status during the construction phase is considered to be **neutral, imperceptible and short-term**.

- **Operational Phase**

The implementation of design and mitigation measures detailed in Section 10.6 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change in surface water during the operational phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible and long-term**.

- **Mitigation**

The design has taken account of the potential impacts of the development on the hydrological environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding water bodies.

- **Difficulties Encountered**

No difficulties were encountered in relation to the preparation of the Water and Hydrology chapter of the EIAR.

4.9 Biodiversity

The assessment of Biodiversity is contained within Chapter 11 of the EIAR.

An assessment of the likely effects on biodiversity (flora and fauna) arising due to the proposed development was undertaken by JBA Consulting. The assessment involved several steps and was conducted by suitably qualified ecologists in Altamar.

Firstly, baseline ecological surveys were undertaken to assess the nature conservation importance of the proposed development site. Secondly, the direct, indirect, and cumulative ecological implications or impacts of the proposed development during its lifetime were assessed. Finally, where possible, mitigation measures to remove or reduce negative impacts during the Construction and Operational phases of the proposed development were proposed.

For the Biodiversity Chapter baseline ecological surveys involved a combination of both desk- based and field studies. A desk study was conducted to assess existing information relating to the Site's natural environment. A range of appropriate field surveys were undertaken, including habitat surveys, invasive species survey, bird surveys, bat surveys, mammal surveys, and scoping for, amphibian, reptile, and fish species as incorporated into the field surveys. All surveys were conducted following standard and/or best practice protocols.

Impact Assessment

- **Do Nothing**

If the proposed works were not to go ahead and the present land management continues as is, then it would be expected that the land remained of agricultural use, the ecological value of the site would likely remain as recorded during the baseline assessment.

- **Construction phase**

In the absence of mitigation measures the overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora within the site. Direct negative effects will be manifested in terms of the removal of the site's internal and perimeter habitats

Potential Impacts in the absence of mitigation are found to be ***permanent, slight negative effects***.

- **Operational Phase**

The construction and operational mitigation proposed for the development satisfactorily addresses the potential impacts on the sensitive receptors through the design and the application of construction and operational phase controls.

The overall impact on the ecology of the proposed development will result in a ***low adverse / not significant / long term impact*** on the ecology of the area and locality overall.

- **Mitigation**

As outlined in section 11.16 mitigation measures are proposed to manage and control potential impacts during construction of the proposed development will reduce the magnitude and significance of impacts from the development to a minimum.

- **Difficulties Encountered**

No difficulties were encountered in relation to the preparation of the Biodiversity chapter of the EIAR.

4.10 Noise and Vibration

The assessment of Noise and Vibration is contained within Chapter 12 of the EIAR.

This EIAR Chapter has been prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration effects of the proposed development in the context of current relevant standards and guidance.

Impact Assessment

- **Do Nothing**

Under the Do-Nothing scenario the proposed development will not be constructed. In this scenario noise and vibration levels at the site will remain as per the baseline and will change in accordance with trends within the wider area. As the 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.

- **Construction phase**

During the construction phase of the project there is the potential for short-term noise effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

Likely noise and vibration effects during the construction phase will be **negative, short-term and moderate**.

- **Operational Phase**

- **Building Services**

Noise emissions from building services associated with the residential development including mechanical ventilation systems, air source heat pumps and general domestic plant will be designed to comply with the adopted day- and night-time noise limits at the nearest noise-sensitive properties. Once the design criteria in Section 12.8.2.1 are adopted, the resultant residual noise effects from this source will be of **negative, not significant, long-term impact**.

- **Residential Activity and On-Site Movements**

Typical residential activities, including pedestrian movement, parking activities and general community use, will not give rise to significant noise emissions. Outlined in Section 12.8.2.2, this will ensure that residual noise effects from this source will be of **negative, not significant, long-term impact**.

- **Additional Vehicular Traffic on Surrounding Roads**

The predicted change in noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic are considered to be of **neutral, imperceptible and long-term effect to nearby noise sensitive locations**.

- **Cumulative Impact**

As discussed in Section 12.8.2.5 the cumulative impact of building services noise has been taken into account and the effect is considered **not significant**.

Similarly, the cumulative change in traffic flows as presented shows that the effect is **not considered significant**.

4.11 Air Quality

The assessment of Air Quality is contained within Chapter 13. 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.

Existing Environment

Baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO₂), particulate matter less than 10 microns (PM₁₀) 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.

Impact Assessment

Do Nothing Scenario

In the Do-Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 13.4.2 of Chapter 13, concentrations of the key pollutants in future years are predicted to be in compliance with the relevant air quality limit values.

Construction Phase

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 and human health effects. The surrounding area was assessed as being of medium sensitivity to dust soiling 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 four distinct categories: demolition, 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 medium risk of dust related impacts associated with the proposed development. In the absence of mitigation there is the potential for **direct, short-term, negative** and **slight** impacts to air quality, which have the potential to be **significant**. Best practice mitigation measures appropriate for medium risk sites are recommended in Section 13.6.1 of Chapter 13 to ensure dust emissions are reduced and significant effects do not occur.

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 2025 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 **short-term, neutral** and **imperceptible** impact on air quality, which is an overall **not significant** impact in EIA terms.

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, and it was determined that concentrations of NO₂, PM₁₀ and PM_{2.5} will increase by an imperceptible amount as a result of the proposed development. Operational stage traffic emissions will have a **long-term, direct, localised, negative** and **not significant** impact on air quality.

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 500 m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken.

The dust mitigation measures outlined in Section 13.6.1 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 is deemed **direct, short-term, negative** and **not significant**.

Operational phase direct impacts on air quality associated with the proposed development and cumulative traffic emissions are predicted to be **long-term, direct, localised, negative** and overall, **not significant**.

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

Mitigation

Construction Phase

Detailed dust mitigation measures are outlined within Section 13.6.1 of Chapter 13 to ensure that no significant impacts 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, **short-term, direct, negative** and **imperceptible**, which is overall **not significant** in EIA terms, posing no nuisance at nearby sensitive receptors (such as local residences).

Operational Phase

No site-specific mitigation measures are proposed for the operational phase. The impact to air quality has been assessed as **long-term, direct, localised, negative** and overall, **not significant**.

Residual Impact Assessment

When the dust mitigation measures are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be **short-term, direct, localised, negative** and **not significant**.

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 **short-term, direct, localised, negative** and **not significant**.

Monitoring

Monitoring of the dust mitigation measures will be required as set out in Section 13.11 of Chapter 13 and the Construction Environmental Management Plan. The monitoring requirements will ensure that the dust mitigation measures are working satisfactorily.

4.12 Climate

The assessment of Noise and Vibration is contained within Chapter 14 of the EIAR. This chapter identifies, describes and assesses the likely direct and indirect effects of the proposed development on climate.

Impact Assessment

- **Do Nothing**

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc.). The Do-Nothing scenario is considered neutral in terms of the climate assessment.

- **Construction phase**

During the construction phase of the project there is the potential for short-term noise effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

Likely noise and vibration effects during the construction phase will be **negative, short-term and moderate**.

- **Operational Phase**

Water and Hydrology

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 30% climate change allowance. Interactions between climate and water and hydrology are not considered significant. The effect of the interactions between climate and land, soils and water (Chapter 10 Water and Hydrology) are **direct, short-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

Air Quality

Air quality (Chapter 9 Air Quality) and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

Traffic and Transport

During the construction and operational phase, there is the potential for interactions between climate and traffic (Chapter 14 Material Assets: Traffic and Transport). Vehicles accessing the site will result in emissions of CO₂, a greenhouse gas. The effects of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effects of the interactions between traffic and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which overall is not significant in EIA terms.

Waste

Waste (Chapter 15 Material Assets: Waste) management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which overall is not significant in EIA terms.

No other significant interactions between climate and other environmental topics have been identified.

As per the assessment criteria in Chapter 14 the residual 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.

- **Cumulative Impact**

With respect to cumulative assessment, there is no geographical constraints for a climate assessment. Therefore, the normal approach for cumulative assessment in EIA is not considered applicable as per PE-ENV-01104 (TII, 2022a). No specific cumulative mitigation is proposed.

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.

4.13 Archaeology and Cultural Heritage

The assessment of Archaeology and Cultural Heritage is contained within Chapter 15 of the EIAR.

An assessment of the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the proposed development was completed, in order to determine any significant impacts that may arise as a result of the development and highlight any potential effects this may have on these resources.

Impact Assessment

All ground disturbance works across the remainder of the development site will be monitored by a suitably qualified archaeologist. In the event that archaeological material is recorded during monitoring, further discussion/consultation with the DHLGH will be sought in order to ascertain the appropriate treatment (i.e. preservation by record/preservation *in situ*) of any additional archaeological remains

- **Mitigation**

No further archaeological works/mitigation will be required

4.14 Interactions of the foregoing

Interrelationships between various environmental aspects must be considered when assessing the impact of the proposed development, as well as individual significant impacts. The significant impacts of the proposed development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that poses potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts.

When considering interactions, the assessor has been vigilant in assessing pathways, direct and indirect, that can magnify effects through the interaction. In practice many impacts have slight or subtle interactions with other disciplines. However, the EIAR concludes that most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the operation of the proposed development.

4.15 Mitigation and Monitoring Measures

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the proposed development on the various aspects of the receiving environment.

The proposed development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

The mitigation and monitoring chapter of the EIAR collates and summarises the mitigation commitments made in EIAR Chapters 4 to Chapter 15.

5 SUMMARY OF MITIGATION MEASURES

The proposed development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects

This chapter identifies the principle interactions between the potential impacts of the environmental factors identified.

ElAR Chapter	Design Stage Mitigation
Chapter 4 Population & Human Health	Appointment of a project supervisor for the design process (PSDP) to oversee and coordinate the design work including: - Identification of hazards and managing the project to avoid adverse impacts on the recipient environment. - Adherence to best practice in the Construction Management Plan. - Ensure all work is carried out in a safe manner for surveys and site inspection - Design to achieve compliance with Building Regulations.
Chapter 5 Landscape & Visual	-Designing the development and site layout to achieve integration with the wider Castletroy setting. -Interaction with the urban area and retention of boundaries where possible. -Incorporating new planting to provide high quality visual environment and enhancement of biodiversity.
Chapter 6 Material Assets: Traffic & Transport	-Provision of bicycle parking for active travel. -Creating connections to existing footpaths that serve the local roads. -Designing the entrances to DMURS requirements. -Extending and utilising the existing development for pedestrian, cyclist and vehicular connectivity. -Providing an appropriate quantum of parking. -A Quality Audit also carried out.
Chapter 7 Material Assets: Built Services	-Designing the infrastructure and service connections to meet standards for water, foul, storm, ESB, gas and telecommunications.
Chapter 8 Material Assets: Waste	-Incorporating best practice for the 'Waste Hierarchy' and 'Circular Economy' is employed when considering all stages of waste production (both design, construction and operational phases).
Chapter 9 Land & Soils	-The CEMP Design and specification of earthworks to accommodate reuse of all excavated subsoils including any testing regimes required during excavation and compaction. This will be informed by a cut and fill calculation on materials required to achieve finished ground levels. -The preparation of a siteworks specification which will outline the construction controls required during earthworks to minimise impacts on surrounding environment via noise, dust, vibration and construction traffic.

ElAR Chapter	Design Stage Mitigation
Chapter 10 Water & Hydrology	Ground Water All foul and storm drainage lines will be designed in accordance with the Irish Water Code of Practice and requirements of Limerick City & County Council to ensure it operates appropriately and does not contribute to ground water contamination. -Connection made to the Irish Water foul mains network to ensure no risk of contamination of surrounding ground water. Surface Water -The surface water system is designed to be fully separate from the foul drainage system. -The surface water system is designed in accordance with The Greater Dublin Strategic Drainage Strategy and the Ciria SuDS manual. This will provide controls on flow rates during heavy rainfall events and water treatment processes to improve the quality of the runoff prior to discharge to water course. -All systems are designed to limit flooding to 100-year events and allow for 30% HEFS increase in rainfall due to climate change. Flooding The design of the surface water system and provision of adequate attenuation including allowance of 30% for climate change (HEFS), will prevent on site pluvial flooding. The correct design of flow control devices will prevent the site from contributing to downstream pluvial flooding.
Chapter 11 Biodiversity	-Drainage infrastructure designed to minimize pollution risk. Also retention of existing vegetation to the fullest practical extent.
Chapter 12 Noise & Vibration	- Noise emissions from the internal plant room and outdoor plant areas will be designed to ensure that noise levels at the façade of the noise-sensitive locations both within the development and in the surrounding area do not exceed the criteria discussed at Section 12.5.1. During the detailed design of the development, the selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission limits set out above are not exceeded.
Chapter 13 Air Quality	-There are no mitigation measures proposed for the incorporated design of the proposed development.
Chapter 14 Climate	-To achieve compliance with requirements of the Near Zero Energy Building (NZEB) standards. -Incorporating provision for EV vehicle charging infrastructure. -Connecting to the existing footpath network for local sustainable journeys.
Chapter 15 Cultural Heritage: Archaeology & Built Heritage	All ground disturbance works across the remainder of the development site will be monitored by a suitably qualified archaeologist.

Table 5.1 Summary of Mitigation for Design Stage

ElAR Chapter	Construction Stage Mitigation
Chapter 4 Population & Human Health	Appointment of a project supervisor for the design process (PSDP) to oversee and coordinate the design work including: - Identification of hazards; - Elimination and / or reduction of hazards where possible; - Communication of necessary control measures and remaining risks to PSCS for addressal in safety and health plans; - Ensure that the work of designers is coordinated to ensure safety; and - Ensure compliance with Building Regulations.
Chapter 5 Landscape & Visual	Orientation of buildings and spaces to achieve good wayfinding, permeability, access, aspect and microclimate, and coherence with the wider Castletroy setting. ▪ Positive relationship of buildings, parking and yard areas to boundaries and streetscapes. ▪ Use of trees and design elements to enhance the usability of spaces and mitigate wind. ▪ Introduction of vegetation and management of the landscape to provide high quality visual environment and enhancement of biodiversity. ▪ Sustainable management of water and enhancement of biodiversity.
Chapter 6 Material Assets: Traffic & Transport	The proposed development incorporates secure bicycle parking facilities to encourage active travel modes for employees and visitors to the site. The location of bicycle storage areas has been selected to ensure convenience and accessibility to building entrances, in secure and well-lit areas. ▪ As per section 4.4.4 and 4.4.5 of the Design Manual for Urban Roads and Streets, a Stopping Sight Distance of 45m is required on roads with a 50kph speed limit. The access proposed as part of this development shall meet the expectations of DMURS. The location of new trees, including the provision of a pedestrian footpath, grass verge, and straight road alignment, shall support good visibility. ▪ The traffic modelling analysis undertaken has shown that the proposed development will have an imperceptible effect on the surrounding road network. ▪ A Quality Audit accompanies the application and the recommendations will be implemented to ensure the road layout is safe for all users.
Chapter 7 Material Assets: Built Services	The design has been prepared based on relevant codes of practice, design guidance and in consultation with relevant local and statutory authorities to ensure best practice design in respect of water supply, foul and surface water drainage, gas supply, electrical network and the telecommunication network.

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ElAR Chapter	Construction Stage Mitigation
Chapter 8 Material Assets: Waste	The concept of the 'Waste Hierarchy' and 'Circular Economy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The circular economy principle aims to keep materials, components, and products in-use in the economy for as long as possible. In circularity, the key objective is to design consumption and production systems to create and retain value. Both principles have been applied and will further be applied during the detailed design, construction and operational phases.
Chapter 9 Land & Soils	Design and specification of earthworks to accommodate reuse of all excavated subsoils including any testing regimes required during excavation and compaction. ▪ A detailed cut and fill exercise (in addition to the cut and fill report which accompanies the application documentation) will be carried out across the development to determine the optimum finish floor levels of the unit to balance the volume of cut require with the volume of fill required. ▪ Preparation of an earthworks specification which will outline the construction controls required during earthworks to minimise impacts on surrounding environment via noise, dust, vibration and construction traffic
Chapter 10 Water & Hydrology	Ground Water: ▪ The water supply network is designed in accordance with Irish Water Code of Practice and details the sufficient capacity and onsite storage to accommodate the proposed development at low service pressures. ▪ The fitout design will include for the correct storage of hazardous materials if present including bunds to contain spills or leakage. ▪ All foul drainage lines will be designed in accordance with the Irish Water Code of Practice and requirements of Limerick City & County Council to ensure it operates appropriately and does not contribute to ground water contamination. ▪ The temporary private wastewater treatment plant will be designed in accordance with Uisce Eireann requirements and will be monitored to ensure no risk of contamination of surrounding ground water. ▪ The existing water treatment plant adjacent to the site are in operation and were previously designed in accordance with best practice. Surface Water: ▪ The surface water system is designed to be fully separate from the foul drainage system. ▪ The surface water system is designed in accordance with Limerick City and County Council Surface Water/SuDs Specification. ▪ All systems are designed to limit flooding to 100-year events and allow for 30% increase in rainfall due to climate change. Flooding: The design of the surface water system and provision of adequate attenuation including allowance of 30% for climate change (HEFS), will prevent on site pluvial flooding. The correct design of flow control devices will prevent the site form contributing to downstream pluvial flooding.

ElAR Chapter	Construction Stage Mitigation
Chapter 11 Biodiversity	A project ecologist will be appointed to oversee all works.
Chapter 12 Noise & Vibration	• Selection of quiet plant; • Noise control at source; • Screening, • Hours of work; and; • Liaison with the public.
Chapter 13 Air Quality	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.
Chapter 14 Climate	• Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled. • Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. • Ensure all plant and machinery are well maintained and inspected regularly. • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. • Sourcing materials locally where possible to reduce transport related CO₂ emissions. • Target embodied carbon rates for detailed design (LETI, 2020):
Chapter 15 Cultural Heritage: Archaeology & Built Heritage	All ground disturbance works across the remainder of the development site will be monitored by a suitably qualified archaeologist.

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ElAR Chapter	Operation Stage Mitigation
Chapter 4 Population & Human Health	No operational stage mitigation measures are proposed.
Chapter 5 Landscape & Visual	Standard maintenance and management of landscaped areas.
Chapter 6 Material Assets: Traffic & Transport	No operational stage mitigation measures are proposed.
Chapter 7 Material Assets: Built Services	The design has been prepared based on relevant codes of practice, design guidance and in consultation with relevant local and statutory authorities to ensure best practice design in respect of water supply, foul and surface water drainage, gas supply, electrical network and the telecommunication network.
Chapter 8 Material Assets: Waste	The Operator will ensure that all waste materials will be stored in designated bins or other suitable receptacles in designated, easily accessible locations. All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site. The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and The Operator will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.
Chapter 9 Land & Soils	Any waste(s) to be stored in accordance with best practice and in designated areas. Monitoring and inspection of the drainage network, with periodic desilting of the drainage network to remove sediment and no blockages arise.
Chapter 10 Water & Hydrology	Ground Water Monitoring and inspection of the drainage network, with periodic desilting of the drainage network to remove sediment and no blockages arise. The design will include for the correct storage of hazardous materials if present including bunds to contain spills or leakage. Surface Water The surface water system is designed to be fully separate from the foul drainage system. Monitoring and inspection of the drainage network, with periodic desilting of the drainage network to remove sediment and no blockages arise. Flooding Monitoring and inspection of the drainage network, with periodic desilting of the drainage network to remove sediment and no blockages arise.

EIAR Chapter	Operation Stage Mitigation
Chapter 11 Biodiversity	Post construction inspection by the appointed ecologist to ensure no pollution risk from the development when construction works are complete.
Chapter 12 Noise & Vibration	The selection of building services plant, which will be carried out at detailed design stage, shall be in accordance with the relevant criteria so that noise limits from the site do not exceed anticipated or acceptable noise limits set out in chapter 12 of the EIAR.
Chapter 13 Air Quality	There are no mitigation measures proposed for the operational phase of the proposed development.
Chapter 14 Climate	The accompanying Energy report by IN2 sets out mitigation measures incorporated into the design and reduce the impact to climate (and climate change) are the targets for the building energy rating, the energy performance targets for the warehouse and office spaces.
Chapter 15 Cultural Heritage: Archaeology & Built Heritage	No mitigation measures are required or proposed at operational stage.

Table 5.3 Summary of Mitigation for Operational Stage



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 1: INTRODUCTION

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

FEBRUARY 2026



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1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been developed by Genesis Planning Consultants, in collaboration with a team of specialist consultants, on behalf of Columbia Estates Management (IE) Limited (the prospective applicant). The report supports a planning application submitted to Limerick City & County Council for the construction of a Large-scale Residential Development (LRD) in Castletroy, Co. Limerick.

The EIAR outlines and evaluates the potential significant effects of the proposed project in compliance with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU. The project description includes details regarding the site, design, size and other relevant characteristics of the development, as required by the Directive.

Chapter 2 of this report sets a detailed account of the proposed project.

In summary the proposed development provides for 523 no. residential units and crèche on lands zoned 'New Residential' in the Limerick City & County Development Plan 2022-2028.

The proposal is to be served from the Monaleen Road with pedestrian entrance from the R445 to the north. In summary a total of 648no. car parking spaces are proposed, while local journeys will be encouraged to be undertaken via walking or cycling where practical with all units incorporating or having immediate access to storage space for bicycles.

The application is accompanied by landscaping proposals and sustainable urban drainage systems (SuDS) form an integral part of the surface water management system.

1.1 Proposed Development Site

The application area comprises 9.7 hectares and is located on Monaleen Road in the Castletroy area of Limerick. It is strategically positioned with the R445 regional road forming its northern boundary and the Castletroy Golf Club situated directly to the south.

In terms of the site itself it comprises a greenfield parcel of lands measuring 9.7 hectares.

In terms of access a new vehicular entrance to the site will be established from Monaleen Road, providing convenient connectivity. In addition, a dedicated pedestrian access point is proposed from the R445 on the northern boundary to support active travel.

Foul sewer and mains water infrastructure services are also existing along the local road with existing capacity to service the site.

1.2 Surrounding Context

The site is located in the Castletroy area of Limerick City. It is bounded by Monaleen Road to the east, Dublin Road (R445) to the north and Castletroy Golf Club to the south.

The site comprises a greenfield parcel of agricultural lands measuring 9.7 hectares in total.

Access to the site will be provided via a new entrance from Monaleen Road. This location was selected due to level differences and mature tree cover and also the planned Bus Corridor along Dublin Road, which are constraints to vehicular access. Foul sewer, mains water, and ESB infrastructure are available along Monaleen Road, with capacity to service the development.

The site benefits from its position within an established residential area and is readily accessible.

Existing bus services run along R445 Road, and pedestrian connections to local facilities will be enhanced through integrated footpaths and safe crossing points.

The development connects to existing footpaths along Monaleen Road and provides an internal network of pedestrian routes, promoting walkability.

Adjoining uses include residential developments and agricultural lands.



Figure 1.1 Surrounding context (Source: Google Earth)

1.3 The applicant

The prospective applicant, Columbia Estates Management (IE) Limited, is a company within Formation Homes Group who are industry leading residential developers in Ireland. The group is primarily a residential and commercial developer. With a team of highly skilled and experienced people, each project is assessed carefully in terms of where and how the Group can add value, from concept stage right through to delivery.

Formation Homes is a family-based business with over 40 years experience in property development. They have a proven track record of creating high quality, landmark developments across Ireland, the UK and Europe.

1.4 Requirement for EIAR

'Screening' is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or in the case of sub-threshold development, by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

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

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

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

"Schedule 5, Part 2 - Infrastructure projects

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

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

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

The Proposed Development does constitute an "urban development" as it is an Urban housing development.

According to the Interpretation of Definitions of Project Categories of Annex I and II Document (European Commission, 2015), "Housing developments, in particular, are frequently included in the 'urban development projects' category".

The total area of the Proposed Development site is approximately 9.70 hectares.

Notwithstanding the site is below the mandatory 10 hectare but exceeds the 500 unit mandatory threshold. Accordingly it is proposed that an EIAR be carried out on the basis of being a EIA-scale development and also given the potential for impacts on the area when considered in conjunction with other projects under development.

Accordingly, an EIAR is being prepared as part of this application.

1.5 Purpose of Environmental Impact Assessment

An EIAR is defined in the Guidelines on the Information to be contained in Environmental Impact Statements as:

"A statement of the effects, if any, which proposed development, if carried out, would have on the environment."

The preparation of this EIAR is in accordance with Directive 2011/92/EU as amended by Directive 2014/52/EU (the Directive), the Planning and Development Act 2000, as amended and the Planning and Development Regulations 2001, as amended.

The prescribed range of environmental factors are as follows: -

"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

- a) *population and human health.*
- b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.*
- c) *land, soil, water, air and climate.*
- d) *material assets, cultural heritage and landscape.*
- e) *the interaction between the factors referred to in points (a) to (d)"*

In addition the guidelines quote Article 5(1) of the Directive when describing the contents of an EIAR, as follows:

"the developer shall include at least: -

- a) *a description of the project comprising information on the site, design, size and other relevant features of the project.*
- b) *a description of the likely significant effects of the project on the environment.*
- c) *a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.*
- d) *a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.*
- e) *a non-technical summary of the information referred to in points (a) to (d); and*
- f) *any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."*

Article 94 of the Planning and Development. Regulations 2001, as amended, provides for the information to be contained in an EIAR as follows:

"94. An EIAR shall take into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments and shall contain—

- a) *the information specified in paragraph 1 of Schedule 6,*
- b) *any additional information specified in paragraph 2 of Schedule 6 relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected,*
- c) *a summary in non-technical language of the information required under paragraphs (a) and (b),*
- d) *a reference list detailing the sources used for the descriptions and assessments included in the report, and*
- e) *a list of the experts who contributed to the preparation of the report, identifying for each such expert—*
 - a. *the part or parts of the report which he or she is responsible for or to which he or she contributed,*
 - b. *his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and*
 - c. *such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality."*

1.6 EIAR Guidance

This EIAR has been completed in accordance with the requirements as set out in the EIA Directive (2014/52/EU) and relevant guidelines and documentation, including:

- The relevant EU Directives and associated Irish Regulations concerning Environmental Impact Assessment.
- *Environmental Impact Assessment of Projects: Guidance on the Preparation of 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).

Also the project have referred to other discipline-specific guidelines, which are detailed in the individual chapters of the EIAR.

1.7 The EIAR Process

This section demonstrates the process that has been carried out by the Applicant and Design Team in the preparation of this EIAR. As described and shown Figure 1.2 the EIAR forms a part of the EIA process.

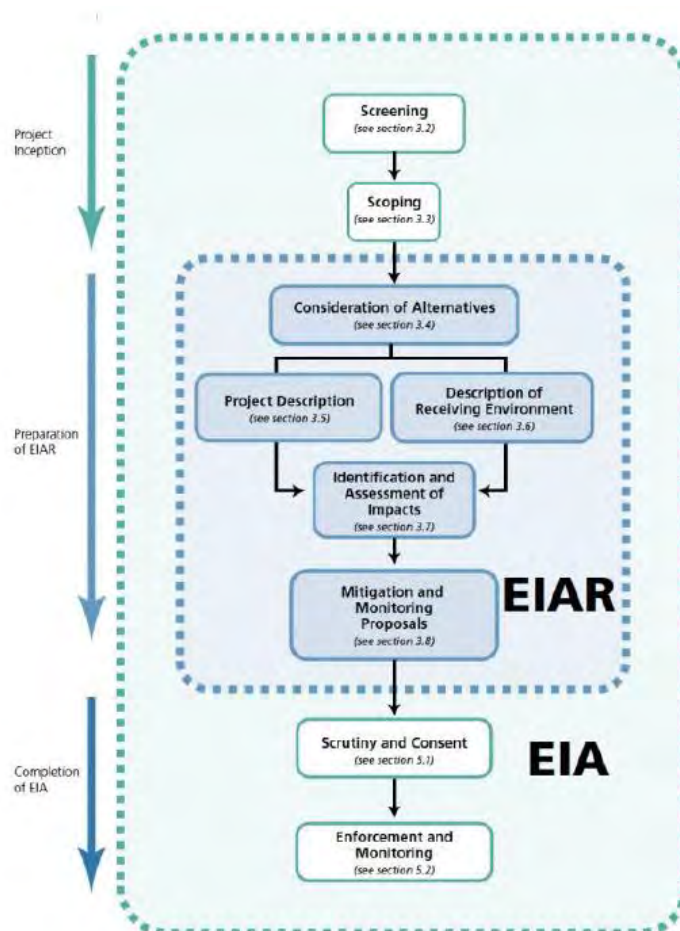


Figure 1.2 EIA Process- abstract from the EPA Guidelines

Further explanation of the terms referred to in the Figure above is provided below:

Screening: -

"The process of assessing the requirement for a project to be subject to Impact Assessment based on project type and scale as well as the significance or environmental sensitivity of the receiving environment."

Scoping:

"The process of identifying the significant issues which should be addressed by a particular Impact Assessment as well as the means or methods of carrying out the assessment."

Environmental Impact Assessment Report (EIAR):

"A statement of the effects, if any, which proposed development, if carried out, would have on the environment."

Environmental Impact Assessment (EIA):

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

Competent Authority Decision

If, during the review, the Competent Authority determines that the information presented in an EIAR is not sufficient for it to make a determination, then the developer may be asked to provide further information.

If granting permission, the Competent Authority may attach conditions to the consent. The conditions will typically seek to ensure adherence to mitigation and monitoring measures presented in the EIAR. These may be augmented and modified by the Competent Authority.

If refusing permission the Competent Authority may cite specific evidence from the EIAR such as the non-conformity of potential impacts with official standards, impractical mitigation measures or uncertainty about environmental interactions.

1.8 Scope of Cumulative Effects

The Directive requires that an EIAR assess the cumulative effects of the proposed project alongside other existing and/or approved developments. These cumulative effects can result from:

- The interaction of different impacts within a single project.
- The interaction between the proposed project and other existing or approved developments in the same area.

In August 2018 the Department of Housing, Planning, and Local Government issued *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*. The Guidelines define cumulative effects as follows:

'Effects should not be considered in isolation but cumulatively, meaning in combination with other effects. An individual effect may not significantly impact the environment on its own but could become significant when combined with other effects. Conversely, an individual effect that is significant on its own may have a reduced impact when combined with others.'

Paragraph 2(e)(i)(V) of Schedule 6 (mirroring paragraph 5(e) of Annex IV) states:

'the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.'

Specialist consultants contributing to this EIAR have individually assessed under-construction, permitted, or proposed developments within the local area. Using their expertise, they have identified projects relevant to their specific disciplines that may contribute to cumulative effects.

While the Directive does not mandate an assessment of cumulative impacts from future projects without lodged planning applications, the broad intent of the EIA Directive necessitates consideration of potential impacts. This principle aligns with the Supreme Court's decision in *Fitzpatrick v. An Bord Pleanála* [2019] IESC 23 (commonly referred to as the "Apple Case").

The Supreme Court in the *Apple Case* concluded that an EIA must assess the cumulative effects of future developments that are an "integral part" of the proposed project, meaning there is "functional or legal interdependence" between the proposed development and any envisaged future projects.

In this instance the proposed development is not functionally dependent on other sites within the Castletroy area. However, contributors to this EIAR have considered the potential impacts of the development on the broader zoned lands.

1.9 Competency

The preparation of an EIAR must be undertaken by qualified and competent experts. To fulfil this requirement the applicant appointed Genesis Planning Consultants to oversee and coordinate the development of this EIAR. Additionally, a team of specialised professionals was engaged to contribute to the various chapters. Table 1-1 provides a list of the consulting firms and lead authors involved. The qualifications, expertise, and relevant experience of each discipline's lead author are detailed within their respective chapters.

1.10 Format and Structure of Report

This EIAR has been prepared following the 'Grouped Format Structure' outlined in the *Guidelines on Information to be Contained in Environmental Impact Statements* (EPA, 2002). The composition of this EIAR has been prepared in the context of the EPA Guidelines (2022) and the screening and scoping stages described above.

The structure of the EIAR is summarised in the table below.

Chapter No. & Title		Consultant	Project Lead
Non Technical Summary		Genesis Planning	R Woods
1	Introduction	Genesis Planning	R Woods
2	Project Description	Genesis Planning	R Woods
3	Alternatives Considered	Genesis Planning with Input from AL Architects on alternative layouts considered	R Woods

4	Population & Human Health	Genesis Planning	R Woods
5	Landscape & Visual	CSR	Jamie Ball
6	Material Assets: Traffic & Transport	Road Plan	Richard Frisby
7	Material Assets: Built Services	Garland Engineers	Brian Lahiff
8	Material Assets: Waste	Garland Engineers	Brian Lahiff
9	Land and Soils	JBA	Conor O'Neill
10	Water and Hydrology	JBA	Conor O'Neill
11	Biodiversity	JBA	Dominic Tiley
12	Noise & Vibration	AWN	Mike Simms
13	Air Quality	AWN	Tanmay Gojamgunde
14	Climate	AWN	Avril Chaloner
15	Cultural Heritage (Archaeology)	Rose Cleary	Rose Cleary
16	Interactions of the foregoing	Genesis Planning	R Woods
17	Summary of Mitigation	Genesis Planning	R Woods

Table 1.1 EIAR structure and authors of chapters

1.11 Impact Assessment Methodology

Clarity of method, language and meaning are vital to accurately explain the full range of effects. Adherence to a systematic method of description can be of considerable assistance in this matter.

The relevant terms listed in the table below can be used to consistently describe specific effects. All categories of terms do not need to be used for every effect.

With regards to the 'Quality of Effects' it is crucial that any such effects are clearly identified, especially to non-specialist readers. These effects which may occur can be characterised into 3 types: positive, negative or neutral.

Firstly, if the proposed element of the project improves the quality of the receiving environment it is seen as a Positive Effect.

Secondly, where such a change does not affect the quality of the receiving environment it can be described as a Neutral Effect.

Finally, Negative / Adverse Effects can be described as a change, which reduces the quality of the environment.

Each section of this EIAR evaluates the direct, indirect, cumulative, and residual impacts of the proposed development during both the construction and operational phases. The assessment of the quality, significance, and duration of effects for each aspect is primarily guided by the terminology outlined in the EPA's Guidelines on the Information to be Included in Environmental Impact Assessment Reports (2022), as summarized in the table below.

Quality of Effect	
Positive	A change which improves the quality of the environment
Neutral	No effects of effects that are imperceptible; within normal bounds of variation or within the margin of forecasting error.
Negative Effects	A change which reduces the quality of the environment
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 Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Duration of effects	
Momentary	Seconds to minutes Less than 1 day
Brief	Less than 1 year
Temporary	1-7 years
Short-term	7-15 years
Medium-term	VED 16/05/2023
Long-term	15-60 years
Permanent	Over 60 years
Reversible Effects	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly- or hourly, daily, weekly, monthly, annually).

Extent and Contents 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	Impacts 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 significant 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.

Table 1.2 Summary of effects and classification in the EIAR

1.12 Public & Stakeholder Consultation

The structure, presentation and the non-technical summary of the EIAR document, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of projects prior to the granting of consent.

This EIAR and application will be available for inspection free of charge or purchased on payment of a specified fee (which fee shall not exceed the reasonable cost of making such a copy) during public opening hours excluding Bank Holidays at the Offices of Limerick City & County Council, Co. Limerick.

EIAR Portal

As of the 1 September 2018, there is an obligation on the applicant, where an EIAR has been prepared, to submit the relevant information to the EIA Portal.

The Applicant has submitted an application form, a copy of the public notice and a site location plan to the Department of Housing Planning and Local Government.

A copy of this submission and acknowledgement receipt issued by the Department of Housing Planning and Local Government accompanies the planning application.

1.13 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the proposed development. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

1.14 Forecasting Methods Used

The methods employed to forecast the effects on the various aspects of the environment are standard techniques used by each of the particular individual disciplines.

The general format followed was to identify the receiving environment, to add to that a project of the 'loading' of the proposed development on the various aspects of the environment considered, to put forward amelioration measures as necessary to lessen or remove a potential impact, and thereby to arrive at a net predicted impact.

1.15 Quotations

EIAR's by their nature contain statements about the proposed development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a misleading impression of the findings of the study.

Therefore, the study team urge that quotations should, where reasonably possible, be taken from the conclusions of specialists' section or from the non-technical summary and not selectively.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 2: PROJECT DESCRIPTION

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

FEBRUARY 2026



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2 PROJECT DESCRIPTION

2.1 Introduction

This Chapter of the EIAR provides a description of the proposed development which will be assessed as part of the EIA process.

The description of development provides details of this project which requires planning consent. It includes a description of the location of the project and its physical and environmental characteristics. The description of development as set out in this chapter is also set out in the following chapters prepared by consultants specialising in the environmental topics subject of the Chapters.

In line with the EIA Directive a description of the application site, design, size and scale of development are also discussed within this chapter. Consideration is also given to all relevant phases of development from construction through to operation.

This chapter provides a broader summary description of the proposed development that is subject of this EIAR. The environmental impacts of the proposed development are then examined for each of the prescribed environmental topics discussed in turn. It should be considered alongside the planning drawings submitted with the application and any supporting reports

This chapter has been prepared by Ronan Woods, EIAR Manager, with assistance from Niall Carr, EIAR Co-ordinator at Genesis Planning. Ronan has 24 years professional experience of town planning in Ireland, is a Corporate Member of both the Irish Planning Institute and the RTPI. Niall has 5 years' professional experience in the planning field, has a MSc in Planning, Regeneration and Development and is also a corporate member of the RTPI.

2.2 Proposed Development Site

The application area comprises 9.7 hectares and is located on Monaleen Road in the Castletroy area of Limerick. It is strategically positioned with the R445 regional road forming its northern boundary and the Castletroy Golf Club situated directly to the south.

In terms of the site itself it comprises a greenfield parcel of lands measuring 9.7 hectares.

In terms of access a new vehicular entrance to the site will be established from Monaleen Road, providing convenient connectivity. In addition, a dedicated pedestrian access point is proposed from the R445 on the northern boundary to support active travel.

Existing bus services run along R445 Road, and pedestrian connections to local facilities will be enhanced through integrated footpaths and safe crossing points.

Foul sewer and mains water infrastructure services are also existing along the local road with existing capacity to service the site.



Figure 2.1 Site boundary (Source: Google Earth)

2.2.1 Land Use Zoning

Under the Limerick City & County Development Plan (LCCDP) 2022-2028, the subject site is zoned 'New Residential'. The overarching zoning objective is:

"To provide for new residential development in tandem with the provision of social and physical infrastructure."

Furthermore the provision of a creche on site is supported by the aim:

'This zone may include a range of other uses particularly those that have the potential to facilitate the development of new residential communities such as open space, schools, childcare facilities, doctor's surgeries and playing fields etc.'

Under the core strategy Castletroy located in Limerick City and Suburbs and is identified within the Limerick Shannon Metropolitan Area.

The proposed site layout has been carefully designed to respond to its zoning context in the Limerick City and Suburbs Density Map., which straddles two designated density zones:

- 35+ units per hectare ;
- 45+ units per hectare.

By balancing unit distribution and building typologies across the site, the design achieves a net residential density of 53.9 units per hectare.

Overall the lands are strategically positioned within an established and accessible area, making them well suited for residential development in terms of local connectivity.

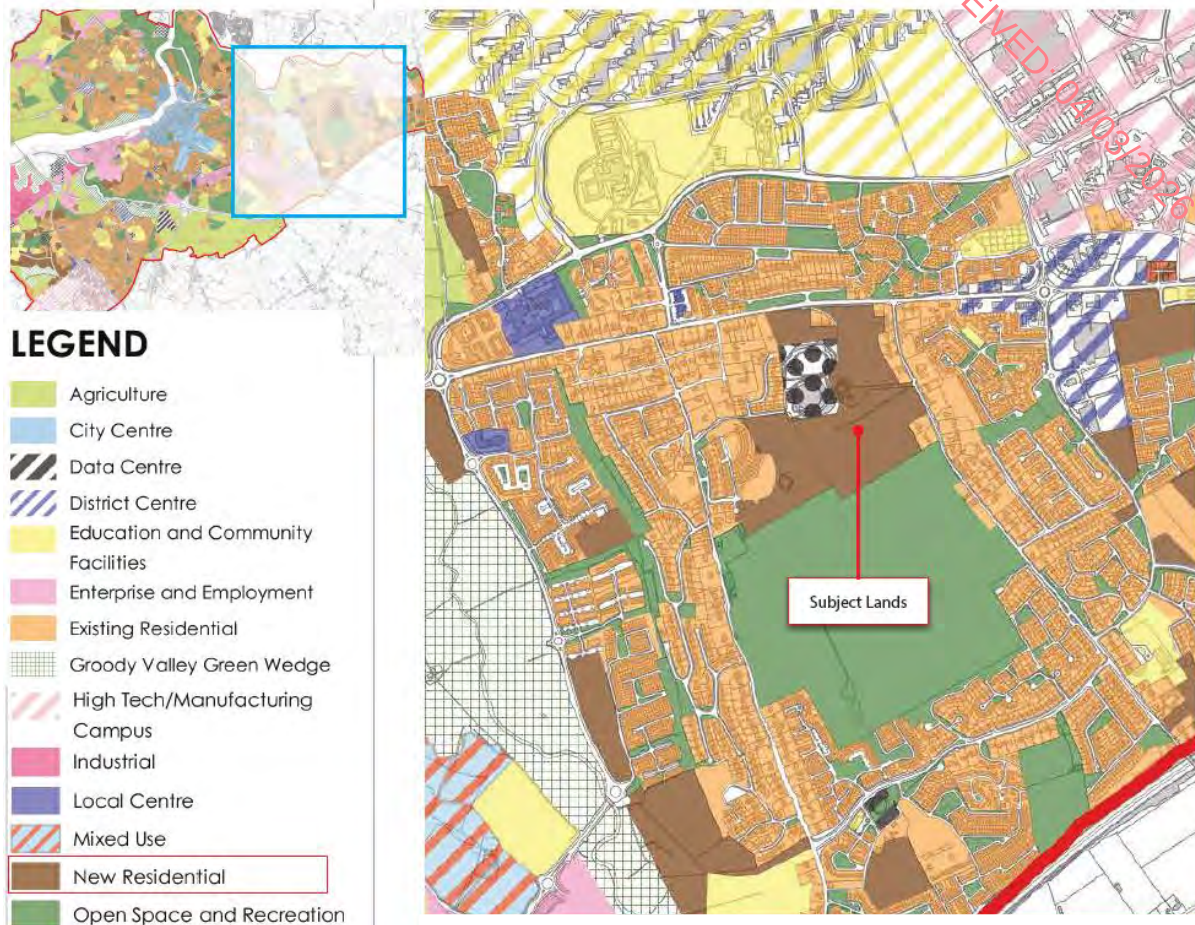


Figure 2.2 Land use zoning LCCDP 2022-2028 (Source: Limerick City & County Council)

2.3 Proposed Development

Columbia Estates Management (IE) Limited (the prospective applicant) intend to apply for a 10 year permission comprising of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g)Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points

for residents throughout the site.

(h) Provision of associated bicycle storage facilities at surface level throughout the site.

(i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.

(j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.

(k) Provision of associated ESB substations.

(l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

2.3.1 Site Layout

The site layout is as per detailed on the accompanying drawings by Arnold Leahy Architects.

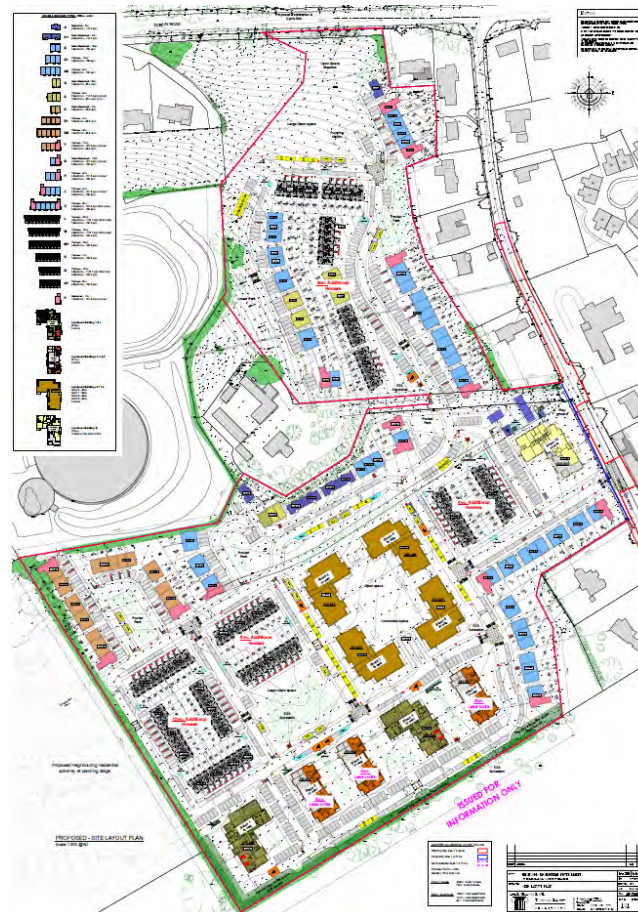


Figure 2.3 Site layout (Source: Arnold Leahy Architects)

The proposed residential development has been designed and configured within the site layout to meet contemporary housing needs and support a cohesive community within Castletroy.

The scheme is positioned on a 9.7ha greenfield site along the Monaleen Road and R445, adjoining existing residential and commercial uses. Vehicular access will be provided from Monaleen Road with pedestrian-only access via the R445. Existing foul sewer and water infrastructure are available along the public road, with capacity to service the proposed development.

A crèche is positioned in building proposed at the site entrance, forming a local landmark and community hub. The layout responds to the site contours, positioning taller 5-storey buildings towards the lower environs and stepping down to 2-storey dwellings adjoining existing residential curtilages.

Interlinked open spaces, including a central park, pocket parks and a linear green route are incorporated throughout the layout to enhance amenity, biodiversity and connectivity. Overall public open space provision totals 16.2% of the site area, exceeding the LCCDP requirements, with communal areas provided for apartment residents.

The design achieves a net residential density of 53.9 units per hectare, comprising a mix of houses, duplexes, and apartments. In total, 523no. units are proposed with varied building heights of 2-5 storeys to create a strong sense of place and character.

The internal road layout is designed in accordance with DMURS, ensuring a clear hierarchy and safe movement for vehicles, cyclists, and pedestrians. Pedestrian and cycle links ensure permeability through the site and to adjoining lands. Car parking provision totals 564 spaces, with 651 bicycle spaces also provided, reflecting the emphasis on sustainable travel.

SuDS measures are integrated within the scheme to manage surface water sustainably. Landscape proposals further respond to existing topography and ecological features along the northern site boundary.

Overall, the proposed development provides a high-quality, sustainable residential environment that responds appropriately to its context and supports the creation of a distinctive new neighbourhood within Castletroy.



Figure 2.4 Site layout and circular exercise trail (Source: CSR Landscape Architects)

2.3.1.1 Materiality

We refer to the accompanying elevational drawings, prepared by Arnold Leahy Architects and accompanying CGIs for details of materials and finishes of the Proposed Development. A palette of materials and colours has been chosen to provide a robust, quality finish to the scheme while referencing the existing developments in the area.



Figure 2.5 CGI of proposed development



Figure 2.6 CGI of proposed development

2.3.2 Energy

The building design incorporates energy efficiency measures that will ensure the office spaces comply with the Near Zero Energy Building (NZEB) requirements outlined in Technical Document L 2021 for the Conservation of Fuel and Energy.

To meet Part L requirements, a minimum of 20% of the development's primary energy demand is derived from renewable sources, achieved through the use of highly efficient air source heat pump systems serving all dwellings.

Low-carbon design principles are embedded throughout the scheme, with high-performance building fabric, enhanced airtightness, and mechanical ventilation with heat recovery (MVHR) contributing to overall energy efficiency. The proposed development thereby meets the current regulatory requirements for sustainable design and long-term energy performance.

2.3.3 Access And Parking

Traffic-related matters of the proposed development are assessed in Chapter 6 of this EIAR with traffic modelling and analysis carried out by Road Plan Consulting.

Access to the site will be provided via a new entrance from Monaleen Road.

This location has been selected having regard to the optimal position for a new entrance, and also aiming to avoid an entrance directly onto the Dublin Road given existing level differences, mature tree cover and the planned Bus Corridor along the Dublin Road, which collectively present constraints to alternative vehicular access points.

Foul sewer, mains water, and ESB infrastructure are available along Monaleen Road with sufficient capacity to service the proposed development.

Access design will be carried out in accordance with the Design Manual for Urban Roads and Streets (DMURS), ensuring safe and efficient movement for all users. Further details are set out within the Traffic and Transport Assessment and Engineering Report prepared by CS Consulting.

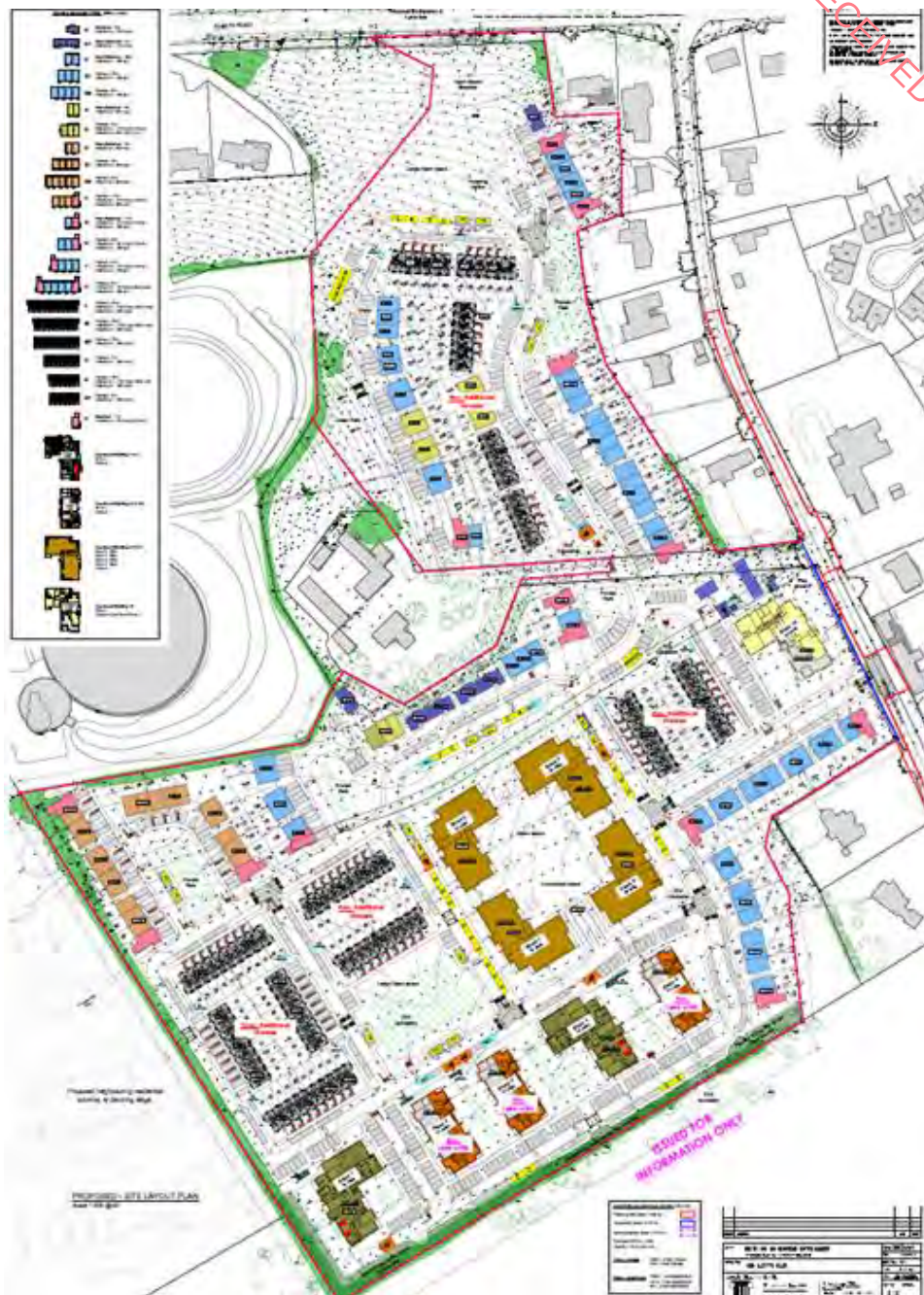


Figure 2.7 Site layout (Source: Arnold Leahy Architects)

2.3.3.1 Car Parking

Car parking is provided in accordance with the parking requirements outlined in the Limerick City & County Development Plan (LCCDP) 2022-2028.

Car parking provision across the development totals 648no. spaces, which is below the maximum standard set out in the Limerick City Development Plan, reflecting the scheme's emphasis on sustainable travel modes.

Accessible parking spaces are distributed throughout the site and positioned proximate to main building entrances to ensure ease of access for all residents and visitors.

Electric vehicle (EV) charging spaces are provided within the overall parking layout, with ducting and cabling

infrastructure incorporated to future-proof all remaining spaces for the installation of additional charging points as demand increases.

2.3.3.2 Bicycle Parking

The bicycle parking provision of the proposed development has been assessed in relation to the Limerick City & County Development Plan 2022-2028, which lists the minimum required bicycle parking provision for new developments by land use type

Comprehensive bicycle parking is also proposed, totalling 633no. spaces (468 for apartments, 155 visitor spaces, and 10 for the crèche), supporting active travel and reducing car dependency.

2.3.4 Landscaping

The landscape proposals have been designed by CSR Landscape Architects having regard for the existing landscape and nature of the area. We refer the Planning Authority to the enclosed landscape drawings and Landscape Strategy Report prepared by CSR Landscape Architects for greater detail on the proposals.

2.3.5 Drainage

An Engineering Services Report by Garland Consulting Engineers accompanies this planning application and should be consulted for a detailed description of the proposed surface water management, foul drainage, and water supply strategies. Chapter 7 of this EIAR sets out how the design caters for the proposed development.

The design of surface water, wastewater drainage, and water supply systems for the proposed development adheres to the Irish Water Code of Practice, standard details, policies, and guidelines, as well as the requirements set forth by Limerick City & County Council.

The following guidelines shall be adhered to during the preparation of the detailed method statement for the proposed ditch diversion works, and all associated works will be carried out in accordance with these guidelines;

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors
- Guidelines on protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland 2016)
- Eastern Regional Fisheries Board, Fisheries Protection Guidelines.

The accompanying Construction Environmental Management Plan sets out in detail measures to protect water quality.

2.3.5.1 Foul Drainage

The site is to be connected into the Uisce Eireann foul sewer network and then discharge into the local Wastewater Treatment Plant which serves Castletroy.

2.3.5.2 Water Supply

In order to service the proposed development site, it is proposed to tie into the existing watermain.

2.3.5.3 Flooding

In summary the site is not affected by Fluvial, Tidal or Pluvial Flood risk as per the CFRAM study. Also to ensure the proposal does not increase flood risk to other lands the stormwater drainage design is designed to cater for a 1000 year storm even HEFS (30%) allowance in rainfall events.

Accordingly with the site being outside an area identified at flood risk under the CFRAM study no further elaboration on flood risk is required and matters are settled in this regard.

2.3.5.4 Electricity Supply

Connection is to be made to the existing ESB network. All proposed power cables within the development will be underground or internal within the buildings and will be installed according to ESB Networks specifications.

2.3.5.5 Telecommunications

New connections will be provided via ducting connections to the existing road network.

2.3.6 Site Lighting

A site lighting layout and report is prepared by IN2 and sets out the proposed lighting strategy.

2.4 Construction Phase

A Construction and Environmental Management Plan (CEMP) has been prepared by Consulting Engineers and is submitted under separate cover with this application. The CEMP outlines the commitments and mitigation measures to be implemented during the construction phase of the proposed development and should be reviewed alongside this chapter.

All the mitigation measures proposed within the Environmental Impact Assessment Report (EIAR) are incorporated into the CEMP.

2.4.1 Construction Programme

The proposed project is expected to take approximately 10 years to complete with site works commencing mid 2027. This is based on the accompanying phasing plan for delivery, and which has informed the need for a 10 year permission in this instance.

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- Parking facilities for the construction team.
- A site office and associated facilities for the construction team.

The compound is strategically positioned within the project site, minimizing the distance for transporting materials and equipment, and will not require significant disruption to the wider area.

2.4.3 Fencing

Temporary Fencing: Perimeter fencing will be erected to secure the site. The location of this fencing will remain in-situ until construction works are nearly complete for each phase at which point the permanent 'operational phase' fencing will then be installed.

2.4.4 Earth Works

As part of construction works it is anticipated that, fill exceeds cut by approximately 15,000m³ therefore imported fill will be required. Excavated materials will be reused on-site wherever possible to reduce export/import requirements, with off-site movement limited to situations where there is surplus, unsuitable material, or where imported material is required to meet design specification. Further discussion on this aspect of the works is set out in Chapter 8 of this EIAR.

Given the greenfield nature of the site, construction is expected to involve conventional or strip foundations and pavement construction, along with localized excavations for utilities and plant installation.

Topsoil excavated from the site is planned to be reused within the landscaped areas surrounding the development to enhance sustainability.

2.4.5 Construction Operations

Construction activities on-site are expected to generally take place between 07:00 and 19:00 Monday to Friday, and 07:00 to 14:00 on Saturdays.

There are a number of construction activities involved in a project such as this. The activities (independent of phasing) can be divided into five general categories:

- Excavation: This includes site clearing and earthworks - soil / rock removal - required to prepare the site for the foundations and warehouse unit above.
- Structure: Structure includes the foundations and the physical frame of the building.
- Enclosures: The enclosures for the building will be formed.
- Services: The requisite services will be provided including drainage and lighting.
- Landscaping: The landscaping works include some hard landscaping, roads, footpaths, cycle-paths, bed and tree planting, and significant open spaces. In addition, there are a number of existing trees to be protected on site and incorporated into the new scheme.

The staffing levels during construction are anticipated to peak at around 30 workers on-site at any given time, which is expected to generate approximately 60 car trips per day.

2.4.6 Construction Traffic

Construction access to the site will be through the existing access via the Monaleen road. Due regard will be paid to minimising any impacts by construction vehicles on the existing developments in the area. Should an issue arise in respect of construction traffic, then the position will be reviewed by the Project Team and changes made.

2.4.7 Construction Waste

A Construction & Environmental Management Plan and a Resource and Waste Management Plan have been prepared and are included with the planning application. In addition Chapter 8: Material Assets (Waste) of this EIAR includes details regarding the anticipated amounts of waste generated from the project, the subsequent potential impacts and the mitigation measure proposed to ameliorate any anticipated negative impacts.

In summary, all waste generated during the construction and operational periods is proposed to be appropriately disposed of in accordance with the Waste Management Plans.

A Resource and Waste Management Plan (RWMP) has been created by Garland Engineers with further details provided in Chapter 8, Material Assets: Waste.

As the site is greenfield no demolition arisings will occur.

By adhering to the RWMP waste management during the construction phase will comply with the EPA's Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects and the Limerick City & County Council Waste Bye-Laws. This approach will ensure that resource use and waste handling align with sustainability and regulatory requirements.

2.5 Cumulative Development

This EIAR also considers the development proposed in the context of the cumulative, or secondary, impacts arising.

Each Chapter of the EIAR includes a cumulative impact assessment of the Proposed Development with other planned projects in the immediate area.

For the purposes of this EIAR we have examined proposals within 0.5km of the development being proposed. In that context the developments in the environs are considered under the receiving environment. The cumulative assessment considered as part of this EIAR are as follows:

- **Project Site No.1: Residential Developments as granted under Limerick City & County Council:** The site has been subject to a series of residential development permissions granted. Permission was granted on 8th March 2016 (Ref. 1619) for the construction of 9 no. residential houses along with Retention Permission for a temporary construction access road and associated site works. Subsequently, permission was granted on 12th September 2017 (Ref. 17462) for alterations to the existing estate road and the construction of an additional 12 no. residential houses with associated site development works. Most recently, permission was granted on 31st May 2018 (Ref. 1855) for the construction of 31 no. residential houses and all associated site development works.
- **Project Site No.2: Large Residential Development as submitted under Limerick City & County Council reference LRD 2560271:** The proposed development incorporates 114 no. residential units comprising: 16 no. 2.5-storey 4-bed detached units; 8 no. 2.5-storey 3-bed semi-detached units; 36 no. 2.5-storey 3-bed terraced units; 19 no. 3-storey 2-bed duplex units; 19 no. 3-storey 3-bed duplex units; and 16 no. 2-bed apartments within 2 no. 4-storey blocks. The development also includes an ancillary apartment storage facility (including bin and bike stores), a crèche facility, new access road off Mount Green Road, on-street and off-street car parking, bicycle stands, 6 no. bicycle storage sheds, bin storage, landscaping, temporary construction access, an ESB substation, and all associated site development works. At the time of writing, the application is at appeal stage
- **Project Site No.3: Residential Development as granted under Limerick City & County Council reference 18698:** The development incorporates 38 no. residential units comprising 26 no. semi-detached houses and 12 no. terraced houses. The development includes a new entrance onto the existing L1121 road and all ancillary site development works. Ancillary works include new connections to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking, landscaping, boundary treatments and site development works both above and below ground. This permission was granted on 18/10/2018
- **Project Site No.4: Residential Development as granted under Limerick City & County Council reference 2360263:** The development incorporates 13 no. residential units, comprising 2 no. semi-detached houses and 11 no. terraced houses. The proposal includes boundary treatments, ancillary surface car parking, site services, bin and bike storage, vehicular and pedestrian access, and all associated site development and landscaping works. This permission was granted on 20/09/2023. No amendments or revisions to this permission have been recorded at the time of writing.
- **Project Site No.5: Large-Scale Residential Development as granted under Limerick City & County Council reference 2461270:** The development consists of minor amendments to the permitted Strategic Housing Development (SHD) Reg. Ref. ABP-307631-20, including the provision of 4 no. sets of pedestrian gates to the permitted apartment blocks (A-D), along with associated works and landscaping treatments. The remainder of the development will remain as permitted under SHD Reg. Ref. ABP-307631-20. This permission was granted on 19/02/2025.
- **Project Site No.6: Residential Development as granted under Limerick City & County Council reference 181104:** The development comprises 89 no. residential units, including (i) 20 no. semi-detached dwelling units; (ii) 5 no. semi-detached buildings, each comprising a semi-detached dwelling combined

with a two-bedroom ground floor apartment and a one-bedroom first floor apartment; (iii) 2 no. terraced buildings, comprising 10 no. terraced units; (iv) 4 no. ground floor apartments and 4 no. three-bedroom duplex units overhead; (v) 1 no. five-storey apartment block with 19 no. two-bedroom apartments and 1 no. one-bedroom apartment; (vi) 1 no. five-storey apartment block with 16 no. two-bedroom apartments; and (vii) a creche accessed via an existing entrance onto Castletroy College Road. Ancillary site development works include new connections to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking, landscaping, boundary treatments, and all associated site development works above and below ground. This permission was granted on 30/04/2019.



Figure 2.10 Map denoting 0.5km radius from subject site (Source: Google Earth)

The relevance of the above list of cumulative projects may differ as between the environmental topics contained in this Environmental Impact Assessment Report when considering cumulative impact.

The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the following EIAR chapters has regard to these in the assessment and mitigation measures proposed.

As such with the necessary mitigation for each environmental aspect, it is anticipated that the potential

cumulative impact of the proposed development in conjunction with the other planned developments will be minimal.

2.6 Mitigation and Monitoring

Monitoring activities outlined in Chapters 4 to 15 of this EIAR will be undertaken throughout the construction phase to ensure no significant environmental impacts arise during the development of the site. The Construction and Environmental Management Plan (CEMP), submitted with this application, details the monitoring measures that will be passed to the appointed contractor and refined before work begins on-site.

The appointed contractor will develop a tailored Construction Environmental Management Plan (CEMP) prior to the commencement of works. This plan will serve as a framework to implement the mitigation and monitoring measures specified in the EIAR. The CEMP reflects the applicant's commitment to conducting the construction process responsibly, aiming to avoid or minimize potential environmental impacts. All site personnel will be trained and required to adhere to the CEMP's provisions.

2.7 Commissioning

The testing and commissioning of essential services such as drainage, water supply, gas, electricity, and telecommunications will adhere to the relevant codes of practice outlined in Chapter 7 of the EIAR.

2.8 Decommissioning

The proposed development has a design life exceeding 50 years. Consequently, for the purposes of the Environmental Impact Assessment (EIA), the project is regarded as a permanent installation, and a decommissioning phase has not been included in this report.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 3: ALTERNATIVES

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

FEBRUARY 2026



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RECEIVED: 04/03/2026

3 ALTERNATIVES

3.1 Introduction

This Chapter of the EIAR sets out the reasonable alternatives that have been considered for the proposed development and provides an indication of the main reasons for the final scheme choice, taking into account the effects on the environment in the context of the characteristics of the site (receiving environment). Article 5(1)(d) of the EIA Directive requires Environmental Impact Assessment Reports (EIAR) to include the following:

“a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment”.

Paragraph 2 of Annex IV elaborates the requirement as follows:

“A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), the consideration of alternatives also needs to be cognisant of the fact that:

“...in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant ‘alternative location’...”

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

The EPA Guidelines (EPA, 2022) states:

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

Thus, the reasonable alternatives studied by the project design team and in the context of the associated Regulations, the alternatives of the Proposed Development in this EIAR Chapter as follows:

- Alternative Locations.
- ‘Do Nothing’ Alternative.
- Alternative Processes.
- Alternative Mitigation Measures.
- Alternative Layouts & Designs.

This chapter has been prepared by Ronan Woods, EIAR Manager, with assistance from Niall Carr, EIAR co-ordinator at Genesis Planning. Ronan has 24 years professional experience of town planning in Ireland, is a Corporate Member of both the Irish Planning Institute and the RTPI. Niall has 5 years’ professional experience in the planning field, has a MSc - Masters in Planning, Regeneration and Development and is also a corporate member of the RTPI.

3.2 Development Rationale

The proposed development seeks to provide 523no. residential units and creche in line with the New Residential land use zoning objective.

The nature of the development is actively promoted at this location by Limerick City and County Council through the Limerick City and County Council Development Plan 2022-2028 ("the Development Plan") and having regard to other strategic plans and guidance.

3.3 Main Alternatives Studied

The main alternatives considered during the development of this project comprise alternative design solutions and layouts for a predominantly residential development at the subject site.

3.3.1 Alternative Locations

Under the Limerick City & County Development Plan (LCCDP) 2022-2028, the subject site is zoned 'New Residential'. The overarching zoning objective is:

"To provide for new residential development in tandem with the provision of social and physical infrastructure."

The development plan was prepared by Limerick City and County Council to provide a framework for future development in the Castletroy area at the subject lands.

It is to be noted the development plan underwent a Strategic Environmental Assessment (SEA), which included an evaluation of alternatives for this site and its surrounding area. In the context of the SEA carried out for the development plan exploring alternative locations for the proposed development was deemed unnecessary.

The CDP emphasizes a balanced approach to strengthening urban centers and fostering growth in key settlements, such as the Castletroy.

Having regard to the development plan and zoning objectives it is not considered necessary to consider alternative sites for the proposed development.

In addition the proposed development is ideally located to achieve clustering with the existing residential area and is ideal in providing additional housing for the growing population in the area.

As such it is considered that the site is entirely suitable for the nature of development as proposed in this planning application. It is not considered necessary to consider an alternative site location for the proposed development as a result.

3.3.2 Do Nothing Alternative

In the event of a 'do-nothing' scenario, the site would remain 'as-is' with the undeveloped nature of the site or its former agricultural use retained.

A do-nothing approach would be contrary to the Council's objectives to promote residential land use at this site, in accordance with national, regional and local planning policy and guidance, including the obligations under the Core Strategy of the adopted statutory Development Plan.

It would potentially result in a failure of the economic needs of the County being appropriately met and the site being identified as 'vacant, or idle land'. An opportunity to achieve efficient and compact development which benefits from existing transport connectivity would also be undermined. A 'do-nothing' approach would be considered inappropriate and unsustainable from a planning and socio economic perspective.

From an environmental perspective, beyond the adverse impact on the socio-economic from a failure to deliver sustainable residential development a 'do nothing' approach is otherwise likely to result in a neutral impact on the environment in respect of material assets, land, water, air, climate, cultural heritage, biodiversity and landscape.

Furthermore if this development does not proceed the associated housing opportunities may be permanently lost for the County. From a socio-economic perspective this would negatively affect the local population and hinder efforts to strengthen and grow Castletroy.

According to the 2022 Census, a significant portion of Castletroy's working population commutes outside the immediate area, with approximately 77% of people travelling between 15 minutes to an hour to work. Additionally, 57.17% of workers rely on private cars or vans for their commute. This heavy dependence on private vehicles contributes to increased greenhouse gas emissions, traffic congestion, and associated negative impacts on human health. Without the development of zoned residential sites near employment and education centres, such unsustainable commuting patterns are likely to continue. This would undermine national and local efforts to reduce emissions from the transport sector, which remains one of the largest contributors to climate change in Ireland.

In summary, adopting a 'do-nothing' scenario is neither suitable nor sustainable, as it would lead to the underutilization of a strategically positioned and serviced landbank designated for residential purposes.

This approach would hinder the achievement of the strategic planning goals for the area. Considering the mitigation measures outlined in this EIAR, and the conclusion that no significant environmental impacts are anticipated with these measures implemented, the comparative environmental considerations do not justify dismissing the proposed development.

3.3.3 Alternative Uses

The over-arching land-use planning approach to delivering residential development focuses on facilitating use alignment with the permitted and discretionary uses outlined under the site's zoning designation.

For ease of reference the permitted and discretionary uses associated with the New Residential zoning designation in the Limerick City and County Development Plan 2022-2028 are detailed in the table below.

Zoning	Permitted Use	Open to Consideration
E3	Allotments, Bed & Breakfast/ Guesthouse, Bring Banks/ Bring Centres, Childcare Facilities, Community/ Cultural/Tourism Facility, Education/Training Facility, Health Centre, Health Practitioner, Nursing Home/ Residential Care or Institution*/ Retirement Village, Residential , Student Accommodation,	Funeral Home, Halting Site, Park and Ride Facilities, Place of Worship, Renewable Energy Installation.

Table 3.1 Zoning and land use matrix

It is noted the development plan emphasizes the importance of fostering sustainable growth within the settlement and encouraging residential development, as highlighted in the CDP:

'Ensure new and existing residential development is of the highest quality, enabling life cycle choices and physical, community, recreation and amenity infrastructure are provided in tandem, to create sustainable, healthy, inclusive and resilient communities.'

Considering the zoning designation of the site, the strategic location and development potential, there are no reasonable alternative land-use scenarios for the proposed development site of 9.7ha that would be a sustainable and appropriate use of land.

In this context the site offers an opportunity to fulfil much needed housing units that would benefit both Castletroy and the broader Limerick City region. Aligning with the vision to support sustainable growth in Castletroy either form of development would have a positive socio-economic impact.

In terms of land use planning, the policy context emphasizes the importance of directing residential development towards established settlements, supporting sustainable growth by providing housing in close proximity to existing and planned employment opportunities.

On consideration of alternative development scenarios, it is evident that while various land uses could be physically accommodated on a site of this scale, the strategic need for housing makes residential development the most appropriate and justifiable option. Given the site's zoning, location within an established settlement, and proximity to employment and services, the delivery of new residential units directly addresses national and local policy objectives aimed at tackling the housing crisis.

Although large-scale commercial development could also generate visual impacts and similar construction-phase effects such as noise, traffic, and soil movement, such a use would not respond to the critical demand for housing nor align with the site's designated land use.

In contrast, residential development supports compact growth, sustainable land use planning, and reduces long-distance commuting by placing homes near existing and planned employment areas.

In conclusion, while alternative scenarios could be technically feasible, residential development represents the most appropriate and policy-compliant use of the 9.7ha site. It delivers significant social and environmental benefits by contributing to much-needed housing supply in a sustainable and strategically located setting.

3.3.4 Alternative Design And Layout

The section below outlines the progression of the proposed development, detailing the exploration of alternative design approaches and the process that led to the final scheme submitted to Limerick City and County Council for planning approval.

Throughout the design process, multiple layout and configuration options were evaluated, with key adjustments and refinements incorporated to shape the final proposal.

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Draft Layout 1

The proposed alternative design (Option 1) for the draft layout highlights an attempt to utilise the site effectively, but several limitations make it less than optimal for the site's potential. Key observations about this layout are outlined below:

- **Movement, Access and Permeability:** The internal road network is overly convoluted and lacks a clear hierarchy, resulting in poor legibility and inefficient movement for vehicles, pedestrians and cyclists. Connections between different parts of the site are indirect, and permeability to adjoining lands is limited, reducing the integration of the development within the wider Castletroy area.
- **Urban Structure and Layout:** The layout is dominated by cul-de-sacs and irregular blocks, which results in a fragmented urban form. This undermines the creation of coherent streets and neighbourhoods and limits opportunities for active frontages and natural surveillance. The arrangement of buildings does not establish a strong spatial structure or sense of place.
- **Open Space and Amenity:** Public open space is poorly distributed, with several small, isolated pockets that are not well overlooked or easily accessible. The layout fails to deliver a clear hierarchy of open spaces, and there is no strong central park or green spine to provide a focal point for the community.
- **Response to Site Context:** The layout does not respond effectively to the site's relationship with Monaleen Road, the R445 Dublin Road or the adjoining residential areas. Building orientation and street alignments do not reinforce connections to the surrounding urban fabric, resulting in a scheme that appears inward-looking and disconnected.

Overall, the Option 1 layout results in a low-density, inefficient use of land that does not support the creation of a walkable, well-connected neighbourhood. The arrangement of streets, blocks and open spaces does not provide a robust framework for a high-quality residential environment, and as such this option was not progressed further.



Figure 3.1 Draft layout no.1 considered by the project team

Draft Layout 2

The proposed alternative design (Option 2) represents a more developed iteration of the masterplan, with an increased residential yield and a more structured street layout, but several limitations remain that reduce its suitability. Key observations are noted below:

- **Site Structure and Legibility:** The layout is organised around large development blocks which create a rigid and repetitive pattern across the site. This reduces legibility and limits the ability to create distinct neighbourhood character areas, resulting in a scheme that lacks variety and a clear sense of place.
- **Relationship Between Built Form and Streets:** A significant proportion of buildings are arranged around internal courts and inward-looking blocks. This reduces the quality of street frontages, with several streets lacking consistent building definition and overlooking, undermining passive surveillance and street activity.
- **Open Space Configuration:** Open space is provided, but it is largely secondary to the building layout. The absence of a continuous green network or linear park reduces permeability for pedestrians and limits opportunities for landscape-led placemaking and biodiversity enhancement.
- **Interface with Surrounding Lands:** The scheme does not establish strong urban edges along Monaleen Road or the Dublin Road, with several site boundaries defined by rear gardens and service areas rather than active frontages. This weakens the integration of the development with the existing urban fabric.

Although Option 2 delivers an efficient quantum of housing, it does so through a layout that prioritises building yield over spatial quality, connectivity and landscape structure. As a result, the option was not considered capable of delivering a high-quality, sustainable residential neighbourhood and was therefore not progressed further.



Figure 3.2 Draft layout no.2 considered by the project team

3.4 Proposed Preferred Alternative

The proposed site layout for the residential development has been carefully designed to optimise connectivity, residential amenity and integration with the surrounding Castletroy area. A clear internal street network links to Monaleen Road and the R445, providing direct access to all parts of the scheme. The street hierarchy accommodates vehicles, pedestrians and cyclists, with traffic-calming measures incorporated to support a safe living environment.

Residential blocks and housing areas are arranged to create a coherent neighbourhood structure, with a mix of houses, duplexes and apartments distributed across the site. The layout includes a crèche, communal facilities and landscaped public spaces to support a balanced residential community. Car and bicycle parking is provided close to dwellings and entrances while avoiding dominance of the streetscape.

The infrastructure strategy integrates with existing services, and Sustainable Drainage Systems (SuDS) are incorporated to manage surface water and enhance the landscape framework. A network of parks and landscaped corridors provides amenity, biodiversity and recreational opportunities for residents.

Overall, the layout balances density, accessibility and quality of place. Buildings and open spaces are positioned to reinforce streets and create active, well-overlooked public areas, ensuring the development integrates successfully with its surroundings.

Final Layout

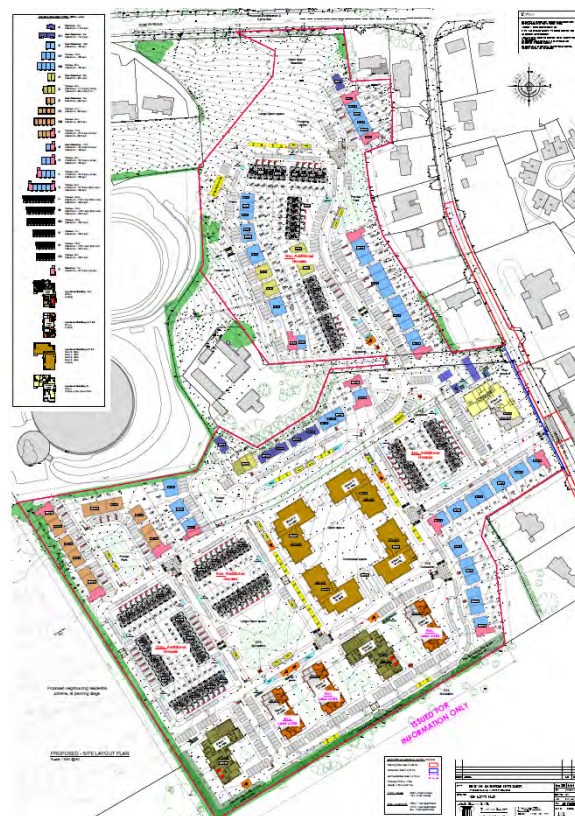


Figure 3.3 Final layout no.3 considered by the project team

The design development process, led by the multidisciplinary design and EIAR team, has focused on prioritising the preservation of the existing environmental improvements. This chapter highlights that the selected alternative is more effective compared to other options explored.

The preferred approach enhances local biodiversity, provides safe and legible access throughout the site, minimises visual impact through a carefully considered layout and architectural treatment, delivers much-needed new housing, and supports climate action through the integration of sustainable design and drainage measures.

The final iteration of the proposed development is not considered to give rise to any significant adverse environmental impacts. Mitigation measures to be implemented at construction and operation stages of the project are summarised in Chapter 17: Summary of Mitigation Measures of the EIAR.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 4: POPULATION & HUMAN HEALTH

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

FEBRUARY 2026



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4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This chapter has been prepared to assess the likely significant impacts on Population and Human Health in respect of the proposed development (as defined in Chapter 2 of this EIA Report).

The Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) recommend that *'the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur'*.

Human health should be considered in the context of environmental pathways which may affect health such as air quality, noise, water and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research.

Accordingly this chapter evaluates the potential significant environmental effects of the proposed development on population and human health.

Furthermore, in accordance with the EPA (EPA, 2022), the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR. The likely significant impacts on with Human Health and Population in regards to issues such as soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are addressed in detail within the following EIA chapters:

- Chapter 5 - Landscape and Visual Impact Assessment
- Chapter 6 - Material Assets: Transportation
- Chapter 9 - Land and Soils
- Chapter 10 - Water and Hydrology
- Chapter 12 - Noise and Vibration
- Chapter 13 - Air Quality

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this Chapter to provide the Planning Authority with a context for their determination.

4.2 Expertise

This chapter has been prepared by Ronan Woods, EIAR Manager, with assistance from Niall Carr, EIAR Co-ordinator at Genesis Planning. Ronan has 24 years professional experience of town planning in Ireland, is a Corporate Member of both the Irish Planning Institute and the RTPI. Niall has 5 years professional experience in the planning field, has a MSc in Planning, Regeneration and Development and is also a corporate member of the RTPI.

4.3 Methodology

To support this assessment a site visit to the application area and its surroundings was conducted in September and October 2025. The purpose of the visit was to examine the characteristics of the land and surrounding area, in order to assess the potential impacts on human receptors.

Furthermore in accordance with the EPA Guidelines (2022) the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR.

The relevant chapters have been cross referenced to provide the Planning Authority with a context for their determination.

The assessment of other health and safety issues that are carried out under other EU Directives are also relevant. These may include reports prepared under the Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Water Framework Directive, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR considers the results of such assessments without duplicating them.

The following publications and data sources were consulted for this assessment:

- National Planning Framework, Ireland 2040 - Our Plan (Government of Ireland, 2018)
- Southern Regional Spatial and Economic Strategy
- Limerick City and County Development Plan (2022-2028)
- Limerick City and County Council website (www.limerick.ie)
- 2022 Census carried out by the Central Statistics Office (CSO)
- Pobal HP Deprivation Index based on 2022 Census Data (CSO)
- Google maps available from <https://www.google.com/maps>
- OpenStreetMap and contributors available from <https://www.openstreetmap.org>
- GeoHive contributors and available from <https://www.geohive.ie>
- Tusla Child and Family Agency website <https://www.tusla.ie>

This chapter has been prepared in accordance with:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Environment Protection Agency (EPA, 2022)
- Health Impact Assessment Guidance. Institute of Public Health (IPH), (IPH, 2021).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report European Commission (EU, 2017)
- Advice Notes for Preparing Environmental Impact Statements Draft Environment Protection Agency (EPA, 2015).

This chapter follows these guidelines and will examine the health effects relevant to the proposed development as they relate to the relevant study area.

The description of the sensitivity, magnitude and significance, outlined within this assessment are based on the Health Impact Assessment Guidance (IPH, 2021) criteria, while the probability and duration of effects are based on the definitions set out within Section 3.7 of the 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

4.3.1 Assessment Sensitivity of Population

The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area the sensitivity of individuals in a population will vary. The Health Impact Assessment Guidance (IPH, 2021) sets out conceptual model of the different components of sensitivity (Figure 5.1). It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of sensitivity. The conclusion may be summarised as a high, medium, low or negligible sensitivity to change.

The existing sensitivity of the receiving environment (in terms of population and human health) has been appraised for the study area with a desk-based assessment of routine demographic and health indicators, rather than the use of surveys or collection of primary data. This includes analysis of existing data (based on the availability of information) from the Central Statistics Office (CSO) and the Pobal database to build up a profile of the baseline population information within the study area. Google maps has also been used to inform the baseline description of the area to inform the proximity of the Site to areas of economic activity, employment, community infrastructure, emergency services, tourism and recreation amenities.

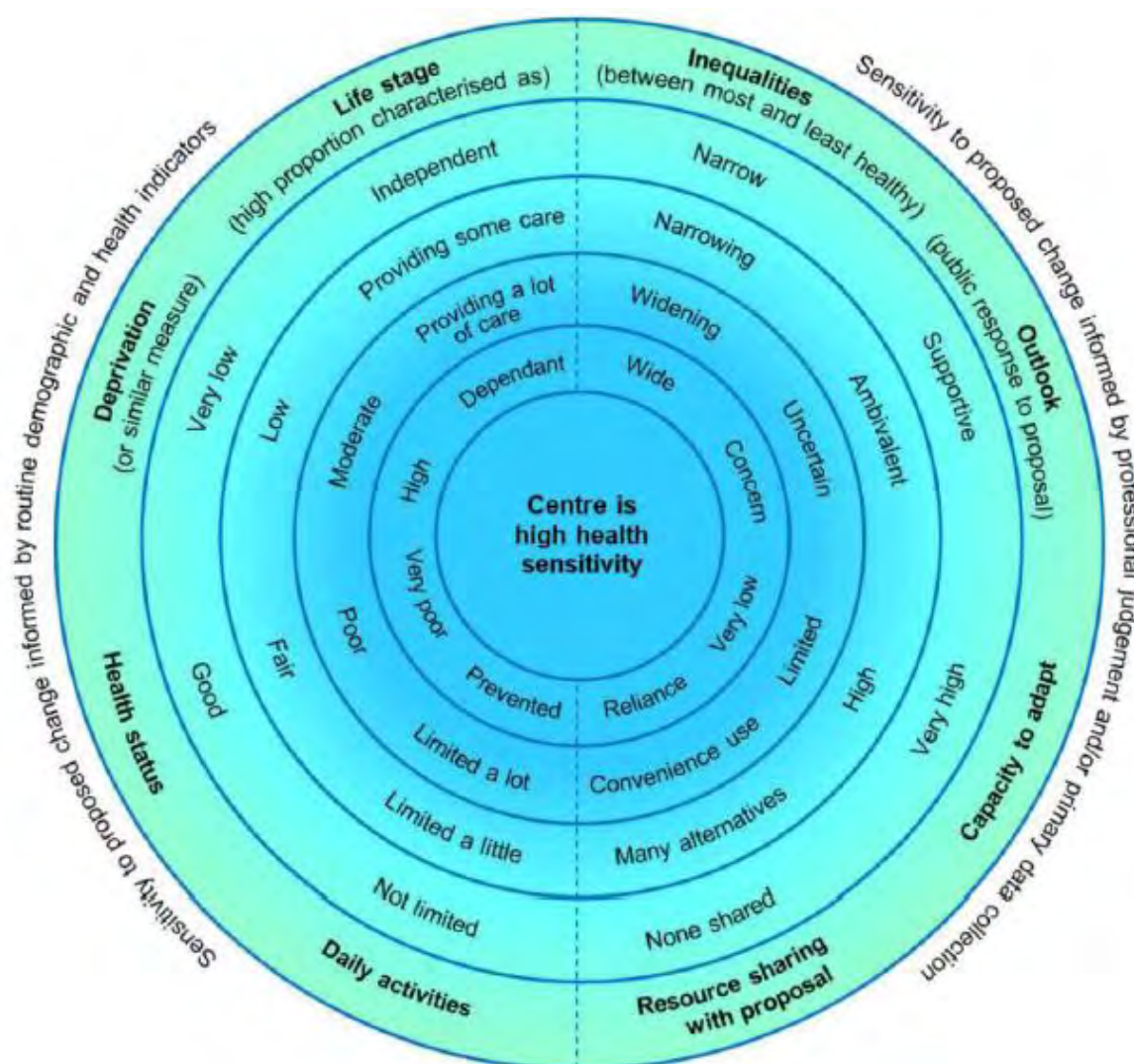


Figure 4.1 Health sensitivity: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))

4.3.2 Magnitude of Impact

Magnitude considers the characteristics of the change which would affect the receptor as a result of the proposal. The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of sensitivity (Figure 5.2). Again, this model provides different components of *magnitude*. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of *magnitude*. The conclusion may be summarised as a high, medium, low or negligible magnitude of change.

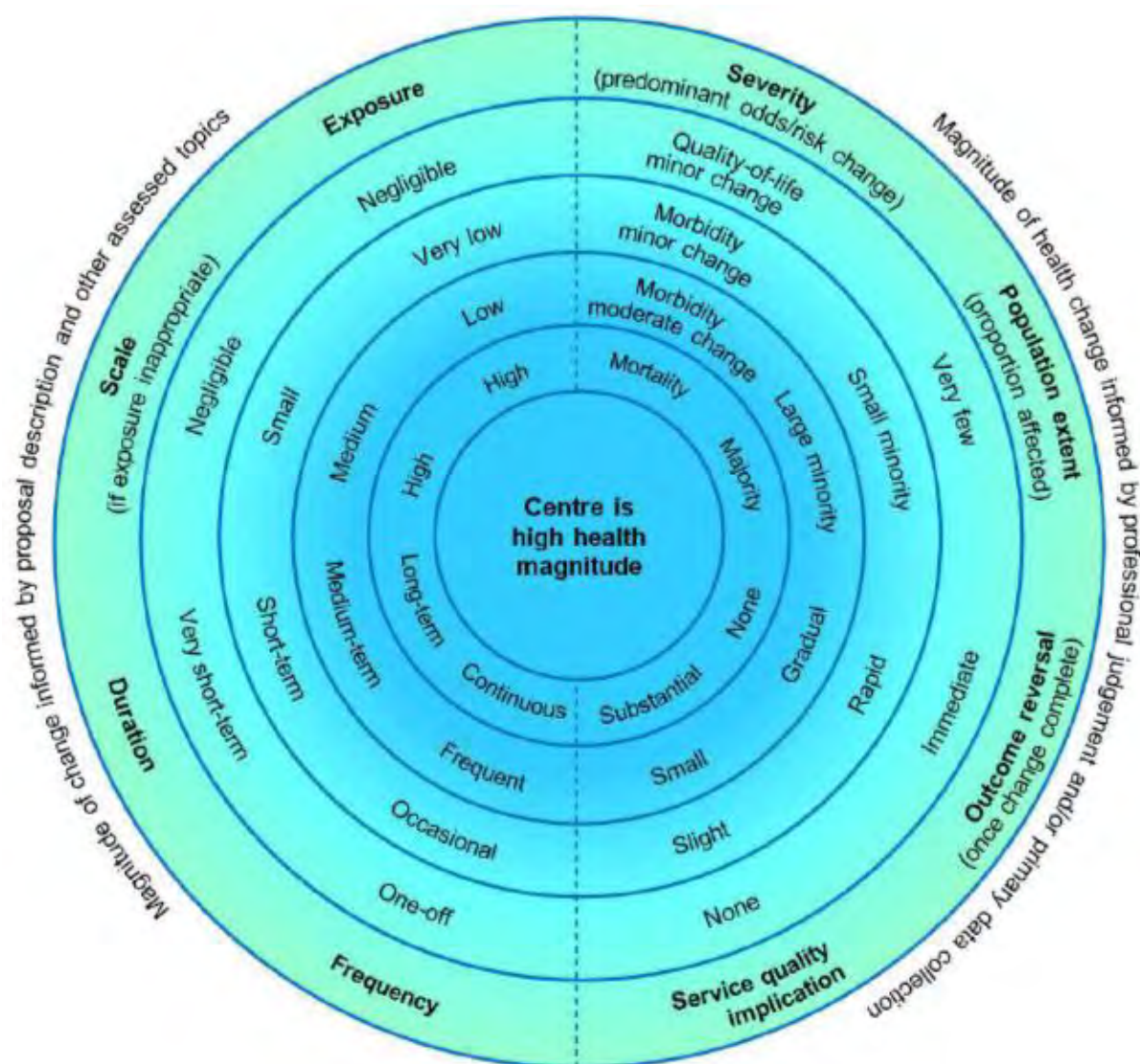


Figure 4.2 Health magnitude: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))

The significance of effects relies on informed, expert judgement about what is important, desirable or acceptable with regards to changes triggered by the proposal in question. The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of the effects and the sensitivity of the receptor.

The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of significance. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding that a health effect is significant or not significant.

The Health Impact Assessment Guidance (IPH, 2021) model brings together different types of evidence, e.g. scientific literature, public health priorities, regulatory standards and health policy. The model thus not only take into account a range of evidence sources, but also a diversity of professional perspectives, e.g. academics, public health practitioners, regulators and policy makers.

The model below includes the factors of magnitude of impact and the sensitivity of receptors as determined above. This EIA assessment typically relies on regulatory thresholds, where there would be formal monitoring by regulators, to set out the acceptability or desirability of change to population health.

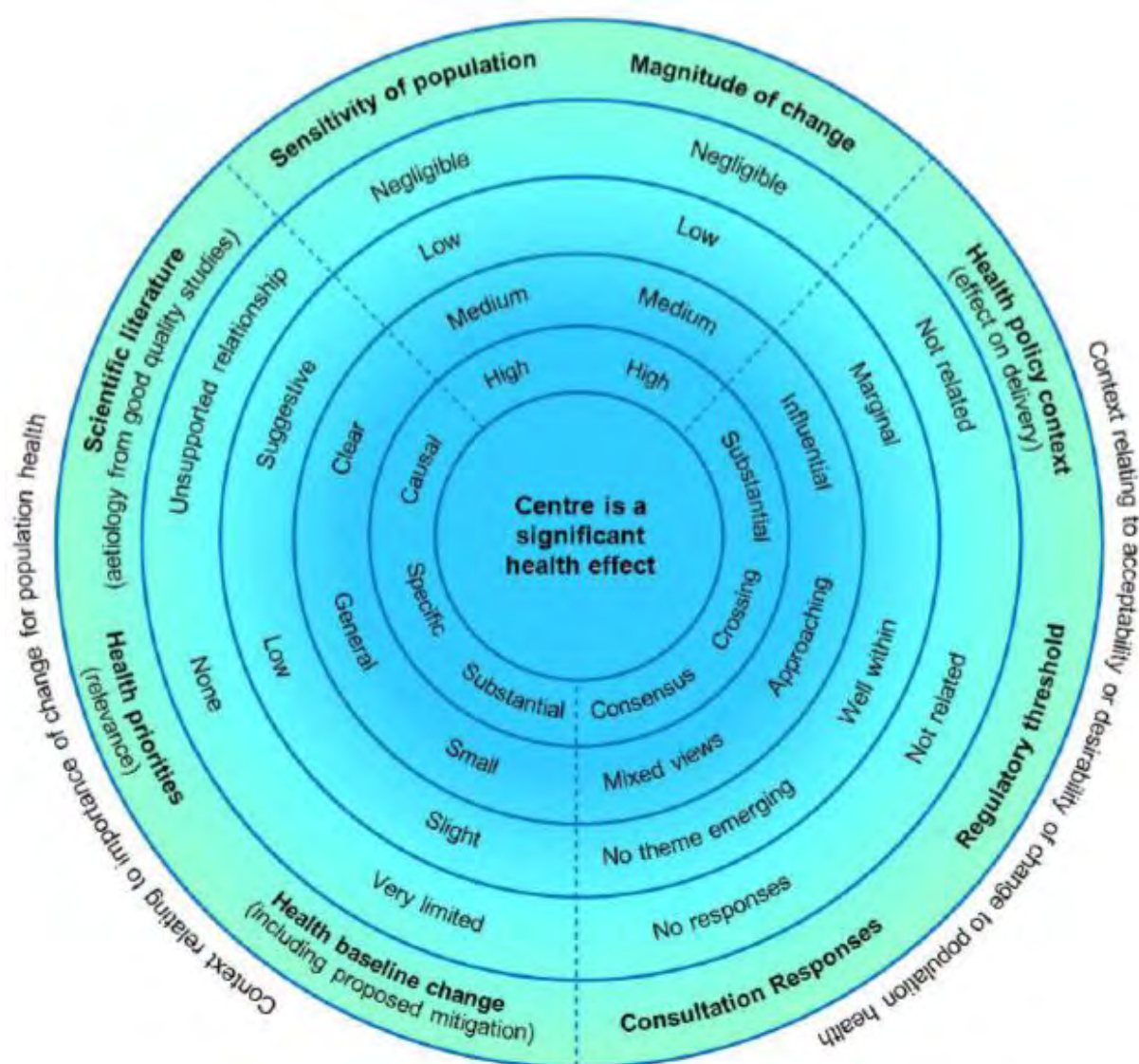


Figure 4.3 Health significance: conceptual model

4.4 Baseline Environment and Study Area

There is no specific guidance available on an appropriate study area to focus the assessment of existing land use and/or permitted projects. The research area has been established using expert judgement and based on the accessibility of data and taking into consideration the potential for impact from the proposed development.

It is acknowledged that projects like the one proposed can have an impact on activity in a larger area than only the site itself. Generally the closer to the works the greater the potential for impacts. The most significant environmental impacts are likely to be confined within 50-150 m of the proposed development. Some effects from the proposed development, including air quality and traffic, might have a larger area of effect, and these are addressed in further detail in the corresponding expert assessments that set out the chapters within this EIAR.

The project being considered, is not expected to have Regional, National or International, or Transboundary impacts on Human Health. Therefore, the study area has been restricted to the neighbouring community (site-specific population), and wider community (local population). A general study area of 1 km from the site location is included for population statistics, while the wider area of circa 1km from the site location has been used to inform the baseline description of the area. This involves the 3no. surrounding Electoral Districts (Eds) namely:

- Ballysimon ED, where the project is located;
- Limerick South Rural ED to the west;
- Ballyvara ED to the east.



Figure 4.4 Study area

4.4.1 Site Area

The application area comprises 9.7 hectares and is located on Monaleen Road in the Castletroy area of Limerick. It is strategically positioned with the R445 regional road forming its northern boundary and the Castletroy Golf Club situated directly to the south.

In terms of the site itself it comprises a greenfield parcel of lands measuring 9.7 hectares.

In terms of access a new vehicular entrance to the site will be established from Monaleen Road, providing convenient connectivity. In addition, a dedicated pedestrian access point is proposed from the R445 on the northern boundary to support active travel.

Existing bus services run along R445 Road, and pedestrian connections to local facilities will be enhanced through integrated footpaths and safe crossing points.

Foul sewer and mains water infrastructure services also existing along the local road with existing capacity to service the site.



Figure 4.5 Local context

4.4.2 Public Transport

The site is served by Monaleen Road, which connects to the R445 (Dublin Road) and provides direct access to the wider road network, including the M7 motorway.

The location benefits from strong road connectivity, facilitating efficient access to and from Limerick City and the surrounding region.

Existing footpaths and cycle infrastructure in the area offer good access to local services and amenities. The site is also well served by public transport, with regular 308 bus services operating along Dublin Road to Limerick City Centre.

Overall, the lands are strategically positioned within an established and accessible area, making them well suited to residential development in terms of local connectivity.



Figure 4.6 Local Transport network

4.4.3 Population

For this assessment Electoral Divisions (EDs) within a 1 km radius of the site have been analysed. As noted above while no specific guidelines define the zone of influence for such studies this radius was selected based on professional judgment to assess the local demographic and employment capacity effectively.

Within this zone of influence, there are three EDs:

- Ballysimon ED, where the project is located;
- Limerick South Rural ED to the west;
- Ballyvara ED to the east.



Figure 4.7 Study area

4.4.4 Population Health Sensitivity

The purpose of the population health sensitivity assessment is to identify the likely sensitivity of the local population and its capacity to absorb change. It is considered that for the purpose of this assessment that available data on:

- Population;
- Deprivation;
- Life Stage;
- Health Status.

The analysis below provides sufficient information to establish the population sensitivity and to inform the EIAR with a context for this assessment.

• Population

As per the 2022 Census the total population of the study area is 17,715. This reflects an increase of 1,823 people since the 2016 Census and 2,746 people since the 2011 Census.

Our analysis also finds that the Electoral Division (ED) containing the project site, Ballysimon ED, experienced a notable population growth of 9.2% increase from 2016 to 2022.

Area	Population For Census Year		% Change 2016-2022
	2016	2022	
State	4,761, 865	5,123,536	7.6%
Ballysimon ED	13,590	16,540	21.7%

Table 4.1 Population change from 2016-2022 (CSO statistics)

To capture the local population changes and gain an understanding of how the Eds and County as a whole compare we also summarise population changes since 2011 below.

Location	2011	2016	2022	% Change 2011 - 2022	Change 2016 - 2022	% Change 2016 - 2022
Ballysimon ED	13073	13590	16540	26.5	2,950	21.7
Limerick South Rural ED	1,660	1786	2215	33.4	555	24
Ballyvara ED	4269	4288	4513	5.7	244	5.2
Study Area Total	19002	19664	23268	22.5	3604	18.3
County Limerick City and County	189943	194899	209536	10.3	14637	7.5
State	4588252	4761865	5149139	12.2	387274	8.1

Table 4.2 Population change from 2011-2022 (CSO statistics)

To gain an understanding of the age profile of the area our analysis has also reviewed CSO statistics on age. In 2022 there were 11,592 children aged 0-4 years (pre-school children) in Limerick City and County, representing 5.5% of the total population. This is slightly lower than the 5.54% of pre-school children in Ballysimon ED, where there were 917 children in this age group. We summarise the data:

- Within the primary school age category (5-12 years), there were 25,124 children in Limerick City and County, accounting for 12% of the population. In comparison, the primary school age group in Ballysimon ED (children aged 5-12) accounted for 12% of the total population, with 1982 children.
- Among young adults (aged 20-39 years), there were 54,517 individuals in Limerick City and County, which makes up 24.6% of the population. In Ballysimon ED, young adults represent 37.5% of the population, with 6195 people in this age group.
- In terms of older individuals (aged 65+ years), Limerick City and County had 33588 people, representing 16% of the population. In Ballysimon ED, older adults (65+) accounted for 10.4% of the population, with 1728 individuals in this age group.

• Deprivation

The Health Impact Assessment Guidance (IPH, 2021) outlines that impact assessments should consider if the population is already stressed by limited resources or high burdens as well as if groups are affected that have reduced access to financial, social and political resources. Deprivation differences between areas are indicative

of social gradients, which are central to the consideration of health inequalities. Deprivation statistics for Ireland are available from the Pobal HP Deprivation Index that shows the overall affluence and deprivation. This index draws on data from the national Census and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation that are measured by ten key socio-economic indicators from the Census of Population.

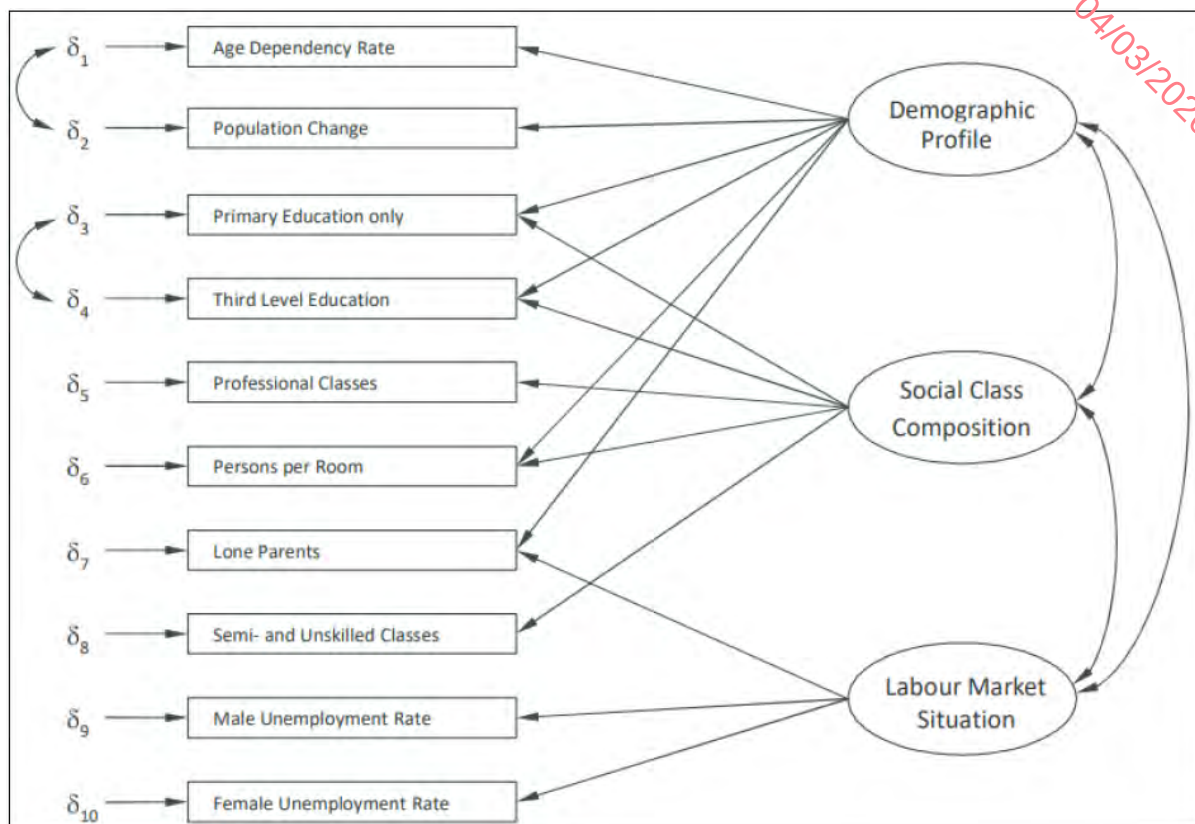


Figure 4.8 Basic Model of the Pobal HP Deprivation Index

The Pobal HP Deprivation Index Relative Index Score allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in the table below. In order to make a uniform assessment using the conceptual model as set out in the figure above a relative population sensitivity the deprivation score of 'Very disadvantaged', or 'Extremely disadvantaged' would represent a high sensitivity. Conversely, a 'Extremely affluent' or 'Very affluent' would represent a very low sensitivity.

Deprivation Score	Pobal HP Description	Sensitivity of Population
> 30	Extremely affluent	Very Low
20 to 30	Very affluent	Very Low
10 to 20	Affluent	Low
0 to 10	Marginally above average	Low
0 to -10	Marginally below average	Moderate
-10 to -20	Disadvantaged	Moderate
-20 to -30	Very disadvantaged	High
< -30	Extremely disadvantaged	High

Figure 4.9 Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)

This index integrates three key dimensions: demographic profile, social class composition, and labour market conditions. Scores on the index range from -35 (indicating extreme disadvantage) to +35 (indicating extreme affluence).

An extract from the Pobal Deprivation Index is shown below and illustrates the distribution of affluence and deprivation at the ED level.

Area	Deprivation Score	Pobal HP Description
State	0	Average
Limerick City and County	0.83	Marginally Below Average
Ballysimon ED	9.51	Marginally Above Average

Table 4.3 Deprivation score (as per Pobal Index)

We note that under the 2022 Census the County has been categorised as ‘Marginally below average’ whereas this classification has not been applied to Ballysimon ED with the score recorded under the Pobal Index at 9.51, classified as ‘Marginally above average’. Notably the specific small area (ID: 127026025) where the project site is situated has a score of 8.23, also placing it in the ‘Marginally Above Average’ category.

Therefore it can be concluded that the study area predominantly falls within the above average category. This indicates a low population sensitivity (deprivation) within the study area.

- Life Stage (Age Dependency)**

The Health Impact Assessment Guidance (IPH, 2021) outlines that life-course analysis is often used in public health and reflects differing health sensitivities and needs at different ages. Typically, children and older people are particularly sensitive to change, including due to being dependants. Dependents are defined for statistical purposes as people outside the normal working age of 15-64. Dependency ratios are used to give a useful indication of the age structure of a population with young (0-14) and old (65+) shown as a percentage of the population of working age (15-64).

A low dependency ratio indicates that there is a larger proportion of working population age (15-64) years as compared to young (0-14) and old (65+). Conversely, a high dependency ratio indicates that there is a larger proportion of young (0-14) and old (65+) as compared to working population age. High dependency ratio can also indicate if some groups are more likely to be at home during the day (for example, due to childcare, or retired persons) and would therefore be more likely to be impacted by a development within the area.

Age dependency ratio are available through the Pobal Online Geo-Profiling tools (<https://maps.pobal.ie>) which are based on the national Census.

The age dependency ratio for the study area is shown in the table below. From these dependency ratios we can tell that the study area is less dependent when compared with ROI. Indicating a largely ‘independent’ population within the Study Area as compared ROI which can be defined as per the conceptual model as ‘providing some care’ to ‘providing a lot of care’.

Age Dependency Ratio For Census Year		
Area	2016	2022
State	52.7%	53.2%
Ballysimon ED	25.47%	27.97%

Table 4.4 Age Dependency Ratio within the Study Area (Pobal Geo-Profiling, 2022 Census)

- Health Status (General Health)**

The CSO as part of the census records an overall self-reported measure of population health within Ireland. Areas with a poor health status are typically considered to be of a higher sensitivity and more susceptible to change in environmental conditions.

The table below shows the self-reported measure of population health within the Study Area compared to ROI. This shows the area predominately self reports their health as 'Very Good' in-line with national trends.

Area	% population describing their general health					
	Not Stated	Very Bad	Bad	Fair	Good	Very Good
State	1%	1%	3%	12%	30%	53%
Ballysimon ED	52.4%	24.6%	5.2%	0.9%	0.2%	16.7%

Table 4.5 Self-reported measure of population health (CSO, 2022 Census)

Ability to perform daily activities

People's ability to perform day-to-day activities is relevant to population sensitivity, particularly where there are changes in access to services or community amenities. Persons with disabilities can also be more susceptible to the changes in environmental conditions. The CSO as part of the census records an overall self-reported measure of persons with disabilities within Ireland.

The table below details the number of persons with a disability compared to the population as a whole. The data shows that the study area has a lower % of persons with a disability than the national average; indicating that for persons within the area there is a relatively limited restrictions on daily activity.

Area	Persons with a disability	Population	% persons with a disability
State	1,109,557	5,123,536	21.6%
Ballysimon ED	2884	16540	17.4%

Table 4.6 Persons with a disability

Summary of Population Health Sensitivity

The sensitivity of the surrounding area has been considered based on the details of the published data available from CSO and Pobal. The study area has seen a population growth between the 2016 and 2022 census. The Pobal HP Deprivation Index shows the area be Marginally Above Average indicating a relatively Low Population Sensitivity (Deprivation) within the study area.

There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows, 16.9% describes their health status as 'Very Good' or 'Good' and 31.8% as 'bad' or 'very bad', with 52.4% as 'Not stated'. In terms of disability, the study area has a lower percentage of persons with a disability compared to the national average. This suggests that restrictions on daily activity within the population are relatively limited, further indicating a low level of vulnerability in this regard.

The population within the study area is therefore not particularly sensitive to change, with a ranking of low sensitivity.

4.4.5 Location and Character of the Local Environment

The purpose of describing the location and character of the local environment provides useful information on the current local community and usage within the study area provide the Planning Authority with a context for this assessment. This includes community and social infrastructure that covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. In this context it includes local business, residential areas, education, health facilities, emergency services, and places of worship, and green infrastructure.

Furthermore the baseline identifies tourism and landscape amenity within the study Area which provides an indication on current intrinsic values placed on the area for local, national and international users that may be impacted by the Proposed Development.

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the proposed development, this includes economic resources, recreational and bathing waters, and drinking water resources.

While a general study area of ED's within 1 km from the site location is included for population statistics the wider area to include the neighbouring EDs from the site location has been used to inform the baseline description of the area.

4.4.5.1 Social Infrastructure

Desktop research reveals that the study area is well-served by a variety of social infrastructure, such as schools, healthcare facilities, retail outlets, and recreational amenities, all primarily concentrated around the town of Castletroy.

4.4.5.2 Community Facilities

The Castletroy Golf Club is a focal point for the area.

The wider Castletroy environs includes several convenience retail units including a Spar, restaurants and cafes in the area. For further needs, residents can access stores like Centra, SuperValu, Odeon Cinemas and McDonalds.

The area also has several community facilities which includes Maguires Pitches, University Limerick facilities, Aisling Annacotty Football Club, Church of Our Lady Help of Christians and a post office. Additional services in the area include a vet, beauty salon, legal services, a florist, a gym, real estate agents, and a hairdresser.

4.4.5.3 Education Facilities

There are a total of 22 primary schools and 6 post-primary schools located within the study area.

Primary Schools	Post-Primary Schools
St Vincents Sp School	Castletroy College
Scoil Naisiunta Lios Na Groi	Limerick City East Secondary School
Donoughmore N S	Colaiste Mhichil
Gaelscoil Chaladh An Treoigh	Gaelcholáiste Luimnigh
Monaleen National School	Ardscoil Mhuire
Milford Grange National School	St Munchin's College

Le Cheile National School	
St Brigids National School Limerick	
Gaelscoil Sheoirse	
Our Lady Queen Of Peace School	
An Mhodh Scoil	
Limerick School Project	
St Michaels	
Scoil Iosagain	
Presentation Primary School	
St Johns Convent	
St John The Baptist Boys N S	
Scoil Padraig Naofa B	
Scoil Padraig Naofa C	
St Mary's National School	
Scoil Ide	
Sn An Phairtin Mixed	

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Table 4.7 Local schools

Census 2022 data for Ballysimon, Ballyvara, and Limerick South Rural shows a high level of educational attainment among residents. In all three areas a significant portion of the population has completed secondary or higher education. Specifically, upper secondary education was completed by 12-20% of individuals, and tertiary qualifications (including higher certificates, bachelor's degrees, and postgraduate degrees) were held by 30-52% of respondents. In terms of qualifications, Ballysimon had the highest percentage (20.1%) with an honours bachelor degree or professional qualification, while Ballyvara and Limerick South Rural also had strong representation in this category at 18.9% and 12.2%, respectively.

4.4.5.4 Tourism Facilities

Tourism in Ireland continues to experience strong growth and remains an important contributor to national and regional economic development.

The development site is located within Castletroy in the eastern environs of Limerick City. Limerick is one of Ireland's key urban centres and a gateway city along the Wild Atlantic Way with a rich cultural, sporting and historical heritage that attracts both domestic and international visitors.

Limerick city offers a wide range of attractions including King John's Castle, the Hunt Museum, St. Mary's Cathedral, and the Limerick City Gallery of Art. The nearby University of Limerick and its riverside campus are also recognised as significant visitor destinations, hosting major sporting, cultural and academic events throughout the year.

The Castletroy area itself is primarily residential in character, with supporting community, educational, and recreational amenities. The development site is located within a greenfield area and does not directly adjoin any designated tourism assets or heritage sites. Tourism is therefore not a major land use or economic activity in the immediate environs of the site.

4.4.5.5 Health Facilities

A total of 10 health facilities were identified within the study area, including a medical center, pharmacies, mental health services, physiotherapists and medical care facilities.

No.	Name
1	Hanly Doctors Castletroy Park Medical Centre
2	Griffin Daly Medical Centre Castletroy
3	Limerick–Castletroy Primary Care Centre
4	Castletroy Physiotherapy Clinic
5	Mid West Physiotherapy Castletroy
6	Castletroy Pharmacy
7	Castletroy Park total health Pharmacy
8	Lloyds Pharmacy
9	Limerick Mental Health Association
10	Evolve Mental Health

Table 4.8 Local Health Facilities

4.4.5.6 Creche Facilities

The study area is supported by 18no. childcare facilities the majority of which are located near Castletroy.

These facilities are all registered with TUSLA's Register of Early Years Services for County Limerick City and County. Among these 8no. facilities all offer full-day care services, which are complemented by a variety of sessional and part-time care options.

No.	Name	Type
1	Wilmot's Childcare	Full Day/Part Time/Sessional
2	Karibu Montessori	Full Day/Part Time/Sessional
3	Magic Minds	Sessional
4	Niki O'Connell Montessori School AMI	Part time
5	Early Learning Academy	N/a
6	Kiddies Klub	Sessional
7	Tall Trees Childcare	Full Day/Part Time/Sessional
8	Unikids Childcare	Full Day
9	Silver Apples Creche	Full Day/Part Time/Sessional
10	The Old School ABC	Full Day/Part Time/Sessional
11	Jollytots Preschool	Full Day/Part Time/Sessional
12	Starting Small Standing Tall	Full Day/Part Time/Sessional
13	Castletroy View Montessori	Sessional
14	Happy Times Preschool	Sessional
15	Small World	Sessional
16	Park Childcare	Full Day
17	Early Start Education	Part time
18	Lilliput Montessori	Sessional

Table 4.9 Local Childcare Facilities

4.4.5.7 Employment

According to the CSO Labour Force Survey (Quarter 2 2025), Ireland's employment continued to grow, with 2,818,100 people employed, reflecting a 2.3% increase from the previous year. This growth was driven by a rise in both male and female employment, with males increasing by 43,700 (+3%) and females by 20,300 (1.6%).

The overall employment rate for those aged 15-64 reached 74.7%, up from 74.4% in Q2 2024. In Q2 2025, the employment rate for males aged 15-64 years was 78.5%, compared to 71.0% for females

By economic sector, notable growth occurred in Construction (up by 29,600 or 18.4%) and Human Health & Social Work Activities (up by 14,500 or 3.9%). The increase in Construction was primarily driven by gains in the Construction of Buildings (+17,800) and Specialised Construction Activities (+14,400). Similarly, growth within Human Health & Social Work Activities was led by Residential Care Activities (+8,700) and Social Work Activities without Accommodation (+9,400).

The table below sets out a detailed summary of Employment status for all Eds in the study area.

Industry	Ballysimon No. of families	Ballysimon %	Ballyvara No. of families	Ballyvara %	Limerick South Rural No. of families	Limerick South Rural %
Agriculture, forestry and fishing	42	0.6%	48	2.4%	6	0.6%
Building and construction	191	2.6%	86	4.3%	43	4.2%
Manufacturing industries	1051	14.4%	337	16.7%	186	18.1%
Commerce and trade	1523	20.9%	423	21%	213	20.8%
Transport and communications	664	9.1%	176	8.7%	91	8.9%
Public administration	281	3.9%	109	5.4%	35	3.4%
Professional services	1902	26.1%	557	27.6%	248	24.2%
Other	1640	22.5%	280	13.9%	203	19.8%
Total	7294	100%	2016	100%	1025	100%

Table 4.10 Local Employment Types

In terms of industry, the dominant sector across Ballysimon, Ballyvara and Limerick South Rural is Professional Services, accounting for 26.1%, 27.6% and 24.2% of families respectively.

Commerce and Trade also represents a significant proportion, with 20.9% of families in Ballysimon, 21% in Ballyvara and 20.8% in Limerick South Rural engaged in this sector.

Other notable sectors include Manufacturing Industries, Transport and Communications, and Building and Construction, with representation varying between 8% and 18% across the three areas. Smaller proportions are recorded in Public Administration and Agriculture, Forestry and Fishing.

4.5 Characteristics of the Proposed Development

4.5.1 Proposed Development

Columbia Estates Management (IE) Limited (the prospective applicant) intend to apply for a 10-year permission comprising of a total of 523 no. residential units together with the provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g)Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of associated ESB substations.
- (l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

4.5.2 Potential Impact of the Proposed Development

The main potential impacts on population and human health from the proposed development are potential for spills/leaks, air emissions, noise, visual, and traffic impacts.

A summary of the main potential impacts as they are relevant to human health criteria during construction, commissioning, operation and decommissioning of the proposed development is presented herein.

4.5.3 Construction Stage

- **Potential Impacts on Businesses and Residences**

The main potential impacts on local businesses and residences associated with the proposed development will be in relation to nuisances; air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

The baseline environment, pollution pathways, relevant mitigation measures and residual impacts have been assessed in greater detail within the corresponding chapters:

- Chapter 5 - Landscape and Visual Impact Assessment
- Chapter 6 - Material Assets (Transportation)

- Chapter 7- Built Services
- Chapter 8- Material Assets: Waste
- Chapter 9- Land and Soils
- Chapter 12 - Noise and Vibration
- Chapter 13 - Air Quality

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services. There will also be a need to bring in specialist workers on a regular basis that may increase the above estimated working population at times. Specialists are only likely to stay for shorter periods depending on the nature of the work. The construction phase, therefore, is considered to have the potential to have an imperceptible, temporary and positive impact on the economy and employment of the local and wider area.

- **Potential Impacts on Landscape Amenity and Tourism**

There will be no impact on the local parks or the larger amenity areas. It is not anticipated the proposed development will have any impact on local tourism or shopping amenities. The proposed development will not create any wastewater discharge which could have a potential impact on local amenities or the local population. The foul drainage has been designed such that the development be served with a series of sewer networks in line with Irish Water Code of Practice for Wastewater.

Visual impacts and amenity impacts perceived by individual persons are highly subjective and difficult to characterise however, it is considered that the overall impact on the community will be **medium** and **temporary** during the construction phase.

- **Potential Impact from Land and Water Emissions on Human Health**

With reference to Chapter 9 (Land and Soils) during construction of the proposed development there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) - arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) - arising from construction materials;
- Hydrocarbons (ecotoxic) - accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) - arising from accidental discharge from on-site toilets and washrooms.

Accidental spillages which are not mitigated may result in localised contamination of soils and groundwater underlying the site, should contaminants migrate through the subsoil's and impact the underlying groundwater.

With reference to Chapters 9 & 10 (Lands, Soils, Water and Hydrology) the GSI Well Card Index does not show any wells drilled or springs at the site.

The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site. The GSI groundwater wells and springs register was consulted. This shows all registered groundwater abstractions which are above 25m³ per day, with grid locations rounded to the nearest kilometre (for privacy reasons). There are no registered groundwater abstractions on site. The closest abstraction site is located c. 1km to the west; unique well ID IE_GSI_GW_Well_19928, well name 1415SEW001, Depth of hole is 73.2m and source yield is 54.50m³/day. This is within the 2km study area (plus 1km to account for grid location rounding).

There are no groundwater monitoring sites in the vicinity for Group Water Schemes, Public Water Supplies, Regional Water Supply Schemes, or Source Protection Zones, nor are there any Group Water Scheme abstraction sites. The closest monitoring stations are the Castleconnell Groundwater Station (IE_SH_G_052) is located c. 2.3km east on the Mulkear River, the Groody River station (IE_SH_25S012600) is situated c. 1.2km west of the site. There is a group water scheme and a public water supply protection area at the Murroe area c. 12.1km and 10.4km east respectively.

Even with the lack of receptors i.e., no groundwater wells in the vicinity of the site or direct pathway to surface water, the proposed development construction phase could impact population and human health due to excavation material transported from the site with no appropriate mitigation measures or in the event of an accidental pollution incidence.

In respect of the proposed development construction phase, considering the environmental factor of soils, geology and hydrogeology, the predicted impact on Human Health would be short-term, slight, and negative. With reference to Chapter 10 (Water & Hydrology) during construction of the proposed development, there is a risk of accidental pollution incidences from the following sources:

- Increased sediment loading in run-off, possibly containing increased silt levels or contaminated by construction activities;
- Suspended solids (muddy water with increase turbidity) - arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) - arising from construction materials;
- Hydrocarbons (ecotoxic) - accidental spillages from construction plant or on site storage;
- Wastewater (nutrient and microbial rich) - arising from accidental discharge from on-site toilets and washrooms
- Spillage of fuels, oils, paints, etc, from machinery used on site and overall operations

The described risks could impact surface water if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses. However, implementation of the mitigation measures detailed in Chapter 10 (Water) will ensure that this does not occur. Also with reference to Chapter 10 the potential impact on the surface water and hydrology during construction adopting the recommended mitigation measures is considered to have a neutral, imperceptible and short term impact.

• **Potential Impact from Air Quality on Human Health**

The key elements of construction of the proposed development with potential impacts on populations and human health from air quality and climate impacts are:

- Potential for Dust Soiling Effects on People and Property from general site preparation, vehicles and construction activities;
- Potential Human Health Impacts from dust, emissions from general site preparation, vehicles and construction activities;
- Engine emissions from construction vehicles, traffic and machinery.
- A change in traffic flows on road links nearby the proposed development.

In line with the UK Institute of Air Quality Management (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2024) the worst-case sensitivity of the area to dust soiling is considered low based on the IAQM criteria outlined in Table 2. Based on the IAQM criteria the worst-case sensitivity of the area to human health is considered to be low.

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 100 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local

meteorological factors such as rainfall, wind speed and wind direction. In terms of receptor sensitivity to dust soiling, there are no residential properties with 250m of the proposed works area

It can therefore be determined that the construction stage traffic will have an **imperceptible, neutral, short-term** and **not significant** impact on air quality.

- **Potential Impact from Noise and Vibration on Human Health**

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include:

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 12 of the EIA Report.

As detailed in Chapter 12 (Noise and Vibration), noise emissions associated with the different stages of the construction phase and construction traffic at the nearest sensitive locations of the proposed development are expected to be **slight to moderate** in the **short-term** to **medium-term**.

- **Potential Impact from Traffic and Transportation on Human Health**

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states:

"Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians"

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air - Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

Regarding the proposed development, there is potential for construction traffic to impact from a noise, vibration and dust perspective in relation to the surrounding road network due to the use of heavy vehicles and vehicles travelling along gravel roads and from general earthwork activities.

The number of construction vehicle movements is low compared to the number of vehicular trips expected to be generated by the proposed development during the operational phase. Once most of construction trips will occur outside the traditional peak hours, and it is not considered that this level of construction traffic would result in any major operational problems.

- **Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health**

The proposed development has the potential for an impact on the health and safety of workers employed during the construction phase. The activities of the applicant's contractors during the construction phase will be carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) to minimise the likelihood of any impacts on workers' health and safety

There is a negligible risk of external natural disasters; including landslides, seismic activity, volcanic activity and sea level rise. There is a negligible risk of major accidents to occur at the facility due to the lack of proximity to Seveso/Control of Major Accident Hazards (COMAH) Regulations sites.

The potential effect is therefore **imperceptible**, and unlikely, respect of Major Accident Hazards or Natural Disasters on Population and Human Health during the Construction Phase of the Proposed Development.

4.5.4 Operational Stage

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances; air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 5 - Landscape and Visual Impact
- Chapter 6 - Material Assets (Transportation)
- Chapter 11 - Air Quality
- Chapter 14 - Air (Noise and Vibration)

The proposed development comprises a new residential scheme of 523 no. units, together with associated open space, community facilities, and supporting infrastructure. The introduction of new residents to the area will enhance the vibrancy and vitality of Castletroy, contributing to the growth of a sustainable community and supporting existing local services, schools, and commercial amenities.

As outlined within Section 4.3 (Receiving Environment) of this chapter, there is an established range of community and social infrastructure within a 1.5 km radius of the subject site, including educational, recreational, and health facilities, which future residents will be able to readily access.

During the operational phase, the proposed development will generate long-term socio-economic benefits through increased local expenditure and demand for services, supporting the continued viability of businesses and community infrastructure in the area.

In this context, the proposed development is expected to have a **positive** and **long term impact** on the local community, contributing to the creation of a vibrant and sustainable residential neighbourhood.

- **Potential Impacts on Amenity and Tourism**

The proposed development once operational will have no adverse impact on local tourism or shopping amenities.

The proposed development will not create any wastewater discharge which could have a potential impact on local amenities or the local population. There will be no impact on the local parks or the larger amenity areas. The development will be fully serviced with separate foul and stormwater sewers which will have adequate capacity for the facility and discharge limits as required by Irish Water licencing requirements. Discharge from

the site to the public foul sewer will be sewage and grey water only due to the nature of the proposed development.

Landscape impacts associated with the proposed development throughout the site and surrounding environs will be *negligible* to *slight-positive* in the *long term*.

- **Potential Impact from Land and Water Emissions on Human Health**

With reference to Chapters 9 & 10 (Soils and Hydrology), there will be an increase in hardstand as a result of the development. Incorporation of hard stand area on previous greenfield area and the use of SUDs techniques (refer to Chapter 7) will have a minor effect on local recharge to ground; however, the impact on the overall groundwater regime will be insignificant considering the proportion of the site area in relation to the total aquifer.

In the absence of mitigation, the effect on the geological and hydrogeological environment is likely to be *long-term, slight* and *negative*. The effect is considered to be 'slight' due to there will not be intervention on the geological and hydrological regime on a local or regional scale.

The surface water network has been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100 year event to the attenuation basins without any overland flooding including an additional allowance of 30% in rainfall intensities due to climate change. Storm Water Management Plan will be implemented using of various SuDS techniques to treat and minimise surface water runoff from the site. Discharge flow will be restricted to the greenfield equivalent runoff for the catchment area. Run-off systems and drainage infrastructure will be prepared to contain and intercept any accidental fuel leakage that might occur, and it is concluded that the increased hardstanding on site will have an insignificant impact on the overall hydrological regime.

Considering the implementation of mitigation measures, the potential impact during operation on Population and Human Health in respect of the environmental factor of Hydrology is *long-term-imperceptible-neutral*. Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered *negligible*.

- **Potential Impact from Air Emissions on Human Health**

As outlined in Chapter 13 - Air Quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are the protection of human health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Chapter 13). The standards for human health have designed to avoid harmful effects to health.

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development.

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will significantly below the ambient air quality standards. The impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be *imperceptible, negative* and *long-term*, which is overall *not significant* in EIA terms.

- **Potential Impact from Noise and Vibration Emissions on Human Health**

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include:

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 12 of the EIA Report.

Once operational, there are no significant noise sources associated with the proposed residential development. Typical noise emissions will arise from normal residential activities, such as domestic use, vehicular movements, and general community interaction, all of which are consistent with the established suburban character of the surrounding area.

These activities are not expected to give rise to any significant change in the existing noise environment. Accordingly, the impact in terms of noise and vibration is assessed as neutral, imperceptible, and long-term, and is therefore **not significant** in EIA terms.

- **Potential Impact from Traffic and Transportation on Human Health**

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states:

'Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians.'

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 6 Material Assets (Transportation).

The proposed development will generate a number of trips by various modes of travel including vehicular, pedestrian, cycle and public transport. Given the existing road infrastructure and carrying capacity these trips are found to have a **long term, insignificant negative impact** on the surrounding road network.

- **Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health**

The proposed development has been designed with consideration given to the health and safety risks of people living and working in the vicinity. The facility has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience.

As outlined in Section 5.3.4 there is a negligible risk of external natural disasters; including landslides, seismic activity, volcanic activity and sea level rise. There is a negligible risk of major accidents to occur at the facility due to the lack of proximity to Seveso/Control of Major Accident Hazards (COMAH) Regulations sites.

The potential effect is therefore **imperceptible**, and unlikely, respect of major accident hazards or natural disasters on population and human health operational phase of the proposed development.

- **Do-Nothing Impact**

If the proposed development is not built there will be a **neutral effect** on the land as it will remain the same. However, the area is within the adopted Limerick City and County Development Plan 2022-2028 as zoned for Castletroy so it can be presumed that some form of development would progress on the site.

4.5.5 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

4.5.5.1 Construction Stage

The mitigation measures to address the potential impacts on population and human health from the proposed development have been assessed within the corresponding specialist chapters; Chapter 5 (Landscape and Visual); Chapter 6 Material Assets (Transportation); Chapter 9 (Land and Soils), Chapter 12 (Noise) and Chapter 13 (Air Quality).

- **Businesses and Residences**

There are no potential likely significant impacts on businesses and residences therefore additional measures are not required. Any impact will be further mitigated by the use of binding hours of construction as well as the measures set out in Chapter 6 (Material Assets Transportation) Chapters 9 and 10 (Soils, Water and Hydrology), Chapter 12 (Noise and Vibration) and Chapter 13 (Air Quality).

- **Landscape Amenity and Tourism**

With reference to Chapter 5 (Landscape and Visual), the proposed development will entail groundworks and building construction works. The mitigation landscape works including planting to site boundaries and internal areas that will assist in absorbing the proposed development into the wider Castletroy area setting within the short to medium term. The site will have a more wooded character as a consequence.

- **Land and Water Emissions**

All mitigation measures outlined within the Chapters 7, 8 and 9 will be implemented alongside a *Construction Environmental Management Plan (CEMP)*, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

- **Air Emissions**

Mitigation measures proposed to minimise the potential effects on human health in terms of air quality during the construction phase are set out in Chapter 13. These include measures for dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to ensure that no dust nuisance occurs a series of measures will be implemented, drawing on best practice guidance from Ireland and the UK.

- **Noise and Vibration Emissions**

Mitigation measures proposed to minimise the potential effects on human health in terms of noise and vibration during the construction phase are set out in Chapter 12. Provided that the mitigation measures detailed in Chapter 12 (Noise) are put in place the likelihood of a significant impact will be reduced to imperceptible levels.

- **Traffic and Transportation**

With reference to Chapter 6 Material Assets (Transportation) a detailed Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The plan will include measures to minimise the impacts associated with the construction phase upon the peak periods on the surrounding road network.

HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day with deliveries being on a required basis throughout the construction works.

It is not likely that construction will have a perceptible effect on the transportation network.

- **Major Accident Hazards and/or Natural Disasters**

The potential effect is imperceptible, and unlikely, in respect of major accident hazards or natural disasters on population and human health during the construction phase of the proposed development. Therefore no specific mitigation measures are required.

4.5.5.2 Operational Stage

The mitigation measures to address the potential impacts on population and human health from the proposed development have been assessed within the corresponding specialist chapters:

Chapter 5 (Landscape and Visual), Chapter 6 (transportation), Chapter 9 (Soils), Chapter 10 (Hydrology), Chapter 12 (Noise and Vibration), Chapter 13 (Air Quality) and Chapter 14 (Noise and Vibration).

- **Businesses and Residences**

There are no potential likely significant negative impacts on businesses and residences therefore additional measures are not required.

- **Amenity and Tourism**

With reference to Chapter 5 (Landscape and Visual) the mitigation landscape works including planting to site boundaries and internal areas that will assist in absorbing the proposed development into the wider Castletroy area setting within the short to medium term. The site will have a more wooded character as a consequence.

- **Land and Water Emissions**

The proposed development will provide an improvement to the local drainage catchment as it is proposed to introduce SUDs measures. A number of design measures will be put in place to minimise the likelihood of any spills entering the water environment to include ditches, detention basins, attenuation tank and flow control devices. In the event of an accidental leakage of oil from the parking areas, this will be intercepted by the drainage infrastructure proposed and any releases to drainage will be mitigated through a hydrocarbon interceptor.

- **Air Emissions**

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be neutral and non-significant.

- **Noise and Vibration Emissions**

Noise emissions from the internal plant room and outdoor plant areas will be designed to ensure that noise levels at the façade of the noise-sensitive locations both within the development and in the surrounding area do not exceed the criteria discussed at Section 12.5.1. The predicted daytime and night-time noise levels are within the criteria and the impact is therefore considered not significant.

Changes to traffic flows will not result in a perceptible increase in noise level in the surrounding environment. Therefore no mitigation measures are necessary in this case.

The selection and location of plant items within the development buildings at the design stage will ensure that noise emissions from any mechanical and electrical building services plant do not exceed the relevant internal noise criteria. Therefore no further mitigation is required. Once operational noise emissions are controlled within the development site, there will be no perceptible noise impact at sensitive receivers off-site.

- **Traffic and Transportation**

With reference to Chapter 6 Material Assets (Transportation) in order to understand the traffic impact and to determine suitable mitigation measures, a 'Traffic and Transport Assessment' (TTA) has been prepared by Road Plan Consulting.

As part of the proposed mitigation measures a Mobility Management Plan has been included in the subject application, describing on how to reduce car Journeys, and encouraging population to walk, cycle and use public transport rather than driving. The proposed development provides connectivity to existing facilities and public transport options.

- **Major Accident Hazards and/or Natural Disasters**

The potential effect is imperceptible, and unlikely, in respect of major accident hazards or natural disasters on Population and Human Health during the operational phase of the proposed development. Therefore, no specific mitigation measures are required.

4.5.6 Residual Impact Assessment

4.5.6.1 Construction Stage

- **Businesses and Residences**

It is predicted that there will be a positive impact on local business activity during the construction phase with the increased presence of construction workers using local facilities. This job creation will result in a **positive, local to regional, imperceptible, long-term** socio economic impact.

- **Landscape Amenity and Tourism**

With reference to Chapter 15 (Landscape and Visual), the significance of the residual construction stage impacts is considered to be **Moderate Adverse to Negligible, significant to not significant**. The proposed development will have no discernible effect on local tourism.

- **Land and Water Emissions**

The implementation of mitigation measures outlined above will ensure that the residual impacts during the construction phase in respect of the environmental factor of Soils, Geology and Hydrogeology is **short term-imperceptible-neutral** and **negligible** in magnitude. In respect of the environmental factor of Hydrology is **short-term-imperceptible-neutral**.

- **Air Emissions**

As detailed in Chapter 13 (Air Quality) best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be **negative, direct, short-term** and **imperceptible** with respect to human health.

- **Noise and Vibration Emissions**

The residual noise and vibration effects during the construction phase will be **local, negative, slight to moderate** and **temporary to short-term**. The residual impact of construction vibration building occupants is determined to be of **Negative, Imperceptible to slight** and **Short-Term** effect.

- **Traffic and Transportation**

Provided the mitigation measures and the management procedures outlined in the Construction Management Plan (CMP) are incorporated during the construction phase, the residual impact upon the local receiving environment is predicted to be **imperceptible** in terms of effect.

- **Major Accident Hazards and/or Natural Disasters**

There are no significant potential impacts on human health from major accident hazards and/or natural disasters; therefore, there are no residual impacts.

4.5.6.2 Operational Stage

- **Businesses and Residences**

The proposed development will enhance the local area by providing a residential development that will strengthen the social and community infrastructure of the area and provide employment opportunities.

As such, the Proposed Development will result in a **positive, significant** and **long term** impact.

- **Amenity and Tourism**

With reference to Chapter 5 (Landscape and Visual), the proposed development, while sizeable, can be accommodated and absorbed into this part of Castletroy without causing significant detrimental or unacceptable landscape or visual effects.

The residual impact of the proposed development is considered to result in a **positive, slight**, and **long-term** impact for operational phase. The proposed development will have no discernible effect on local tourism.

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- **Land and Water Emissions**

The implementation of mitigation measures outlined above will ensure that the residual impacts during the operational phase in respect of the environmental factor of soils, geology and hydrogeology is **long-term-imperceptible-neutral** and **negligible** magnitude. In respect of the environmental factor of Hydrology is **long-term-imperceptible-neutral** and **negligible** magnitude.

- **Air Emissions**

As detailed in Chapter 13 Air Quality, air dispersion modelling was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the dispersion modelling results residual impacts to human health related to air quality will be **long-term, localised, neutral and non-significant**.

- **Noise and Vibration Emissions**

Regarding traffic noise levels, the predicted impact is expected to be imperceptible and long term in the context of the existing noise environment and of traffic noise level at the nearest NSLs to the site.

Regarding mechanical and electrical plant noise, once operational noise emissions are controlled within the development site, noise emissions outside the site will be imperceptible. The residual noise effect is **neutral, imperceptible and long term**. The proposed development will not generate any perceptible levels of vibration during operation and therefore there will be no impact from vibrations on human health.

- **Traffic and Transportation**

The analysis of the road network has shown that the existing junctions would operate within capacity during both the AM and PM peak hours. The residual effect is **Neutral, Imperceptible and Long Term**.

- **Major Accident Hazards and/or Natural Disasters**

There are no significant potential impacts on human health from major accident hazards and/or natural disasters; therefore, there are no residual impacts.

4.5.6.3 Cumulative

The potential for cumulative impact of the proposed development with any/all relevant other planned or permitted developments are discussed below for construction and operational phases.

The likely cumulative impact of the proposed development in conjunction with these cumulative developments upon health in relation to noise, dust generation, construction traffic, visual impacts, etc., associated with the works; have been assessed in the respective EIA Report Chapters.

- **Construction Stage**

In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust, and noise.

The implementation of mitigation measures within each chapter as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The cumulative impact is considered to be **neutral** and **imperceptible**.

Regarding Water impacts, the implementation of the mitigation measures contained CEMP will result in minimal cumulative potential for change in surface water quality or the natural hydrological regime. The cumulative impact is considered to be **neutral** and **imperceptible**.

Predicted cumulative adverse impacts arising from the construction phase of the proposed development have also been considered in the Traffic and Transportation Assessment.

Contractors for the proposed development will be contractually required to operate in compliance with a project-specific CEMP and Construction Traffic Management Plan which will include the mitigation measures outlined in this EIA Report. The construction phase for the overall development of the residential units would be restricted by the same binding limits for noise, dust, and emissions to water.

The residual noise and vibration impact from the various projects with potential for cumulative impacts have been assessed. There are no residual significant cumulative impacts forecast. The residual effects are **negative, slight** to **moderate** and **temporary to short-term**.

- **Operational Stage**

Regarding chapter 9 (Soils) all developments are required to manage groundwater discharges. As such there will be no cumulative impact to groundwater quality and therefore there will be no cumulative impact on the Groundwater Body Status. The operation of the proposed development is concluded to have a **long-term, imperceptible** significance with a **neutral** impact on soil and water quality.

All developments are required to manage groundwater discharges in accordance with S.I. 272 of 2009 and S.I. 77 of 2019. As such there will be no cumulative impact to groundwater quality and therefore there will be no cumulative impact on the Surface Waterbody Status. The cumulative impact is considered to be **neutral** and **imperceptible**.

The cumulative impact for air emissions is included within the operational stage impact for the proposed development. The impact is predicted to be **long-term, negative** and **imperceptible** with regards to air quality.

The residual noise and vibration impact associated with the operational phase of the proposed project and the projects assessed for cumulative impacts are **negative, not significant** and **long-term**.

- **Businesses and Residences**

The proposed development will enhance the local area by providing a sustainable residential development that will strengthen the social and community infrastructure of the area and provide employment opportunities.

As such the proposed development will result in a **positive, significant** and **long term** impact.

4.6 Interactions

This is addressed in section 16 of this EIAR.

4.7 Worst Case Impacts

In the event that all mitigation measures fail to hinder potential negative impacts, the following possibilities may occur:

- An increase of traffic within the surrounding roads and junctions of the site
- An increase in noise caused during the construction phase can cause a disturbance any residential dwellings in close proximity to the site.
- An increase in the production of dust that can be carried throughout the site and create adverse effects on the neighbouring environment, including the residential dwellings.

However, it is imperative that such mitigation measures are implemented to ensure that the worst-case scenario does not occur. When considering the mitigation measures that will be in place, the event of a worst-case scenario is deemed to be unlikely.

4.8 Monitoring

The design and layout of the proposed development are primarily structured to avoid impacts on population and human health. Adherence to these design principles will be a condition of any permitted development.

Monitoring of compliance with relevant standards will be carried out through the Building Regulations certification process and the specific conditions outlined in the planning permission. Additionally, the Project Supervisor for the Construction Process will oversee the monitoring of Health & Safety compliance throughout the construction phase.

4.9 Difficulties Encountered

No particular difficulties were encountered in preparing the population assessment.

There are uncertainties in relation to assessing impacts on individuals or communities due to the lack of individual health data and the difficulty in predicting effects, which can only be based on general guidance and assumptions.

Forecasting methods and methodology, if any, are set out within the specialist chapters that this assessment relies upon.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 5: LANDSCAPE & VISUAL IMPACT ASSESSMENT

PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT

**MONALEEN ROAD, CASTLETROY,
LIMERICK CITY**

FEBRUARY 2026



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5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.1 Introduction

The Landscape and Visual Impact Assessment (LVIA) prepared by CSR was informed by a desktop study and a survey of the site and receiving environment in August 2025. The assessment is in accordance with the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

The report identifies and discusses the likely landscape and visual effects in relation to the proposed large scale residential development on existing agricultural lands at Monaleen Road, Castletroy, in the eastern suburbs of Limerick City. Further details on the proposed development is contained in Chapter 2 of this EIAR.

5.1.1 Statement of Expertise

This Landscape and Visual Assessment was carried out by Jamie Ball, BA LA, MILI. Having graduated in 1998 from the University of Gloucestershire with a BA Hons in Landscape Architecture, Jamie has over ten years' experience specifically in LVIA. He has worked on LVIA's for a range of developments throughout Ireland, including multiple residential developments.

The preparation of the baseline for this assessment has been assisted by Ronan Finnegan, BSc, PG Dip, CMLI, a chartered Landscape Architect of Cunnane Stratton Reynolds. He has over fifteen years' experience as a Landscape Architect, which has involved undertaking LVIA's for a broad range of development types including large renewable energy, residential and infrastructure projects located across Ireland and the UK.

5.1.2 Study Area

According to Section 5.2 of the Guidelines for Landscape and Visual Impact Assessment (3rd Edition 2013):

"The study area should include the site itself and the full extent of the wider landscape around it, which the proposed development may influence in a significant manner."

The extent of a study area for an LVIA mainly derives from the nature of the site and wider landscape, in combination with the specifics of the proposed development.

In this instance, owing to the nature of the proposed development, there is a notably low capacity for significant impacts to arise beyond c. 1km from the site. Figure 5.1, below, sets out the extent of the 1km study area.



Figure 5.1 Extents of Study Area for the LVIA

5.2 Methodology

5.2.1 Definition of Landscape

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity. The methodology followed for LVIA is that set out in the Guidelines for Landscape and Visual Impact Assessment by the Landscape Institute and the Institute of Environmental Management and Assessment (2013), 3rd Edition, hereafter referred to as the GLVIA.

It is important to note that this definition of landscape applies not only to all types of rural landscape, marine and coastal landscapes (seascapes) but also to the landscape of villages, towns and cities with a predominantly urban context and character (Section 2.5, LI, IEMA 2013).

Ireland is a signatory to the European Landscape Convention (ELC). The ELC defines landscape as "An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".

This definition is important in that it expands beyond the idea that landscape is only a matter of aesthetics and visual amenity. It encourages a focus on landscape as a resource in its own right - a shared resource providing a complex range of cultural, environmental, and economic benefits to individuals and society.

5.2.2 Guidance

The GLVIA note that as a cultural resource, the landscape functions as the setting for our day-to-day lives, also providing opportunities for recreation and aesthetic enjoyment and inspiration. It contributes to the sense of place experienced by individuals and communities and provides a link to the past as a record of historic socio-economic and environmental conditions. As an environmental resource, the landscape provides habitat for fauna and flora. It receives, stores, conveys, and cleans water, and vegetation in the landscape, stores carbon and produces oxygen. As an economic resource, the landscape provides the raw materials and space for the production of food, materials (e.g. timber, aggregates) and energy (e.g. carbon-based fuels, wind, water, geothermal, solar), living and working space and for recreation and tourism activities.

The reversibility of change is an important consideration. If change must occur to meet a current need, can it be reversed to return the resource (in this case, the landscape and suburban fringe) to its previous state to allow for development or management for future needs.

5.2.2.1 Key Guidance Documents

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity. The methodology for assessment of the landscape and visual effects is informed by the following key guidance documents, namely:

- Guidelines for Landscape and Visual Impact Assessment GLVIA, 3rd Edition Landscape Institute and the Institute of Environmental Management and Assessment, 2013
- Guidelines on the Information to be Contained in Environmental Impact Statements, EPA, 2022

The GLVIA is authored by the Landscape Institute in the UK and the IEMA, who contain a network of members in the UK, Ireland and internationally. The guidance was prepared within the parameters of relevant EU directives at the time and is updated, where necessary, by Landscape Institute bulletins online, including the LI TGN 06-19 Visual Representation of Development Proposals. The GLVIA is used internationally and is the industry standard for LVIA in Ireland. The EPA guidance 2022 refers to the use of topic specific guidance and specifically references the GLVIA in relation to professional judgement. The GLVIA (paragraph 3.72) recognise that:

"Some uncertainty is unavoidable in EIA, especially about matters that involve an element of judgement, such as assigning a level of significance to an effect. Such judgements should be explicit and substantiated rather than presented as objective fact. This is best done using agreed referable approaches, e.g. the Guidelines on Landscape and Visual Impacts Assessment provide guidance on what constitutes a severe visual effect".

5.2.2.2 Policy Documents

References are made to the 'Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities' document, published in 2000 by the Department of Environment, Heritage and Local Government.

Definitions and descriptions of sensitivity, magnitude of change and quality and longevity of effects are derived from the GLVIA. The GLVIA does not set out specific definitions of descriptions used but contains key widely used principles and case studies / examples that are intended to inform a professional's methodology, supported by their experience and judgements in relation to landscape and landscape change. These descriptions expand and

complement the EPA guidelines as intended in relation to topic specific guidance.

5.2.3 Landscape and Visual Assessment Process

The GLVIA outline the assessment process, which combines judgements on the sensitivity of the resource, and the magnitude of the change as a result of the proposed development. These are combined to reach an assessment of the significance of the effect.

Critical for the assessment is the distinction the GLVIA methodology applies, between **landscape effects** and the **visual effects** of a proposed development.

Landscape results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. 'Landscape character assessment' is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as 'a resource'. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

Views & Visual Amenity refer to the interrelationship between people and the landscape. The GLVIA prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

The assessment of Landscape and Visual Effects assesses the effects of the development on the landscape as a resource, and on the fabric and character of the landscape. Assessment of visual effects relates to the change in views and visual amenity experienced by groups of people. The assessment includes the review of the proposed development, desktop study, and several site visits both to the site and the wider landscape. This approach emphasises the distinction between the assessment of Landscape Effects and Visual Effects, which, though related, are assessed separately.

5.2.3.1 Establishment of Baseline

The process set out in the GLVIA 2013 and in EPA 2022 guidance involves the preparation of the baseline or receiving environment characteristics. This includes two stages, which are a desk-based study and site visit / field study. These allow the assessor to establish the existing receiving environment and key landscape and visual characteristics and their sensitivities.

The desk-based study includes:

- Review of preliminary proposals and identification of preliminary study area,
- Review of current Development Plan within the study area, and any other plans as appropriate, to identify relevant national and local designations and policies. This may include designations such as scenic routes, protected views and other landscape designations including any Landscape Character Assessments (International designations such as UNESCO designations would also be relevant here, if present), and
- Other information that may be consulted include aerial imagery, OSI Discovery series mapping, historic (6-inch and 25 inch) mapping and CORINE Landcover Maps (2018).

A site visit is then carried out to review and / or confirm the findings of the desk-based study and provide a more detailed description of the landscape and visual character of the study area. Based on both the desk study and site visit, the assessor identifies landscape and visual receptors and their relative sensitivity. A site visit was carried

out in August 2025.

Assessment of Effects

Once the Baseline is established, and the proposed development drawings and descriptions reviewed, the assessment process is commenced, as per the GLVIA and as outlined below.

Use of 'Impact' and 'Effect'

Section 1.16 of the GLVIA (referring to the EIA Directive), advises that the terms **Impact** and **Effect** should be clearly distinguished and consistently used in the preparation of an LVIA.

Impact is defined as the action being taken. In the case of the proposed development, the impact would include the construction of the proposed housing and other elements.

Effect is defined as the change or changes resulting from those actions, e.g. a change in landscape character, land cover, or changes to the composition, character and quality of views in the receiving environment. This report focusses on these effects.

5.2.4 Methodology for Landscape Assessment

In Section 5.4 Predicted Landscape Impacts of this report, the landscape effects of the proposed development are assessed. The nature and scale of changes to the landscape elements and characteristics are identified, and the consequential effects on landscape character are discussed. Trends of change in the landscape are taken into account. The assessment of the significance of effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape, which will result from the proposed development.

Definitions and descriptions of sensitivity, magnitude of change, quality and longevity of effects are derived from the GLVIA. The GLVIA does not set out specific definitions of descriptions used, but contains key widely used principles and case studies / examples that are intended to inform a professional's methodology, supported by their experience and judgements in relation to landscape and landscape change. These descriptions expand and complement the EPA guidelines as intended, in relation to topic- specific guidance.

5.2.4.1 Sensitivity of the Landscape Resource

Sensitivity is a combination of Landscape Value and Landscape Susceptibility.

Landscape values can be identified by the presence of landscape designations or policies, which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape. These are described further below, in **Table 5.1**.

Landscape susceptibility is defined in the GLVIA as:

"The ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline scenario and/or the achievement of landscape planning policies and strategies."

Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development.

Landscape susceptibility (in terms of its ability to accommodate the proposed development) in relation to

residential developments can include consideration of:

- Topography and skyline – uplands can easier absorb residential development depending on siting and design.
- Landscape pattern and landcover – a simple landscape pattern can be less susceptible than a complex pattern, including varying types of landcover.
- Settlement pattern – this can influence susceptibility.

It includes consideration of landscape values as well as the susceptibility of the landscape to change. Landscape sensitivity is a function of its land use, landscape patterns and scale, visual enclosure and distribution of visual receptors, scope for mitigation, and the value placed on the landscape. It also relates to the nature and scale of development proposed.

Landscape Sensitivity ranges from **Very High** to **Negligible** as outlined in **Table 5.1** below.

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principal management objective for the area is conservation of the existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong. The character of the landscape is such that there is some capacity for change in the form of development. These areas may be recognised in landscape policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principal management objective is to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Table 5.1 Categories of Landscape Sensitivity

5.2.4.2 Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features, and characteristics (also known as 'landscape receptors'). Five categories are used to classify Magnitude of Landscape Change.

For the purpose of assessment, five categories are used to classify the **Magnitude of Landscape Change** on the receiving environment, from **Very High** to **Negligible**. These categories are defined in **Table 5.2** below.

Sensitivity	Description
Very High	Change that is large in extent, resulting in the loss of, or major alteration to key elements, features or characteristics of the landscape and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in alteration or compromise to key elements, features or characteristics, and/or introduction of large elements considered uncharacteristic in the context. Such development results in a moderate to large change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily uncharacteristic in the context. Such development results in moderate change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is very limited in extent, resulting in no alteration to key elements, features, or characteristics of the landscape, and/or introduction of elements that are characteristic in the context. Such development results in minimal change to the character of the landscape.

Table 5.2 Magnitude of Landscape Change

5.2.5 Methodology of Visual Assessment

In Sections 5.5 Predicted Visual Impacts, the visual effects of the proposed development are assessed. Visual assessment considers the sensitivity of the viewers, (i.e. groups of people) and the magnitude of the changes to the composition and character of views. The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the visual receptor sensitivity against the magnitude of change to the view resulting from the proposed development.

5.2.5.1 Sensitivity of the Visual Receptor

Visual receptor sensitivity is a function of the following two main considerations:

1. Susceptibility of the visual receptor to change. This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention or interest is focussed on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include

residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage or other attractions and places of community congregation where the setting contributes to the experience.

Visual receptors less susceptible to change include travellers on road, rail and other transport routes (unless on recognised scenic routes which would be more susceptible), people engaged in outdoor recreation or sports where the surrounding landscape does not influence the experience, and people in their place of work or shopping where the setting does not influence their experience.

2. Value attached to the view. This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

For the purpose of assessment, five categories are used to classify **Sensitivity of Visual Receptor**. These categories range from **Very High** to **Negligible** and are described in **Table 5.3** below.

Sensitivity	Description
Very High	Viewers at iconic viewpoints - towards or from a landscape feature or area that are recognised in policy or otherwise designated as being of high value or national value. This may also include residential viewers who are focussed to a large extent on the view.
High	Viewers at viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features) and views which are highly valued by the local community. This may also include tourist attractions, and heritage features of regional or county value, and viewers travelling on scenic routes.
Medium	Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape, or where the landscape has some valued views. The views are generally not designated, but include panoramic views or views judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquillity or some rare element in the view.
Low	Viewers at viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, etc. The view may present an attractive backdrop to these activities but there is no evidence that the view is valued and not regarded as an important element of these activities. Viewers travelling at high speeds (e.g. motorways) may also be generally considered of low susceptibility.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping where the view has no relevance or is of poor quality and not valued.

Table 5.3 Categories of Sensitivity of Visual Receptors

5.2.5.2 Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of the proposed development into the view, (relative to the other elements and features in the composition) i.e. its relative visual

dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects. It should be noted that the proposed turbines are considered a 'reversible' element, as on decommissioning they can be removed.

Five categories are used to classify **Magnitude of Change to View**. These range from **Very High** to **Negligible** and are defined in **Table 5.4** below.

Sensitivity	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs highly valued features or characteristics, or the introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

Table 5.4 Magnitude of Change to a View

In this case, a number of tools are used to assist in the assessment of visual effects. These include Photomontages, which are produced from selected viewpoints. Initial viewpoints for photomontages are selected during the desk study with the exact location confirmed in the field during the site visit. The completed photomontages are also used to assist in the assessment of visual effects.

5.2.6 Significance of Effects

In order to classify the significance of landscape and visual effects, the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint. The definitions used by the EPA (2022) provide a useful scale to describe the significance of the effects. Seven classifications of significance are defined, namely: Imperceptible; Not significant; Slight; Moderate; Significant; Very significant; Profound. Please refer to **Table 5.5**, below.

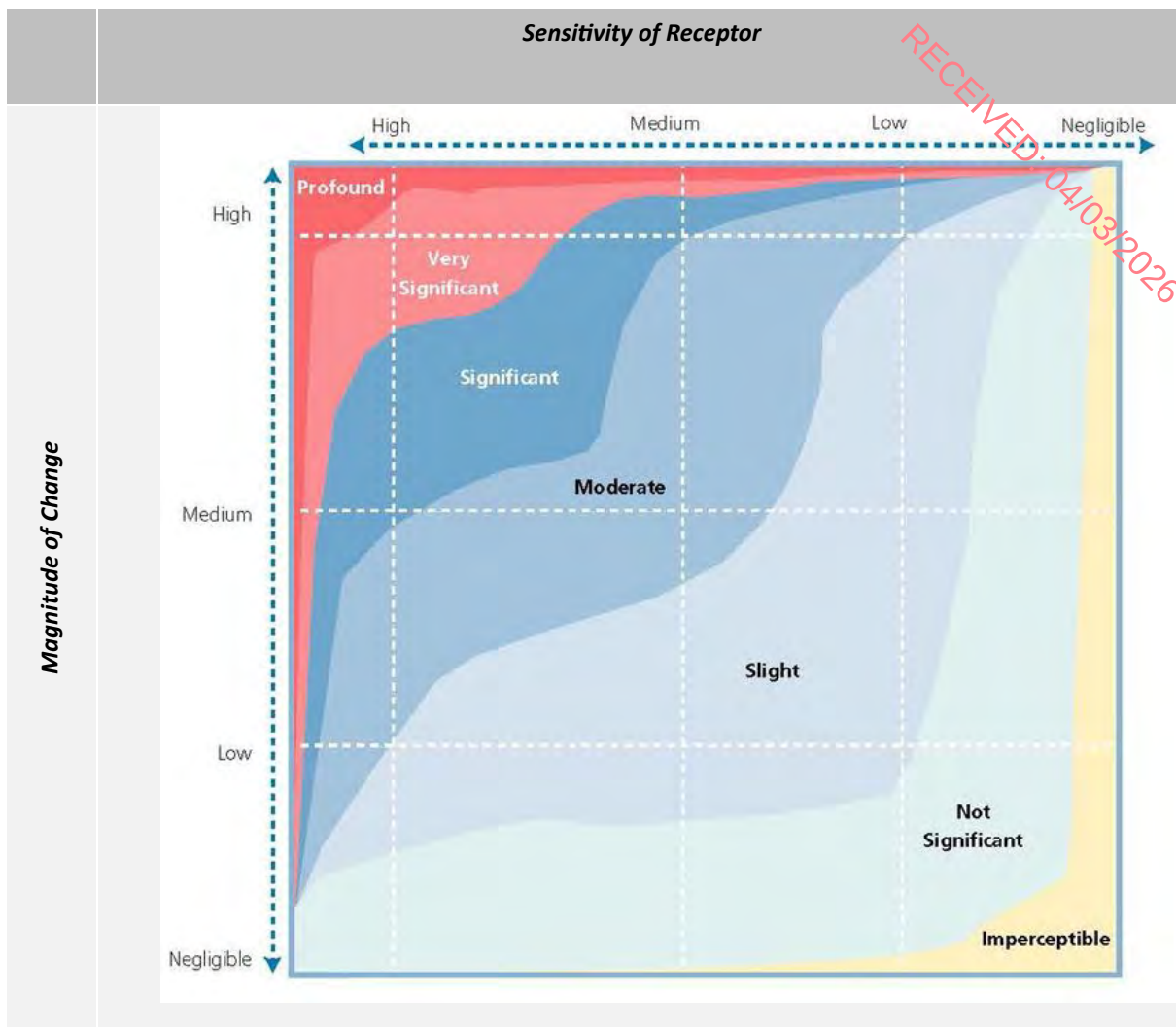


Table 5.5 Significance Matrix (based on EPA 2022 and GLVIA 2013)

Note: This table is a guideline only but is useful in illustrating the way in which judgements are combined to arrive at a judgement regarding significance, while illustrating that an element of professional judgment is also applied. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable. The GLVIA 3rd Edition (Section 2.23) recognises that:

“Professional judgement is a very important part of LVIA. While there is scope for quantitative measurement of some relatively objective matters, much of the assessment must rely on qualitative judgements.”

5.2.7 Qualitative of Effects

In accordance with the EPA (2022), the predicted impacts are also classified as beneficial, neutral, or adverse.

“This is not an absolute exercise; in particular, visual receptors’ attitudes to development, and thus their response to the impact of a proposed development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn.”

These qualitative definitions are included in **Table 5.6**, below.

Quality of Effect	Definition
Adverse	Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape(townscape)/view to be diminished.
Neutral	Scheme complements (or does not detract from) the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality.
Beneficial	Improves landscape(townscape)/view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.

Table 5.6 Quality of Effect (Source: CSR based on GLVIA 2013)

In accordance with the EPA (2022), Impacts/effects are also categorised according to their Duration of effect as in **Table 5.7** below.

Terminology	Definition
Temporary	Effect lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years

Table 5.7 Duration of Effects (Source: EPA 2022)

5.3 Existing Environment

5.3.1 Policy Context: Limerick Development Plan 2022-2028

The relevant landscape planning context for the area is the Limerick City and County Council's Limerick Development Plan 2022-2028 (i.e. the LCCDP). The Plan includes both city and rural areas. The Limerick Development Plan contains a number of landscape related policies and objectives and also includes a Landscape Character Assessment. Policy EH P8 emphasises the importance of Landscape Character:

Policy EH P8 Landscape Character Areas

"It is a policy of the Council to promote the distinctiveness and where necessary safeguard the sensitivity of Limerick's landscape types, through the landscape characterisation process in accordance with the 'Draft Guidelines for Landscape and Landscape Assessment' (2000) as issued by the Department of Environment and Local Government, in accordance with the European Landscape Convention (Florence Convention) and with 'A National Landscape Strategy for Ireland – 2015- 2025'. The Council shall implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Landscape Strategy for Ireland, 2015 – 2025."

Zoning/Land Use

Chapter 12 and Map 3 Volume 2a of the LCC County Development Plan 2022-2028 sets out the zoning across the city in order to support continued sustainable growth of the city. It includes encouraging consolidation of the built environment through compacted growth and utilising existing infill areas and brownfield within established settlements.

The development site is zoned for New Residential Use, as shown in **Figure 5.2** below.

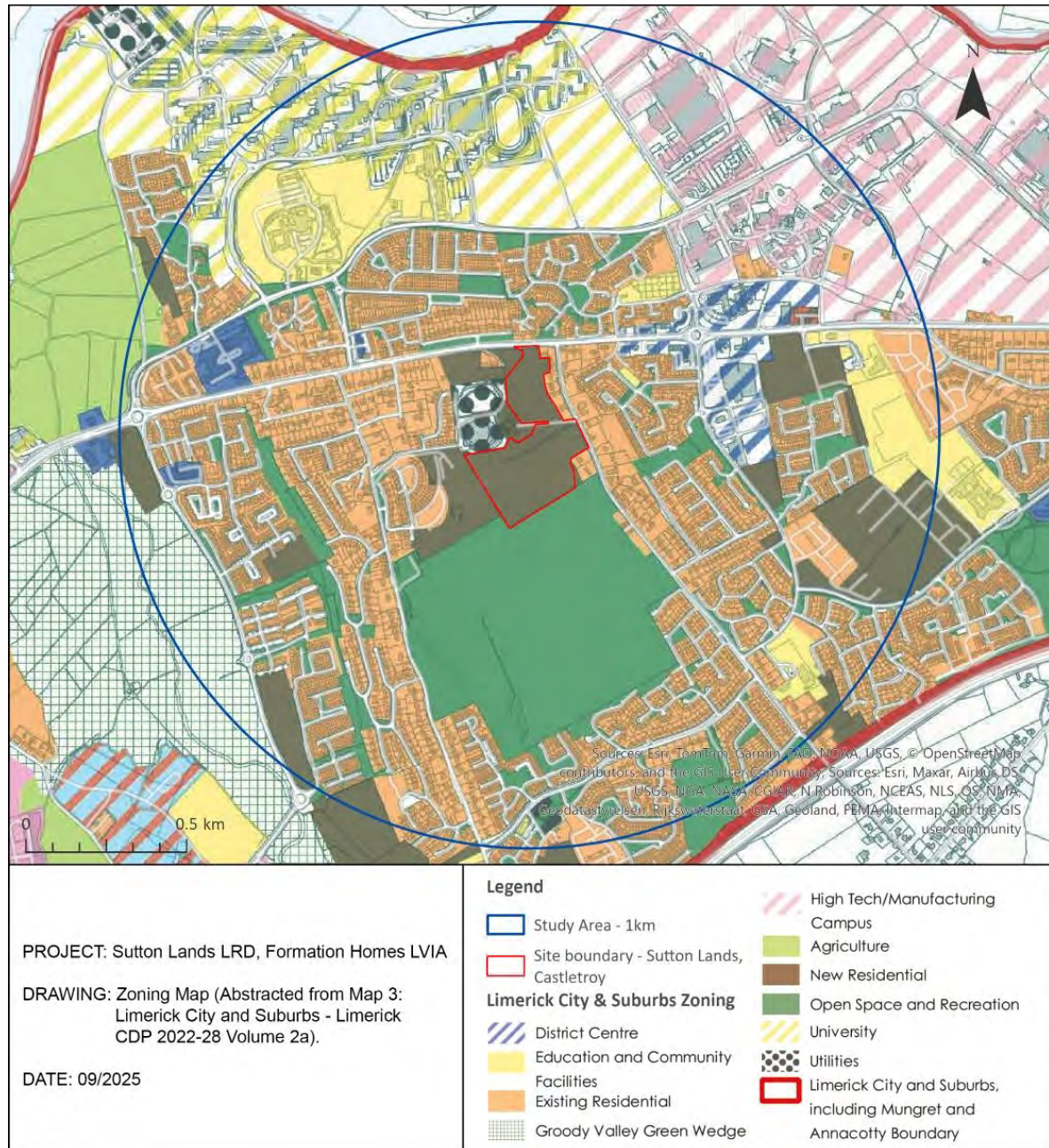


Figure 5.2 Zoning Map (Source: Limerick City and County Council Limerick Development Plan 2022-2028)

Chapter 12 outlines the zoning strategy for New Residential as:

Objective: To provide for new residential development in tandem with the provision of social and physical infrastructure.

Purpose: This zone is intended primarily for new high quality housing development, including the provision of high-quality, professionally managed and purpose built third level student accommodation. The quality and mix of residential areas and the servicing of lands will be a priority to support balanced communities. New housing and infill developments should include a mix of housing types, sizes and tenures, to cater for all members of society. Design should be complimentary to the surroundings and should not adversely impact on the amenity of adjoining residents. These areas require high levels of accessibility, including pedestrian, cyclists and public transport (where feasible). This zone may include a range of other uses particularly those that have the potential to facilitate the development of new residential communities such as open space, schools, childcare facilities, doctor's surgeries and playing fields etc.

Spatial Strategy

Chapter 3 (Spatial Strategy) sets out the overall spatial strategy for sustainable population growth across Limerick City and County.

Policy CGR P1 Compact Growth and Revitalisation

"It is a policy of the Council to achieve sustainable intensification and consolidation, in accordance with the Core Strategy, through an emphasis on revitalisation and the delivery of more compact and consolidated growth, integrating land use and transport, with the use of higher densities and mixed use developments at an appropriate scale on brownfield, infill, backland, state-lands and underutilised sites within the existing built footprint of Limerick's City, Towns and Villages."

Objective CGR O2: Place-making, Universal Design and Public Realm

It is an objective of the Council to:

"a) Ensure that all developments are designed to the highest quality with respect to the principles of placemaking, universal design and public realm including the guidance set out under the Urban Design Manual – A Best Practice Guide (2009) and the Design Manual for Urban Roads and Streets (2013) the Whole of Government National Disability Inclusion Strategy (NDIS) 2017-2022 and the 2020 DMURS Interim Advice Note – Covid 19 Pandemic Response.

b) Prepare and facilitate implementation of Public Realm Plans for settlements including Limerick City, Adare and Rathkeale.

c) Ensure the construction of the highest quality and innovative designed buildings, in particular on the approaches to Limerick City, along the Riverfront/Quays, on important street corners or junctions, corner sites, the end of vistas and gateways, Town Centres and the edges of public squares or open space.

Objective CGR O3 Urban Lands and Compact Growth

It is an objective of the Council to:

a) Deliver 50% of new homes within the existing built-up footprint of Limerick City and Suburbs (in Limerick), Mungret and Annacotty and 30% of new homes within the existing built-up footprint of settlements, in a compact and sustainable manner in accordance with the Core and Housing Strategies of this Plan.

b) Encourage and facilitate sustainable revitalisation and intensification of brownfield, infill, underutilised and backland urban sites, subject to compliance with all quantitative and qualitative Development Management Standards set out under Chapter 11 of this Plan.

c) Continue to work proactively with key state agencies, such as the LDA to bring forward, brownfield urban underutilised state land, which can contribute to the delivery of compact growth within an urban context, subject to Development Management Standards set out under Chapter 11 of this Plan.

d) Encourage residential development in the City Centre zone by requiring at least 20% of new development to comprise residential use. Exceptions may be made on a case-by-case basis, where residential use is not deemed compatible with the primary use of the site e.g. museums/tourist attractions etc.

e) Require owners of urban sites, in instances where phased development is proposed, or where such land adjoins other undeveloped, zoned land in third party ownership, to develop a masterplan for the coherent and sustainable development of such lands, addressing issues of the sustainable use of available lands, preservation of existing residential amenity, access, urban design and connectivity. These Masterplans shall set out the framework for the sustainable, phased and managed development of a particular area. The Masterplan should include the written consent of all landowners, where applicable, a conceptual layout, infrastructure proposals including any consultation with service providers and phasing details. The Masterplan should clearly detail how adjoining undeveloped, zoned land in third party ownership, can be accessed and serviced in an integrated and coherent manner."

Objective CGR O4: Active Land Management

It is an objective of the Council to:

"a) Promote an active land management approach through cooperation with relevant stakeholders and infrastructure providers to deliver enabling infrastructure to achieve compact growth.

b) Support and facilitate the reuse and revitalisation of derelict, vacant and underutilised sites and disused buildings throughout Limerick for residential, economic, community and leisure purposes.

c) Establish a database of strategic brownfield and infill sites in the City Centre to be updated on an annual basis to monitor the progress of the active land management measures."

Policy CGR P3 - Level 1 Growing Limerick City and Suburbs (in Limerick) Mungret and Annacotty

"It is a policy of the Council to strengthen and consolidate Limerick City and Suburbs (in Limerick), Mungret and Annacotty as a key driver of social and economic growth in Limerick and become a vibrant living, retailing and working City. In accordance with national and regional policy it is a requirement that at least 50% of all new homes will be located within the existing built-up footprint of the settlement, in order to deliver compact growth and reduce unsustainable urban sprawl."

Building Height Strategy

Objective CGR O9 Building Heights

It is an objective of the Council to:

"a) Ensure that all new tall buildings in Limerick City are designed in accordance with the character area objectives, tall building recommendations and criteria set out in the Development Management Standards. All such buildings shall be of an exceptional architectural quality and standard of design and finish.

b) Focus delivery of tall buildings in the City Centre, in particular the areas that have been identified as having potential for increased building height. In particular, tall building clusters will be encouraged at The Quays, Colbert Station Quarter, Cleaves Site and The Docklands in accordance with the building classification criteria set out in the Building Height Strategy. There shall be a general presumption

against tall buildings in other areas, except at designated areas and the gateway locations identified in the Tall Buildings at City Level Map below.

c)Protect the unique intrinsic character, scale and significant views of Limerick City, the skyline and key landmark buildings in the delivery of increased building heights, through the application of the Tall Building Classifications, Recommendations, High Level Principles and Assessment Tools and Criteria set out in the Building Height Strategy.

d)Ensure applications for tall buildings are supported by the following assessments and any additional assessments required at the discretion of the Planning Authority - Environmental Assessment, Wind Analysis, Sunlight and Daylight Analysis, Verified View Analysis, Landscape and Visual Impact Assessment, Architectural Design Statement, Traffic Impact Assessment including a Mobility Management Plan for non- residential uses, Building Services Strategy.”

Landscape Character Assessment

Chapter 6 (Environment, Heritage, Landscape and Green Infrastructure) of the Limerick Development Plan 2022-2028 includes Landscape Character Areas, which are a continuation from the 2010-2016 Plan (as extended) across the county. Limerick City has been divided into five Urban Character Areas which comprise of the different Neighbourhoods of the City and its Environs as defined in Chapter 3 of the Development Plan and analysed in the Building Height Strategy and also underpinned by the Neighbourhoods set out under the Limerick 2030 Review and Update.

The Site and the study area fully falls within the Castletroy/Plassey/Annacotty Urban Character Area, with this character area extending across the eastern end of the city, as shown in **Figure 5.3** and **Table 5.8**, below.

Area	Urban Structure/Character	Specific Objectives
UCA 03 Castletroy/ Plassey/ Annacotty	This area is located to the east of the City Centre and covers the urban areas of Castletroy, Annacotty, Monaleen and Plassey as well as the University of Limerick. This area is substantially residential, served by a range of uses including the Castletroy Shopping Centre, Castletroy Park Hotel, recreational facilities such as the Castletroy Golf Club, educational institutions and business parks. A substantial character area is the University of Limerick campus. The campus is expansive at over 130 hectares and located both north and south of the River Shannon in Counties Limerick and Clare. The campus is largely self-contained and is substantially enclosed. Its presence has attracted technology companies to the area, with the National Technology Park located to the east	a) Infill and brownfield development patterns to be favoured. b) River Groody Green Wedge to be retained. c) Building Height Strategy to inform design of higher buildings, in particular: – Any proposed buildings of height must be balanced with the need to maintain the status of the University rather than the creation of a high building cluster. – A modest increase in building height at important intersections/nodes and street corners may be required to enhance legibility and sense of place.

Table 5.8 Landscape Character Areas, its description and specific objectives (Source: LDP 2022-2028)

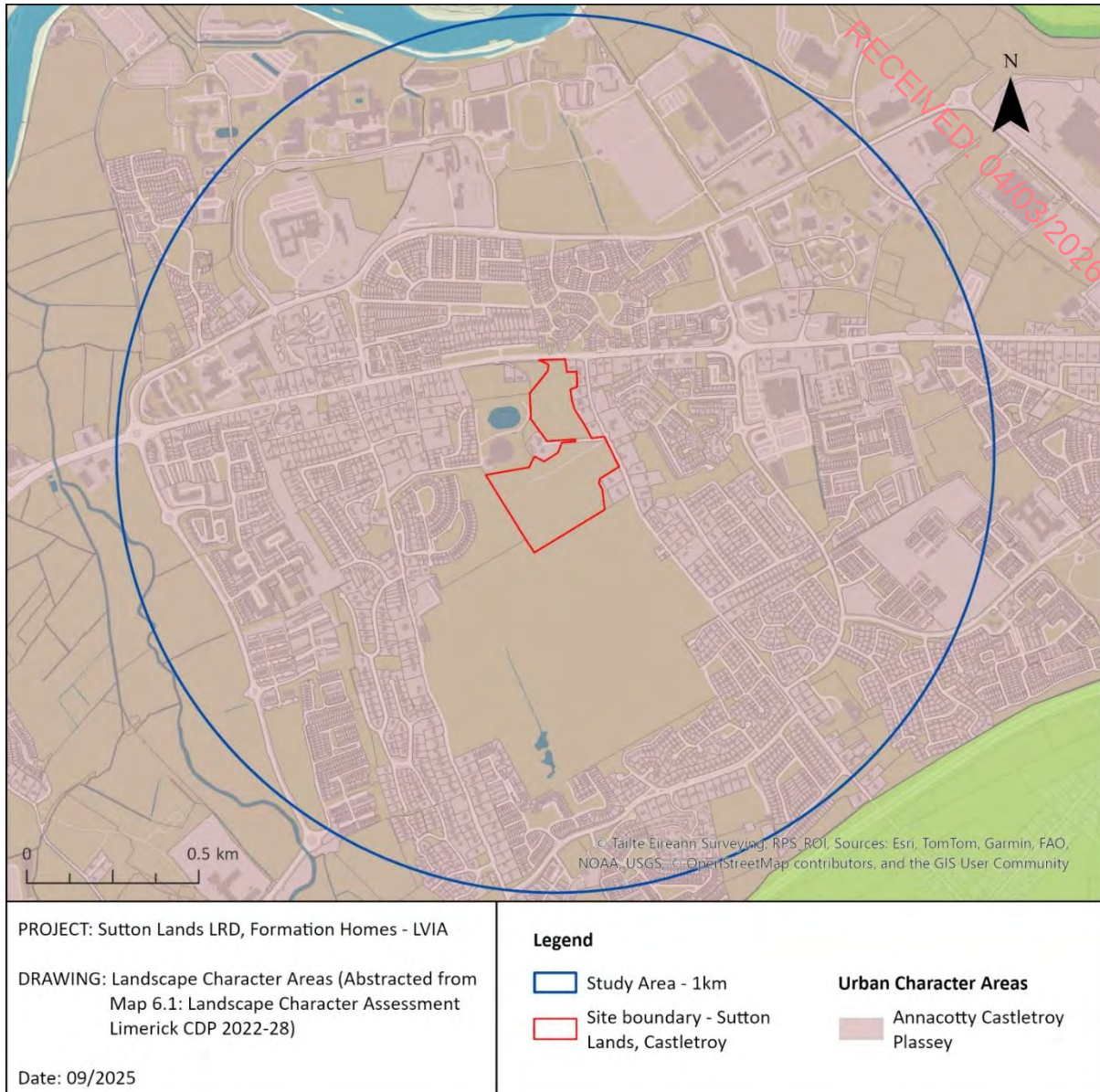


Figure 5.3 Landscape Character Areas (Source: LDP 2022-28)

Protected Views

Section 6.4.2 of the Plan refers to Views and Prospects, and identifies important prospects in Limerick City and County, including views from key vantage points, of landmark buildings or skylines, of prominent townscapes and landscapes, or views of special amenity value. The County views are illustrated on Map 5.2 in the Development Plan and the City views within Volume 6: Building Height Strategy on Map 3.4 and Map 6.10.

There are no protected city or county views or scenic routes found within the study area. The nearest view is that of the Key Vantage Point View No. 3, approx. 2.25km east of the suite, located at Annacotty, as illustrated in Map 3.4 of LDP Vol 6. Thus, any potential views towards the site are substantially screened by the intervening built elements. Protected city views, as illustrated in Map 6.10 of LDP Vol 6, are located within the city centre and face away from the site. Thus, as the proposed development will have no capacity to generate significant visual effects from any protected views, these view are not further considered in this assessment.

Natural Heritage and Biodiversity

Policies relating to the natural heritage, including the rivers and specifically the River Shannon, tree and hedgerow protection and riparian buffers are included below.

Chapter 1 of the Plan includes a Strategic Vision for Limerick. This includes four Key Ambitions, one of which relates directly to the Shannon:

“Limerick will provide room for people to enjoy the River Shannon/Estuary. The animation of the waterfront will increase public access and create new recreational opportunities for residents and visitors.”

Objective EH O10 Trees and Hedgerows

“It is an objective of the Council to:

a) Retain and protect amenity and biodiversity value of the County and City by preserving as far as possible trees, woodlands and hedgerows, having regard to the significant role that trees and hedgerows play in local ecology, climate change and air quality and their contribution to quality place making and the associated health and wellbeing benefits.

b) Require, in the event that mature trees or extensive mature hedgerow is proposed to be removed, that a comprehensive tree and hedgerow survey be carried out by a suitably qualified tree specialist to assess the condition, ecological and amenity value of the tree stock/ hedgerow proposed for removal and to include mitigation planting and a management scheme. The Council will seek in all cases to ensure when undertaking development, or when permitting development, that the loss of, or damage to, existing trees is minimised.”

Other landscape related policies are found in Chapter 6 Environment, Heritage, Landscape and Green Infrastructure.

Archaeology and Built Heritage

Section 6.5 (Archaeology and Built Heritage) of the plan sets out policies for protection of archaeology and built heritage.

A number of National Monuments Service Sites and Monuments Record (SMR), Record of Protected Structures (RPS) and National Inventory of Architectural Heritage (NIAH) buildings and structures along with one Architectural Conservation Area (ACA) are located within the study area but none within the site. These are shown in **Figure 5.4** below.

The relevant policies in the Development Plan are as follows:

Objective EH O36 - “Preservation of the Archaeological Heritage *It is an objective of the Council to seek the preservation of all known sites and features of historical and archaeological interest. This is to include all the sites listed in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act 1994. The preferred option is preservation in situ, or at a minimum preservation by record.”*

Objective EH O39 – “Protection of the setting of Archaeological Monuments *It is an objective of the Council to ensure that no development shall have a negative impact on the character or setting of an archaeological monument.”*

Objective EH O52 - National Inventory of Architectural Heritage (NIAH) – “It is an objective of the Council to review and update the RPS on foot of any Ministerial recommendations including the NIAH and any future updates. The Ministerial Recommendations, made under Section 53 of the Planning Act, will be

taken into account when the Planning Authority is considering proposals for development that would affect the historic or architectural interest of these structures.”

Objective EH 053 - Architectural Conservation Areas—“It is an objective of the Council to: a) Protect the character and special interest of an area, which has been designated as an Architectural Conservation Area (ACA) as set out in Volume 3.... c) Ensure that any new development or alteration of a building within an ACA or immediately adjoining an ACA is appropriate in terms of the proposed design, including scale, height, mass.”

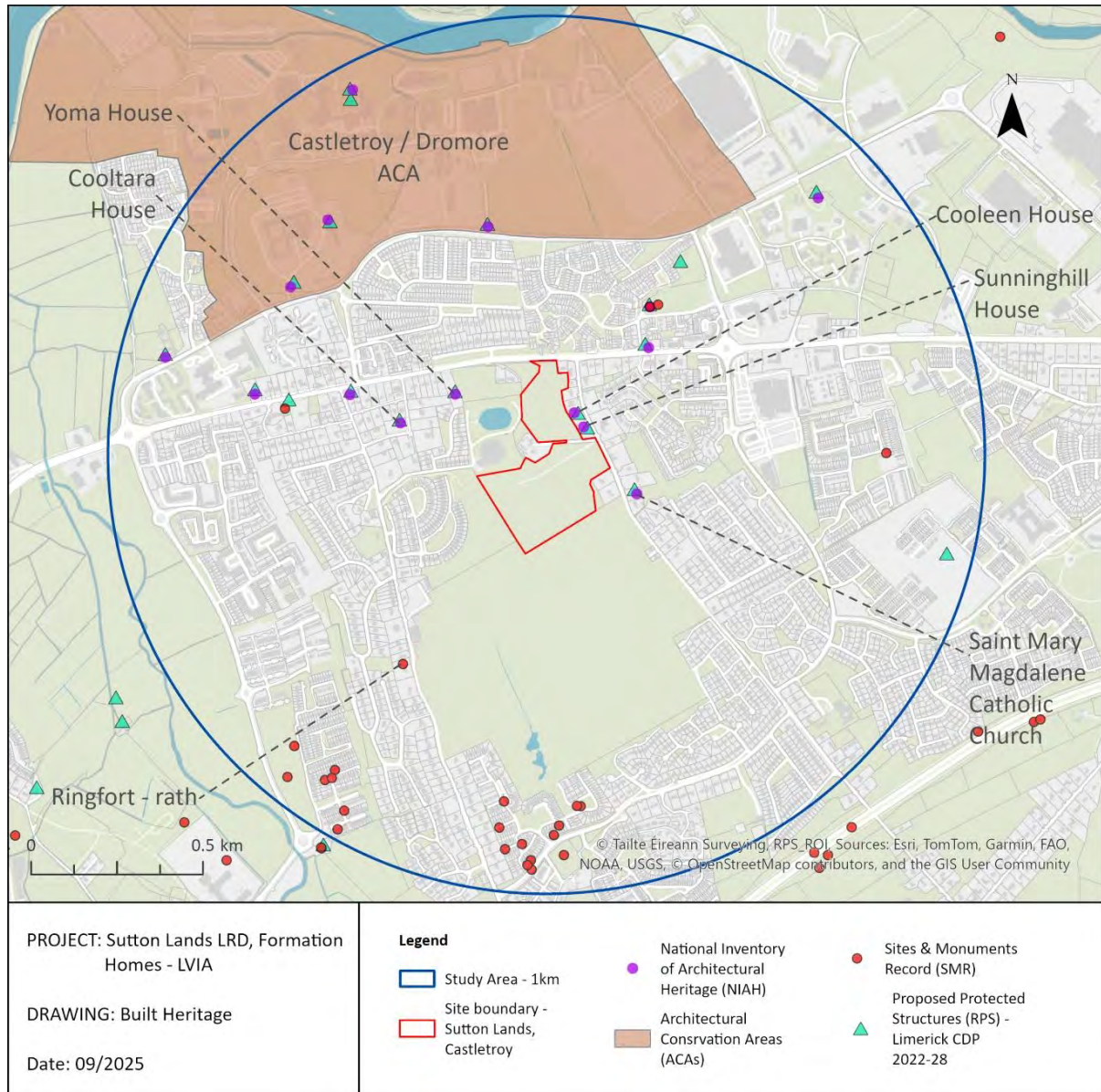


Figure 5.4 Archaeology And Built Heritage (Source: LDP 2022-2028)

NPWS

There is only one NPWS designations within the study area. It pertains to the Lower River Shannon Special Area of Conservation (SAC) covering the section of the River Shannon within the study area’s northern edge (i.e. more than 900m from the site), as shown in **Figure 5.5** below.

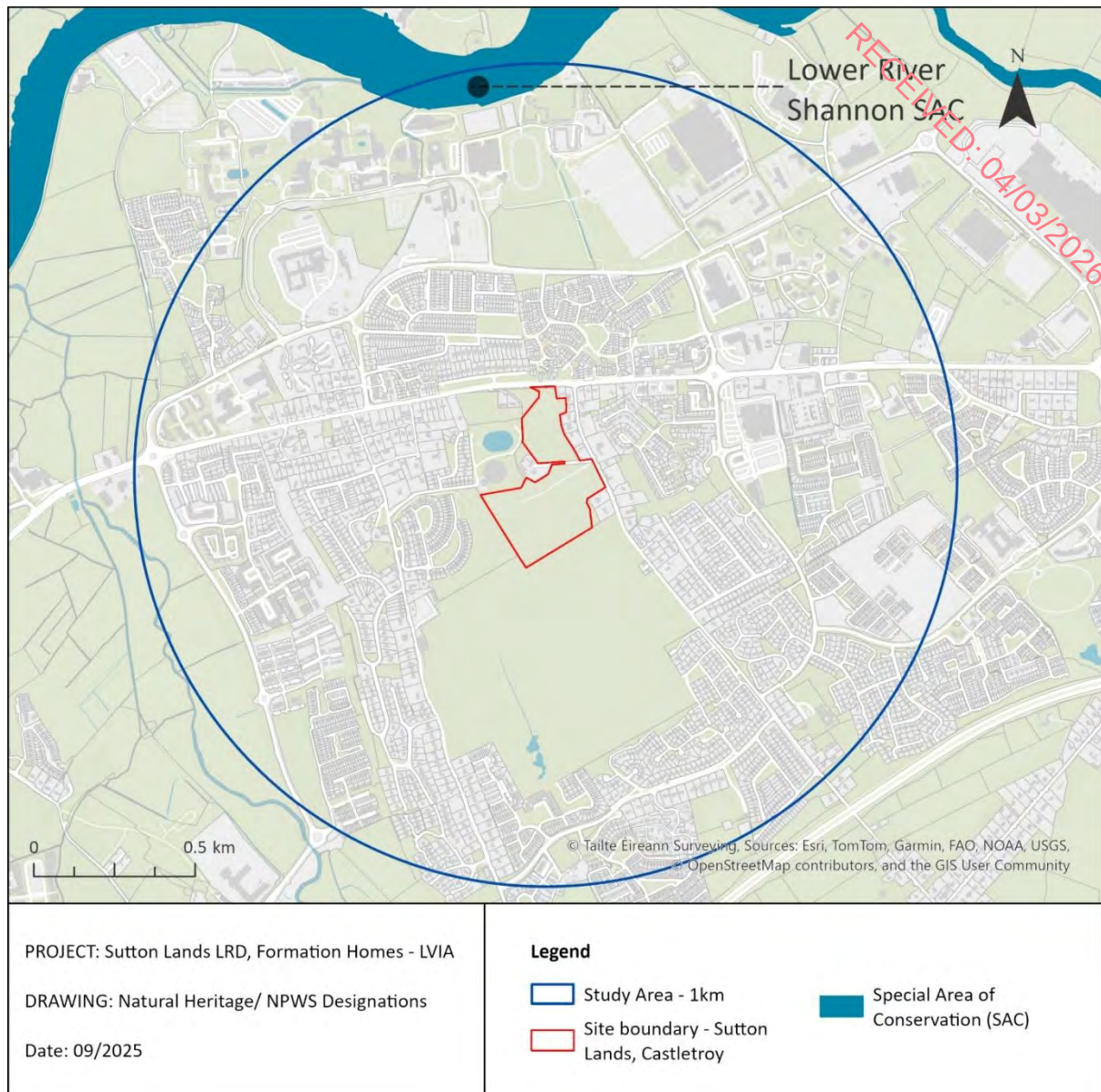


Figure 5.5 NPWS Designations (Source: LDP 2022-2028)

Access

Section 7 : (Sustainable Mobility and Transport) of the Development Plan sets out policies in relation to improving access through the city and county.

A number of existing walkways/cycleways are found within the study area, but none are located along the existing footpaths nearest to the site's northern and eastern boundaries. An indicative cycleway/walkway is proposed to run along the Dublin Road passing the site's northern boundary. These existing and indicative walkways/cycleways as included on Map 6in Volume 2 of the Development Plan are shown in **Figure 5.5** below.

The relevant policy in the Development Plan are as follows

Policy TR P3: Integration of Land Use and Transport Policies

"It is a policy of the Council to support and facilitate the integration of land use and transportation policies ensuring the delivery of sustainable compact settlements served by sustainable modes of transport."

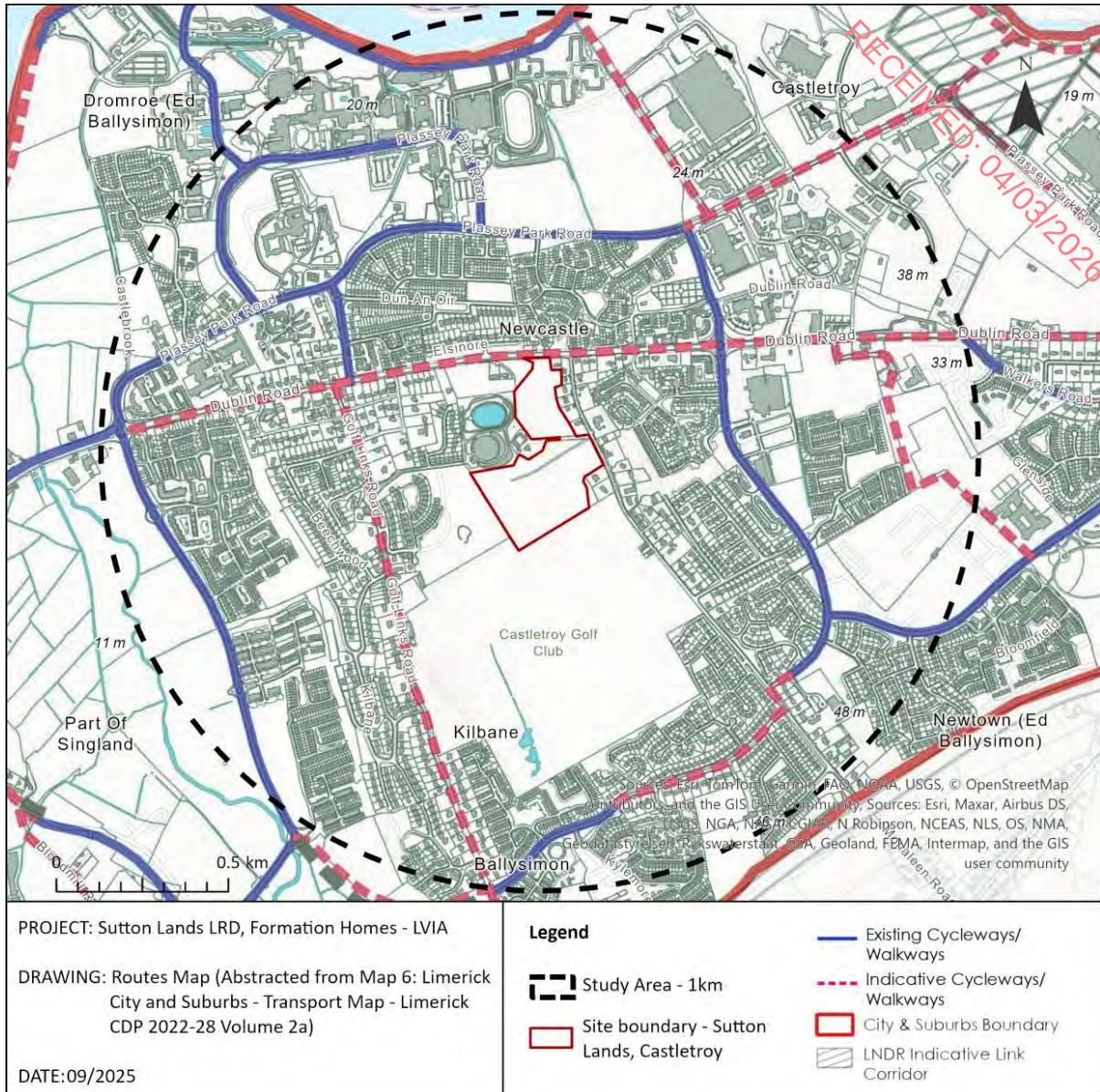


Figure 5.6 Routes Map (Source: LDP 2022-2028)

Development Management Standards

The Limerick County Development Plan states all new developments within the city will need to comply with the Building Heights Strategy, as per criteria set out in Table DM 1 Limerick City Building Height Objectives, recommendations and criteria.

Building Heights Strategy for Limerick City

The Building Heights Strategy for Limerick City included within Volume 6 of the Development Plan seeks to increase building heights through Limerick City to meet the city's growing population, while ensuring any development is of quality and balancing amenity and environmental considerations. The strategy also follows the latest Development Plan and National Planning Guidance, including Urban Development & Building Heights Guidelines for Planning Authorities, 2018, (Building Heights Guidelines).

The strategy states the development across the substantial land banks within the existing built-up suburban areas of the city should be informed by a Masterplan and comply with SPPR 4 of the Building Heights Guidelines.

"In this regard a greater mix of building heights and typologies is supported i.e. typically a mix of town-houses (2-3 storeys), duplexes (3-4 storeys) and apartments (4 storeys upwards) alongside existing larger buildings, trees and parkland, river/sea frontage or along wider streets. The appropriate height should be assessed and addressed as part of the masterplanning process on a case by case basis and should consider inter alia accessibility, public transport provision, access to amenity, recreational and community facilities, the existing character of the area and wayfinding."

Building Height Strategy – Castletroy/University of Limerick

A building height and tall building guidance is provided for the Castletroy/University of Limerick suburban area of the city in which the site is located, which states:

"The gateway flagpoles at University of Limerick are an established high point within the surrounding environs of Limerick City. Its significance as a gateway is due to its development as a University quarter. The connection between the University and the City Centre has been reignited by the University's intention to locate part of its campus within the former Dunnes Stores site at the base of Sarsfield bridge."

Many sites within the Castletroy area are designated for residential development of good quality design that should adhere to site specific briefs. Form and massing should be emphasised at landmark locations, such as street corners and road junctions, through higher density development."

Area Objectives

- 1. "Any proposed buildings of height in this gateway area must be balanced with the need to maintain the status of the University rather than the creation of a high building cluster;*
- 2. Any proposed area of height should be in line with the framework of the planned, coordinated and sustainable development of the Castletroy area; and*
- 3. While adhering to the framework of the planned, coordinated and sustainable development of the area, where appropriate, a modest increase in building height at important intersections/nodes and street corners may be required to enhance legibility and sense of place."*

5.3.2 National Planning Policy Context: Urban Development and Building Heights Guidelines (2018)

The 'Urban Development and Building Heights, Guidelines for Planning Authorities, Department of Housing, Planning and Local Government' were issued by the Department of Housing in December 2018.

In order to discourage generic restrictive policies on building heights in local development plans the Government introduced the above guidelines. The guidelines set out to encourage higher building and densities within, particularly, existing built-up areas to take advantage of existing infrastructure, vary the building typology and contribute to placemaking.

Section 2.5 of the Guidelines states:

"Furthermore, while taller buildings will bring much needed additional housing and economic development to well-located urban areas, they can also assist in reinforcing and contributing to a sense of place within a city or town centre, such as indicating the main centres of activity, important street junctions, public spaces and transport interchanges. In this manner, increased building height is a key factor in assisting modern placemaking and improving the overall quality of our urban environments."

The guidelines require the applicant to demonstrate that they satisfy the following criteria.

At the scale of the relevant city/town:

- *"The site is well served by public transport with high capacity, frequent service and good links to other modes of public transport.*
- *Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views. Such development proposals shall undertake a landscape and visual assessment, by a suitably qualified practitioner such as a chartered landscape architect.*
- *On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape."*

At the scale of district/ neighbourhood/ street:

- *"The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape.*
- *The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.*
- *The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" (2009).*
- *The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.*
- *The proposal positively contributes to the mix of uses and/ or building/dwelling typologies available in the neighbourhood."*

At the scale of the site/building:

- *"The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.*
- *Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'.*
- *Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."*

The proposed development is located in the suburbs of Limerick City, rather than the city centre or inner suburbs. For these situations the following guidance is provided:

- *Newer housing developments outside city and town centres and inner suburbs i.e. the suburban edges of towns and cities, typically now include town-houses (2-3 storeys), duplexes (3-4 storeys) and apartments (4 storeys upwards). Such developments deliver medium densities, in the range of 35-50 dwellings per hectare net. Such developments also address the need for more 1 and 2 bedroom units in*

line with wider demographic and household formation trends, while at the same time providing for the larger 3, 4 or more bedroom homes across a variety of building typology and tenure options, enabling households to meet changing accommodation requirements over longer periods of time without necessitating relocation. These forms of developments set out above also benefit from using traditional construction methods, which can enhance viability as compared to larger apartment-only type projects.

- The forms of development set out above can, where well designed and integrated, also facilitate the development of an attractive street-based traditional town environment with a good sense of enclosure, legible streets, squares and parks and a strong sense of urban neighbourhood, passive surveillance and community as in the case of the award winning Adamstown Strategic Development Zone in South Dublin County Council.
- Development should include an effective mix of 2, 3 and 4-storey development which integrates well into existing and historical neighbourhoods and 4 storeys or more can be accommodated alongside existing larger buildings, trees and parkland, river/sea frontage or along wider streets.
- Such development patterns are generally appropriate outside city centres and inner suburbs, i.e. the suburban edges of towns and cities, for both infill and greenfield development and should not be subject to specific height restrictions. Linked to the connective street pattern required under the Design Manual for Urban Roads and Streets (DMURS), planning policies and consideration of development proposals must move away from a 2-storey, cul-de-sac dominated approach, returning to traditional compact urban forms which created our finest town and city environments.

The overall intention of the above guidelines is to achieve minimum densities, ensure a greater mix of building heights and typologies and avoid mono-type building typologies in any one development.

5.3.3 Planning History

Planning history of the Site

The site has no known, recent planning history associated with it. The site's last planning submissions are a number of historic applications submitted between 2005-2009. This included planning approvals for a mix of residential areas, including houses, apartments and duplexes and creche unit types located across the site lands, with access to it gained via the Monaleen Road. However, none of these approved residential schemes were ever developed.

Planning Applications in the wider area

Other development applications of note which are located within the wider residential area are included in **Table 5.9** below.

Planning Ref: & Status	Description	Address Description	Distance & Direction from nearest site boundaries
LCC-2560271 Approved Dec 2025 <i>But under</i>	Large-Scale Residential Development (LRD) application : (i) 114 no. residential units comprising (a) 16 no. 2.5 storey 4 bed detached units; (b) 8 no. 2.5 storey 3 bed semi-detached units; (c) 36 no. 2.5 storey 3 bed terrace units; (d) 19 no. 3 storey 2 bed duplex units; (e) 19 no. 3 storey 3 bed duplex units; and (f) 16 no. 2 bed apartments provided within 2 no. 4 storey blocks (ii) ancillary apartment storage facility	Golf Links Road and Mount Green Road, Newcastle, Castletroy, Limerick	0m, on adjoining lands directly west of the proposed Suttonfield development.

<i>appeal to</i>	inclusive of bin and bike store; (iii) creche facility; (iv)		
<i>ACP.</i>	new access road off Mount Green Road; (v) off and		
<i>ACP –</i>	on street car parking and bicycle stands; (vi) bin		
<i>LL91.3240</i>	storage; (vii) 6 no. bicycle storage sheds; (viii)		
<i>13</i>	landscaping; and (xi) all associated site works.		
<i>Pending</i>			

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Table 5.9 Planning Applications in the Wider Area

Summary of Policy

The section above can be summarised as follows:

- The site and study area fall within the Urban Character Area No. 03 Castletroy/Plassey/Annacotty.
- The site is located on agricultural lands which are zoned for residential use, and which have previous historic planning approvals for residential schemes that were not developed.
- There are no scenic views or routes within the study area. The nearest significant vantage point is 2.25km east of the site at Annacotty.
- Objective EH10 refers to the importance of retaining trees and hedgerows where possible and where removal is proposed, it requires that a comprehensive tree and hedgerow survey be carried out by a suitably qualified tree specialist.
- Objective EH036, EH039, EH052, EH053 seeks the protection of archaeological heritage, monuments and sites, RPS and NIAHs, and ACAs but none are within the site.
- The Building Heights Strategy objectives emphasis sustainable good quality design residential development across the Castletroy area, with the possibility of height to 5 storeys or more, and variation in form and massing where appropriate to ensure interest in building typology and form.

5.3.2 Landscape Baseline: Description of the study area, site and environs

The receiving environment is described below in terms of:-

- Location and overview.
- Access & Site boundaries.
- Topography and drainage.
- Vegetation and natural heritage.
- Built and Cultural heritage.
- Settlements, Landscape and Visual Amenity.

Where applicable, the above will be separated into:

- The Site and its immediate environs.
- The wider Environs of the Study Area.

Location and Overview

The site comprises 9.7 hectares of agricultural/improved pasturelands located within the townland of Newcastle and surrounded by established residential development that form part of the suburban area of Castletroy, within the eastern limits of Limerick City.

The wider study area consists of the suburban environments of Castletroy and Plassey, within the eastern extents of Limerick City.

The site's context within the wider study area is shown below figure 5.7, which indicates a large portion of the land use in this area is that of the various residential estates. To the northern end is the University of Limerick, with its mix of buildings widely spread out. Large employment lands are directly east of the university while further east of the site is the retail uses clustered around Castletroy Town Centre. The area also contains several recreational open spaces, with the largest space being the Castletroy Golf course directly south of the site. A number of playing fields are located within the grounds of the university, Castletroy College and residential areas. Towards the outer edges are some more naturalised or agricultural lands such as around the valleys of the Groody River and the River Shannon.

The site's context within its immediate setting is illustrated in the annotated aerial within Figure 5.8. The various elements and features which are characteristic of the wider landscape and the site and it's vicinity are described in detail below.



Figure 5.7 Site context (Source: Open Street Map 2026)



Figure 5.8 Local Site context (Source: Google Earth Imagery capture November 2024)

Access & Site Boundaries

The Wider Landscape

The primary key road within the study area is the R445 Dublin Road which runs along an east to west direction and directly passes the site's northernmost boundary edge, as described below. It runs from the M7 interchange to the centre of Limerick City, serving as the thoroughfare into Limerick City from the suburbs around Castletroy, Newcastle and Anacotty. Providing access for residential, University of Limerick and business/technology parks by Plassey users access by either private or public transport to/from Limerick city. Several secondary routes lead directly off the R445 route providing further access through the area, key examples of these routes include: Plassey Park Road, Kilmurry road, Groddy Road, Golf Links Road and Monaleen Road. The later route runs from its junction with the R445 and continues south-westerly passing directly next to the existing site entrance) next to its eastern boundary (approx. 240m from the R445 junction, as described below. There are also a network of various shorter tertiary roads/streets running throughout the residential estates, university and employment lands in the study area.

Site and immediate vicinity

The Site consists of private improved pastureland made up of two fields, referred here to as the northern and southern parcels, as indicated above in Figure 5.8. These parcels are divided by an existing private laneway leading from a gated entrance on Monaleen Road, on the eastern site boundary and which leads up to a small, detached residence with adjacent large sheds/ farmyard surrounded by tall trees. However, this house and farmyard is outside the site boundary. The site is largely enclosed by a mix of tree lines and hedgerows that bound the adjoining residential areas, Newcastle Reservoir and Castletroy golf course. The laneway running between the northern and southern parcels is enclosed by a low concrete post and wire fence while some short sections of wooden panel fencing are found to the rear of houses against the corner of the site's northeastern boundary.

There are two sections of the site boundaries that directly front onto an adjoining public footpath and road. One roadside section runs along the site's eastern boundary, bordered by a modern narrow stone wall fronting onto the Monaleen Road. The other section is more enclosed by a low wall with a steep tree-lined bank which runs against the site's northern boundary fronting onto the Dublin Road (R445).



Plate 1: View of a section of the tree lined site's northern boundary edge fronting onto the Dublin Road



Plate 2: View of the existing roadside entrance onto Monaleen Road off of the site's eastern boundary

Topography and Drainage.

Wider Landscape

The wider study area is undulating, with the topography ranging from between approx. 5m to 43m above Ordnance Datum (AOD). The lowest elevation is along the river banks of the River Groody to the far west and River Shannon to the far north of the study area. The lands slope down to the west and north of the study area, with a notable drop in elevation near to Groody Valley to the far western end of the study area.

Site and immediate vicinity

The highest lands within the study area fall within the site, forming a low hill which peaks at approx. 60m AOD on the adjoining lands to the site, located by the aforementioned residence. Upon the top of this hill and next to the site are located the two Irish Water's covered reservoirs and a water tower that take advantage of this local high point within the city. The water tower is a prominent local feature within views from the surrounding landscape of the study area, due to its height and elevated siting.

The highest elevation of the site's southern parcel is approx. 53m AOD, with terrain sloping down to the southeast and south, with the lowest lands around its southern boundary at approx. 44m AOD.

The highest elevation of the site's northern parcel is approx. 54m AOD, located next to its boundary with the aforementioned farmyard. Terrain slopes down to the northeast and east, with the lowest elevation being approx. 37m AOD, located on its northeastern corner of the site, next to the Dublin Road. There are no known water bodies and water courses present on the site.



Plate 3: View from within the site's southern parcel looking westwards as the land rises to the highest part of the site. The northern parcel is visible beyond the fenced laneway in the middle ground.



Plate 4: View of water tower and enclosed reservoir tank which are located adjoining the western site boundary.

Landcover – Vegetation and Natural Heritage

Wider Landscape

The wider landscape predominantly consists of residential areas, which typically contain a mix of grassland, ornamental/native shrubs and tree cover. Some of the existing mature treelines, which define the boundaries between some residential estates, are remnants of their lands former field system.

Large areas of tree cover within the study area include those set across the designed landscapes of the Castletroy golf course to the south and the University of Limerick Campus grounds to the north. Some of the university's tree cover are remnants from the former Plassey estate. Amongst the built up areas are some parcels of grassland consisting of undeveloped farmland and parkland by housing estates, industrial estates and playing fields within the university and Castletroy College. Some wetland marginal planting, along with riparian woodland, can be found along sections of the River Goody and River Shannon.



Plate 5: View of dense tree cover found through the surrounding estates and further afield, with these trees helping to break up the built elements in this view when looking north east to east from within the site's elevated northern end.



Plate 6: View from Castletroy Golf Course looking towards the site's south-western corner.

Site and Immediate vicinity

The site's vegetation cover across its two fields consists largely of improved grassland cover interspersed with large clumps of dock leaf plants located over its two fields. No livestock, or traces of such, are present, and it is understood the grassland on the site is currently grown for silage. As described earlier, most of the site boundaries are enclosed by lengths of mature tree lines and hedgerows. This tall band of vegetation cover helps to restrict inward views of the site.

The most common species of trees against the site's boundary is Sycamore (*Acer pseudoplatanus*), with these mostly found within the site's northern boundary with the Dublin Road. Other individual or small clusters of species to the boundaries include a mix of deciduous trees: Beech; Norway Maple, Ash and Horse chestnut.

There are also multiple evergreen trees along these site boundaries, including Leylandii, Cedar; and Lawson's Cypress (*Chamaecyparis lawsoniana*). These form a distinct, two coloured band running against the southern parcel's northwest boundary. The hedgerow bounding the western and southern boundaries of the site is dominated by Hawthorn (*Crataegus monogyna*).

An arboricultural survey of these trees and hedgerows within the site was undertaken by CSR in July 2025. It found that the trees and hedgerows bounding the site are of good condition and the majority graded as category B (Moderate Quality) and two of category C (Low Quality). The trees around the farmstead include a few individual category A (High Quality) along with category B (Moderate Quality) and a single group of trees in poor condition that are graded as category U (recommended for removal).

There is a narrow field margin strip between the edges of the improved grassland and tree/hedgerow boundaries. This margin consists of tall, rough grassland cover with low scrub, containing a mix of grasses, weeds and scrub species like docks, thistles, nettles and briars.

Across the immediate vicinity of the site, the vegetation cover is similar to that of the wider study area, given the mix of individual houses, housing estates and Castletroy Golf Course adjoining the site. Also, the area directly west of the site within the water tower/reservoir area is enclosed by a mix of mature trees and scrub cover.



Plate 7: View looking north-eastwards across the site's southern parcel where the site's boundaries are largely enclosed by mature tree lines.



Plate 8: View of site's hedgerow and trees running along its south boundary with the golf course

Built and Cultural Heritage.

Wider Landscape

Many of the National Monument Services SMRs database listing across the study area are noted as being for past recordings of historic elements, as many of these are no longer evident at ground level. The study area contains a number of Record of Protected Structures (RPS), which are listed in the LCC Development Plan. Many of these are found within the University of Limerick Campus, as its lands once formed part of the Plassey estate. This includes the former Country houses of Plassey House (RPS no. 1601, c.1770) and Milford House (RPS no. 1603, c.1770) and other smaller elements. These buildings are now used by the university and, along with a number of modern buildings on the campus, form Architectural Conservation Area (ACA) No. 9 Castletroy, Dromore, with a section of the ACA falling within the northern part of the study area.

Other such built heritage include a number of built structures off and along the Dublin Road, such as Dromore House (RPS no. 1623, c.1820) or Park House (RPS no. 1605, c.1830) country houses, a former police barracks (RPS no.1625, c.1850) and the ruins of a Medieval Castle (RPS no. 1626). Many of these RPS are also listed in the National Inventory of Architectural Heritage (NIAH). The various heritage assets found within the study area are mapped in Figure 5.4 above in Section 5.3.1.

Site and immediate vicinity

There are no known heritage assets found within the site. The RPS and NIAHs structures found within the immediate vicinity of the site include some of the nearby residential properties along/off of the Monaleen Road and Dublin Road (e.g. RPS nos. 1618, d.1937; 1621, d.1937; 1619, d.1936 and 1620 d. 1936). There is also a Coaching Inn (RPS no.1616, c.1830) and the churches of Mary Magdalen Catholic Church (RPS 1627, d.1873) and Kilmurry Church of Ireland (1607, d.1812). Please refer to Figure 5.4, above.

Of these, the nearest RPS to the site are two detached houses known as Cooleen (ROS 1619) and Sunning Hill (RPA 1620). These are located on the Monaleen Road, with their rear gardens directly bounding the site's eastern boundary. Both houses were built in 1936, and are of a distinct early modern architecture style, with the other listed houses in the immediate area reflecting the same style. Being neither farmsteads nor Country Houses, they provide evidence of the establishment of suburban development around this part of Castletroy since the 1930's.

The maps in Figures 5.9 (from 1829-41) and 5.8 (from 1897-1913), below, help illustrate how the site and surroundings have evolved within this period, when these lands were of part of a broader rural landscape. Figure 5.9 shows the southern parcel of the site partially containing a racing track and the northern parcel bearing a small, designed landscape, indicating both areas have some form of recreational use. The later map (Figure 5.10) shows the presence of the earlier Newcastle reservoir on the adjoining lands; a land use that still remains today. In addition, the racecourse has been removed and the lands at this stage are reverted to farmland with the southern parcel divided into two fields. More details on these heritage assets, and any potential impacts of the Proposed Development on them, can be found within Chapter 15 Cultural Heritage of this EIAR.

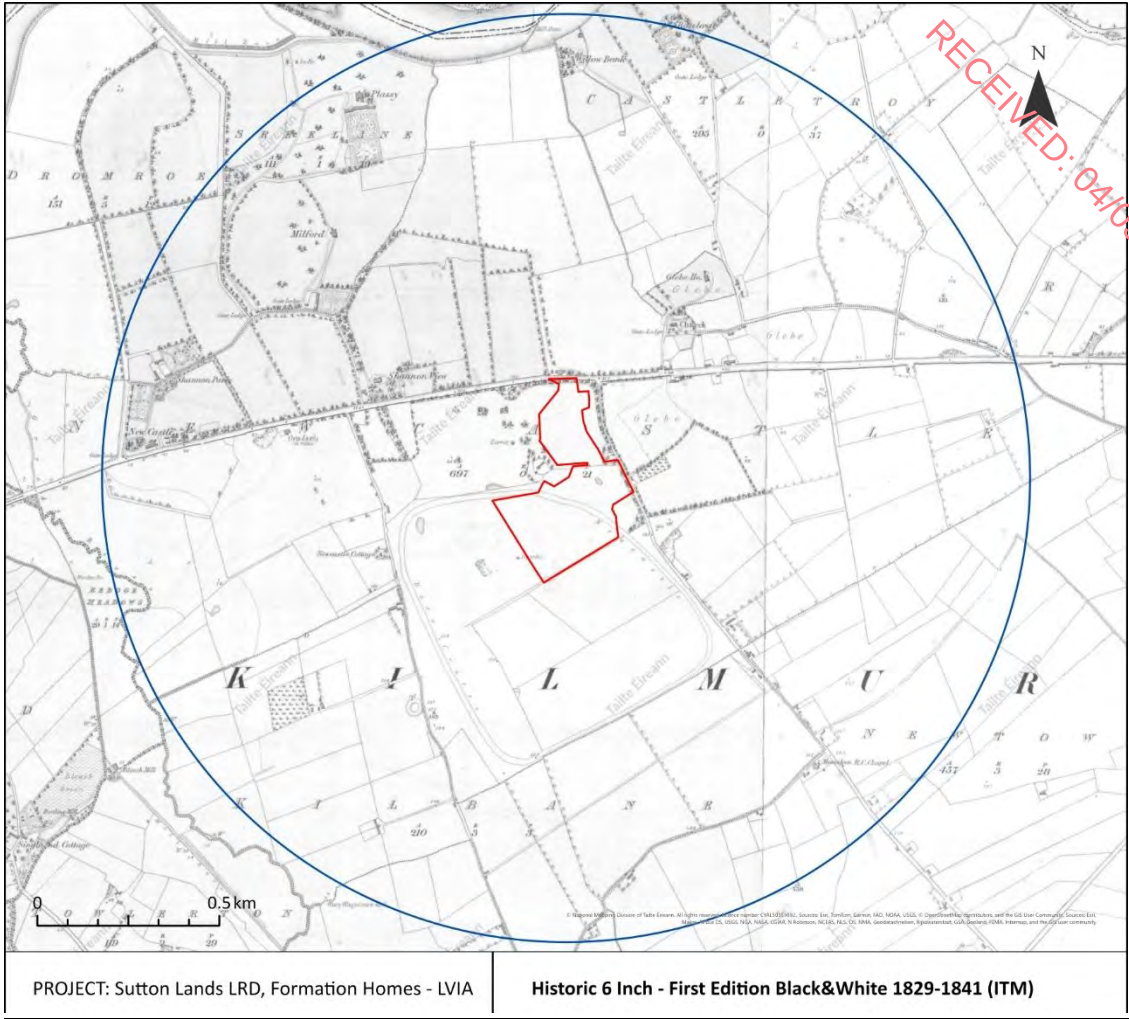


Figure 5.9 Historic 6 inch First Edition Map Black & White 1829-1841(Source: Heritagemaps.ie)

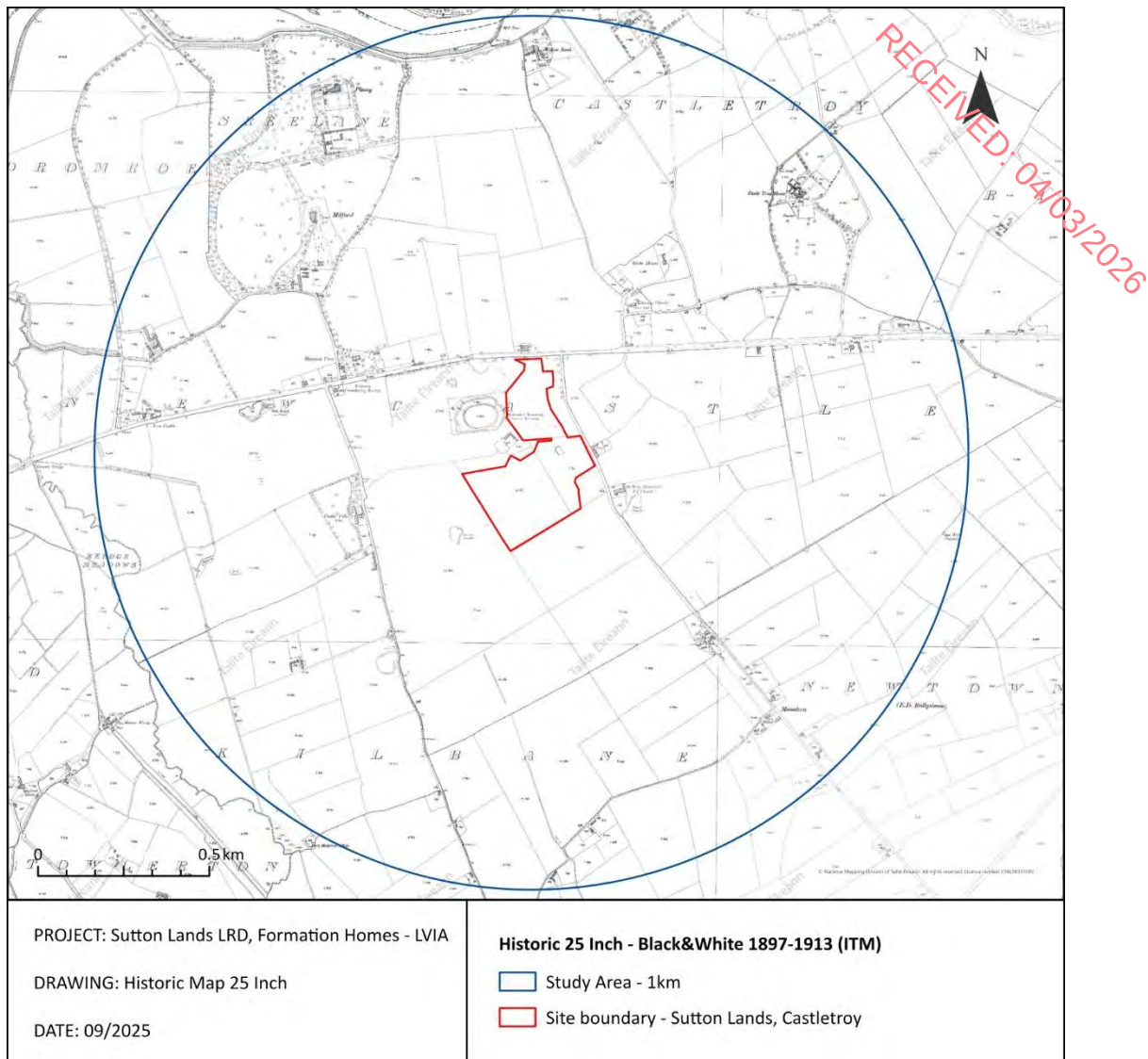


Figure 5.10 Historic 25 Inch Black & White 1897-1913 (Source: Heritagemaps.ie)

Settlements, Landscape and Visual Amenity

The built environment of the study area is predominantly residential housing typically of 2-storey high semi-detached housing. There are some apartment blocks extend to 4 storeys high, with these being of later developments off of Groody Road to the west of the study area. Recent housing developments in the area have occurred across small infill sites of former agricultural and underused open space lands located between the established housing estates. The lands north of Plassey Park Road to the River Shannon differ in character from the compacted residential areas to its south. There is a change in land use to a varied mix of educational, employment, recreational and residential uses associated with the University of Limerick Campus.

The area is well served by a transport network connecting the various estates and university with the city centre. These route include the Dublin Road (R445), which is the main thoroughfare from Castletroy to the city centre and directly passes the northern end of the site. Monaleen Road, which passes directly east of the site, serves several housing estates off of it. Just outside of the study area is the M7 motorway, which provides easy connection from within the study area to wider national transport connections. The site's agricultural lands are at odds to the surrounding residential characteristic of the area, as it forms an isolated private area of improved grassland set amongst surrounding built-up urban elements.

Visibility of the site is limited by its tall hedgerows and trees across most of its boundaries, with the greatest views experienced from the eastern boundary edges including from Monaleen Road and from the rear of some residences along this site boundary. Within the site, outward views are similarly restricted by the various mature tree cover along its site boundaries and those found through the surrounding areas. Here, potential views of the various residential areas are mostly limited to the side or rear views of the nearest residences to the site's eastern boundary. A number of rooflines and upper floors of the factories located off the Dublin Road (R445) to the northeast of the study area are partially visible.



Plate 9: View from entrance of Castletroy Shopping complex looking east across to The Park housing estate, towards the site.



Plate 10: View from playing fields within the University of Limerick Campus looking south-southwest towards the site.

5.3.3 Visual Baseline & Potential Visual Receptors

A review of the desktop study and the site visit identified several potentially sensitive visual receptors, as well as locations that were subject to landscape or visual designations in the County Development Plan, which were reviewed and visited.

Residential Views

The most sensitive residential visual receptors in the vicinity of the site are those residents which are found to the east of the site, along the Monaleen Road. A small break in the western hedgerow allows some views from the nearby Caisleán Nua housing estate, but these are highly limited/contained. Potential visibility from within the surrounding housing estates throughout the study area are likely to be limited by topography variations and screening by other nearby houses and trees.

Recreational/Amenity Views

The nearest recreation to the site is the adjoining Castletroy golf course, where potential views are likely to be restricted by the trees and hedgerow along the site's southern boundary and tree lines located between the course's fairways. Although there are a number of small amenity and open spaces within the various housing estates across the study area, it is likely potential views from these spaces will similarly be restricted by intervening houses, tall treelines and variations in topography.

Educational/Institutions

Mary Magdalene Church is approx. 105m southeast of the site's eastern boundary. The site isn't visible from the church grounds, due to screening by large, intervening trees, as well as residences on the opposite side of the road. The church spire is visible in the site peering above trees to the rear of the same residences.

This church and its spire is a local (visual) landmark, being particularly visible from the lower residential areas located on lower lands to the south and east of the church and some views from the north. Views in the direction of the site from schools in the area, like that of Castletroy College, Gaelscoil Castletroy or Milford National School, are largely blocked by treelines and housing estates next to them. Potential views in the direction of the site from within Limerick University Campus are similarly limited by various buildings and mature planting.

Commercial Premises

Castletroy town centre, which is located approx. 465m east of the site, is the largest retail complex within the study area, although other, smaller commercial premises can be found nearby along Dublin Road. Again, potential views in the direction of the site are restricted by the surrounding housing estates, tree lines and variations in topography.

Transport Routes

The nearest routes with the potential for unobscured views of the proposed development will be from a short sections of Monaleen Road, directly east of the site. While the northernmost end of the site would be visible from the Dublin Road (R445), views are highly restricted by the high bank and thick, mature treeline along the northern side of the road. Potential views from further along this road to the west and east of the site are restricted by the presence of trees/hedgerows cover, buildings and other structures together with topography variations found through the intervening urban landscape. The site's southern parcel is partially visible along a short, elevated section of the Golf Links Road, approx. 500m to the southwest, over a lower section of the roadside hedgerow.

Although there are many other roads and streets running through the study area, views in the direction of the site are largely restricted by the building mixes and density, trees/hedgerows and topography variations within the intervening landscape.

5.3.4 Summary of Landscape Characteristics and Values

The landscape characteristics and values of the site and receiving environment may be summarised as follows:

- The site is located on improved pastureland, divided into two parcels, which is largely surrounded by built-up residential areas and Castletroy golf course.
- The site's topography rises up to form a local hill. On this hill sits the adjoining Newcastle reservoir/ large concrete water tower (i.e. outside the site), which forms a distinct visual element from the surrounding locality.
- The site boundaries are mostly enclosed by a mix of tree lines and hedgerows in good condition, which help to restrict views into the site. The exception is a short section of the site's eastern boundary fronting onto the Monaleen Road.
- Although short sections of both the River Shannon and River Groody waterways fall respectively within the far north and west of the study area, these rivers are clearly separated from the site by over 800/900m of intervening built elements.
- There are no known heritage assets on the site. The nearest entail buildings listed in the RPS, including two 1930's houses bounding the site's eastern boundary, various RPS contained within the Castletroy/Dromore ACA and local churches RPS and SMR.
- There is no public access to these private agricultural lands (i.e. the site). The nearest areas of outdoor recreational spaces include the adjoining Castletroy Golf course to the south and southwest, small amenity spaces within the nearby housing estates and the playing fields within the University of Limerick and Castletroy College.
- Overall, the area in which the site is located is a popular residential suburb of Limerick City that has been heavily influenced by its proximity to the University of Limerick campus.

5.4 Predicted Landscape Impacts

5.4.1 Landscape Sensitivity

The site itself is an area of improved agricultural lands surrounded by established areas of residential housing, Newcastle reservoir and Castletroy golf course resulting in it being an isolated parcel of farmland set amongst an urban landscape. This land has been zoned for residential use and so the lands are recognised as being in a state of change/ transition, with through and robust policy in place to guide their transformation to new residential neighbourhoods. The lands benefit from several, mature, tree-lined hedgerows along its site boundaries that help contain the site and provide amenity and ecological value.

In combination with the multiple factors laid out in **Section 5.2 & 5.3**, above, the site is deemed to be of **Medium Sensitivity**, in accordance with **Table 5.1**, above. This is defined as:

"Medium: Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would result in a minor change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principal management objective is to facilitate change through development, repair, restoration or enhancement."

Owing to the multiple factors laid out in **Section 5.2 & 5.3**, above, the urban landscape of the wider study area in general is deemed to be of Low Sensitivity across its built up areas while some greenspaces present having Low-Medium Sensitivity.

"Low: Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong. The character of the landscape is such that there is some capacity for change"

in the form of development. These areas may be recognised in landscape policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.”

Thus, the receiving environment of the wider study area can be summarised, on balance, as having a Medium-Low Sensitivity.

5.4.2 Predicted Landscape Impacts and Effects

Construction Stage: Impacts and Effects on the Landscape

The proposed project is expected to take approximately 10 years to complete with site works commencing mid-2026. This is based on a 5-Phase construction plan, which has informed the need for a 10-year permission in this instance

This will entail:

- Erection of site perimeter hoarding, maintaining existing pedestrian and traffic routes around the site.
- Site Clearance, which will also involve removal of the roadside wall to allow access, half of the existing laneway and the removal of 9 individual trees, three groups of trees and a portion of the existing hedgerow (i.e. 15% of total length) to facilitate the proposed works. The affected trees are detailed in Tree Survey report and Tree Protection Plan (Drawing no. 25217_T_103) as produced by CSR (September 2025).
- Protective fencing added around the remaining retained trees for the duration of the site works in accordance with the project arborist's recommendations.
- Clearing of the grassland vegetation cover and temporary storage of soil through the site for reuse as part of the landscaping.
- Reduced level excavations and the temporary movement and stock piling of earth and materials.
- Site service installations (e.g. drainage, power, water, etc.)
- The temporary movement of machinery and personnel in and out of the site.
- All engineering, building and landscape works required with associated site infrastructure, fencing and plant.
- Construction of building frame and envelopes.
- Interior finishing and exterior landscaping.

The landscape sensitivity of the receiving environment is **Medium**

The magnitude of change would be a '**Medium**' landscape change which is defined as:

'Change that is moderate in extent, resulting in partial loss or alteration to key elements features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.'

Thus, in accordance with **Section 5.2.6 (Table 5-5)**, a Medium landscape sensitivity combined with a Medium magnitude of landscape change will result in the significance of effect being **Moderate**. In terms of qualitative effects, as with construction works generally, this would temporarily reduce the landscape quality and be considered **Adverse** in quality, which is defined as:

"... cause the quality of the landscape(townscape)/view to be diminished."

The timescale of construction-stage impacts/ effects will be Medium-term (i.e., lasting seven to fifteen years, in

accordance with Table 5.7).

Operational Stage: Effects on the Landscape

Following the completion of the Construction Stage, and its associated impacts, the main landscape effect associated with any proposed development are those likely effects on the landscape character of the receiving environment.

The proposed development will replace the existing isolated area of agricultural lands with a mix of 523 no. residential units, along with the provision of a crèche, provided across a mix of high quality houses and apartment block types, ranging from one to five storeys in height, and with contemporary landscape design to the communal and public open spaces.

Whilst some trees and hedgerows will be affected, the new development has been laid out to take advantage of the high degree of enclosure already provided by the retained mature tree line and hedgerow cover running against the site's outer boundaries. These boundaries will be further strengthened by the proposed tree and hedgerow planting up against the site's boundaries which will act as a screening buffer between the site development and surrounding lands. Combined, the enhanced boundary planting and the proposed planting to internal public/private amenity areas will create important green corridors which will bolster environmental connectivity throughout the area.

The proposed development has been prepared in accordance with best practice urban design guidelines, including the sitting of the highest buildings within the lowest lands, and is reflective of the land use changes anticipated for the affected lands through that of supporting local planning policies.

In the context of the landscape character of the vicinity of the site, this change is regarded as **Medium** magnitude of change, which is defined as:

"Change that is moderate in extent, resulting in partial loss or alteration to key elements features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape."

However, in terms of the wider study area, the operational landscape impact associated with the proposal is regarded as **Low**, which is defined as:

"Change that is moderate or limited in scale, resulting in minor alteration to key elements features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape."

Thus, in accordance with Section 5.2.6 (Table 5-5), a Medium landscape sensitivity combined with a Medium magnitude of landscape change will result in the significance of effect being **Moderate**. In terms of qualitative effects, as the proposed development is reflective of housing patterns within the area it is considered **Neutral** in quality, which is defined as:

"Scheme complements (or does not detract from) the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality."

In terms of duration of effect, the operational stage impacts will be permanent (i.e., lasting over 60 years) and would relate to a small geographical area.

Cumulative Landscape Effects

A review of Limerick City and County Council online planning search facility was undertaken to determine if there could be potential cumulative landscape effects between the proposed development with other approved or pending developments.

Much of the lands previously zoned for future residential development within the LCCDP in Figure 5.2, which included some infill areas of lands between established housing areas, have since been developed out, including the new housing estate of Caislean Nua to the west of the site. A recent application has been lodged for a new housing estate located directly between Caislean Nua and the proposed Sutton Land, which is called Caislean Nua LRD (Planning ref: 2560271), with its planning status still pending a decision. It was approved by LCCC (December 2025) but its current planning status is pending a decision following a third party appeal to An Coimisiún Pleanála (case ref: LL91.324013).

Were the proposed Sutton lands to be approved, along with the pending Caislean Nua housing development, this would have a collective loss of grassland cover to residential development. However, such changes are anticipated by both lands being zoned for residential use, resulting in notably more residential landcover between the Golf Link Road and Monaleen Road. Concurrently, the golf course's predominant tree line along the northern boundary would be retained and enhanced, with additional planting added as part of both schemes landscape proposals.

Although large areas of both proposed developments will include new housing and associated hard surfaces, there are opportunities to enhance the biodiversity of the area through an increase of tree cover, hedgerow and wildflower meadows proposed throughout the public/private spaces, replacing areas of monocultural improved grassland. There is the potential for cumulative landscape effects during the construction phase of the proposed Sutton lands, if this phase were to occur concurrently with the construction works for the proposed Caislean Nua housing scheme (if approved). This would result in a notable increase of construction activity in the locality, albeit contained by the retained tree cover along their respective site boundaries.

Overall, in terms of the cumulative landscape effects, these are regarded as **Low**, which is defined as:

"Change that is moderate or limited in scale, resulting in minor alteration to key elements features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape."

Thus, in accordance with Section 5.2.6 (Table 5-5), a Medium landscape sensitivity combined with a Low magnitude of cumulative landscape change will result in the significance of effect being **Slight**. In terms of qualitative effects, as the proposed development is reflective of local housing growth patterns and supporting planning policies for the area, it is considered **Neutral** in quality, which is defined as:

"Scheme complements (or does not detract from) the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality."

In terms of duration of effect, the operational stage impacts will be permanent (i.e., lasting over 60 years) and would relate to a small geographical area.

5.5 Predicted Visual Impacts

5.5.1 Zone of Visual Influence and Potential Visual Receptors

Based on the assessment of the landscape characteristics, values and sensitivities, 13 no. representative visual receptors (i.e., viewpoints/VPs) were selected, from a range of distances, angles and viewing contexts, for the purposes of the following Visual Impact Assessment. These are scheduled below in Table 5.10, below, and illustrated in Figure 5.9, below.

Sensitive visual receptors in the vicinity of the site include residential viewers, located in all directions within the surrounding residential estates but many of these receptors potential views in the direction of the site are somewhat curtailed by other nearby housing. The greatest residential views of the site are those found directly bordering it or located within close proximity to it. More open views looking towards the site are possible from the surroundings open spaces including those of recreational users at Castletroy Golf Club and those within the Limerick University campus grounds as well as the large carparking around Castletroy Shopping Centre, where receptors are more set back from the surrounding residential areas.

Potential views in the direction of the site from main transport routes are often restricted by the surrounding built up areas. In addition, there are not any Limerick City or County wide protected views where the proposed development would be visible.

A sensitivity rating has been ascribed to the visual receptors at the assessed 13 viewpoints, in accordance with the definitions provided in **Table 5.3**, above, with a rationale for the sensitivity rating provided under the description of each existing view. The potential impact of the various phases of the proposed development upon these receptors' existing views are assessed in **Section 5.5.3** below.

No:	Viewpoint Description	Distance/Direction from site boundary	Relevant receptor
VP1	Dublin Road/R335	39m northwest	- Local community - Road users
VP2	Monaleen Road, east of site	10m northeast	- Local residents - Road users
VP3	Monaleen Road, southeast of site	142m southeast	- Local residents - Road users
VP4	Heatherdale (housing development)	712m south-southeast	- Local residents - Road users
VP5	Golf Links Road	482m southwest	- Local residents - Road users
VP6	Caislean Nua (housing development)	93m west	- Local residents - Road users
VP7	University of Limerick	731m northeast	- University students - Recreational walkers/runners
VP8	Castletroy Town Centre (shopping mall)	411m east	- Local residents - Road users
VP9	Mary Magdalene Church, Monaleen Road	104m east	- Local residents - Road users
VP10	Between 'Sunninghill' and 'Cooleen' residence on Monaleen Road, east of site	52m east	- Local residents - Road users
VP11	Entrance to Castletroy Golf Course	387m southwest	- Local residents - Road users
VP12	The Fairways Housing Estate	581m southeast	Local residents
VP13	Dublin Road next to Monaleen Road Junction	66m northeast	- Local residents - Road users

Table 5.10 Viewpoints Selection Table

Shot Locations.

- VPO1 : Dublin Road.
- VPO2 A \ B \ C : Monaleen Road.
- VPO3 : Monaleen Road.
- VPO4 : Heathersdale.
- VPO5 : Golf Links Road.
- VPO6 : Caislean Nua.
- VPO7 : University of Limerick.
- VPO8 : Castletroy Town Centre.
- VPO9 : Mary Magdalene Church.
- VP10 : Monaleen Road.
- VP11 : Castletroy Golf Club.
- VP12 : The Fairways.
- VP13 : Dublin Road.

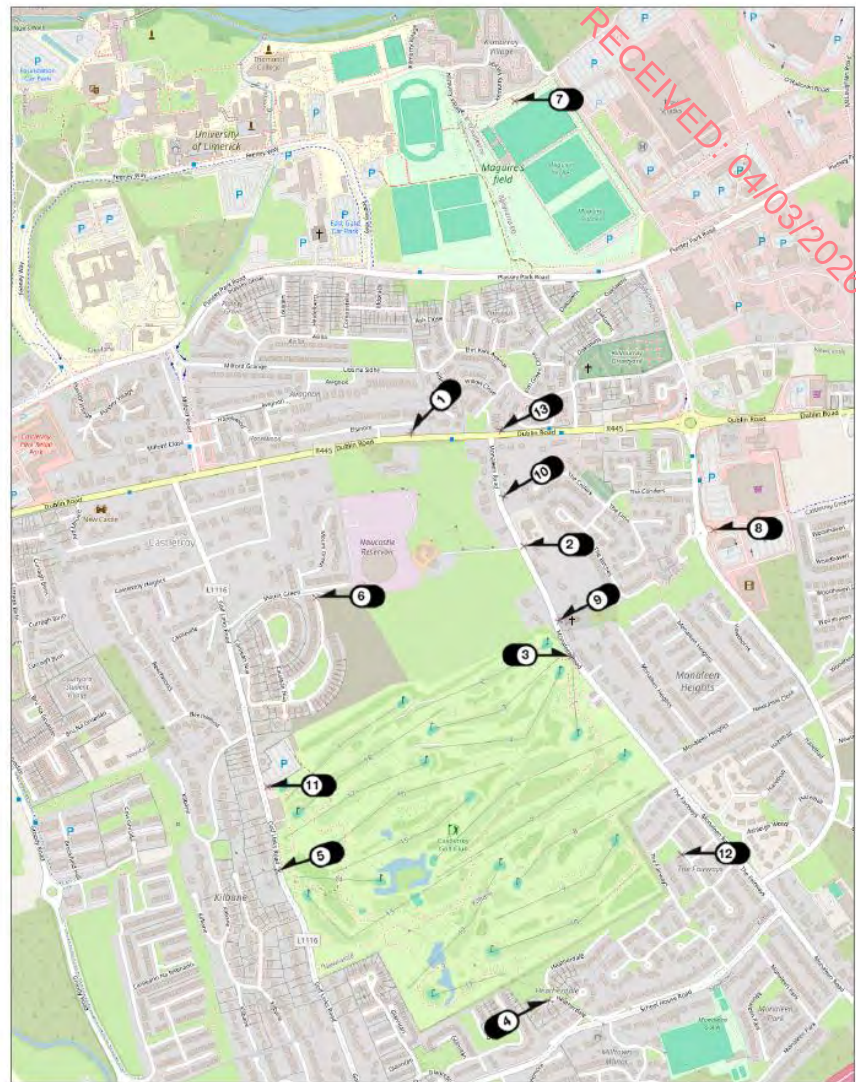


Figure 5.9 Viewpoint Map (Source: Shove Media)

5.5.2 Photography and presentation of viewpoints

Each Viewpoint is illustrated by a photograph showing the existing view and a verified photomontage showing the proposed development. The photomontages were produced by Shove Media in February 2026, with the site photography capturing the existing views, undertaken in November 2025. These are presented in a separate booklet, with a map of the viewpoint locations, in **Appendix 5.1**.

These verified photomontages have been taken with a wide angle focal length (FL) and prime lens to allow representation of the development within its context. In all visualisations, the extent of the 50mm FL view has been indicated for reference, which is broadly equivalent to the c.40 degree Horizontal Field of View (HFOV). This is representative of what the human eye perceives and reflects the requirements of the Landscape Institute Technical Guidance Note on Visual Representation 2019.

To correctly view the photomontage at the correct scale, the extents of the 50mm lens/ 40 degree angle of view should be extended to A3 in size and viewed at arm's length. This can be done by printing a hard copy or, more easily, digitally on screen, allowing reference back to the wider angle to understand the context. Each viewpoint is described below in its existing condition, followed by the effects of the proposed development. The descriptions focus primarily on the extent of the 50mm image, with reference to the wider view, where appropriate, to inform analysis.

5.5.3 Assessment of Visual Effects

The 13 No. selected viewpoints across the study area will be assessed here with the existing viewpoint conditions and the likely effects of the Proposed Development upon its existing view described below. Each viewpoint should be read in conjunction with the Photomontages Booklet included in Appendix 5.1.

The temporary effects during Construction Phase are briefly described, while the effects at Operational Phase are described in more detail.

For the definitions of the following assessments, please refer to:

- Table 5.3 (for Sensitivity of Visual Receptor);
- Table 5.4 (for Magnitude of Change to View);
- Table 5.5 (for the Significance matrix);
- Table 5.6 (for Quality of Effect);
- Table 5.7 (for Duration of Effect).

Viewpoint 1: Dublin Road/R335

Existing View

This view is looking south-eastwards directly across the Dublin road to the site's northernmost boundary. In the foreground, running diagonally (east-west) across and occupying much of the view is the main road itself, bounded by the adjoining public footpaths. Adjacent to the far footpath, along the southern edge of the road corridor, is a continuous line of mature trees which are sited along a low embankment marking the site boundary.

Visible behind these trees is the improved grassland cover across the site's northern end, gradually rising further towards the south. This agricultural pasture is somewhat incongruous within the context of a highly developed residential suburb, which road users or pedestrians have been experiencing along this route. Views into the site from the road are greatest when the trees are lacking any leaf cover in the winter months. The road corridor is contained on either side by a mix of trees of a similar nature to this southern boundary. Some distant rooflines of housing within Castletroy are visible in the background. The trees create an attractive and mature leafy character to the Dublin Road.

Visual Receptors Sensitivity

Although a busy transport route, its mature leafy character and modestly scenic character suggests a viewpoint sensitivity of Medium.

Visual Impacts and Effects

Construction Effects :

There will be some alteration to the site's existing tree cover visible next to the road, resulting in the removal of four Class B1 trees to accommodate the site works. Inward views of the site will be temporarily reduced by the installation of hoarding around the site boundary behind the retained tree line. There will be some partial views of the site works set further back within the site, upon its higher lands, partially visible above the hoarding.

The Magnitude of change would be Medium.

The Significance of effect would be Moderate and Adverse and Medium term.

Operational Phase:

The lost trees would leave a gap in the continuity and maturity of tree cover, although the amenity of the new access ramp, and adjacent proposed vegetation, would be an attractive feature. Over time, the new tree planting and native shrubs would extend the treeline deeper into the site. With the reduced tree cover initially, and

particularly in winter, the proposed internal amenity area would be more visible, as well as its pathway which connects pedestrian/cyclist users from the site to the Dublin Road. Some of the northern development blocks would also be partially visible, which will present as a high quality residential development in a residential neighbourhood, while being set considerably back from this road.

The main visual change would be the loss of the mature trees to the site boundary, with more distant partial views of proposed housing. The change would not be out of character as the urban area consolidates in this locality. Over time the woodland character to the road will be reinstated and the development integrated almost hidden behind the woodland boundary.

In the short and Medium term, the magnitude of change is considered to be Medium. However, In the Long Term, this would decline to Low.

Significance of Effects

The significance of the effect in the Short and Medium term would be Moderate. This would decline to Slight Significance in the Long Term.

In terms of qualitative visual effects, the effect would be Adverse in the Short and Medium term, improving to Neutral in the Long Term, as the proposed tree planting recreates and improves the verdant corridor of the main road.

Cumulative Visual Effects

There are no likely cumulative visual effects of note associated with the proposed development, when viewed from this viewpoint.

Viewpoint 2: Monaleen Road, east of site

Existing View

The view is located along the Monaleen Road, before a number of residences in the vicinity of the site, with an open view looking west across the road directly onto the site lands. Due to the wide frontage and proximity of the viewer to the site, three photographs are taken to comprehensively create an overlapping panorama across the frontage here.

In the foreground can be seen the Monaleen Road itself. Across the road in each photograph can be seen the roadside footpath and a stone boundary wall running the full extent of the site boundary, until the formal gated entrance (See VP02 B) at the northern end of the boundary that provides access to the buildings located centrally in the site. A large adjacent single residence can be partially seen north of this gateway (VP02 C) – this house is not part of the proposed site.

Beyond the boundary wall there are views of the site's improved grasslands rising to the west. There are some mature trees and hedgerows visible along the site distant boundaries closing views beyond. The current view is incongruously rural in character, influenced by distinctive, large private houses along the road.

Visual Receptors Sensitivity

As this view has some distinct scenic qualities associated with it, particularly for local residences, the viewpoint sensitivity is deemed to be Medium-High.

Visual Impacts and Effects

Construction Phase:

The ground level views of the siteworks will be largely obscured by the hoarding running against the site's roadside boundary. Views of the site activity will likely be possible above this hoarding, including upon the higher lands to the west, as well as works at upper floor levels as the construction phase progresses. There will be also views of site traffic coming/going from the single site entrance on Monaleen Road.

The magnitude of change would be Medium.

The Significance of effect would be Moderate and Adverse and Medium term.

Operational Phase:

The proposed development includes removal of the site's existing roadside boundary wall, and some distant tree cover by and a change in the view from a rural field to suburban enclosure. The current stone wall and open fields will be replaced by a new boundary slightly set back behind a grass verge from the footpath. This boundary will consist of a railing and low stone wall with regular stone pillars mostly obscured by an ornate hedge. A new road will be created to access the site at the southern end of the view where a large, detached house will act as a distinctive corner building.

The main visual change will be in the foreground, where a high-quality 4.5 storey apartment building (i.e. Block 10), with ground floor creche, presents its elevation along the road. This building would greatly foreshorten westward views from this roadside, while it's 4.5 storeys will generate an increased sense of enclosure, owing to its relative proximity to the roadside. However, the tasteful alternation of tones and materials across Block 10, in addition to the proposed trees along this section of the boundary, will reduce the potential for massing, while preventing the block from becoming over-dominant in the scene.

This existing vehicular access into the site would be removed as part of the proposed development, to be replaced by a more modest and appealing pedestrian access gate. The frontage with Monaleen Road would include new landscaped areas, children's play areas and tree planting, which would further soften and frame the new buildings. The proposed development would transform the view from semi-rural to sub-urban, reflecting the land zoning of the site and the contemporary context of Castletroy.

The magnitude of change is considered to be High.

Significance of Effects

The visual effect of the proposed development would be Significant.

The proposed development would be Neutral in quality.

With regards to duration of effect, these will be Permanent in nature.

Cumulative Visual Effects

There may be some very limited cumulative views of the construction phase, at locations where the proposed development is to be constructed at the same time as the adjoining Caislean Nua development, further to the west. This will mostly entail that of crane or upper apartment floor works partially visible above the retained section of hedgerow on the sites southwestern end.

However, once the proposed development is complete, its collection of buildings will screen any potential views of the adjoining proposed Caislean Nua from this location.

Viewpoint 3: Monaleen Road, southeast of site

Existing View

This view is before a small group of houses along Monaleen Road and looking northwest in the direction of the site. In the foreground can be seen the Monaleen Road itself running across the view from south to north. A footpath and concrete block wall bounds the road corridor, beyond which lies the out-of-sight Castletroy Golf

Course. The main view of these houses is looking straight across the road onto the golf course, with oblique northwest views towards the site, albeit behind numerous intervening trees.

The golf course's high roadside block wall is a crude and unattractive outlook. There are some scattered trees visible along the boundary and within the golf club lands, culminating further north with a more significant group of trees. Other tall elements visible include the golf course's protective/ball stop netting, set against the roadside boundary, and the top of the water tower (to the west of the site) partially visible on the horizon.

Visual Receptors Sensitivity

This viewpoint is representative of adjacent residents and is thus deemed to be Medium-High.

Visual Impacts and Effects

Construction Phase:

The golf course's boundary roadside wall and its trees will greatly help contain potential views of the siteworks from this location. There will likely be some views of cranes within the site as the works progress, but these will be partially screened by the intervening trees.

The magnitude of change will be Negligible; the significance of effect would be Not Significant and Adverse and Medium term.

Operational Phase:

The presence of the golf course's wall and trees, and intervening trees will restrict views of the proposed development from this point. Parts of the upper elements of buildings and roofscapes (e.g. houses and Blocks 2- 6). which back on to the site boundary with the Golf Course, will be partially seen through the boundary trees. This is likely to be more apparent during the winter months when the boundary trees lack leaf cover. However, such a partially seen residential view is to be expected in a residential suburb. Otherwise, the view would mostly remain unchanged.

The magnitude of change is considered to be Low.

Significance of Effects

The visual effects would be of Slight Significance.

In terms of qualitative visual effects, the proposal would be Neutral in quality.

With regards to duration of effect, these will be Permanent in nature.

Cumulative Visual Effects

There is no potential for cumulative visual effects associated with the proposed development, from this viewpoint.

Viewpoint 4: Heatherdale (housing development)

Existing View

This view is looking northwards from next to a small public green located within the northern end of Heatherdale housing estate that bounds the southern end of Castletroy golf course. In the foreground and middle ground can be seen the estate road, parking bay and amenity grassland. To the right (east) of the view, some of the estates' houses are visible. The view is curtailed to the north by a continuous band of mature trees and shrubs on the boundary with the golf course. Some of the course's greens and trees are partially visible through minor gaps between these trees. The mix of tree cover through the golf course and house to the right (east) limits views of

the site from this location. The view is broadly an attractive verdant outlook for the local residents and/or user of this amenity space.

Visual Receptors Sensitivity

Being residential in nature, this viewpoint sensitivity is deemed to be High.

Magnitude of Change

Construction Phase:

As the site is not visible and some distance away, likely views of the siteworks will be confined to occasional glimpses of upper arms of cranes against the background.

The magnitude of change will be Negligible; the significance of effect would be Not Significant and Neutral and Medium term.

Operational Phase:

Owing to intervening vegetation and buildings, the proposed development would not be visible from this location. Thus, there would be no change to the view.

The magnitude of change will be Negligible; the significance of effect would be Not Significant and Neutral and Permanent duration.

Significance of Effects

The visual effects would be Not Significant.

In terms of qualitative visual effects, the proposal would be Neutral in quality.

With regards to duration of effect, these will be Permanent in nature.

Cumulative Visual Effects

There would be no cumulative visual effect.

Viewpoint 5: Golf Links Road

Existing View

This view is from an elevated location on the Golf Links Road looking northeasterly in the direction of the site. The land slopes away from the viewer across the golf course, which is located to the right, behind the roadside hedgerow.

Views further towards the site are restricted by the roadside hedge and some tall trees across the (out-of-sight) course. Partially visible in the centre of the view is the water tower and reservoir wall directly west of the site. In the background there are distant views of hills, in the light of sight of road users and pedestrians travelling north. Although serving a large area of extensive housing, this road has a marginally attractive rural character.

Visual Receptors Sensitivity

The viewpoint sensitivity is deemed to be Medium.

Magnitude of Change

Construction Phase:

As the site is not visible and some distance away, views of the siteworks are likely to be confined to occasional glimpses of upper arms of cranes more than 500m away.

The magnitude of change will be Negligible; the significance of effect would be Not Significant and Neutral and Medium term.

Operational Phase:

Owing to the density of the intervening vegetation over a distance of over 500m, in spite of this marginally elevation location the only element of the proposed development that is likely to be faintly discernible will be a very confined section of a top storey of the proposed development along the southern boundary (e.g. Blocks 1 – 5). However, this barely discernible, distant snippet of a residential development, set within a highly residential suburb, will not detract from the inherent visual amenity of this location.

The magnitude of change is considered to be Negligible.

Significance of Effects

The visual effect of the proposed development would be Not Significant.

In terms of qualitative visual effects, the proposal would be Neutral in quality.

With regards to duration of effect, this will be permanent.

Cumulative Visual Effects

The presence of such abundant tree cover across the golf course and site boundaries, as well as the foreground roadside hedgerow, will greatly curtail potential cumulative views of the proposed development in combination with the adjoining Caislean Nua housing development.

Viewpoint 6: Caislean Nua (housing development)

Existing View

This view is from the northern end of the recently completed sections of the Caislean Nua housing estate and looks eastwards onto the estate's existing site compound area. In the foreground is the compound access, with the compound boundary enclosed by a mix of solid panel fencing and temporary security fence panels. Within the compound (i.e. middle ground), the partially visible and distinctly unappealing spoil and construction materials are piled/stored within the compound. Above this compound, along the skyline a broken treeline is partially visible. This treeline is the western site boundary of the southern parcel of the site.

Noticeable to left of the view is the concrete reservoir and large hilltop water tower in the adjoining to the west of the site, which dominates the skyline.

The view is dominated by the large hilltop reservoir as well as the foreground site compound. This compound will be replaced by new housing, if approved, as the development is currently awaiting approval within the planning system. Overall, there are a paucity of elements in the scene which offer appreciable amenity.

Visual Receptors Sensitivity

Although a residential location, the current "under construction" outlook is of low quality and is not helped by that of the large concrete water tower. Therefore, the sensitivity is regarded as Low.

Magnitude of Change

Construction Phase:

A section of the site's western boundary hedgerow will be removed as part of the works. However, this newly open boundary will be secured by hoarding which will restrict ground level views of the works from this point. Potential ground level views towards the site are also further restricted by the existing solid panel fencing and, in due course, by the current development under construction. There may be some views of the cranes within the site and works on the upper floors of the apartment blocks above or through gaps in the site's retained hedge boundary. However, the housing currently under construction here is likely to be completed prior to commencement of the new development in this application and the outlook here would be of new housing and open space, tree and shrub planting.

The magnitude of change would be Low; the significance of effect would be Imperceptible and Neutral and Medium term.

Operational Phase:

The removal of some of the existing boundary hedgerow will be replaced by the rear wall of the nearest proposed housing located along the site's western end. Looking further southwest, the area of proposed housing continues along the site's western boundary, with a partially visible mix of houses and a 5 storey apartment block. Views of the new housing will be partial screened by the retained and enhanced section of hedgerow to the western boundary and street trees near to these properties. However, such views at ground level would most likely not be available following the construction / completion of the proposed, but not yet permitted, Caislean Nua development, in the immediate foreground.

Overall, the magnitude of change is considered to be Low.

Significance of Effects

The significance of the visual effect of the proposed development would be Slight.

In terms of qualitative visual effects, the proposal would be Neutral in quality.

With regards to duration of effect, this will be permanent.

Cumulative Visual Effects

The immediate lands between the existing Caislean Nua housing estate and the site have another housing development application currently pending, as detailed in the planning section above. Were this development to be approved it would notably reduce visibility of the proposed development, due to the presence of the new housing located in the foreground. Thus, the cumulative visual effect would be Slight.

Viewpoint 7: University of Limerick

Existing View

The viewpoint is located next to the playing pitches within the University of Limerick campus and looks south-eastwards across these recreational facilities in the direction of the site. The foreground and much of the view consists of various tall flood lighting, protective ball stop netting and support structures present around the pitches, creating much vertical visual clutter within the middle ground view.

In the distance, the view is closed in by trees at the edge of the university and adjoining housing estates. Some of these trees are likely located on more elevated lands along the site's southwestern boundary and within the adjoining Newcastle reservoir lands, albeit more than 90m from this location. There are some limited, partial views of local housing through gaps in this tree cover and the playing pitch fencing, while the church spire of Mary Magdalene RC Church is faintly discernible in the distance.

Visual Receptors Sensitivity

The viewpoint represents an outdoor amenity, which influences its visual sensitivity, which is deemed to be Medium.

Magnitude of Change

Construction Phase:

The lack of visibility of the site will limit views of the siteworks to that of upper arms of cranes against the background, at worst. Changes to the site's tree cover along the Dublin Road boundary, and internally due to removal of some trees for the site works, would be barely noticeable from this point.

The magnitude of change will be Negligible; the significance of effect would be Not Significant and Adverse and Medium term.

Operational Phase:

Visibility of the proposed housing development from this point is limited by the intervening tree cover, with some rooflines of some of the taller proposed buildings likely to be faintly discernible through minor gaps in the tree cover.

Overall, the magnitude of change is considered to be Negligible.

Significance of Effects

The effects of the proposed development will be Imperceptible.

These effects would be Neutral in quality.

These would be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There is no potential for cumulative visual effects associated with the proposed development, when viewing from this viewpoint.

Viewpoint 8: Castletroy Town Centre (shopping mall)

Existing View

This view is located next to the entrance to Castletroy Town Centre, looking westwards in the direction of the site. In the foreground is the access road to the Town Centre leading to the roundabout on the Kilmurray road running left to right (south to north) centrally in the view. The white houses of the Park housing estate can be seen beyond the Kilmurray Road, limiting the view beyond.

Behind the housing, lands rise up towards Monaleen Road where the mature tree cover limits any further views. There are partial views of the large houses and Mary Magdalene RC Church visible through minor gaps in this tree cover. The site lands are not visible from this point due to screening provided by the intervening housing and trees.

Visual Receptors Sensitivity.

The viewpoint sensitivity is deemed to be Low.

Magnitude of Change

Construction Phase:

The lack of the site's visibility from this point will highly curtail, if not entirely screen, all views of the siteworks. The magnitude of change would be Negligible; the significance of effect would be Imperceptible and Neutral and Medium term.

Operational Phase:

The proposed development would not be visible from this point due to the presence of the intervening housing and tree cover, together with topography variations.

Overall, the magnitude of change is considered to be Negligible.

Significance of Effects

The effects of the proposed development will be Imperceptible.

These effects would be Neutral in quality.

These would be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There is no potential for cumulative visual effects associated with the proposed development, when viewed from this viewpoint.

Viewpoint 9: Mary Magdalene Church, Monaleen Road

Existing View

The view is taken from in front of Mary Magdalene Church, a protected structure, from the top of its entrance steps, allowing a marginally elevated view looking west-northwest across the Monaleen Road in the direction of the site. In the foreground is the frontage / gardens of the church and stone gateway. The Monaleen Road runs north-south across the centre of the view.

The large mature trees of Castletroy Golf Club (to the left/south) and of adjacent large private houses (to the right/north) close views further west beyond the road corridor. Potential views of the site are obscured by this mix of mature trees and hedging, despite its proximity to the eastern corner of the site's southern parcel of land. The view is of a strong suburban townscape quality, being mature, enclosed and leafy with a strong heritage character.

Visual Receptors Sensitivity

The viewpoint sensitivity is regarded as High.

Magnitude of Change

Construction Phase:

The intervening mature trees will likely greatly curtail views of the siteworks, with the upper arms of cranes being discerned, in places, behind upper tree branches being the likely worst case scenario.

The magnitude of change would be Negligible; the significance of effect would be Imperceptible and Neutral and Medium term.

Operational Phase:

Potential views of the proposed development will be heavily screened by the private house opposite and the mix of deciduous and evergreen tree cover closing views towards the site.

As a winter view, there is filtered visibility of parts of Block 10 and House 1, although highly obscured and having no change to the view quality in this settled suburban context.

The magnitude of change is considered to be Negligible.

Significance of Effects

The effects of the proposed development will be Imperceptible.

These effects would be Neutral in quality.

These would be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There is no potential for cumulative visual effects associated with the proposed development, when viewed from this viewpoint.

Viewpoint 10: Between 'Sunninghill' and 'Cooleen' residence on Monaleen Road, east of site

Existing View

This view is representative of residential views on Monaleen Road, looking between two houses (i.e. 'Sunninghill' and 'Cooleen') both protected structures, in the foreground. This view looks westwards towards the adjoining site lands between and beyond the houses. There is extensive mature shrubs and trees within these properties grounds, behind which gently rising topography is discerned. Part of the site's northern parcel is identifiable by the mature trees near or on its eastern boundaries.

Visual Receptors Sensitivity

The viewpoint sensitivity is regarded as High.

Magnitude of Change

Construction Phase:

There would likely be some roadside views of the site works within the site's northern parcel. The hoarding added to the outer site boundaries will help restrict some of the ground level views of the siteworks. However, likely views will be possible of the works located further back upon this field's higher lands to the west.

The magnitude of change will be Low-Medium; the significance of effect would be Slight-Moderate and Adverse and Medium term.

Operational Phase:

The roofs of a line row proposed houses would be partially visible between breaks in the tree cover within these gardens. However, these rooflines will be set below that of most of the large trees within these gardens, but also below that of the foreground residences. Aside from this roofline of a single row of housing, no other aspect or element of the proposed development is likely to be visible from this location.

Overall, the magnitude of change is considered to be Low.

Significance of Effects

The significance of the visual effect of the proposed development will be Slight.

The effects would be Neutral in quality.

These would be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There is no potential for cumulative visual effects of note associated with the proposed development, when

viewed from this viewpoint.

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Viewpoint 11: Entrance to Castletroy Golf Course

Existing View

The view is from the entrance to Castletroy Golf Course along the Golf Links Road and looks north east towards the development site. In the foreground is the entrance to the carpark area, buildings and landscaped grounds within the golf course. The mature treeline within the site's more elevated land is discernible in the distance, albeit more than 400m from this location. Also partially visible is the concrete structures / water tower within the Newcastle reservoir. However, these elements within and adjoining the site are largely screened by intervening buildings and trees within the site. Overall, the view is focused on the busy, but well landscaped, carpark and golf course infrastructure in a strongly residential suburban setting.

Visual Receptors Sensitivity

The viewpoint represents an outdoor amenity, which influences its visual sensitivity, which is deemed to be Medium.

Visual Impacts and Effects

Construction Phase:

The siteworks will require removal of a section of the western boundary hedgerow/treeline and some internal groups of trees that are partially visible in the view. Likely views of the siteworks across the highest levels of the site may be partially visible, albeit at some distance.

The magnitude of change would be Negligible.

The significance of effect would be Not Significant and Neutral and Medium term.

Operational Phase:

There would be distant, partial visibility of the roofscape of some houses and apartment blocks, above the site's western boundary. These views are heavily filtered by the intervening mix of trees found across the golf course. The change would not be uncharacteristic in the view, and the proposed roofline - where discernible - would remain far below that of the more noticeable existing concrete water tower.

Overall, the magnitude of change is considered to be Low-Negligible.

Significance of Effects

The visual effect of the proposed development would be Not Significant.

In terms of qualitative visual effects (the proposal would be Neutral in quality).

With regards to duration of effect, these will be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

The slightly closer proximity of the neighbouring proposed extension to the Caisleán Nua housing estate means its various housing (including the mix of 2-4 storey high housing types) will be located, in part, in front of the proposed development, when viewed from this location. As the change would also be Low-negligible and reflect the evolving character of this residential suburb, the likely cumulative visual effect would also be Not Significant.

Viewpoint 12: Fairways Housing estate

Existing View

This view is within the Fairview housing estate looking northwest across the small, grassed amenity area, in the foreground, in the direction of the site. The site is not visible from this point due to the presence of this dense vegetation cover and housing, over more than 500m. The outlook is of an attractive sub-urban, strongly residential area.

Visual Receptors Sensitivity

Given the quality and residential nature of the location, the viewpoint sensitivity is deemed to be High.

Visual Impacts and Effects

Construction Phase:

The proposed development's siteworks are highly unlikely to be visible from this location due to screening by the intervening existing housing, tree cover and variations in the local topography.

The magnitude of change would be Negligible.

The significance of effect would be Not Significant and Neutral and Medium term.

Operational Phase:

For the aforementioned reason, no aspect or element of the proposed development is likely to be visible from this viewpoint.

The magnitude of change would be Negligible.

Significance of Effects

The visual effect of the proposed development would be Imperceptible.

In terms of qualitative visual effects (the proposal would be Neutral in quality).

With regards to duration of effect, these will be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There would be no capacity for cumulative visual effects from this viewpoint.

Viewpoint 13: Dublin Road next to Monaleen Road Junction

Existing View

This view is located on the Dublin Road opposite a group of residences, sited on relatively elevated lands (to this viewpoint), near the junction with Monaleen Road. It looks west/ southwest in the direction of the site. The foreground houses are primarily detached on large plots with mature trees running along their garden boundaries. The mature tree line continues along the southern side of the Dublin Road, merging with the site's northernmost boundary edge.

Visual Receptors Sensitivity

As a busy road, albeit with a residential and generally attractive character, the viewpoint sensitivity is deemed to be Medium.

Visual Impacts and Effects

Construction Phase:

Potential views of the site works from this location will be largely restricted by the detached houses and their mature tree planting. More than 80m away, there would be a slight reduction in tree cover on the Dublin Road as a result of the proposed four trees to be removed along the site's northern boundary.

The magnitude of change will be Negligible.

The effect would be Not Significant and Neutral and Medium term.

Operational Phase:

The proposed development's likely visibility will be largely screened by the relatively elevated, detached houses together with the mature trees within their grounds and along the Dublin Road. There would be partial view of the new housing from this viewpoint, heavily filtered by the trees. However, in the context of a busy road transecting a contemporary residential suburban, such a partial view will not be incongruous.

The magnitude of change is considered to be Low.

Significance of Effects

The significance of the visual effect of the proposed development would be Slight.

In terms of qualitative visual effects (see Section 5.8, above), the proposal would be Neutral in quality.

With regards to duration of effect, these will be permanent in nature (i.e., lasting over 60 years).

Cumulative Visual Effects

There is no potential for cumulative visual effects of note associated with the proposed development, when viewed from this viewpoint.

5.5.4 Viewpoint Assessment Summary

The following tables summarises the results of the assessment of the effects of the Proposed Development on the visual resource in the construction and operational phase.

Construction Phase:

No:	Viewpoint Description	Sensitivity	Degree of Change	Significance and Qualitatively Temporary / Short Term
VP1	Dublin Road/R335	Medium	Medium	Moderate & Adverse
VP2	Monaleen Road, east of site	Medium-High	Medium	Moderate & Adverse
VP3	Monaleen Road, southeast of site	Medium-High	Negligible	Not Significant & Adverse
VP4	Heatherdale (housing development)	High	Negligible	Not Significant & Neutral
VP5	Golf Links Road	Medium	Negligible	Not Significant & Neutral
VP6	Caislean Nua (housing development)	Low	Low	Imperceptible & Neutral
VP7	University of Limerick	Medium	Negligible	Not Significance & Adverse
VP8	Castletroy Town Centre (shopping mall)	Low	Negligible	Imperceptible & Neutral

VP9	Mary Magdalene Church, Monaleen Road.	High	Negligible	Imperceptible & Neutral
VP10	Between 'Sunninghill' and 'Cooleen' residence on Monaleen Road, east of site	High	Low-Medium	Slight-Moderate & Adverse
VP11	Entrance to Castletroy Golf Course	Medium	Negligible	Not Significant & Neutral
VP12	The Fairways Housing Estate	High	Negligible	Not Significant & Neutral
VP13	Dublin Road next to Monaleen Road Junction	Medium	Negligible	Not Significant & Neutral

Table 5.11 Summary of Visual Effects – Construction Phase

Operational Phase:

No:	Viewpoint Description	Sensitivity	Degree of Change	Significance and Qualitatively
VP1	Dublin Road/R335	Medium	Medium	Slight & Neutral
VP2	Monaleen Road, east of site	Medium-High	High	Significant & Neutral
VP3	Monaleen Road, southeast of site	Medium-High	Low	Slight & Neutral
VP4	Heatherdale (housing development)	High	Negligible	Not Significant & Neutral
VP5	Golf Links Road	Medium	Negligible	Not Significant & Neutral
VP6	Caislean Nua (housing development)	Low	Low	Slight & Neutral
VP7	University of Limerick	Medium	Negligible	Imperceptible & Neutral
VP8	Castletroy Town Centre (shopping mall)	Low	Negligible	Imperceptible & Neutral
VP9	Mary Magdalene Church, Monaleen Road	High	Negligible	Imperceptible & Neutral
VP10	Between 'Sunninghill' and 'Cooleen' residence on Monaleen Road, east of site	High	Low	Slight & Neutral
VP11	Entrance to Castletroy Golf Course	Medium	Low-negligible	Not Significant & Neutral
VP12	The Fairways Housing Estate	High	Negligible	Imperceptible & Neutral
VP13	Dublin Road next to Monaleen Road Junction	Medium	Low	Slight & Neutral

Table 5.12 Summary of Visual Effects – Operational Phase

5.6 Cumulative Impacts

The landscape (Section 5.4.2) and visual assessment (Section 5.5.3) sections above have each considered the potential cumulative landscape and visual impacts of the proposed development with other appropriate developments, including those whose planning status is pending or approved but not yet constructed.

It was found that the only development with potential cumulative impacts with that of the proposed Sutton Lands is another pending residential scheme. This is a proposed extension to the existing Caisleán Nua housing estate to be sited across the undeveloped parcel of land between the boundaries of the existing housing estate to its west and Sutton Lands to its east.

Here, the two proposed developments would collectively change the existing local land character from one of a small area of disused and agricultural lands enclosed by the surrounding housing, to that of lands under more regular housing cover. The style, scale and layout of both developments are of a compatible form and not out of character with other recent housing developments within the local area. These cumulative changes are also reflective of local planning policy supporting sustainable growth of the city's underdeveloped lands.

In summary, no cumulative landscape or visual effects of note are associated with the proposed development.

5.7 Do Nothing Scenario

Were the Proposed Development not to proceed, it is expected that the existing agricultural lands within the site limits would continue to be intensively managed, in keeping with their current land management regime.

However, as the lands are already zoned for residential development in the LCCDP, it is envisaged that the current agricultural land use would be likely to change to housing in the near future, partly due to the anticipated expansion of Limerick City to meet its housing needs. Such a change in land use would result in a similar change to landscape character and visual amenity as that predicted for this application.

5.8 Risks To Human Health

There are no risks to Human Health other than managed Construction Stage potential health & safety risks, as per standard residential developments.

5.9 Mitigation Measures

Mitigation by design and avoidance was carried out with the preparation of a Landscape Masterplan for the Proposed Development site. The landscape masterplan has influenced the overall site layout through the proposed development design evolution.

5.9.1 Construction Phase

The landscape proposals for the Proposed Development entail retaining existing landscape features wherever possible, including lengths of mature hedgerows and trees.

The works around the existing vegetation to be cleared and retained will be supervised by the clerk of works ecologist and project arborist. Protection measures will be outlined in the Construction Environmental Management Plan (CEMP), which will help protect these features. Retained trees and hedgerows will be protected throughout the construction phase by the installation of secure fencing in accordance with BS5837:2012: *Trees in Relation to Construction around the root protection areas* (RPAs) as per the arborists Arboricultural Impact Assessment (AIA) within the Tree Survey Report.

Areas of soil outside the main site works will be fenced off to prevent compaction. Where the soil will be disturbed by the site works, it will be removed and stored elsewhere on site in accordance with best practice so

that it can be reused where possible across the Proposed Development for landscaping, including use as a seedbank for wildflowers in order to minimise the need for its removal offsite or importing any additional topsoil.

Visual impacts will be mitigated through the appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish. Any temporary lighting will be directed onto the area of site works so to prevent unnecessary light spillage onto the surroundings. Works will be carried at agreed hours with the council.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. Similarly, other structures including the site compound and scaffolding will be temporary in nature and contained within the works area.

5.9.2 Operational Phase

The retained landscape features will be incorporated into the overall landscape proposals which will bolster the existing green infrastructure of the existing Proposed Development site and immediate surroundings.

Planting across the Proposed Development will include trees, hedges, shrubs, perennials, wildflower meadow, amenity/private grassland. The planting will consist of a range of suitable native and non-native, non-invasive species that will help to soften the appearance of the buildings and act as a visual buffer to help reduce potential visual impacts.

The existing retained hedgerows and trees along the perimeter of the site act as an important physical and visual barriers to the surrounding areas of housing, with these boundaries enhanced with additional native planting to provide additional screening. Tree lines are proposed across the Proposed Development to add structure and act as vertical screens.

Pathways are designed to allow good legibility for all abilities/ users and to directly connect onto the Monaleen Road and Dublin Road, providing access into Castletroy and the wider Limerick City. Access points have been designed to allow for future potential connections into the adjoining zoned development lands directly to the northwest of the Site. The lighting across the Proposed Development will be designed to prevent light spillage pollution into the surrounding residential areas and rural areas.

5.10 Monitoring

The landscape mitigation and enhancement measures are incorporated into the Proposed Development's landscape masterplan and associated drawings. The masterplan proposals include a range of hard and soft landscaping. The soft landscape measures include the retainment of existing hedgerows and trees, along with new SUDs drainage and planting of trees, hedges, grasses, wildflowers, shrubs, bulbs and perennials. The successful establishment of the planting will be key to helping to fully integrate the Proposed Development's built structure into the surrounding landscape and provide a visual buffering of the Proposed Development's built elements from surrounding visual receptors. The mitigating effects of this has been considered when determining the predicted landscape and visual effects in the assessment above.

In order to ensure the success of the proposed landscape planting and retained vegetation, implemented during the construction phase, the appointed landscape contractor will be required to undertake and maintain the planting in accordance with the proposed landscape maintenance and management plans.

5.13 Interactions

The following considers the potential interactions of Landscape and Visual with other chapters of this EIAR.

Biodiversity

The potential for interactions with Biodiversity will be where the proposed development will result in the removal of existing vegetation coverage and changes to existing agricultural land use.

The proposed additional planting of trees, hedgerow, shrubs, wildflower meadows, SUDs rain gardens and bat box housing will help integrate the new housing development into the local landscape. It will also provide net biodiversity gains through the provision of new planting, including native pollinator-friendly planting and habitat cover that will replace the site's former improved agricultural and monocultural grassland. For more information, please refer to Chapter 11 -Biodiversity.

Traffic & Transport

The potential for interaction with Traffic & Transport will likely take the form of adverse effects as a result of the increased movement of traffic during the construction phase and during the operational phase from the site lands. Similarly, there will be localised adverse effects on the visual amenity as result of changes to existing traffic levels within the immediate surroundings as a result of the notable increase in traffic. This will be in the form of vehicles, pedestrian and cyclist users, exiting/entering the site, with levels being greatest during the operational phase. For more information, please refer to Chapter 6 - Material Assets, Traffic & Transport.

Land and Soils

The potential interaction with Land and Soils will occur during the earthworks of the construction phase with movement of soils and other materials through the site and the temporary stockpiling as a result of ground clearance, with any movement of materials out of the site to be limited. For more information, please refer to Chapter 9 - Land, Soils, Geology & Hydrology.

Noise and Vibration

The potential for interaction with Noise & Vibration will occur as a result of the proposed buffer planting to be added along sections of the proposed site boundaries, including next to the retained tree lines. Such planting will help act as a noise buffer to the predicted noise levels originating from within the proposed housing estate. The greatest buffering provided by this planting will likely occur as the new planting matures and thickens out overtime, and when in full leaf cover. For more information, please refer to Chapter 12 - Noise and Vibration

Cultural Heritage

The potential for interaction with Cultural Heritage and this LVIA include its' consideration of the potential for visibility of the proposed development from some key heritage assets found within proximity of the site boundary. Views were selected from select, nearby protected structures for assessing in the above LVIA, which included from grounds of Mary Magdalene RC Church (Viewpoint 9) and between two residential properties (Viewpoint 10). For more information, please refer to Chapter 15 - Cultural Heritage.

5.14 Difficultly Encountered

No difficulties were encountered during the production of this LVIA.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 6: MATERIAL ASSETS- TRAFFIC AND TRANSPORT

**PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT
ON LANDS AT MONALEEN ROAD
CASTLETROY, LIMERICK**

FEBRUARY 2026



RECEIVED: 04/03/2025

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APPENDICES

- Appendix 6.1 - Traffic Counts
- Appendix 6.2 - TRICS Data
- Appendix 6.3 – Traffic Flow Sheets
- Appendix 6.4 - PICADY Modelling Results

6 MATERIAL ASSETS: TRAFFIC AND TRANSPORT

6.1 Introduction

This Chapter of the EIAR assesses and evaluates the likely impact of the proposed development on the operation of the surrounding road network, in respect of both the construction phase and the operational phase, as well as identifying proposed mitigation measures to minimise any identified impacts.

This chapter of the EIAR has been prepared by Richard Frisby of Roadplan Consulting. Richard Frisby has over 18 years of professional experience in the Traffic and Transport field. Richard is a Chartered Associated Engineer and has a Bachelor of Science Engineering degree. Richard's expertise includes the delivery of Traffic and Transport Assessments for both public and private sector projects, with specific experience in the preparation of EIAR and EIS documentation for environmental developments.

In addition, Richard has technical proficiency in junction and network analysis using industry-standard modelling software packages, including TRANSYT, ARCADY and PICADY.

This assessment has been carried out in accordance with the following guidance and established best practice:

- Environmental protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Transport Infrastructure Ireland (TII) (2014). Traffic and Transport Assessment Guidelines
- TII National Traffic Model

Reference has also been made to the following documents:

- Limerick County Development Plan 2022-2028
- Transport Infrastructure Ireland (TII) Geometric Design of Junctions - DN-GEO-03060
- The Institute of Highways and Transportation Guidelines for Traffic Impact Assessments
- Trip Rate Information Computer System (TRICS) database

6.1.1 Proposed Development Site

The proposed residential development is located at Newcastle, Co Limerick. The proposed development is bounded by residential developments to the east and west including a water reservoir to the west, Castletroy golf course to the south and the R445 to the north.



Figure 6. 1 Location of proposed Development Site (Source: Google)

6.2 Study Methodology

The methodology adopted for this report is summarised as follows:

- Traffic counts over a 7-day period (04th November to 10th November 2025) were undertaken by Irish Traffic Surveys. Count information was obtained at the existing R445 / Monaleen Rd priority junction.
- Existing Traffic Assessment – A spreadsheet model was created which contains the base year DO-NOTHING traffic count data described above. The traffic count data was used to develop a PICADY model of the existing Rivers Rd / Rosskeen priority junction, the existing R445 / Monaleen Rd priority junction and the proposed Development Access / Monaleen Rd priority junction.
- Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and development related traffic was used to assess the future operational performance of the junction at the year of opening of the proposed development, 5 years after opening and 15 years after opening.

6.3 Characteristics of the Proposed Development

6.1.2 Development Description

A 10 year permission for the construction of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- a. Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- b. The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- c. The provision of a total of 308no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units across 10no. apartment buildings. The apartment buildings are 5 storeys in height. Apartment building nos. 1-5 incorporate bicycle storage and bin storage at ground level within the apartment buildings.

- d. Provision of a creche (514sq.metres) at ground level in apartment building no. 10 and associated outdoor play space.
- e. Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartment block nos. 1-5 and block no. 10.
- f. Provision of podium/basement parking for apartment blocks 6-9. The bicycle storage, bin storage, motorbike parking and provision of plant rooms for apartment block nos. 6-9 are incorporated at podium/basement level.
- g. Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- h. Provision of associated bicycle storage facilities at surface level throughout the site.
- i. Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- j. Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- k. Provision of associated ESB substations.
- l. Internal site works and attenuation systems.
- m. All ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks.

6.4 The Existing Receiving Environment (Baseline Scenario)

6.4.1 Existing Roads

Monaleen Road

- It is a single carriageway road that is approximately 6.2m wide.
- There is a 1.8m wide footpath located on the western side of the carriageway and there is a footpath that varies in width located on the eastern side.
- Street lighting is provided along Monaleen Rd.
- The Monaleen Road is governed by a 50 km/h speed limit.

R445 Dublin Road

- It is a single carriageway road that is approximately 10m wide with a 3m wide bus lane on the southern side of the carriageway.
- There are 2m wide footpath located on either side of the carriageway.
- Street lighting is provided along R445 Dublin Road.
- The Monaleen Road is governed by a 50 km/h speed limit.

6.5 Assessment Methodology

6.5.1 Traffic Survey and Background Peak Hour Identification

A 7-day traffic count was undertaken by Irish Traffic Surveys from the 04th November to the 10th November 2025. Count information was obtained at the R445 / Monaleen Rd priority junction. Full traffic count data is contained in Appendix 6.1 – Traffic Counts

The peak volume of traffic occurred on Friday 07th November. The traffic flows during the AM and PM peak hours were abstracted from the surveyed data and are shown in the following tables.

R445 / Monaleen Rd Priority Junction – AM Peak Flows (07:45 – 08:45) Friday 07th November

From / To	R445 (east)	Monaleen Rd	R445 (west)	Totals
R445 (east)	0	29	757	786
Monaleen Rd	10	0	166	176

R445 (west)	489	23	0	512
Totals	499	52	923	1474

R445 / Monaleen Rd Priority Junction – PM Peak Flows (16:45 – 17:45) Friday 07th November

From / To	R445 (east)	Monaleen Rd	R445 (west)	Totals
R445 (east)	0	72	708	780
Monaleen Rd	10	0	44	54
R445 (west)	675	27	0	702
Totals	685	99	752	1536

6.5.2 Background Traffic Growth

The operational impact of traffic on the road network within the proposed development's area of influence has been assessed for the following years:

- 2025 - Baseline year
- 2035 - Assumed opening year (full completion and occupation)
- 2040 - 5 years after opening
- 2050 - Design year (15 years after opening)

The TII issues a range of forecasts: low growth, medium growth and high growth. The implementation of policies relating to Smarter Travel and to public transport will act as a deterrent to high growth in car-based travel. Low growth factors are however likely to be equally unrealistic at present in the Newcastle area, so we have used medium growth factors in our assessment.

The zone in which the site is located is numbered 5253 in the TII National Traffic Model. The growth factors are as follows:

Zone	2025 Base Year	2035 Development Completion	2040 5 years after Dev. Completion	2050 15 years after Dev. Completion
5253	1.00	12.04%	18.61%	6.70%

6.5.3 Development Trip Generation – Operation Phase

Trip generation factors from the Trip Rate Information Computer System (TRICS) database of traffic surveys have been used to predict the vehicular trip generation to and from the proposed development for the AM and PM peak periods. Full details of the TRICS information used for the assessments are provided in Appendix 6.2 - TRICS information.

The category of "Residential - Houses" has been assessed as the most appropriate development type category for this part of the development and the trip rates for the AM and PM peak periods are shown below.

	Trip rates to Development	Trip rates from Development
AM Peak	0.168	0.433
PM Peak	0.399	0.241

For the proposed 214 residential dwellings, this would give the following trips to and from the proposed development.

	Trip rates to Development	Trip rates from Development
AM Peak	36	93
PM Peak	85	52

The category of “Residential – Apartments” has been assessed as the most appropriate development type category for this part of the development and the trip rates for the AM and PM peak periods are shown below.

	Trip rates to Development	Trip rates from Development
AM Peak	0.056	0.230
PM Peak	0.192	0.065

For the proposed 309 apartments, this would give the following trips to and from the proposed development.

	Trip rates to Development	Trip rates from Development
AM Peak	17	71
PM Peak	59	20

The category of “Education - Nursery” has been assessed as the most appropriate development type category for this part of the development and the trip rates for the AM and PM peak periods are shown below.

	Trip rates to Development	Trip rates from Development
AM Peak	4.870	3.644
PM Peak	3.267	4.053

For the proposed Creche, this would give the following trips to and from the proposed development.

	Trip rates to Development	Trip rates from Development
AM Peak	25	19
PM Peak	17	21

To summarise, the total number of trips that are predicted to be generated by the proposed residential development and creche during the AM and PM peak period are shown in the table below:

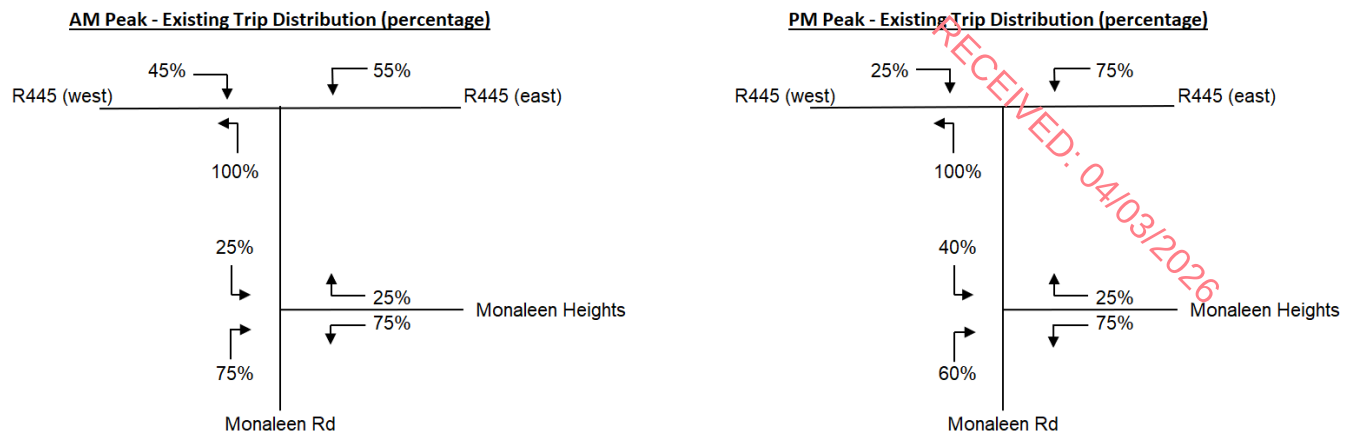
	Trip rates to Development	Trip rates from Development
AM Peak	169	183
PM Peak	161	93

6.5.4 Subject Development Trip Distribution – Operational Phase

Vehicular trips to and from the development will arrive / depart via the proposed Development Access / Monaleen Rd junction. It is assumed that the distribution of development traffic will follow the same pattern as existing traffic currently distributing at the existing Monaleen Rd / Monaleen Heights priority junction.

A traffic count was carried out at the existing Monaleen Rd / Monaleen heights priority junction in order to determine the existing trip distribution.

The following diagram shows the existing traffic distribution percentage for the AM and PM peak at the existing R445 / Monaleen Rd priority junction and the existing Monaleen Rd / Monaleen Heights priority junction.



It is assumed that the distribution of development traffic will follow the same pattern as existing traffic currently distributing at the existing Monaleen Rd / Monaleen heights priority junction.

The following diagram shows the proposed traffic distribution percentage for the AM and PM peak at the existing R445 / Monaleen Rd priority junction and the proposed Monaleen Rd / Development Access priority junction.



Using the proposed directional splits shown above and the trips generated by the proposed residential development outlined in 4.1, the following diagrams show the turning movements of predicted development traffic at the existing R445 / Monaleen Rd priority junction and the proposed Monaleen Rd / Development Access priority junction during the AM and PM peak hours.

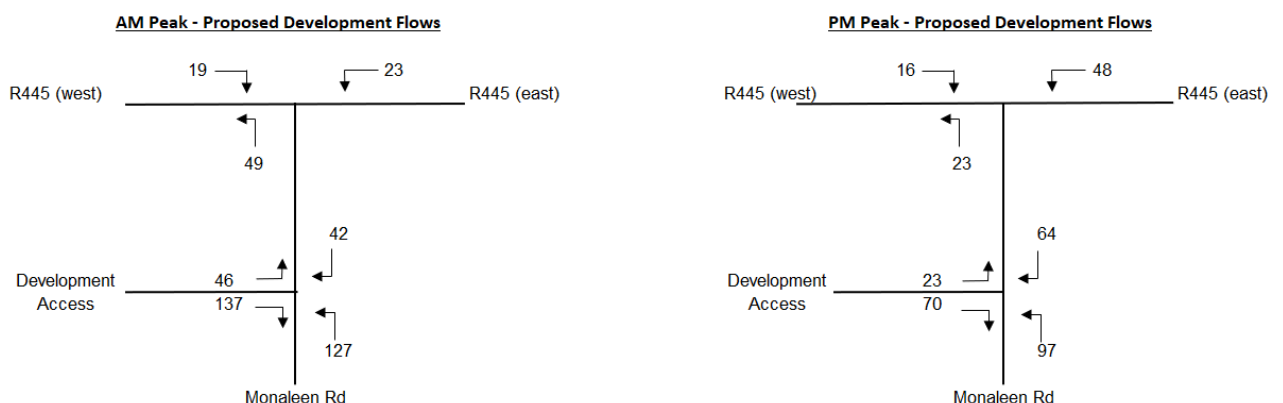


Figure 6.1 – Proposed Development Flows

6.6 Junction Performance Assessment

Traffic generated by the proposed development will have some effect on the local road network surrounding the site. The following junctions were assessed:

- R445 / Monaleen Rd priority junction
- Monaleen Rd / Development Access priority junction

R445 / MONALEEN RD PRIORITY JUNCTION

A capacity assessment has been undertaken using the computer program PICADY for the AM and PM peak hours.

The following table summarises the effects that the proposed development will have on this junction in 2035, 2040 and 2050 using the existing and predicted traffic flows shown in Appendix 6.3 – Traffic Flow Sheets. Full PICADY printouts are provided in Appendix 6.4 – PICADY Results.

The parameters shown in the tables are defined as follows:

Ratio of Flow to Capacity (RFC) is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its practical capacity.

Avg. Queue is the average number of vehicles queued over the time period on the junction approach.

Queue delay is the average number of seconds delay to each vehicle in the time period.

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2025 Baseline Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.52	1	20
		R445 (west)	0.10	0	5
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.18	0	14
		R445 (west)	0.14	0	5
2035 Do-Nothing Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.63	2	28
		R445 (west)	0.13	0	5
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.23	0	17
		R445 (west)	0.19	1	5
2035 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.78	3	46
		R445 (west)	0.22	1	6
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.31	0	18
		R445 (west)	0.30	1	5
2040 Do-Nothing Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.70	2	36
		R445 (west)	0.14	0	5
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.28	0	20
		R445 (west)	0.22	1	5
2040 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.86	5	69
		R445 (west)	0.24	1	6
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.36	1	21
		R445 (west)	0.34	2	5
2050 Do-Nothing Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.58	1	24
		R445 (west)	0.11	0	5
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.21	0	15
		R445 (west)	0.17	1	5

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2050 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.73	3	36
		R445 (west)	0.20	1	8
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.29	0	16
		R445 (west)	0.27	1	5

The summary predictions shown in the table above indicate that currently the existing R445 / Monaleen Rd priority junction is operating within capacity with minimal queues and delays during the AM and PM peak period.

In 2035, 2040 and 2050 the Do-Nothing Scenario indicates that the existing R445 / Monaleen Rd priority junction is operating within capacity with minimal queues and delays during the AM and PM peak period

In 2035, 2040 and 2050 the Do-Something Scenario indicates that the existing R445 / Monaleen Rd priority junction is operating within capacity with small queues and delays during the AM and PM peak period.

MONALEEN RD / DEVELOPMENT ACCESS PRIORITY JUNCTION

The following table summarises the effects that the proposed development will have on this junction in 2035, 2040 and 2050 using the existing and predicted traffic flows shown in Appendix 6.3 – Traffic Flow Sheets. Full PICADY printouts are provided in Appendix 6.4 – PICADY Results.

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2035 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.50	1	18
		R445 (west)	0.10	0	8
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.24	0	11
		R445 (west)	0.14	0	7
2040 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.50	1	18
		R445 (west)	0.10	0	8
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.24	0	11
		R445 (west)	0.14	0	7
2050 Do-Something Scenario	AM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.49	1	18
		R445 (west)	0.10	0	8
	PM Peak	R445 (east)	-	-	-
		Monaleen Rd	0.24	0	11
		R445 (west)	0.14	0	7

The summary predictions shown in the table above indicate that the Monaleen Rd / Development Access priority junction will operate within capacity with minimal queues and delays during the AM and PM peak period in 2035, 2040 and 2050.

6.6.1 Subject Development Trip Generation and Distribution – Construction Phase

Construction of the proposed development is due to be complete in 2035. It has been assumed that the construction vehicular traffic to and from the development shall be distributed similar to the existing traffic distribution patterns.

For the purposes of the present assessment, the following assumptions have been made and are considered generally representative of typical conditions on similar construction sites:

- Site working hours shall be 07:00-19:00, Monday to Friday, and 08:00-14:00 on Saturdays.

- The maximum number of vehicular trips per day during the peak construction period is expected to be 98 vehicular trips (25 car trips, 58 LGV trips & 15 HGV trips)
- The maximum frequency of HGV trips to and from the site shall be 2 vehicles per hour.
- The maximum frequency of LGV trips to and from the site (excluding commuting personnel) shall be 5 vehicles per hour.

The trips generated during the peak construction period are significantly lower than the operational phase and therefore the construction phase will have a short-term insignificant negative impact on the operation of the surrounding road network. This impact will be confined to the duration of construction activity on site and will therefore be entirely reversible.

6.7 Cumulative Impacts

In the evaluation of traffic impact, the future year junction performance assessments conducted in respect of the proposed development typically include traffic flows to be generated by any other relevant committed development, such that the predicted impacts (as outlined in the previous section of this EIAR chapter) also represent the potential cumulative impacts.

6.8 Worst case scenario

In the evaluation of the proposed development's traffic and transport impact in the operational stage, the worst-case scenario is generally assumed by default. For this reason, trip generation calculations employ the maximum appropriate trip rates, and junction performance assessments are conducted in respect of the AM and PM peak hours with the heaviest background traffic flows on the surrounding road network. During the development's operational stage, the preceding impacts described should therefore be considered as the worst-case scenario.

6.9 Mitigation Measures

6.12.1 Construction Phase

The following measures for minimizing construction traffic and mitigating its effects are to be implemented as part of the site-specific Construction Traffic management Plan (CTMP) to be prepared by the lead contractor appointed for the construction of the development:

- Conducting all loading and unloading operations within the site.
- Scheduling deliveries outside of peak hour periods to avoid disturbance to surrounding pedestrian and vehicular traffic.
- Staggering HGV movements to/from site to avoid site queues.
- Preventing haulage vehicles travelling in convoys of more than two vehicles at any time.
- Installation of a wheel wash at exit from the site to prevent any dirt being carried out onto surrounding roads.
- Deployment of a road sweeper as necessary to keep roads around the site clean.

The following specific traffic control and marshalling measures are to be included in the CTMP to minimize the potential for obstructing of surrounding roads:

- At no time will construction associated vehicles be stopped or parked along haulage routes.
- Haulage vehicles will not travel in convoys of greater than two vehicles at any time.
- At no time will haulage vehicles be parked or stopped at the entrance to the site.
- All loading of excess material will occur within the site boundary.
- All off-loading of deliveries will take place within the site, away from the public road and will access via the construction site access.

Construction vehicle movements will be minimised through:

- Consolidation of delivery loads to/from the site and management of large deliveries on site to occur outside of peak periods.
- Use of precast/prefabricated materials where possible.
- Provision of adequate storage space on site.
- Development of a strategy to minimise construction material quantities as much as possible.

6.12.2 Operational Phase

The development shall incorporate several design and management elements intended to mitigate the impact of the development on the surrounding road network during its operational stage. These include:

- Provision of secure bicycle parking, which shall serve to encourage bicycle journeys by staff.
- A Mobility Management Plan to be implemented in the proposed development's operational phase, which stipulates measures to be taken to encourage and support the use of sustainable travel modes among visitors and staff.
- Implement clear signage for directional traffic flow.

6.10 Residual Impact

6.13.1 Construction Phase

As noted in the previous sections of this EIAR Chapter the trips generated during the peak construction period are significantly lower than the operational phase and therefore the construction phase will have a short-term insignificant negative impact on the operation of the surrounding road network. This impact will be confined to the duration of construction activity on site and will therefore be entirely reversible

6.13.2 Operational Phase

As noted in the previous sections of this EIAR Chapter, the operational phase traffic for the proposed development shall have a slight impact on junction capacities and a slight increase in junction delay. All the junctions shall operate within effective capacity during its operational stage.

During its operational phase, the proposed development is therefore predicted to result overall in a long-term, slight impact on the operation of the surrounding road network. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, junction redesign, or changes in general traffic flow restrictions) have the potential to improve local traffic flows generally, as well as to reduce vehicle trips to / from the proposed development

6.11 Mitigation and Reinstatement

6.14.1 Construction Phase

The site-specific Construction Traffic Management Plan (CTMP) to be prepared by the lead contractor appointed for the construction of the development shall outline measures for monitoring the impact of construction traffic on the operation and condition of the surrounding road network, including remedial actions to be taken in the event of construction traffic causing damage to road infrastructure.

No reinstatement works of relevance to traffic and transport are proposed as part of the subject development, with the exception of any repair works made necessary by the passage of construction traffic.

6.14.2 Operational Phase

Post-development monitoring of the surrounding street network's performance is not required or proposed in this case.

No reinstatement works of relevance to traffic and transport are proposed as part of the subject development in its operational stage.

6.12 Difficulties Encountered

No significant difficulties were experienced in compiling this chapter of this EIAR document.

6.13 References

- Environmental Protection Agency (EPA): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022)*
- Transport Infrastructure Ireland (TII): *Traffic and Transport Assessment Guidelines (2014)*
- TII National Traffic Model
- Limerick County Council: *Limerick County Development Plan 2022-2028*
- TRICS Consortium: *Trip Rate Information Computer System (TRICS) database*

RECEIVED: 04/03/2026



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 7: MATERIAL ASSETS & BUILT SERVICES

**PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT
ON LANDS AT MONALEEN ROAD
CASTLETROY, LIMERICK**

FEBRUARY 2026



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- Appendix 7.1 – Storm Water Calculations
- Appendix 7.2 – Irish Water Confirmation of Feasibility

7 MATERIAL ASSETS – AS BUILT SERVICES

7.1 Introduction

This chapter of the EIAR describes the existing surface water drainage, foul drainage, and water supply infrastructure serving the development site area, and provides an assessment of the proposed development's likely impact on these services during the project's construction and operational phases.

This chapter has been prepared by Brian Lahiff, Chartered Engineer, of GARLAND. Brian Lahiff, BE, PGradDip. (Health and Safety in Construction), PGradDip (Project Management), CEng, FConsEI, MIEI, is a Chartered Engineer and Fellow Professional Consulting Engineer with more than 20 years of experience in planning, designing, managing, coordinating, and supervising construction projects. He has an extensive track record of working on a range of project types and sizes, with a particular specialization in the delivery of phased projects in challenging healthcare environments. Brian's expertise has taken him across Europe, the Middle East, and Africa.

This assessment has been carried out in accordance with the following guidance and established best practice:

- Environmental protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Uisce Éireann (Irish Water) Code of Practice for Water Infrastructure (2025)
- Uisce Éireann (Irish Water) Code of Practice for Wastewater Infrastructure (2025)
- Reference has also been made to the following documents:
- Limerick Development Plan 2022-2028
- Greater Dublin regional Code of Practice for Works
- Local Authority Drainage Records
- Uisce Éireann Infrastructure Records
- Confirmation of Feasibility (COF) from Uisce Éireann

7.2 Baseline Environment (Existing Receiving Environment)

7.2.1 Proposed Development Site

The application area comprises 9.7 hectares and is located on Monaleen Road in the Castletroy area of the Castletroy Golf Club situated directly to the south. Limerick. It is strategically positioned with the R445 regional road forming its northern boundary and Monaleen Road aligning the eastern boundary.



Figure 7.1 Site extents and environs (Source: Google Earth)

7.2.2 Development Description

Columbia Estates Management (IE) Limited (the prospective applicant) intend to apply for a 10 year permission comprising of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g)Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of associated ESB substations.
- (l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

Refer to EIAR Chapter 2 – Project Description for further details.

7.2.3 Surface Water Infrastructure

The site contains an existing approximately 900 mm diameter surface water pipeline / trunk drain traversing the lands in an approximate west–east alignment before continuing northwards towards Dublin Road. This asset is owned and maintained by Limerick City and County Council. A dedicated wayleave corridor is present over this infrastructure. Diversions of this surface water pipeline may be required to facilitate the proposed development and will be undertaken in accordance with LCCC requirements.

All works to and within the vicinity of the pipeline will be undertaken in accordance with Limerick City and County Council requirements, including agreed stand-off distances, supervised excavation where necessary, and continued access for inspection and maintenance.

7.2.4 Foul Drainage Infrastructure

Uisce Éireann drainage records indicate public foul sewers in close proximity to the development along Dublin Road and Monaleen Road. Dublin Road contains a 385 mm diameter concrete pipe discharging eastwards. There is a 150 mm diameter sewer within Monaleen Road discharging northwards. Additional foul sewers within Monaleen Road discharge to the south.

The proposed development site will ultimately discharge foul effluent to the Castletroy Wastewater Treatment Plant (WWTP) via the existing public foul sewer network. The Castletroy WWTP serves the Castletroy, Annacotty, Mountshannon and Castleconnell urban area of East Limerick, including residential, educational and light industrial connections.

In accordance with the conditions of its Wastewater Discharge Licence (WWDL D0019-01), Uisce Éireann prepares an Annual Environmental Report (AER) to summarise the environmental performance and compliance of the treatment plant. The 2024 AER for Castletroy WWTP confirms the following key points:

Plant Capacity and Hydraulic Loading

- Castletroy WWTP has a design organic capacity of 45,000 Population Equivalent (PE) and operates tertiary phosphorus removal (3P) treatment.
- The AER reports an average hydraulic loading of approximately 9,010 m³/day (mean) and an annual maximum hydraulic loading of approximately 17,895 m³/day.
- The annual maximum hydraulic loading slightly exceeds the nominal peak design hydraulic capacity of 17,280 m³/day, indicating periods where flows approach or marginally exceed the plant's nominal hydraulic design capacity.
- The as-constructed Organic Capacity (PE) is 45,000. The Organic Capacity (PE) - Collected Load (peak week) is 33,948 leaving a stated remaining capacity of 11,052.

Effluent Compliance

- Effluent monitoring results demonstrate that the Castletroy WWTP does not meet the annual mean Emission Limit Value (ELV) for ammonia-total (as N) in 2024, resulting in a single non-compliance for this parameter at the treated discharge.
- Other monitored parameters, including biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids (SS), total phosphorus and pH, remain compliant with the licence ELVs.

Receiving Water Quality

- Ambient water quality monitoring associated with the Castletroy WWTP discharge indicates that deterioration in some monitored parameters between upstream and downstream locations was observed; however, these changes are not attributed solely to the wastewater discharge and do not demonstrate an observable negative impact on the receiving water's Water Framework Directive (WFD) status.

Incident and Operational Reporting

- A number of operational incidents were recorded during the reporting year in accordance with regulatory reporting procedures, involving events such as overflow occurrences and equipment issues; these are managed by Uisce Éireann as part of normal licence compliance activities.

During 2025 Uisce Éireann have commenced upgrade works at Castletroy WWTP to increase capacity by 70% and enhance stormwater resilience, supporting existing and future population growth. This project involves the construction of a new stormwater storage tank, installation of new primary treatment filters and lifting pumps,

construction of a new primary sludge holding tank, and an upgrade to secondary treatment tanks. These works are due to be completed in 2028.

This baseline information provides context for the assessment of foul drainage impacts from the proposed development and demonstrates that while foul treatment capacity at Castletroy WWTP is generally compliant with licence conditions, there are periods of high loading and an identified ammonia ELV non-compliance that are being addressed in conjunction with the upgrade programme.

As with all new developments, the acceptability of the proposed development in terms of wastewater capacity and compliance is subject to the Uisce Éireann connection process and the already issued Confirmation of Feasibility which has noted the development can be facilitated without the need for upgrade. The current Uisce Éireann Wastewater Treatment Capacity Register was reviewed (on 23 February 2026) which notes that spare capacity available at the plant and also that the aforementioned project is underway.

7.2.5 Water Supply

The site is adjacent to an existing Uisce Éireann water supply reservoir. There are a 250mm diameter and 1000mm diameter watermain which enter the site from the South of the Reservoirs and traverse the site from West to East. There are a number of watermain pipes including of 900mm diameter which travel from the North East Corner of the Reservoir site across the site in a North Eastern Direction.

7.3 Potential Impact of the Proposed Development

7.3.1 Construction Phase

Surface Water Infrastructure and Runoff Control

During the construction phase, site clearance, stripping of topsoil, excavation works and general construction activity have the potential to generate sediment-laden surface water runoff. In the absence of appropriate controls, runoff from exposed ground could enter nearby drainage ditches or existing surface water infrastructure, resulting in temporary increases in suspended solids and localised siltation.

Construction activities also present a risk of accidental pollution from fuels, oils, wet concrete, cement washout water or other materials used on site. If uncontrolled, such substances could enter the surface water drainage system and adversely affect water quality.

Localised groundwater ingress to excavations may occur during trenching and foundation works, particularly during periods of heavy rainfall or elevated groundwater levels. Where required, temporary dewatering may be undertaken. Any groundwater or accumulated surface water pumped from excavations will be managed separately from the foul drainage system. Pumped water will be directed to appropriately designed settlement measures (e.g. settlement tanks, silt bags or temporary settlement areas) prior to controlled discharge to a suitable outfall, subject to any necessary approvals. Alternatively, where required, water will be removed from site by a suitably authorised contractor. No discharge of groundwater or construction runoff to the public foul sewer network is proposed.

Heavy rainfall events during construction could also result in temporary ponding within open trenches. Without appropriate management, rapid discharge of such water could temporarily increase flows in local drainage features. However, with controlled and attenuated discharge via settlement measures, this risk will be minimised.

A key site-specific consideration is the presence of an existing 900mm diameter surface water pipeline traversing the lands. Construction works in proximity to this strategic asset present a potential risk of accidental damage or disruption, which could affect downstream drainage infrastructure.

Foul Water Drainage

Public foul sewer infrastructure is located in the vicinity of the site along Dublin Road and Monaleen Road. There are no recorded public foul sewers traversing the site.

During construction, potential impacts on foul drainage infrastructure could arise from:

- Accidental damage to nearby public sewers during connection works;
- Ingress of silt, debris or surface water into the foul network through open manholes or unfinished pipework;
- Localised spillage during the construction of new connections to the live sewer network.
- Temporary wastewater generated during the construction phase will consist solely of foul effluent from on-site welfare facilities serving construction personnel. This effluent will be of domestic origin and will be discharged to the public foul sewer network via an agreed temporary or permanent connection, in accordance with Uisce Éireann requirements.

Groundwater or surface water arising from excavation dewatering will not be discharged to the foul sewer network.

Potable Water Supply

The site is located adjacent to an existing Uisce Éireann reservoir and contains multiple strategic trunk watermains, including 250mm, 900mm and 1000mm diameter pipelines traversing the lands. The primary construction-phase risk relates to accidental damage to these strategic water supply assets, which could result in disruption to potable water supply, water loss or localised flooding.

No diversion of these Uisce Éireann trunk watermains is proposed. The development design incorporates appropriate wayleaves, stand-off distances and access corridors to ensure their protection.

Construction-phase potable water demand will be limited to minor supply requirements for site offices and welfare facilities, provided via a temporary connection arranged by the contractor.

7.3.2 Operational Phase

The principal risks with the Operational Phase are:

7.3.2.1 Surface Water Network

Due to the proposed stormwater system which will be implemented at the site there is considered to be minimal risk of the site impacting the water quality of the existing storm water network or ditches.

Proposed Surface Water Drainage Layout and Connection Points

Due to the proposed surface water management strategy and the incorporation of Sustainable Drainage Systems (SuDS) throughout the development, there is considered to be minimal risk of the proposed development adversely impacting the water quality or hydraulic performance of the existing surface water network or receiving drainage features.

The proposed surface water drainage system has been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Greater Dublin Regional Code of Practice for Drainage Works, and Limerick City and County Council Development Plan requirements.

The surface water runoff from roofs, roads, driveways and other impermeable areas within the proposed residential development will be collected in a separate surface water pipe network and routed through a series of SuDS treatment stages prior to discharge.

Given the topography of the site and the distribution of open spaces, multiple surface water drainage sub-catchments with associated attenuation storage areas are proposed across the development. These systems will ultimately discharge, at a controlled rate, to the existing 900mm diameter surface water pipeline located along the northern boundary of the site.

A minimum 6.5m wayleave corridor has been maintained along the alignment of the existing surface water pipeline to ensure continued access for inspection and maintenance.

Allowable run-off rate and attenuation storage provision

In accordance with the applicable drainage criteria, the allowable discharge rate is the greater of (i) the calculated greenfield runoff rate (Q_{bar}) and (ii) 2.0 l/s/ha. For the net drained area of approximately 5.56 ha, the 2.0 l/s/ha criterion equates to 11.12 l/s. The calculated greenfield runoff rate for the site is 15.56 l/s. Accordingly, the allowable discharge rate adopted for design is 15.56 l/s, and the surface water system has been designed to ensure this rate is not exceeded during design events.

The development is required to retain stormwater volumes generated during a 1-in-100-year storm event, with an allowance of 30% for climate change and an additional 10% allowance for urban creep. Hydraulic modelling has been undertaken using design software to determine the critical storm duration and the required attenuation storage volume.

Underground geocellular attenuation tanks are proposed to provide the required storage. This approach has been adopted in preference to open basins or ponds due to the high-density residential nature of the site and the associated safety and land-use considerations.

Flow control devices will be provided on the downstream manholes to restrict discharge to greenfield runoff rates.

Summary of Compliance with Criteria 1-4 GDSDS

The GDSDS and the Regional Code of Practice require that surface water drainage arrangements satisfy four key criteria:

- Criterion 1: River Water Quality Protection

This is satisfied through the provision of SuDS measures including bioretention systems, permeable paving, catchpit manholes and bypass interceptors, which provide treatment of runoff prior to discharge.

- Criterion 2: River Regime Protection

This is satisfied through restriction of surface water discharge to the calculated greenfield runoff rate.

- Criterion 3: Level of Service (Flooding) for the Site

This is satisfied through the provision of attenuation storage designed to accommodate the 1-in-100-year storm event plus climate change and urban creep allowances.

- Criterion 4: River Flood Protection

This is satisfied through the combination of attenuation and controlled discharge, ensuring that downstream flood risk is not increased.

Design Standards

- i. The Greater Dublin Strategic Drainage Study (GDSDS), Volume 2
- ii. The Greater Dublin Regional Code of Practice for Drainage Works
- iii. British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
- iv. Part H of the Building Regulations (Building Drainage)

SuDS Design

The second aspect of the Local Authority is to include Sustainable Drainage Systems (SuDS) for all new applications.

Proposed SuDS Elements

In accordance with Local Authority requirements, the proposed development incorporates Sustainable Drainage Systems (SuDS) features which provide both water quantity control and water quality treatment.

The proposed SuDS measures include:

- Bioretention systems distributed throughout the development;
- Permeable paving within private driveways and selected parking areas (with impermeable membrane to prevent infiltration due to presence of bedrock at a relatively high level);
- Catchpit manholes upstream of attenuation systems to allow settlement of silt and suspended solids;
- Class 1 bypass petrol/oil interceptors upstream of outfall points;
- Flow control devices to restrict discharge to greenfield rates;
- Underground attenuation storage tanks located within open space areas.

The SuDS strategy has been designed in accordance with CIRIA C753 (The SuDS Manual), and the Simple Index Approach has confirmed that the mitigation indices provided by the proposed SuDS measures exceed the pollution hazard indices associated with residential roofs and low-traffic residential roads.

Accordingly, the proposed SuDS treatment train provides adequate protection of receiving surface water infrastructure and downstream water quality.

SuDS Water Quality

The proposed surface water drainage strategy incorporates Sustainable Drainage Systems (SuDS) which provide both hydraulic control and water quality treatment prior to discharge to the receiving surface water network.

In accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS) and CIRIA C753 The SuDS Manual, the proposed SuDS measures have been designed to provide an appropriate treatment train for the development, reducing the risk of suspended solids, metals and hydrocarbons entering downstream drainage infrastructure.

Water quality treatment will be achieved through a combination of:

- Bioretention systems located throughout the development;
- Permeable paving in driveways and selected parking areas (with impermeable membrane to prevent infiltration);
- Catchpit manholes upstream of attenuation systems to promote settlement of sediments;
- Class 1 bypass petrol/oil interceptors prior to discharge;

These measures provide filtration, sedimentation, adsorption and biodegradation processes which collectively reduce pollutant loads in runoff from roofs and low-traffic residential roads prior to discharge

Hazard Classification

The potential pollution hazard associated with surface water runoff from the proposed development has been assessed using the Simple Index Approach set out in Chapter 26 of CIRIA C753.

The proposed development comprises primarily:

- Residential roof areas; and

- Individual property driveways, residential car parks and low-traffic access roads.

In accordance with Table 26.2 of the SuDS Manual:

- Runoff from residential roofs is classified as very low hazard; and
- Runoff from driveways, residential parking areas and low-traffic roads is classified as low hazard.

The principal pollutants of concern for such land uses include:

- Total Suspended Solids (TSS);
- Metals; and
- Hydrocarbons.

The pollution hazard indices applicable to the development are therefore low and are considered appropriate for treatment through standard residential SuDS measures.

SuDS Mitigation Index (MI)

The adequacy of the proposed SuDS measures has been assessed using the Mitigation Indices presented in CIRIA C753. The Simple Index Approach requires that:

Total SuDS Mitigation Index $\geq$ Pollution Hazard Index (for each contaminant type)

The proposed SuDS treatment train includes bioretention systems and permeable paving, both of which provide high mitigation indices for the key pollutants, supplemented by proprietary treatment systems (Class 1 bypass interceptors) upstream of attenuation storage.

Indicative mitigation indices from CIRIA C753 include:

- Bioretention systems: MI = 0.8 (TSS, Metals, Hydrocarbons)
- Permeable paving: MI = 0.7 (TSS), 0.6 (Metals), 0.7 (Hydrocarbons)

Given the low hazard classification of the contributing land uses, the proposed SuDS measures provide mitigation indices which exceed the relevant pollution hazard indices for residential runoff.

Table 7. 1 – Water Quality - Simple Index Method

Element / Land Use	Hazard Index	MI 1	MI 2	Total Mitigation Provided	Result
TSS – Residential Roofs via Bioretention	0.2	0.8 (Bioretention System)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.8	Pass
TSS – Residential Roofs Permeable Paving	0.2	0.7 (Permeable Paving / Sub-base Storage)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
TSS – Residential Roofs Direct to Gully & Pipe Network	0.2	Proprietary Treatment System (Class 1 Bypass Interceptor designed to meet the criteria)	—	Designed to meet ≥ 0.2	Pass
TSS – Driveways / Parking / Roads via	0.5	0.8 (Bioretention System)	Proprietary Treatment System	≥ 0.8	Pass

Bioretention or Permeable Paving			(Class 1 Bypass Interceptor)		
TSS – Driveways / Parking / Roads via Permeable Paving	0.5	0.7 (Permeable Paving / Sub-base Storage)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
TSS – Driveways / Parking / Roads Direct to Gully & Pipe Network	0.5	Proprietary Treatment System (Class 1 Bypass Interceptor designed to meet the criteria)	—	Designed to meet ≥ 0.5	Pass
Metals – Residential Roofs via permeable paving	0.2	0.7 (Permeable Paving)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
Metals – Residential Roofs via bioretention	0.2	0.8 (Bioretention System)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.8	Pass
Metals – Residential Roofs via Direct to Gully & Pipe Network	0.2	Proprietary Treatment System (Class 1 Bypass Interceptor designed to meet the criteria)	—	Designed to meet ≥ 0.2	Pass
Metals – Driveways / Parking / Roads via Bioretention	0.4	0.8 (Bioretention System)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.8	Pass
Metals – Driveways / Parking / Roads via Permeable Paving	0.4	0.7 (Permeable Paving / Sub-base Storage)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
Metals – Driveways / Parking / Roads Direct to Gully & Pipe Network	0.4	Proprietary Treatment System (Class 1 Bypass Interceptor designed to meet the criteria)	—	Designed to meet ≥ 0.4	Pass
Hydrocarbons – Residential Roofs via Bioretention	0.05	0.8 (Bioretention System)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.8	Pass
Hydrocarbons – Residential Roofs Permeable Paving	0.05	0.7 (Permeable Paving / Sub-base Storage)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
Hydrocarbons – Residential Roofs	0.05	Proprietary Treatment System (Class 1 Bypass	—	Designed to meet ≥ 0.05	Pass

Direct to Gully & Pipe Network		Interceptor designed to meet the criteria)			
Hydrocarbons – Driveways / Parking / Roads via Bioretention	0.4	0.8 (Bioretention System)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.8	Pass
Hydrocarbons – Driveways / Parking / Roads via Permeable Paving	0.4	0.7 (Permeable Paving)	Proprietary Treatment System (Class 1 Bypass Interceptor)	≥ 0.7	Pass
Hydrocarbons – Driveways / Parking / Roads Direct to Gully & Pipe Network	0.4	Proprietary Treatment System (Class 1 Bypass Interceptor designed to meet the criteria) —	—	Designed to meet ≥ 0.4	Pass

Accordingly, the proposed combination of bioretention systems, permeable paving, catchpit manholes and bypass interceptors provides adequate treatment and water quality protection for surface water runoff from the development.

The SuDS strategy therefore satisfies the CIRIA Simple Index Approach and is considered to provide appropriate mitigation for the protection of downstream surface water infrastructure and receiving waters.

SuDS Outline Management Plan

For the SuDS strategy to operate effectively throughout the lifetime of the development, appropriate maintenance will be required.

Depending on ownership of each particular item, it shall be the responsibility of the appointed Management Company, private house owner or Limerick City and County Council to ensure that all SuDS components, including permeable paving, gullies, catchpits, bioretention systems, interceptors and attenuation tanks, are inspected and maintained in accordance with manufacturer guidance and best practice.

7.3.2.2 Foul Drainage Network

Proposed Foul Effluent Generation – Residential

The Uisce Éireann Code of Practice for Wastewater Infrastructure specifies an average foul effluent flow rate of 150 litres per person per day for residential use with 2.7 people per unit. It is assumed that a maximum of 1,413 no. people shall be present daily. Therefore, the foul effluent generated by staff of the proposed development may be calculated as;

⇒ 150 l/person/day.

⇒ Dry Weather Flow (DWF)

150 l/person/day x 1,413 people = 211,815 l/day = 3.68 l/sec (assuming 16 hours discharge period)

⇒ Peak Flow (3 times DWF)

3.68 l/sec x 3 = 11.03 l/sec

Proposed Foul Effluent Generation –Creche

⇒ 15 Staff at 90 l/person/day.

⇒ 70 Children at 90 l/person/day.

⇒ Total of 85 persons at 90 l/person/day.

⇒ Dry Weather Flow (DWF)

90 l/person/day x 85 people = 7,650 l/day = 0.18 l/sec (assuming 12 hours discharge period)

⇒ Peak Flow (6 times DWF)

0.18 l/sec x 6 = 1.06 l/sec

Proposed Foul Effluent Generation – Total

The total wastewater discharge from the development will be 219,465 l/day ($\approx 219.6 \text{ m}^3/\text{day}$) with a flow rate of 3.86 l/s with a peak of 12.09 l/s.

Proposed Foul Drainage Discharge Location

It is proposed to provide a single gravity foul sewer system for the development, discharging to the existing wastewater network in the Monaleen Road. The existing pipe within the Monaleen Road and along the Dublin Road will be upgraded to facilitate the flow from this development.

A Pre-Connection Enquiry (PCE) was submitted to Uisce Éireann for the proposed development. As a response to the PCE, a confirmation of Feasibility (CoF) was issued by the Uisce Éireann and was noted that wastewater connection is feasible with upgrades. Uisce Éireann's assessment of the existing wastewater network indicates that local capacity upgrades are required in order to accommodate the proposed development. While connection to the public wastewater network is feasible, it is contingent on the completion of improvement works to the existing sewer infrastructure.

To facilitate the proposed connection, the existing sewer between Monaleen Road and Dublin Road will require upgrading. This will involve upsizing the sewer to a minimum internal diameter of 300 mm over an approximate length of 262 metres. These works will increase the conveyance capacity of the local network to accommodate the additional wastewater loading generated by the development.

The required upgrade works are not currently included within Uisce Éireann's capital investment programme. Accordingly, the delivery and funding of these local network improvements will be the responsibility of the applicant as part of the connection process. Subject to the completion of these infrastructure improvements and agreement with Uisce Éireann at connection application stage, the proposed development can be satisfactorily serviced by the public wastewater network.

Due to the existing site topography and the requirement to avoid crossing established services located to the north of the site, it is proposed to provide a pumping station to service approximately 34 residential units situated to the north and north-west of the development. These units cannot discharge to the public sewer along Monaleen Road by gravity.

The proposed pumping station will convey wastewater via a rising main located within the development boundary. This rising main will discharge to a new header manhole, from which flows will enter the gravity sewer network being constructed as part of the internal foul drainage infrastructure for the development.

The proposed wastewater pumping station has been included solely to service a limited portion of the development where gravity discharge is not feasible due to local site topography. The pumping station will be designed and operated in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure and will incorporate the following measures to ensure operational resilience and environmental protection:

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- Duty/standby pump configuration to maintain service continuity in the event of pump failure;
- Emergency storage capacity within the wet well to accommodate short-duration outages or peak inflows;
- High-level alarm systems with telemetry to provide early warning of malfunction or rising levels;
- Secure access arrangements for maintenance and inspection;
- Measures to minimise the potential for odour or noise effects, with enclosed chambers and appropriate ventilation design where required.

The proposed pumping station is intended to be vested in / taken in charge by Uisce Éireann, subject to the pumping station and associated rising main being designed, constructed, tested and commissioned in full accordance with Uisce Éireann requirements (including the Code of Practice for Wastewater Infrastructure) and subject to acceptance through the Uisce Éireann vesting / taking-in-charge process. Until such time as vesting is completed, operation and maintenance will remain the responsibility of the Developer/Management Company or its appointed operator to ensure its continued compliance and reliable operation over the lifetime of the development.

See **Appendix 7.2** to this report for a copy of Confirmation of Feasibility (CoF).

Design Standards

- Uisce Éireann Code of Practice for Wastewater Infrastructure
- Part H of the Building Regulations

7.3.2.3 Water Supply

Proposed Water Demand – Residential

In accordance with the Uisce Éireann Code of Practice for Water Infrastructure, an average domestic water consumption rate of 150 litres per person per day is assumed for residential development, based on an average occupancy rate of 2.7 persons per dwelling unit.

For the purposes of this assessment, it is assumed that a maximum population of 1,413 persons will be present within the proposed residential development on a daily basis.

The estimated potable water demand is calculated as follows:

⇒ Average Daily Demand

$$\Rightarrow 150 \text{ litres/person/day} \times 1,413 \text{ persons} \\ = 211,950 \text{ litres per day } (\approx 212 \text{ m}^3/\text{day})$$

⇒ Average Hourly Demand

⇒ Assuming water usage occurs primarily over a 16-hour active period:

$$\Rightarrow 211,950 \text{ litres} \div 16 \text{ hours} \\ = 13,247 \text{ litres/hour} \\ = 3.68 \text{ litres/second}$$

⇒ Peak Hour Flow

⇒ Applying a peak factor of 1.25:

$$\Rightarrow 3.68 \text{ L/s} \times 1.25 \\ = 4.6 \text{ litres/second}$$

Proposed Water Demand – Crèche Facility

For the proposed crèche facility, a water usage rate of 90 litres per person per day is assumed, in line with typical usage rates for childcare facilities.

The facility will accommodate:

$$\Rightarrow 15 \text{ staff}$$

$$\Rightarrow 70 \text{ children}$$

$$\Rightarrow \text{Total population: } 85 \text{ persons}$$

$$\Rightarrow \text{Average Daily Demand}$$

$$\Rightarrow 90 \text{ litres/person/day} \times 85 \text{ persons} \\ = 7,650 \text{ litres per day (7.65 m}^3\text{/day)}$$

$$\Rightarrow \text{Average Hourly Demand}$$

$$\Rightarrow \text{Assuming water usage over a 12-hour operational period:}$$

$$\Rightarrow 7,650 \text{ litres} \div 12 \text{ hours} \\ = 638 \text{ litres/hour} \\ = 0.18 \text{ litres/second}$$

$$\Rightarrow \text{Peak Hour Flow}$$

$$\Rightarrow \text{Applying a peak factor of 1.25 (appropriate for non-residential daytime usage with concentrated demand):}$$

$$\Rightarrow 0.18 \text{ L/s} \times 1.25 \\ = 0.225 \text{ litres/second}$$

$$\Rightarrow \text{Total Estimated Water Demand (Residential + Crèche)}$$

$$\Rightarrow \text{Total Average Daily Demand:} \\ 211,950 \text{ L/day} + 7,650 \text{ L/day} \\ = 219,600 \text{ litres/day (} \approx 219.6 \text{ m}^3\text{/day)}$$

$$\Rightarrow \text{Combined Peak Hour Flow:} \\ 4.6 \text{ L/s} + 0.225 \text{ L/s} \\ = 4.825 \text{ litres/second}$$

Proposed Potable Water Arrangements

A pre-connection enquiry was submitted to Uisce Éireann for the proposed development, outlining the anticipated water demand and loading associated with the scheme. The purpose of this enquiry was to confirm whether sufficient capacity exists within the public water supply to accommodate the development.

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Uisce Éireann has since issued a Confirmation of Feasibility for the proposal (Reference No. CDS25002898), confirming that the proposed development can be satisfactorily serviced by the existing public water supply infrastructure and that no network upgrades are required to facilitate the connection.

With regard to water supply, it is proposed to provide a 225 mm OD internal watermain network, with hydrants installed in accordance with the requirements of the Building Regulations.

The development will connect to the existing 200 mm diameter public watermain located to the east of the site beneath Monaleen Road. A new bulk water meter will be installed within the development boundary.

Design Standards

- Uisce Éireann Code of Practice for Water Infrastructure;
- Part H of the Building Regulations.

7.4 Mitigation Measures

7.4.1 Construction Phase

Mitigation during construction will focus on:

- (i) protecting existing surface water infrastructure and receiving waters from sediment and pollutants,
- (ii) preventing any ingress of silt/debris/surface water to foul networks, and
- (iii) protecting strategic trunk watermains traversing the site.

A Site-Specific Construction and Environmental Management Plan (CEMP) will be prepared by the Contractor and implemented for the duration of the works. The CEMP will include (as a minimum): construction phase drainage management, erosion and sediment controls, pollution prevention procedures, emergency response, storage and handling of hazardous substances, and inspection/maintenance schedules for all temporary controls.

Surface Water – Sediment and Pollution Control

- Runoff from working areas and exposed soil will be intercepted and routed through silt control measures (e.g. silt traps, settlement tanks, settlement lagoons, silt bags or equivalent) prior to controlled discharge.
- The Contractor will phase stripping/excavation works to minimise exposed ground and will stabilise exposed surfaces where practicable.
- Temporary drainage measures will be inspected routinely and maintained (including removal of silt) to ensure continued performance, particularly ahead of forecast heavy rainfall.
- Concrete pours will be managed to prevent cementitious material entering drains; washout will be undertaken in designated contained areas. No concrete washings will be discharged to surface water drains/ditches.
- Fuels and oils will be stored in designated areas with bunding/secondary containment; refuelling will occur only in controlled areas with spill kits available. Oil storage and refuelling areas will be set back from drainage features as far as practicable (minimum 10m where feasible) and managed in accordance with best practice guidance.

Dewatering

- Any groundwater or accumulated water pumped from excavations will be treated through settlement measures prior to controlled discharge to an appropriate outfall, subject to any necessary approvals.

- No discharge of groundwater or construction runoff to the public foul sewer is proposed.

Protection of Existing Strategic Infrastructure

- The precise location, depth and alignment of all existing services will be confirmed prior to works (including trial holes/slit trenches where required).
- Works in proximity to the existing 900mm surface water pipeline and trunk watermain (including 250mm, 900mm and 1000mm diameter) will be planned and executed in accordance with service owner requirements and agreed protection measures, including maintained wayleaves and access corridors.
- All necessary precautions will be taken to prevent unplanned disruption. Any works within wayleave corridors will be controlled, supervised and executed using agreed methods.

Foul Drainage Protection

- Open manholes and unfinished pipework will be protected to prevent ingress of silt/debris/surface water.
- Connection works to live sewers will be planned with Uisce Éireann/LCCC as relevant, with appropriate isolation/temporary controls to prevent spillage or backflow during tie-in operations.
- Temporary construction welfare effluent will be managed in accordance with Uisce Éireann requirements (via an agreed temporary or permanent connection, or other compliant arrangement).

General

- Site inductions will include environmental control procedures and spill response actions.
- Hazardous materials will be stored appropriately to prevent contamination of soils and waters.
- Regular visual inspections will be undertaken to ensure drainage and water supply networks remain clear of materials that could reduce capacity or cause blockages.

7.4.2 Operational Phase

Mitigation during operation is primarily embedded in the design of the drainage and water systems and through adoption of appropriate maintenance regimes for SuDS, interceptors and networks.

Surface Water

- The proposed surface water drainage system incorporates SuDS measures providing both water quality treatment and runoff control.
- Discharge will be restricted to the allowable rate (greenfield runoff rate criterion as applicable), with attenuation storage designed for the 1-in-100-year event plus allowances for climate change and urban creep.
- Class 1 bypass interceptors, catchpit manholes and SuDS treatment components will reduce the risk of hydrocarbons and suspended solids entering the receiving surface water network.

Foul Drainage

- The foul drainage system will be constructed in accordance with Uisce Éireann standards and Part H, including testing and survey prior to completion/vesting as appropriate.

- Water conservation measures (low-flow fittings, metering) will reduce foul effluent volumes generated.

Water Supply

- Water demand reduction measures will be incorporated (e.g. low water usage appliances and fittings).
- Bulk and domestic metering will be installed to Uisce Éireann specifications to facilitate monitoring and leakage detection.

Management and Maintenance

- Post-completion monitoring and maintenance of private on-site drainage and SuDS components will be the responsibility of the Developer/Management Company and/or other designated parties (e.g. individual homeowners) depending on the final taking-in-charge/vesting arrangements.
- Maintenance will be implemented in accordance with best practice and manufacturer guidance to ensure long-term performance of SuDS, interceptors and flow controls.

7.5 Residual Impacts

7.5.1 Construction Phase

Surface Water

With implementation of the construction-phase mitigation measures set out in Section 7.4.1 (including a site-specific CEMP, staged earthworks, erosion and sediment control measures, controlled dewatering, and pollution prevention measures), the likelihood of adverse effects on the receiving surface water drainage network and downstream water quality is significantly reduced. Any residual effects would be confined to the construction period and would be localised. Residual effects are assessed as:

- **Slight adverse**
- **Short-term**
- **Temporary**
- **Not significant**

Foul Drainage

Construction-phase foul effluent will be limited to domestic-type wastewater from temporary welfare facilities. With appropriate management of temporary connections and protection of manholes/pipework to prevent ingress of silt and surface water, the residual risk of effects on the public foul drainage network is low. Residual effects are assessed as:

- **Neutral to slight adverse**
- **Short-term**
- **Temporary**
- **Not significant**

Potable Water

The principal construction-phase risk to potable water infrastructure relates to accidental damage to existing strategic watermains. With service location verification, maintained wayleaves, controlled working methods in proximity to existing services, and liaison with Uisce Éireann as required, the likelihood of disruption is reduced. Residual effects are assessed as:

- **Neutral to slight adverse (risk-based)**
- **Short-term**
- **Temporary**
- **Not significant**

7.5.2 Operational Phase

Surface Water Quality

During operation, potential pollutants from the development are primarily associated with low-traffic residential roads/parking (e.g., suspended solids and trace hydrocarbons). The proposed SuDS treatment train, catchpits and interceptors will provide water quality treatment prior to discharge, and the drainage system will operate with controlled discharge. Residual effects on surface water infrastructure and receiving waters are assessed as:

- **Slight adverse**
- **Long-term**
- **Not significant**

Surface Water Flood Risk / Hydraulic Performance

The proposed surface water system incorporates attenuation storage and flow control to restrict discharge to the allowable rate and to accommodate the 1-in-100-year event with climate change and urban creep allowances. On this basis, no significant increase in downstream flood risk is predicted. Residual effects are assessed as:

- **Neutral**
- **Long-term**
- **Not significant**

Foul Drainage

The development will increase loading on the receiving public wastewater network. Subject to completion of the identified network upgrade works (where applicable) and successful connection through the Uisce Éireann connection process, the development can be serviced without significant adverse effects on the public network. Residual effects are assessed as:

- **Slight adverse**
- **Long-term**
- **Not significant**

Potable Water

The development will increase potable water demand on the receiving public water supply network. Based on the Uisce Éireann confirmation of feasibility and subject to compliance with Irish Water connection and metering requirements, the development can be serviced without significant adverse effects on public water supply infrastructure. Residual effects are assessed as:

- **Slight adverse**
- **Long-term**
 - **Not significant**

7.6 Monitoring

7.6.1 Construction Stage

Construction-phase monitoring will be implemented through the Contractor's CEMP and will focus on ensuring the effectiveness of erosion, sediment and pollution controls, and on protecting existing strategic services.

Surface Water / Sediment Control Monitoring:

- Daily visual inspection (and after heavy rainfall events) of temporary drainage controls including silt fences, silt traps, settlement tanks/ponds, silt bags, check dams and discharge points.
- Routine inspection of any temporary discharge points for evidence of discolouration, sediment plumes, hydrocarbon sheen or cementitious residues.
- Maintenance records to be retained on site, including dates of inspection, actions taken (e.g., removal of accumulated silt), and reinstatement/repairs of controls.
- Where dewatering is required, pumped water will be routed through settlement measures prior to discharge, and discharge will be monitored visually to confirm clarity and absence of visible pollution.

Pollution Prevention Monitoring:

- Weekly inspection of bunded fuel/oil storage areas, refuelling points, spill kits and designated concrete washout areas.
- Recording and investigation of any spill incidents, including corrective actions and prevention measures.

Protection of Existing Services Monitoring:

- Verification of the location and depth of existing watermain and surface water pipelines prior to works (trial holes where required).
- Supervised works within wayleaves/stand-off corridors, with method statements and records of any service protection measures implemented.
- Liaison procedures to be maintained with relevant service owners where works are proposed in proximity to strategic assets.

7.6.2 Operational Phase

Surface Water:

- A formal inspection and maintenance programme will be implemented for the operational surface water system and SuDS components to maintain hydraulic performance and water quality treatment capacity for the lifetime of the development. As a minimum, the following will apply:

- o Gullies and catchpits: inspection and cleaning at regular intervals and as required (including removal of silt and debris).
- o Bioretention systems: inspection for sediment build-up, vegetation condition, erosion/scour and ponding; sediment removal and replanting as required.
- o Permeable paving: periodic inspection and vacuum sweeping to prevent clogging; reinstatement of jointing material where required.
- o Flow control devices: inspection and removal of debris/blockage; verification of operational condition following significant rainfall events.
- o Attenuation tanks: inspection of access chambers and silt management measures; cleaning/desilting where required to maintain effective storage capacity.
- o Interceptors (Class 1 bypass): inspection and servicing in accordance with manufacturer requirements, with waste removed by authorised contractors and records retained.
- Responsibility for implementation will rest with the Developer/Management Company and/or other designated parties depending on final taking-in-charge/vesting arrangements. Maintenance responsibilities and inspection frequencies will be set out in the operational SuDS Management Plan and included within estate management documentation.

Foul Drainage:

- The private foul drainage network will be inspected and maintained as part of routine estate management.
- Prior to completion/occupation of each phase, new foul sewers will be tested and surveyed (including CCTV as appropriate) to confirm integrity and reduce the risk of infiltration/exfiltration.
- Where a pumping station is provided, it will be subject to a planned preventative maintenance programme, including routine inspection, alarm testing, and maintenance of pumps/valves/control panels in accordance with manufacturer recommendations.

Potable Water Supply:

- Bulk and domestic metering will be installed in accordance with Uisce Éireann requirements.
- Meter readings will be reviewed to identify abnormal consumption patterns indicative of leakage.
- Any identified leakage issues will be investigated and repaired in a timely manner through the estate management maintenance system.

7.7 Cumulative Impacts

7.7.1 Construction Phase

Cumulative construction impacts on material assets typically relate to:

- Increased risk of sediment runoff in the wider area during concurrent construction activities; and
- Increased risk of accidental spillages associated with multiple construction sites.

Given that the proposed development will implement a CEMP and standard best-practice controls (Section 7.4.1), cumulative construction impacts on surface water drainage, foul drainage and water supply infrastructure are assessed as:

- **Neutral**
- **Temporary**
- **Not significant**

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7.7.2 Operational Phase

Cumulative operational effects may arise where other developments in the wider area also connect to and utilise the same public drainage and water supply networks.

The proposed development incorporates:

- Greenfield runoff restriction and attenuation (surface water),
- SuDS treatment to protect water quality,
- Wastewater connection feasibility subject to upgrades (to be delivered as part of the scheme),
- Metered water supply and demand reduction measures.

With these measures in place, cumulative operational impacts on surface water networks, foul drainage networks and potable water supply are assessed as:

- **Slight**
- **Long-term**
- **Not significant**

7.8 Do-Nothing Scenario

In the Do-Nothing scenario, the lands would remain in their existing undeveloped condition (greenfield). There would be:

- No change to existing surface water runoff rates/volumes;
- No additional foul effluent discharge to the public wastewater network; and
- No additional potable water demand.

7.9 Difficulties Encountered

No significant difficulties were encountered in compiling this chapter of the EIAR. The assessment was undertaken using available Uisce Éireann infrastructure records, Local Authority drainage mapping, and the issued Confirmation of Feasibility for connection.

It is noted that, as with all projects of this nature, baseline service information is based on the accuracy of statutory and record-based datasets, and the precise location and depth of underground services will be confirmed during detailed design and pre-construction site investigations in accordance with best practice.

7.10 References

- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Limerick City and County Council (2022). Limerick Development Plan 2022–2028.
- Uisce Éireann (2025). Code of Practice for Water Infrastructure.
- Uisce Éireann (2025). Code of Practice for Wastewater Infrastructure.

- Greater Dublin Strategic Drainage Study (GDSDS), Volume 2.
- Greater Dublin Regional Code of Practice for Drainage Works.
- CIRIA (2015). C753 The SuDS Manual.
- BS EN 752:2008. Drain and Sewer Systems Outside Buildings.
- Building Regulations (as amended), Part H – Drainage and Wastewater Disposal.
- Local Authority Drainage Records
- Uisce Éireann Infrastructure Records
- Uisce Éireann (2025). Annual Environmental Report 2024 – Castletroy WWTP (D0019-01).
- Confirmation of Feasibility from Uisce Éireann

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 8: MATERIAL ASSETS WASTE MANAGEMENT

**PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT
ON LANDS AT MONALEEN ROAD
CASTLETROY, LIMERICK**

FEBRUARY 2025



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APPENDICES

- Appendix 8.1 - Resource and Waste Management Plan
- Appendix 8.2 - Operational Waste Management Plan

8 MATERIAL ASSETS – WASTE MANAGEMENT

8.1 Introduction

This chapter evaluates the likely impacts, if any, which the proposed development may have on Material Assets (related to waste management) as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022).

This chapter addresses waste management during the construction and operational phases of the proposed development, as described in Chapter 2 (Project Description).

A Resource and Waste Management Plan (RWMP) has been prepared by GARLAND for the construction phase of the proposed development and is included as Appendix 8.1.

An Operational Waste Management Plan (OWMP) has been prepared by Genesis Planning Consultants for the operational phase of the proposed development and is included as Appendix 8.2.

The Outline Construction, Environmental and Waste Management Plan prepared by GARLAND sets out the outline methodology for construction of the development including basement construction within shallow bedrock conditions and includes groundwater pathway protection, sediment control and pollution prevention measures relevant to construction phase materials handling and waste management. This note is referenced where applicable within this chapter.

This Chapter has been prepared in accordance with European Commission Guidance on preparation of the EIAR (2017) and the EPA EIAR Guidelines (2022).

For the purposes of this chapter, Material Assets relate primarily to the management of construction and operational waste streams and the availability of authorised waste infrastructure.

8.2 Expertise

This chapter has been prepared by Brian Lahiff, Chartered Engineer, of GARLAND. Brian Lahiff, BE, PGradDip. (Health and Safety in Construction), PGradDip (Project Management), CEng, FConsEI, MIEI, is a Chartered Engineer and Fellow Professional Consulting Engineer with more than 20 years of experience in planning, designing, managing, coordinating, and supervising construction projects. He has an extensive track record of working on a range of project types and sizes. Brian's expertise has taken him across Europe, the Middle East, and Africa.

8.3 Characteristics of the Proposed Development

Columbia Estates Management (IE) Limited (the prospective applicant) intend to apply for a 10 year permission comprising of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.

(c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.

(d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.

(e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.

(f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.

(g) Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.

(h) Provision of associated bicycle storage facilities at surface level throughout the site.

(i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.

(j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.

(k) Provision of associated ESB substations.

(l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

Refer to EIAR Chapter 2 – Project Description for further details.

8.4 Assessment Methodology

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 (Project Description) and considers the following aspects:

- Legislative context;
- Construction phase (including site excavations); and
- Operational phase.

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in Section 8.5 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the *National Waste Reports* and *National Waste Statistics* data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 8.10 of this EIAR Chapter.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 9 of this EIAR (Land & Soils) which also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

8.4.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 8.1).



Figure 8.1 Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 8.2).



Figure 8.2 Circular Economy (Source: Repak)

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The policy document, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2012.

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021). The guidance documents, *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction (2006)* and *Demolition Projects and Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002)*, were also consulted in the preparation of this assessment.

There are currently no national Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including:

- Waste Action Plan for a Circular Economy (2020);
- Circular Economy and Miscellaneous Provisions Act 2022;
- National Waste Management Plan for a Circular Economy 2024–2030;
- EPA Best Practice Guidelines for RWMPs (2021); and
- Limerick City & County Council (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws (2019)
- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended.

The OWMP has had regard to BS 5906:2005 Waste Management in Buildings – Code of Practice.

8.4.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

Authorised facility – a facility authorised by permit/licence/Certificate of Registration under the Waste Management (Facility Permit and Registration) Regulations

8.5 Baseline/Receiving Environment

In terms of waste management, the receiving environment is largely defined by Limerick City and County Council as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the NWMPCE (2024) which superseded the three previous regional waste management plans in Ireland.

The Regional Waste Management Planning Offices have issued a National Waste Management Plan for a Circular Economy 2024 - 2030 in March 2024, which supersedes the Southern Waste Region (SWR) waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWMPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The Limerick Development Plan 2022 – 2028 (2022) sets out the policies and objectives for the Limerick area which reflect those sets out in the regional waste management plan.

In terms of physical waste infrastructure, Limerick City and County Council no longer operates any municipal waste landfill in the area. "A range of authorised facilities operate within the Southern Waste Region and nationally; the final selection will depend on contractor procurement, facility availability and acceptance criteria at the time of works. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria including proximity, competency, capacity and serviceability.

A trial hole investigation was carried out across the site that identified that ground conditions vary across the site, with rock observed close to the surface in most trial hole locations. Topsoil depths range from approx. 200-350mm. Beneath the topsoil, natural ground materials include layers of sand with silt, silty sand, and weathered rock, with the weathered rock transitioning into firmer rock at greater depths. In most locations, the excavated materials appeared dry, with no groundwater encountered in any of the trial holes, although some dampness was noted in deeper layers, suggesting minor infiltration. An area in the western corner of the site, near the existing reservoirs, was found to contain approx. 2-2.5m of construction-related fill, including materials such as CL804, bricks, plastic, concrete, and asphalt (TH-10 and TH-12). This fill overlies the natural ground and its full extent will require further investigation. Overall, the excavated materials, including both natural soils and weathered rock, are likely to be suitable for reuse on site as construction fill.

8.5.1 Demolition Phase

There will be no demolition associated with this application.

8.5.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil and stone excavated to facilitate construction of new foundations, new basement and installation of underground services.

A cut and fill model has been prepared by GARLAND based on the following parameters:

- The existing surface is represented as being stripped of 300mm of topsoil;
- The proposed finished surface is represented as finished level less an assumed 300mm average build-up for roads/floors etc.;
- The model includes a cut section for the basement; and
- Services excavation and attenuation tank excavation are excluded from the base model but have been estimated separately, see below.

The following analysis is also noted:

- 300mm removal of topsoil across the site: 28,515m³
- Design level cut and fill (post topsoil strip):
 - o Cut = 28,000m³;
 - o Fill = 43,000m³
- Surface water trench excavation: 4,300m³ (including approx. 1,800m³ cutting into rock)
- Foul water trench excavation: 3,500m³ (including approx. 1,300m³ cutting into rock)

- Attenuation tank excavation: 13,500m³ (including approx. 5,300m³ cutting into rock)

Based on the indicative balance, fill exceeds cut by approximately 15,000m³ therefore imported fill will be required. Excavated materials will be reused on-site wherever possible to reduce export/import requirements, with off-site movement limited to situations where there is surplus, unsuitable material, or where imported material is required to meet design specification.

If any material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as amended.

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. Any surplus excavated material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Indicative LoW/EWC codes for construction waste streams include: concrete/brick waste (17 01 01–03), timber/plastics (17 02 01–03), metals (17 04 01–11), gypsum materials (17 08 02), mixed C&D waste (17 09 04), and soils and stones (17 05 04). Hazardous mirror entries will be applied where relevant based on classification testing.

Excavated soils will be classified in accordance with EPA waste classification guidance to determine whether they are:

- Suitable for reuse on site
- Suitable for recovery off site
- Waste requiring disposal
- Material reuse on site represents the preferred option under the waste hierarchy.
- Failure to manage construction waste appropriately could result in:
- Litter generation
- Dust
- Pollution of soil or water
- Attraction of vermin
- Visual impacts

All excavated soils and stones proposed for removal off-site as waste will be tested and classified in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous guidance and, where relevant, assessed against landfill acceptance criteria under Council Decision 2003/33/EC. Materials proposed for reuse on site will be subject to geotechnical and environmental suitability assessment to confirm that reuse will not give rise to unacceptable risks to human health or the environment. Should any contaminated or unsuitable material be encountered, it will be segregated, appropriately stored, and managed as either non-hazardous or hazardous waste as required, with removal by authorised contractors to authorised facilities (and, where necessary, managed in accordance with Transfrontier Shipment requirements).

The construction phase waste strategy has been developed with reference to the EPA publication Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA, 2021). In accordance with this guidance, the proposed development exceeds the Tier 1 thresholds and is therefore classified as a Tier 2 project, requiring the preparation and implementation of a project-specific Resource and Waste Management Plan (RWMP) to ensure maximum reuse, recycling and recovery of C&D materials.

The estimated construction waste quantities are derived using typical large-scale residential waste generation rates per m² applied to the gross floor area of the proposed development. Based on the size and scale of the development the following waste generation during construction is envisaged along with the envisaged breakdown of the waste by envisaged reuse, recycle and disposal values are summarised in Table 8.1:

Waste Type	Total Waste	Reuse		Recycle/Recovery		Disposal	
	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	426	10	43	80	341	10	43
Timber	362	40	145	55	199	5	18
Plasterboard	129	30	39	60	78	10	13
Metals	103	5	5	90	93	5	5
Concrete	78	30	23	65	50	5	4
Other	194	20	39	60	116	20	39
Total	1292		293		877		121

Table 8.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste

8.5.3 Operational Phase

As noted in Section 8.1, an OWMP has been prepared for the proposed development and is included as Appendix 8.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable waste (MNR), cardboard, plastic as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, confidential paper, waste cooking oil and furniture.

The estimated waste generation for the house units, apartment units and creche for the main waste types, based on the Genesis waste generation model (WGM), is presented in Table 8.2, below, and is based on the uses and areas as advised by the Project Architects, along with the EPA National Waste Database Reports 1998 – 2020, the Circular Economy and National Waste Database Report 2021 - 2022 (2024) and the EPA National Waste Statistics Web Resource. Further waste management types and details can be found in Appendix 8.2.

Waste Type	Waste Volume (m ³ /week)	Waste Volume (m ³ /week)	Waste Volume (m ³ /week)
	Houses	Apartments	Creche
Organic	4.0	3.5	0.1
Mixed Dry Recyclables	20.0	17.5	0.3
Non Recyclables	19.7	17.2	0.5
Glass	0.1	0.0	0.0
Total	43.8	38.3	1.0

Table 8.2 Estimated Waste Generation for the Proposed Development for the Operational Phase

The operator and their staff will be required to provide and maintain appropriate waste receptacles within the development to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the operator. As required, the operator and their staff will need to bring these

segregated wastes from their unit to their allocated Waste Storage Areas (WSA's). The locations of the WSA's can be viewed on the plans submitted with the planning application under separate cover.

The OWMP seeks to ensure that the proposed Development contributes to the targets outlined in the *NWMPCE (2024). Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland* and the Limerick City and County Council *Waste Bye-Laws*.

8.6 Do Nothing Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no excavation or construction at this site. Existing waste generation patterns in the receiving environment would remain unchanged. There would, therefore, be a neutral effect on the environment in terms of waste.

8.7 Difficulties Encountered

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Site Investigation (SI) process provides spot samples, and further testing is required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There are a number of licensed, permitted and registered waste facilities in Limerick, the Southern Waste Region and across Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can import as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria, including proximity, competency, capacity and serviceability. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

8.8 Consultation

Consultation was undertaken with Limerick City and County Council in the form of a pre-application consultation

8.9 Impact Assessment

8.9.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction as outlined in section 8.5.2. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored in the construction site compound or adjacent to it, on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of

litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect from waste material not being managed and stored correctly on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect from the use of non-permitted waste contractors or unauthorised waste facilities on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the SWR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect from not taking material to suitably registered / permitted / licenced waste facilities on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 9 (Land, Soils, Geology and Hydrogeology). It is not anticipated that there is a surplus of cut material and it would be intended that this would be reused on site subject to being suitable to do so. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect from not correctly classifying and segregating excavated material on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

8.9.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling can be sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion into recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

Waste contractors will be required to service the proposed development on a scheduled basis to remove waste, further details can be found in Appendix 8.2. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

8.10 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'waste hierarchy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal.

8.10.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to further develop a comprehensive RWMP in compliance with planning conditions and to the satisfaction of the Planning Authority, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the developed RWMP throughout the duration of the proposed excavation and construction phases.

Assuming that not all cut material from the site will be possible to reuse on site, a quantity of soil, stone and clay will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;
 - Glass; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, where possible. Where it is proposed to transfer excavated material off-site for reuse as a by-product (and not as a waste), this will only occur where the material can be demonstrated to meet the requirements of Regulation 27 of the European Communities (Waste Directive) Regulations 2011 (as amended). The basis for by-product status (including certainty of further use, suitability without further processing beyond normal industrial practice, and lawful use) will be documented prior to any movement off-site and relevant records will be retained. Where the material does not meet by-product criteria, it will be managed as waste and removed by authorised contractors to authorised facilities with full traceability documentation.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997 and the NWMPCE 2024. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

8.10.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 8.2 and are listed in summary below. The mitigation measures outlined in the OWMP will be implemented in full and form part of mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the NWMPCE (2024), Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the Limerick City and County Council waste bye-laws.

- The operator of the proposed development during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.
- The operator of the proposed development will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site.

The following mitigation measures will be implemented:

- The operator of the proposed development will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Cardboard;
 - Plastic;
 - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
 - Cooking oil;
 - Cleaning chemicals (paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time-to-time other bulky waste); and
- The operator of the proposed development will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The operator of the proposed development will ensure that all waste collected from the site of the proposed development will be reused, recycled, or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and

- The operator of the proposed development will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities.

These mitigation measures will ensure the waste arising from the Proposed Development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996 as amended, associated regulations, the Litter Pollution Act 1997, the NWMPCE (2024) and the Limerick City and County Council Waste Bye-Laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

8.11 Residual Impacts

It is predicted with the implementation of the mitigation measures outlined in section 8.10 and adherence to the RWMP (Appendix 8.1) and OWMP (Appendix 8.2) there will be no significant residual impact in relation to Material Assets - Waste Management. The implementation of the mitigation measures outlined in Section 8.10 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases. It will also ensure that European, national and regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

8.11.1 Construction Phase

A carefully planned approach to waste management as set out in Section 8.10.1 and adherence to a RWMP (Appendix 8.1) (which includes mitigation) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible** and **neutral**.

8.11.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 8.10.2 and adherence to the OWMP (Appendix 8.2) will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be **long-term, imperceptible** and **neutral**.

8.12 Cumulative Impacts

8.12.1 Construction Phase

It is predicted with the implementation of the mitigation measures outlined in section 8.10 and adherence to a RWMP (Appendix 8.1) and OWMP (Appendix 8.2) there will be no significant cumulative residual impact in the receiving environment section, which includes cumulative developments that are already built and in operation in relation to Material Assets - Waste Management.

As has been identified in the receiving environment section (section 8.5) all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

The proposed development will increase the impact on the existing waste services in the area. Having regard to other permitted developments in the area, which are either under construction or where construction has not yet commenced as there is potential for greater impact arising from the demand of additional population working and living in the area.

Concurrent construction activity in the area could influence contractor availability and facility lead times; this will be managed through procurement and RWMP implementation

Even when considered cumulatively with other permitted development, the proportional contribution of this development to overall municipal waste generation within the Limerick functional area remains negligible when compared to annual municipal waste generation figures reported by the EPA at regional scale.

The individual and combined effects as discussed above when considered holistically along with availability of regional waste infrastructure, statutory waste obligations and regulatory oversight are likely to have an imperceptible impact and are therefore not significant.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, imperceptible** and **neutral**.

8.12.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely to improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

8.13 Monitoring or reinstatement

The management of waste during the construction phase will be monitored by the Contractor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the operator of the proposed development to ensure effective implementation of the mitigation measures outlined in Section 8.10 and Appendix 8.2 internally and by the nominated waste contractor(s).

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	An appointed Resource Manager will monitor all on-site waste segregation and classification
Unlicensed Waste Collection (Illegal Dumping)	The operator/ facilities management company will maintain waste receipts on-site for a period of 7 years and make available to Limerick City and County Council as requested.
Poor Waste Segregation	Waste generation volumes will be monitored by the waste contractor / operator / facilities management company
Litter Pollution	Waste storage areas will be monitored by the waste contractor / operator / facilities management company

Table 8.4 Monitoring Proposals

8.13.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The RWMP specifies the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed development will enable better management of waste contractor requirements and identify trends. The data will be maintained to advise on future developments.

8.13.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the waste contractor and or the operator of the proposed development. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractors costs.

8.14 Interactions

It is predicted with the implementation of the mitigation measures outlined in section 8.10 and adherence to a RWMP (Appendix 8.1) and OWMP (Appendix 8.2) there will be no significant residual impact caused by the below interactions in relation to Material Assets - Waste Management.

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

8.14.1 Land & Soils

During the construction phase, excavated soil and stone will be generated from the excavations required to facilitate site levelling, construction of foundations, basement/podium works and the installation of underground services. As outlined in Section 8.5.2, this will include approximately 28,515 m³ of topsoil stripping, along with excavation associated with design level cut works post topsoil strip (c. 28,000 m³), basement formation, and additional excavation for services and drainage infrastructure including surface water trenches (c. 4,300 m³), foul water trenches (c. 3,500 m³) and the proposed attenuation tank excavation (c. 13,500 m³).

The management of these excavated materials has the potential to interact with the Land & Soils environment through risks such as inappropriate storage or handling, dust generation, sediment-laden runoff, or the off-site movement of unsuitable or contaminated material.

In accordance with the waste hierarchy, the primary objective will be to maximise on-site reuse of suitable excavated materials, thereby reducing the requirement for off-site export and, where practicable, reducing the importation of fill. As noted in Section 8.5.2, fill requirements are anticipated to exceed cut volumes and therefore excavated materials will be reused on-site wherever possible, subject to geotechnical and environmental suitability.

Where excavated materials require removal from site, they will be classified in accordance with the EPA's Waste Classification guidance to determine the appropriate List of Waste (LoW) code and confirm whether the material is hazardous or non-hazardous. Where relevant, environmental testing will also be undertaken to confirm acceptance criteria for the proposed authorised recovery or disposal facility. Any made ground or suspect material encountered (such as the construction-related fill identified locally during the trial hole investigation) will be segregated and managed appropriately.

All off-site movements of excavated materials that constitute waste will be carried out by authorised waste contractors to authorised facilities (permit/licence/Certificate of Registration, as appropriate), with full traceability documentation maintained. Measures for soil handling, stockpiling, erosion and sediment control, and pollution prevention will be implemented through the Construction Environmental and Waste Management Plan and the project-specific Resource and Waste Management Plan.

With the implementation of these mitigation measures, interactions with Land & Soils will be effectively controlled, and the residual effect is predicted to be **imperceptible** and **neutral (not significant)**.

8.14.2 Traffic & Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by the removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic related impacts during the construction and operational phases are addressed in Chapter 6 (Material Assets: Traffic and Transportation). Provided the mitigation measures detailed in Chapter 6 and Chapter 8 are adhered to, the predicted effects are **short to long-term, imperceptible** and **neutral**.

8.14.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and worker amenities. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 4 (Population and Human Health) and Chapter 8, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible** and **neutral**.

8.15 Worst Case Scenario

In a worst case scenario where no mitigation is put in place the impacts as outlined in section 8.9 Impact Assessment will occur having an **indirect, long-term, significant** and **negative**.

8.16 Conclusion

It is predicted with the implementation of the mitigation measures outlined in section 8.10 and adherence to a RWMP (Appendix 8.1) and OWMP (Appendix 8.2) there will be no significant residual impact in the receiving environment section in relation to material assets- waste management.

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development, cumulative developments and interactions with regards to Material Assets - Waste Management. These potential impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments has also been considered.

Provided all mitigation measures as set out in this chapter (section 8.10) and a RWMP (Appendix 8.1) and the OWMP (Appendix 8.2), the overall predicted impact of the proposed development is **long-term, imperceptible** and **neutral**.

8.17 References

1. Waste Management Act 1996 (as amended)
2. Protection of the Environment Act 2003 (as amended)
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
4. The Circular Economy and Miscellaneous Provisions Act 2022
5. Regional Waste Management Planning Offices, National Waste Management Plan (2024).
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7. European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
8. Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022)
9. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
10. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
11. DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
12. Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)
13. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
14. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
15. Limerick Development Plan 2022 – 2028 (2022)
16. Limerick City and County Council (LCCC), City and County of Limerick (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws (2019)
17. Planning and Development Act 2000 (No. 30 of 2000) as amended
18. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018)
19. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
20. Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 - 2022.
21. US EPA, Characterisation of Building Uses (1998);
22. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)
23. European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 9: LAND, SOILS, GEOLOGY & HYDROGEOLOGY

**PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT
ON LANDS AT MONALEEN ROAD
CASTLETROY, LIMERICK**

FEBRUARY 2026



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APPENDICES

Appendix 9.1 Site Investigation Reports

9 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

9.1 Introduction

This chapter of the EIAR comprises an assessment of the likely significant effects of the proposed Large-scale Residential Development (LRD) with respect to land and soils. The proposed LRD is located in Newcastle, approx. 3km east of Limerick City. The subject site is greenfield, with an access road traversing the centre of the site from Monaleen Road. The site is bound by Monaleen Road and residential properties to the east, the R445 to the north, Newcastle Reservoir and residential properties to the west, and Castletroy Golf Club to the south. The Groody River, a tributary of the River Shannon, is located approx. 750m west of the proposed development, and the River Shannon is located 970m to the north.

This chapter has been prepared by JBA Consulting, on behalf of Genesis Planning Consultants. This chapter has been compiled by Conor O'Neill and David Casey.

Conor O'Neill BA (Mod) MSc Adv Dip has five years of environmental consultancy experience. He has been involved in all aspects of EIAR, from Screening and Scoping to EIAR co-ordination and chapter authoring for numerous projects, along with other developments including transport infrastructure, renewable energy, residential, and commercial. He has completed numerous EIAR chapters on land, soils, geology and hydrogeology for a range of development types, including LRDs.

David Casey BSc MSc MCIWEM has 14 years of experience in environmental and flood risk assessment, specializing in Strategic Flood Risk Assessments, Flood Risk Assessments, and Environmental Impact Statements, with a focus on Soils and Geology, and Hydrology and Hydrogeology. His work on Environmental Impact Assessments spans large residential, commercial, and port developments, involving significant collaboration with architects, engineers, and planners

9.2 Methodology

9.2.1 Criteria for Rating Effects

This chapter has been prepared in accordance with the EPA's Guidelines on the information to be contained in EIAR (2022) and the EU Commission's Guidance on the preparation of the Environmental Impact Assessment Report (2017) and Notice on changes and extensions to projects (2021).

The methodology used is in accordance with the following guidance documents:

- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Institute of Geologists of Ireland (IGI) (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; and
- National Roads Authority (NRA) (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

The significance or sensitivity of Receptors and assessment of effects have been described following criteria outlined in the EPA's 2022 EIAR Guidelines.

In addition to the EPA (2022) Guidelines, the NRA (2009) criteria for assessing the importance of geological attributes are useful (Table 9-1). These criteria have been used to assist in rating the importance of features, which are then combined with the description of effects as shown below in the matrix of significance (Figure 9-1).

Table 9-1: Criteria for rating importance of geological attributes (NRA, 2009)

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

Note: "Very high", and "high" in Table 9-1 all correspond to "high" significance or sensitivity of a feature in the effects significance matrix (EPA, 2022).

To determine the significance of an effect, the description of the effect is compared to the previously mentioned sensitivity of the receiving environment following the matrix shown in Figure 9-1. The significance or sensitivity of each Receptor will be ranked, as will the character of the predicted effect.

In accordance with Figure 9-1, for example, a high sensitivity value combined with a high character effect, would result in a "profound" effect; if both were low, the final result would be "slight" or "not significant".

There are seven generalised degrees of effect significance that are commonly used in the Environmental Protection Agency guidelines, as it is depicted on the figure: Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound.

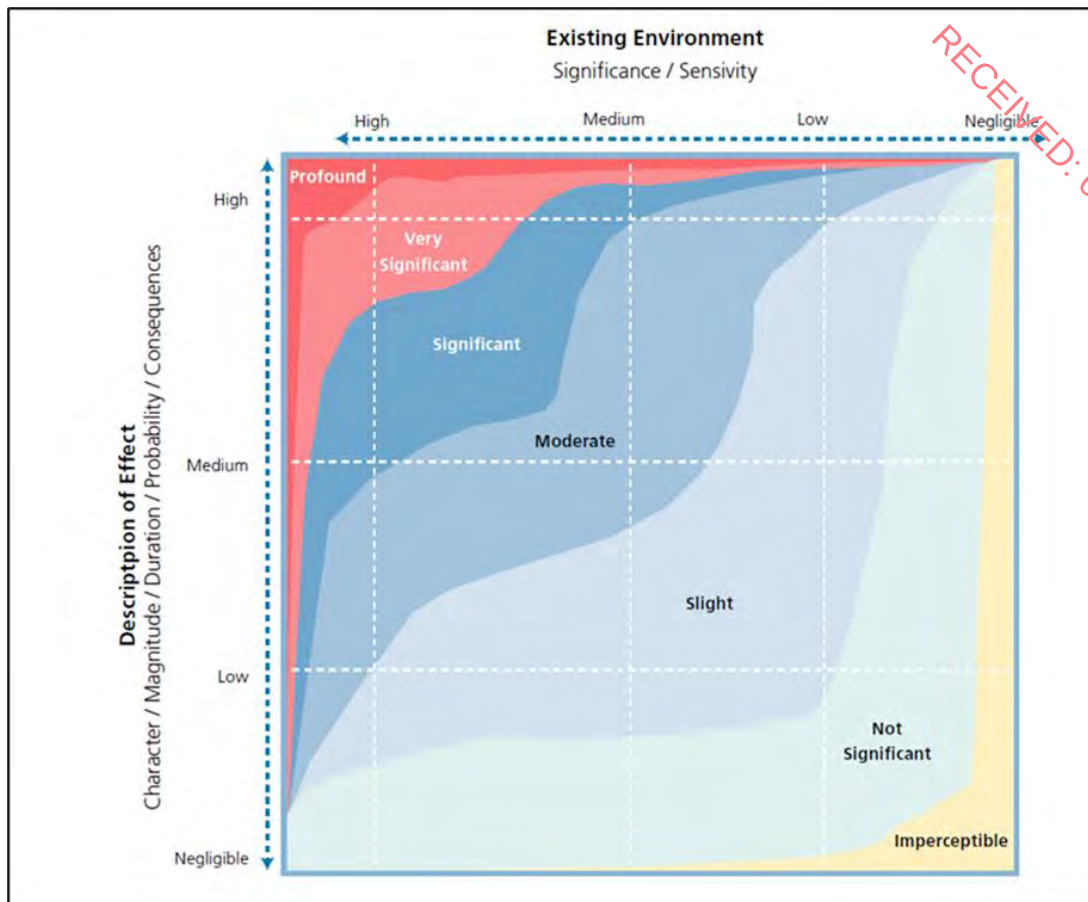


Figure 9-1: Assessment of significance of effects (Environmental Protection Agency, 2022)

The duration of each effect is either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are those which are construction related and last less than one year. Short term effects are effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

9.2.2 Sources of Information

The following sources of information and references were consulted in the preparation of this report:

- Geological Survey of Ireland (GSI) - on-line mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;
- Limerick Development Plan 2022-2028;
- Site investigation report by Garland Consultancy;
- WAC Rilta report by Eurofins;
- Waste Classification Report by BHP.

9.2.3 Study Area

In accordance with the IGI guidance, the study area has been set as a 2km radius from the planning boundary. This is the recommended minimum distance in the IGI guidelines and takes into account the lack of karstic or other sensitive subsurface features at the site, and the scale and nature of the development.

9.2.4 Relevant legislation

The following legislation was consulted during the preparation of this report:

- EIA Directive (2011/92/EU) as amended by Directive 2014/52/EU;
- Waste Management Act 1996, as amended;
- Habitats Directive (92/43/EEC);
- Water Framework Directive (WFD) (2000/60/EC);
- Classification of waste material that may be taken off-site for disposal is based on the Commission Decision of 18th December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and Council (2014/955/EEC) [the List of Waste (LoW)]. These enable waste to be classified as either hazardous, non-hazardous or minor (either hazardous or non-hazardous).
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9/2010 (European Communities Environmental Objectives (Groundwater) Regulations 2016);
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016;
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (Groundwater Directive);
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019; and
- Local Authority planning guidance as applicable.

9.3 Baseline Environment

9.3.1 Topography, Land Use and Setting

The site is situated approx. 3km east of Limerick City, in the area of Newcastle. Newcastle is a largely residential area, close to the University of Limerick.

The subject site is greenfield, with an access road traversing the centre of the site from Monaleen Road. The site is bound by Monaleen Road and residential properties to the east, the R445 to the north, Newcastle Reservoir and residential properties to the west, and Castletroy Golf Club to the south.

The surrounding area is primarily residential, with some commercial and open space uses also present.

The site is at a local topographic high point, being approx. 35-60m above sea level, with topography gradually falling off in all directions but particularly to the north and west. On the site itself, the southern half is relatively flat, while levels in the northern half fall off to the north.

9.3.2 Areas of Geological Interest, Historic & Current Land-Use

Review of the GSI online database confirmed that no geological heritage site has been identified in the vicinity of the proposed development site.

A review of historical mapping c. 1829 to current shows the land has historically been greenfield and in agricultural use as indicated by the historical maps and aerial imagery.

According to the EPA website, the nearest licenced facilities in the vicinity of the site are the following:

- Cook Ireland Limited - Integrated Pollution Control License P0973-01. A medical device manufacturing facility located in the National Technology Park, 1.1km north-east of the proposed development.
- Johnson & Johnson Vision Care Ireland Unlimited Company - Industrial Emissions Licensing P0818-05. A manufacturing facility located in the National Technology Park, 1.6km north-east of the proposed development.

9.3.3 Bedrock geology

The proposed development is underlain by volcaniclastic rocks, according to GSI maps (Figure 9-2). The surrounding area is predominantly underlain by undifferentiated limestone, with a section of pale cherty crinoidal limestone located to the south-east of the proposed development.

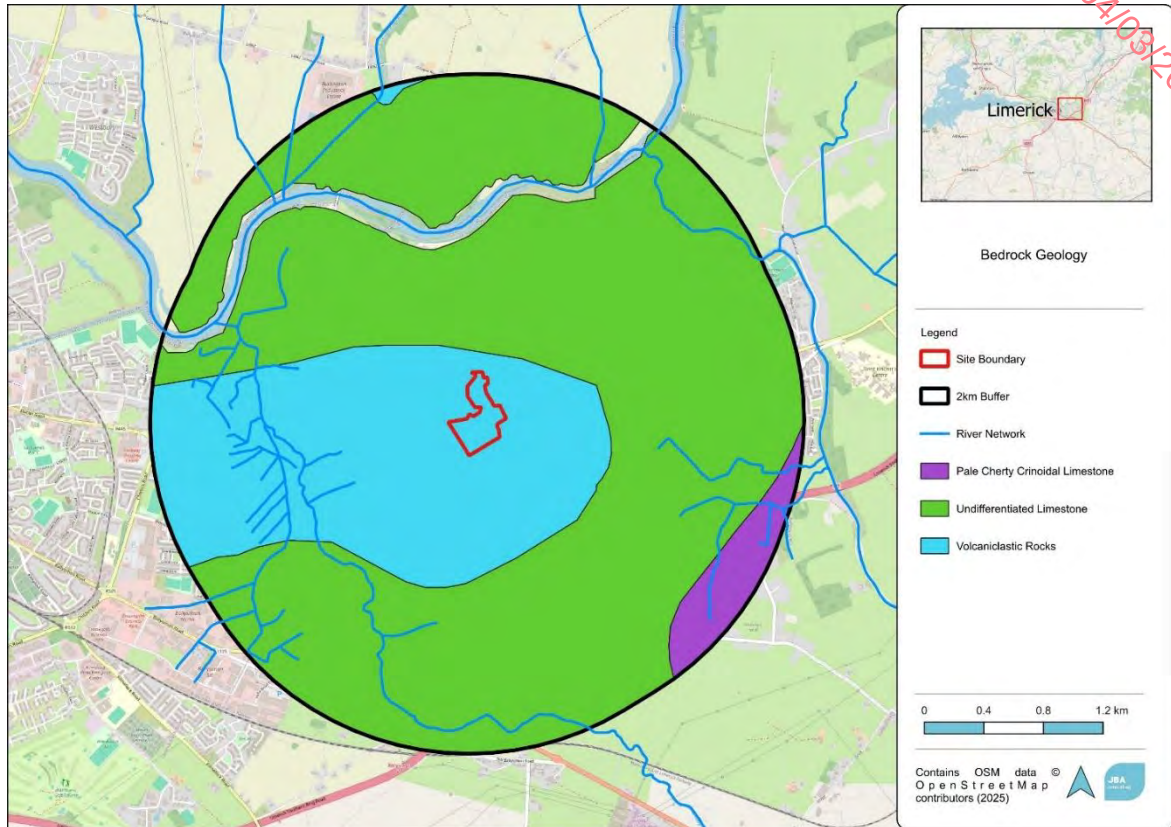


Figure 9-2: Bedrock geology across the study area of the proposed development

9.3.4 Soil

9.3.4.1 Quaternary sediment

Quaternary sediment across the proposed development is a mixture of bedrock at surface and basic igneous till, with a small section of made ground. The quaternary sediment underlying the proposed development and surrounding area can be seen in Figure 9-3 below.

9.3.4.2 Topsoil

The national Irish Soil Information System map shows the proposed development is underlain entirely by urban soil. Soil makeup within the study area includes coarse loamy drift with siliceous stones, tidal marsh and river alluvium (Figure 9-4).

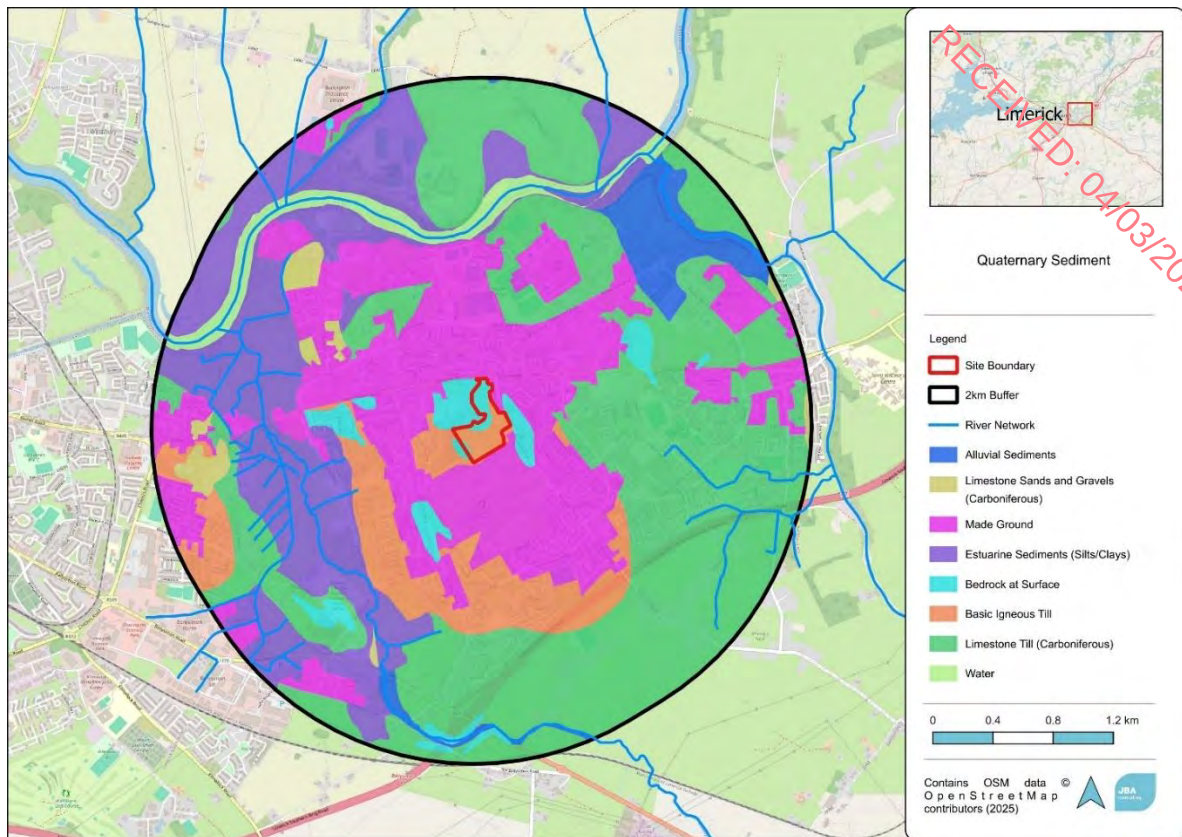


Figure 9-3: Quaternary sediment across the study area of the proposed development

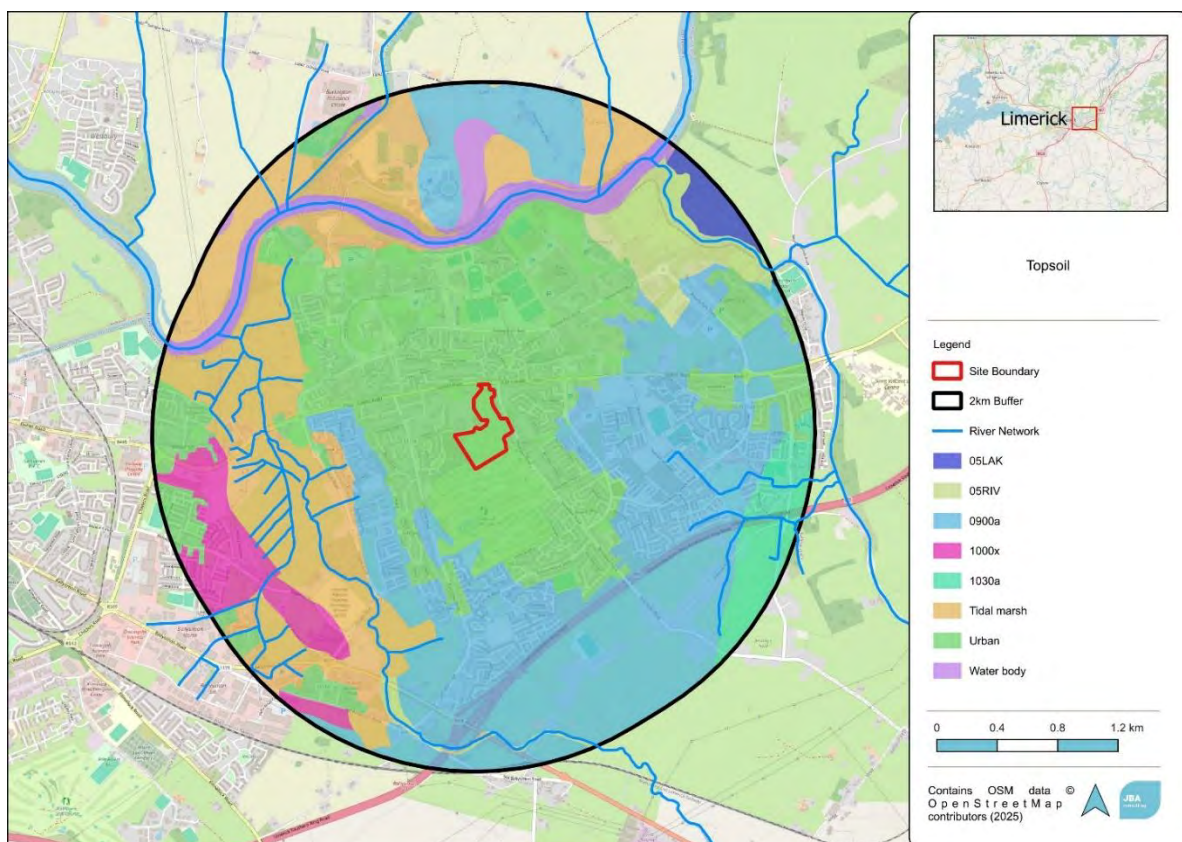


Figure 9-4: Topsoil across the study area of the proposed development

9.3.5 Karst

According to the GSI Karst database there are no karst features within the vicinity of the proposed development. The closest feature is a swallow hole located approx. 4.6km to the north.

9.3.6 Geohazards

There are no recorded landslide events within the study area. According to the EPA Radon Risk Map, the proposed development is located within an area of high risk, with one in five homes in this area likely to have high radon levels. Buildings in this area will require the implementation of radon protective measures.

9.3.7 Minerals/quarries/mines

The EPA Extractive Industries Register and GSI active quarries dataset were consulted to identify any historic/existing mineral sites within the study area. Review of the stated databases confirmed that no mines are or have been located within the vicinity of the proposed development. The closest mineral locality is located in Castleconnell, approx. 6.2km north-east of the proposed development.

9.3.8 Protected ecological environment

Natura 2000 sites (Special Areas of Conservation and Special Protection Areas), Natural Heritage Areas and proposed Natural Heritage Areas in the vicinity of the proposed development are shown in Table 9-2. Effects on the land and soil environment could lead to indirect effects on these protected sites.

Table 9-2: Protected ecological sites within 15km of the proposed development

Natura 2000 site	Site Code	Straight line distance	Hydrological distance (downstream distance)
River Shannon and River Fergus Estuaries Special Protection Area	004077	4.6km	8.7km
Lower River Shannon Special Area of Conservation	002165	0.9km	1.6km
Fergus Estuary and Inner Shannon, North Shore proposed Natural Heritage Area	002048	4.1km	7.6km
Inner Shannon Estuary – South Shore proposed Natural Heritage Area	000435	5.3km	9.4km

9.3.9 Site Investigation

Site investigation was carried out by Garland Consultancy in May and July 2025, detailed in Appendix 9.1.

The site investigation identified that ground conditions vary across the site, with rock observed close to the surface in most trial hole locations. Topsoil depths range from approx. 200-350mm. Beneath the topsoil, natural ground materials include layers of sand with silt, silty sand, silty gravelly sand, and weathered rock, with the weathered rock transitioning into firmer rock at greater depths. In most locations, the excavated materials appeared dry, with no groundwater encountered in any of the trial holes, although some dampness was noted in deeper layers, suggesting minor infiltration. In the northern part of the site, topsoil was observed directly over firm rock (TH-21). An area in the western corner of the site, near the existing reservoirs, was found to contain approx. 2-2.5m of construction-related fill, including materials such as CL804, bricks, plastic, concrete, and asphalt (TH-10 and TH-12). This fill overlies the natural ground and its full extent will require further investigation. Overall, the excavated materials, including both natural soils and weathered rock, are likely to be suitable for reuse on site as construction fill.

The locations of the trial pits can be seen in Figure 9-5 below.

Waste Acceptance Criteria (WAC) analysis using the HazWasteOnline tool was carried out by BHP in December 2025 on soil samples taken from the site. All soil samples taken were found to be non-hazardous.

9.3.9.1 Soil Quality

Laboratory analysis was carried out on 7 no. soil samples recovered from 4 trial pits, detailed in Appendix 9.1. Generally, the soil results were at or below the limit of detection for most parameters. Laboratory testing carried out shows the pH value of the soils ranges from 7.4 to 8.3, with the exception of one sample at 8.9, indicating slightly alkaline conditions. Sulphate levels were below thresholds requiring special measures to protect buried concrete. Contamination testing carried out on seven samples show the material to be uncontaminated with all but one sample meeting the 'inert' range for total organic carbon (source). The single sample remains within non-hazardous waste landfill limits. All other inert criteria were met by all samples.

In line with the historic use and function of the site for agricultural purposes, there was no evidence of contamination noted in during site investigation.

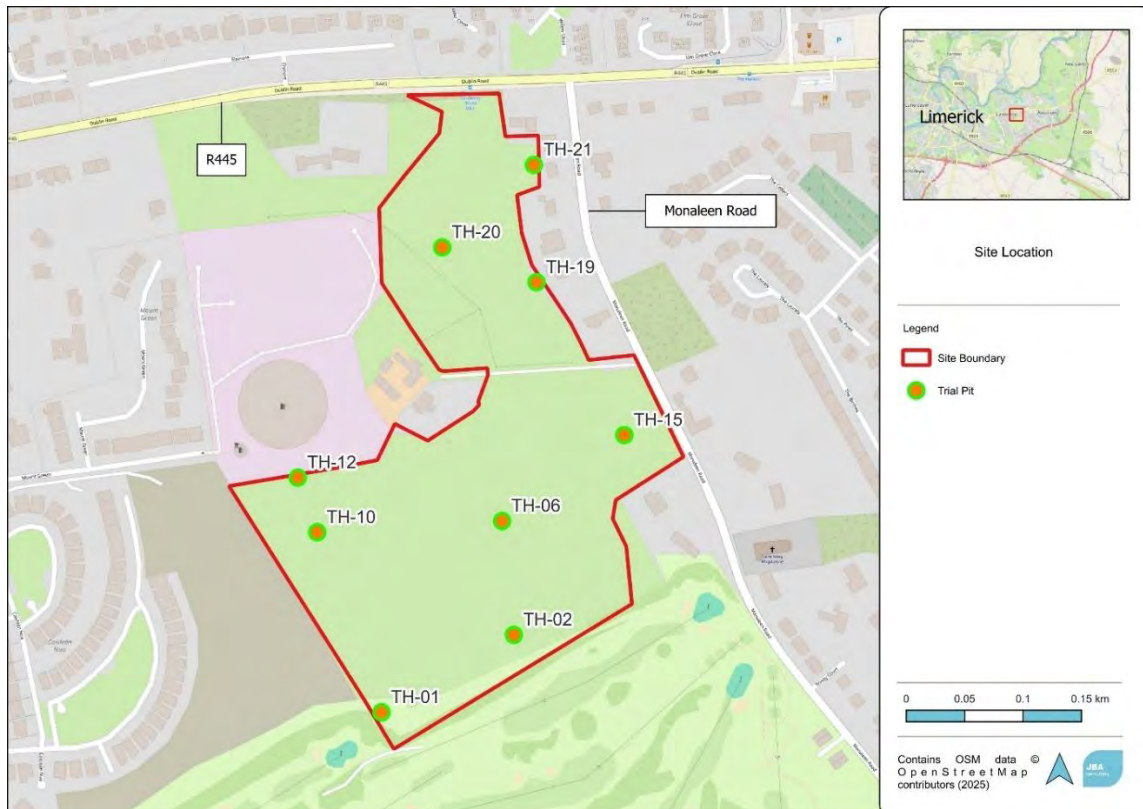


Figure 9-5: Trial pit locations

9.3.10 Hydrogeology

The proposed site is located within the Limerick City East (IE_SH_G_138) groundwater body. The waterbody was classified as Good status for the most recent Water Framework Directive reporting period (2019-2024) and is at Risk of not achieving its WFD objectives.

9.3.10.1 Groundwater Vulnerability

Groundwater vulnerability is a classification based on natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability at the site is classed as rock at the surface or karst in the northern section and at a small on the south-west. The remainder of the site is classed as extreme. Groundwater vulnerability at the site is shown in Figure 9-6.

The groundwater vulnerability classification at the site indicates that groundwater in the area is highly vulnerable to human activities.

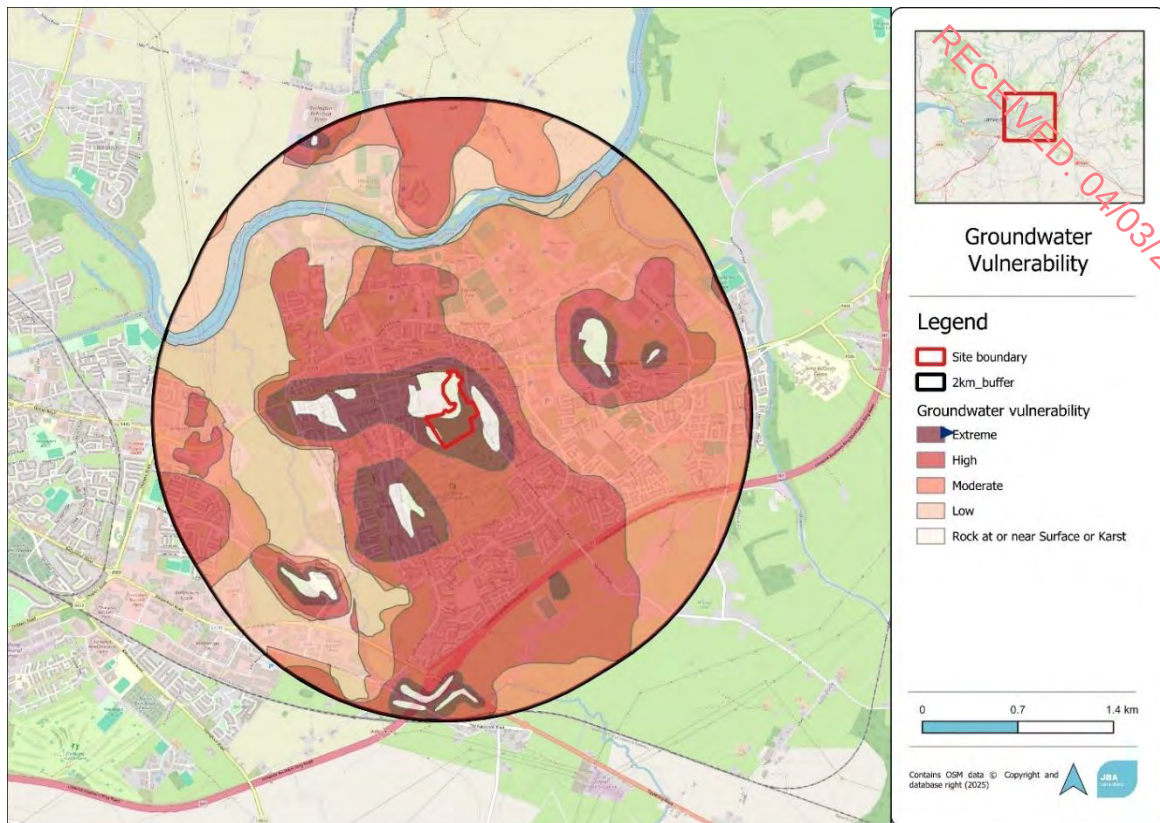


Figure 9-6: Groundwater vulnerability within 2km of the site

9.3.10.2 Aquifer

The GSI has devised a system for classifying the bedrock aquifers in Ireland, with three main classifications: regionally important, locally important, and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

According to the GSI map viewer, the bedrock aquifer underlying the site is of local importance, being moderately productive only in local zones. Approximately 2.6km east of the site is an aquifer that is classified as a regionally important aquifer – Karstified (diffuse).

9.3.10.3 Groundwater Extractions

The GSI groundwater wells and springs register was consulted. This shows all registered groundwater abstractions which are above 25m³ per day, with grid locations rounded to the nearest kilometre (for privacy reasons). There are no registered groundwater abstractions on site. The closest abstraction site is located c. 1km to the west; unique well ID IE_GSI_GW_Well_19928, well name 1415SEW001, Depth of hole is 73.2m and source yield is 54.50m³/day. This is within the 2km study area (plus 1km to account for grid location rounding).

There are no groundwater monitoring sites in the vicinity for Group Water Schemes, Public Water Supplies, Regional Water Supply Schemes, or Source Protection Zones, nor are there any Group Water Scheme abstraction sites. The closest monitoring stations are the Castleconnell Groundwater Station (IE_SH_G_052) is located c. 2.3km east on the Mulkear River, the Groody River station (IE_SH_25S012600) is situated c.1.2km west of the site. There is a group water scheme and a public water supply protection area at the Murroe area c. 12.1km and 10.4km east respectively.

9.3.11 Importance Rating

Based on the NRA methodology outlined in Table 9-1, the criteria for rating site importance of geological and hydrogeological features, the features at this proposed development site are rated as *Low Importance*. This is based on the assessment of their attributes outlined in the sections above.

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9.4 Characteristics of the Proposed Development

The characteristics of the proposed development are described in detail in this section.

A 10 year permission for the construction of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g) Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of associated ESB substations.
- (l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

The development is fully described in Chapter 2 Project Description and comprises a large-scale residential development.

The proposed development includes limited excavations for building foundations, drainage infrastructure, and basement. A section detailing building foundations and existing and proposed ground profiles is shown in drawing F0755-DE-GAR-CE-014. The proposed finished ground profiles are similar and in some cases higher than existing ground profile, with some areas where it is slightly lower.

9.4.1 Surface Water

The proposed surface water management system for the proposed development has been designed in accordance with the principles of Sustainable Drainage Systems (SuDS). Surface water will attenuate to 11 no. attenuation tanks, which provide greater capacity than the equivalent 100-year return period storm event. The attenuation outflows will be fitted with flow control devices which will limit discharge to the pre-development greenfield runoff rate.

The SuDS strategy includes a combination of measures such as gullies, private and public permeable paving, and bioretention areas. In addition to the natural filtering which will be provided by these measures, each surface water catchment on site will be fitted with a hydrocarbon interceptor to remove contaminants and silt from the surface water before discharging from the site.

The proposed drainage layout and location of SuDS features is shown in the drawings F0755-DR-GAR-CE-020 and F0755-DR-GAR-CE-021 by Garland Consulting.

9.4.2 Foul Water

A dedicated foul system has been provided as part of the proposed development. The design of this system is in accordance with the relevant guidelines and is shown on the drawings prepared by Garland Consulting. The foul system and surface water system are separate.

A Statement of Design Acceptance from Uisce Éireann will be submitted as part of the application.

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9.5 Predicted Impacts of the Proposed Development

This section details the potential impacts to land, soil and groundwater associated with the proposed development. As outlined below the activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the geological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the proposed development.

9.5.3 Do-Nothing Impact

If the proposed development is not constructed, the existing land use would remain unchanged. Consequently, there would be no direct disturbance to the land or soil. Natural processes such as vegetation growth and soil formation would continue undisturbed. Without the construction of the proposed development, there would be no excavation, compaction, or introduction of contaminants, preserving the site's natural soil profile and permeability. The absence of development would also maintain the site's current drainage and erosion patterns, which would evolve gradually due to weathering and vegetation growth.

The effect on soil and geology in the 'Do Nothing' scenario is **not significant, long-term, neutral**. However, it is important to note that external influences such as climate change and erosion could affect the site's soil conditions over time.

9.5.4 Construction Phase

9.5.4.1 Potential Impacts on Land, Soils, Geology and Hydrogeology

Excavation

Changes to the soil and geological environment as a result of the proposed development will arise predominantly through excavation and subsequent infilling. The total volume of material to be excavated will be confirmed following detailed design.

Topsoil will be reused where possible and exact volumes to be retained will be provided by the appointed Contractor. Subsoils unsuitable to be used as infill material will be exported off-site and disposed of at a suitable licensed facility. Temporary storage of soil will be carefully managed in such a way as to prevent any potential adverse effect on the receiving environment and the material will be stored away from any surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

Without mitigation the effects of excavation on topsoil would be **slight, temporary, adverse**. Due to the shallow excavation depths, effects on subsoils are **not significant**.

Contamination and Accidental Spills and Leaks

During construction, there is a risk of localised accidental pollution incidences from the following sources:

- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site; and
- Runoff from concrete and cement during the use of cement-based products.

Accidental spillages can result in localised contamination of soils and geology underlying the site, should contaminants migrate through the subsoils. In less permeable soils, the risk of potential contamination of surface water runoff could be higher, as contaminants would be less likely to infiltrate to ground and would instead be more likely to follow overland flow pathways. The effect of pollution on soils and geology would depend on the type of contaminant and extent of the spill. In a worst-case scenario and with no mitigation in place, a spill could result in significant adverse effects to soil health. The effect of this could be **significant, short-term, adverse**.

9.5.4.2 Potential Impacts on Human Health and Population

The baseline assessment identified no source-pathway-receptor linkage to the underlying aquifer or any public water supply. The site is not located within any source protection zones (SPZs), public groundwater supplies or group schemes, with the area supplied by public water mains.

The likely impact during the construction phase on human health and population is **neutral**.

9.5.4.3 Potential Impacts on Water Framework Directive Status

A standalone WFD Assessment Report has also been prepared for the proposed development. The WFD Assessment concluded that there is no likelihood of a negative effect on WFD waterbodies as a result of the proposed development, nor is the development likely to prevent any WFD waterbody from achieving its WFD objectives.

The potential impact on water framework status during the construction phase is considered to be **neutral, imperceptible**.

9.5.5 Operational Phase

There will be no direct discharges to the ground or abstractions from the bedrock aquifer during the operation of the development. There is potential for a localised minor accidental emission to ground from a car leak. However, the proposed drainage design is likely to collect any accidental discharge and convey it to the surface water system, which includes hydrocarbon interceptors.

The proposed development will increase hardstanding area on the site, which will result in a localised reduction in recharge to the aquifer. This provides protection to the underlying aquifer but also reduces local recharge in this area of the aquifer. As the area of aquifer is large this reduction in local recharge will have no significant change in the natural hydrogeological regime.

Limited land take will occur as a result of the proposed development. The land to be built on is currently a greenfield site but is zoned as 'New Residential' in the Limerick Development Plan 2022-2028.

With or without mitigation, the impact of the proposed development on land, soils, geology and hydrogeology in the operational phase will be **neutral, imperceptible, and long-term**.

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9.6 Mitigation Measures

In the assessment of effects discussed above, a range of potential effects on soil and geology were identified. Mitigation measures in the construction and operation phase of the proposed development will be implemented to reduce these adverse effects. Most measures are required during the construction phase as it will pose the greatest level of risks due to the construction activity on site, plant construction and use of construction materials and the soil on site. In the sections below the mitigation measures for the 'Do Nothing' scenario, construction phase and operation phase are discussed.

9.6.1 'Do Nothing' Scenario

No mitigation measures are proposed for the 'Do Nothing' scenario.

9.6.2 Construction Phase

Mitigation measures during the construction phase are discussed below. These mitigation measures have been developed with the Source-Pathway-Receptor links above in mind and are designed to break this link either by removing the source or disrupting the pathway for pollution.

9.6.2.1 Best Practice Construction Methods

A preliminary Construction Environmental Management Plan has been prepared for the proposed development and will be put in place by the appointed Contractor. The Construction Environmental Management Plan will be used by the Contractor to prevent and minimise environmental effects during construction. It includes the below to mitigate effects on soil and geology.

9.6.2.2 Site Compound and Site Management

The site-specific mitigation measures are outlined below:

- Temporary pathways and roads will be constructed to allow for the movement of heavy machinery and minimise the risk of soil compaction;
- Temporary storage of soil will be carefully managed in such a way as to prevent any potential adverse effect on the receiving environment. Topsoil stockpiles will be covered with rapid vegetation or other means, e.g., tarpaulin, as part of the construction methodology. The material will be stored away from any surface water drains;
- Fill material will be tested and imported from a licensed facility to ensure no external contamination is introduced to the soil and geological environment;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal;
- Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off the site), which will be a minimum of 10m from any existing surface water gullies or drains, or exposed ground or excavations;
- An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in any refuelling areas and site compounds. All relevant personnel will be fully trained in the use of this equipment; and
- The pouring of concrete will take place within a designated area using a geo-synthetic material to prevent concrete runoff into the soil media. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility off site.

The Contractor will be required to carry out a waste characterisation of the material that will be taken off site for disposal. Waste acceptance criteria (WAC) analysis, classification of soil samples using the HazWasteOnline tool and testing for asbestos levels shall be determined on any material that will be taken off site for disposal. All wastes in the European Waste Catalogue are classified by a unique 6-digit code. In this case (waste soil/stones), two LoW Codes are applicable to material that may be taken off site for disposal during the construction phase:

- 17 05 03* - Soil and stones containing hazardous substances
- 17 05 04 - Soils and stones other than those mentioned in 17 05 03

Excavated material which is not used as fill on site could be reused on another site as a by-product while adhering to Article 27 of the EC (Waste Directive) Regulations (2011). This would further reduce the volume of waste generated during excavation. If this is not possible, the excavated material will be removed from the site as waste to an appropriate licenced soil recovery facility. The appointed Contractor will investigate potential sites for soil reuse, prioritising the closest suitable sites to reduce haul distances.

The National Waste Collection Permit Office (NWCPO) maintains a register of licenced waste recovery facilities. Numerous facilities are registered for the collection of uncontaminated soil and stone (17 05 04) in the Limerick area. The contractor will consult the register to determine the closest appropriate facilities (<https://www.nwcpo.ie/permitsearch.aspx>).

Any soil samples that are found to contain contaminants should be subjected to full quantification analysis. If the waste soil is sent to a waste licenced soil recovery facility, the chemical analysis of the soil must meet the requirements given in Table 3.3 (Summary of Soil Trigger Levels for Soil recovery Facilities) of the Environmental Protection Agency's Draft Publication – Waste Acceptance Criteria and Development of Soil Trigger Values for Environmental Protection Agency-Licensed Soil Recovery Facilities, December 2017. The acceptance of this material at a licenced soil recovery facility will be subject to the approval of the facility operator. As above, the NWCPO register will be consulted by the contractor. Numerous facilities which are licenced for soil and stone containing hazardous substances (17 05 03*) are on the register and licenced in the Limerick area (<https://www.nwcpo.ie/permitsearch.aspx>).

9.6.2.3 Accidental spills and leaks

Mitigation measures for the protection of groundwater and soils from chemical pollution involve environmental operating plans, chemical storage, and Emergency Response Procedures.

At construction stage, the following mitigation measures are proposed:

- The contractor will construct a site compound at a location remote from any water bodies or open excavations, at least 10m from any drains. The exact location of the compound will be confirmed in advance of works and agreed with the local authority. The compound may be moved or altered dependent on construction needs over the course of the project;
- Any lubricants or hydraulic oils will be banded in bunds that can contain 110% volume of the largest container. Absorbent pig bags will be kept in the site offices. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager;
- All materials taken on-site will be clearly labelled and stored in sealable containers;
- The diesel fuel tank will be adequately banded (110%) and the filling nozzle will be stored within the banded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager;
- Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the underlying geology;
- The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain or open excavation. Should this situation arise emergency procedures will be activated;
- During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand;
- Trucks delivering concrete to the site will not be allowed to washout their vehicles on site. Only washing of the chute will be allowed. The washing facilities will be remote from watercourses and will be banded by a low earthen berm.

- The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to maintain equipment to ensure efficiency and to minimise emissions;
- Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off;
- Precast elements should be maximised to avoid wet concreting in close proximity to water.

9.6.2.4 Sourcing of fill materials

Responsible sourcing will ensure that effects with regard to accidental import of invasive species do not occur. Clean soil will be imported to the site, and the Contractor will be required to source the soil from areas that are free of invasive species, i.e., containing no Japanese Knotweed seed.

9.6.2.5 Silt and Suspended Solids

Mitigation measures for the protection of soil and groundwater quality from silt and suspended solids on site involve silt control, particularly at any drains or open excavations.

At construction stage, the following mitigation measures will be implemented:

- Silt deposited during construction will be removed;
- Soils will be stabilised and protected from erosion whilst planting becomes established;
- Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas. Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential pollutants being discharged from the site;
- All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff/wind erosion. Vegetation will be established as soon as possible on all exposed soils;
- Silt reduction measures on site and settlement measures (e.g. silt traps and settlement tanks/ponds or equivalent) will be used;
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m;
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection;
- Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points;
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination;
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust;
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations;
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.

9.6.3 Operational Phase

The proposed development design includes hardstand cover across the site and the proposed surface water drainage system for this development has been designed as a sustainable urban drainage system (SuDS). The surface water design has been designed in accordance with the Limerick City and County Council Surface Water/SuDS Specification 2022 for adoption. The drainage network will consist of attenuation to the green-field runoff using a flow control device (hydrobrake) from the site. Any localised car leaks will therefore

discharge to the stormwater drainage and be treated in Petrol interceptors prior to outfalling into the main system. Therefore, the risk of accidental discharge has been adequately addressed through design. The likely effect of the proposed development in the operational phase on land, soils, geology and hydrogeology will be **imperceptible, long-term, with a neutral effect on quality**.

9.7 Residual Impacts

9.7.1 Construction Phase

9.7.1.1 Land, Soils, Geology, Hydrogeology

The implementation of the mitigation measures outlined in Section 9.6 of this chapter will ensure that impacts to land, soils, geology and hydrogeology are reduced. When mitigation measures are implemented throughout construction the predicted impact on the environment will be **temporary, imperceptible, and neutral**.

9.7.1.2 Human Health and Population

The implementation of the mitigation measures outlined in Section 9.6 of this chapter will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated. The residual effect on during the construction phase is considered to be **neutral, imperceptible, and temporary**.

9.7.1.3 Water Framework Directive

Even in the absence of the mitigation measures detailed in Section 9.6, there will be no predicted degradation of the Limerick City East groundwater body (chemical, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives of the Water Framework Directive.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of groundwater bodies and as such will not impact on trends in water quality and over all status assessment.

The residual effect on Water Framework Directive Surface and Groundwater bodies during the construction phase is considered to be **neutral, imperceptible and temporary**.

9.7.2 Operational Phase

9.7.2.1 Land, Soils, Geology, Hydrogeology

The implementation of the mitigation measures detailed in Section 9.6, will ensure that the potential impacts on land, soils, geology, hydrogeology once the proposed development is constructed and operational are adequately mitigated. The residual effect on surface water quality during the operational phase is considered to be **neutral, imperceptible, and long-term**.

9.7.2.2 Human Health and Population

The implementation of the mitigation measures detailed in Section 9.6, will ensure that the potential impacts on human health and populations once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible, and long-term**.

9.7.2.3 Water Framework Directive Status

In the operational phase, no effects on the underlying Limerick City East groundwater body are expected. The WFD Assessment Report assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives of the Water Framework Directive.

9.8 Monitoring or Reinstatement

The management of land, soils and ground water during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant waste management legislation and local authority requirements.

9.8.1 Construction Phase

During construction, visual and chemical monitoring of treated surface water will take place to ensure that water draining from the site is not affected by the proposed development. This will take place during the regular site audits during the construction process.

Surface water collected in sumps will be monitored prior to discharge. Samples will be taken and the pH, conductivity, chemical oxygen demand, total petroleum hydrocarbons, and suspended solids levels will be recorded. The monitoring results will be compared to the allowable limits given in the Surface Water Regulations. If the results show an exceedance in the allowable levels, then the appointed contractor will review the mitigation measures and remedy them to lower the levels of the pollutant. A record of these upgrades/changes to the mitigation measures will be recorded.

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

If the mitigation measures in place during construction are observed to be insufficient or inefficient (i.e., elevated suspended solids, pH, conductivity, chemical oxygen demand, or total petroleum hydrocarbons are detected during monitoring prior to discharge), the discharge will be halted, and the mitigation measures will be revised and reimplemented. Further sampling will verify the success of the revised/updated surface water management. The affected water will be conveyed to the revised/updated treatment train and put through a hydrocarbon interceptor and settlement tanks to ensure compliance with the required levels in the treated water.

9.8.2 Operational Phase

There will be no requirement for monitoring in the operational phase.

9.9 Interactions

The EIAR must also consider in-combination effects, or the interactions between the different factors discussed.

Effects on soils or groundwater could have further effects on biodiversity and ecology, through the mobilisation of silts, dusts, suspended solids, oils, or chemicals. On entering the groundwater, these can negatively affect Natura 2000 sites further downstream which depend on groundwater inputs. These effects are further discussed in the Biodiversity Chapter of this EIAR, and the NIS. Following implementation of mitigation measures outlined in this chapter, including the use of silt fences and settlement trains during construction, in Chapter 6, and in the NIS, effects on biodiversity from land, soils, geology and hydrogeology will **be temporary, imperceptible, neutral**.

Surface water runoff can have an effect on soil quality in the area, with chemicals or suspended solids affecting soil fertility and contamination. These effects are further discussed in Chapter 10 – Water and Hydrology. Without mitigation measures, the interaction of these two elements could lead to a *moderate, short-term, adverse effect*. With the proposed mitigation measures outlined in this chapter and in the Water Chapter, the potential interaction between these is reduced to **imperceptible, short-term, adverse**.

9.10 Cumulative Impacts

Other projects which could have a cumulative effect with the proposed development are listed in Chapter 2 of this EIAR, Section 2.5.

Cumulative effects are the result of several minor effects combining to create a more significant effect. The assessment of cumulative effects considers existing stresses on the land and soils environment as well as developments close to this development that are in planning or are underway (which are outlined in Chapter 2).

The proposed development has been assessed in the preceding sections and is not expected to have a significant negative effect on the land, soils, geology, or hydrogeology receptors. When considered with other nearby developments, the cumulative effect is also not likely to be significant. This is due to the design of the proposed development and the mitigation measures to be put in place during both construction and operation, and the non-significant effects which are likely to occur. The other nearby developments are of a size, design, and nature not likely to result in significant negative effects themselves. The cumulative effect of the proposed development will therefore not be significant.

9.11 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIA Chapter.

9.12 Summary

There will be ***no long-term residual impact*** on land soil geology and hydrogeological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 10: WATER & HYDROLOGY

**PROPOSED LARGE SCALE RESIDENTIAL DEVELOPMENT
ON LANDS AT MONALEEN ROAD
CASTLETROY, LIMERICK**

FEBRUARY 2026



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10 HYDROLOGY

10.1 Introduction

This chapter of the EIAR comprises an assessment of the likely significant effects of the proposed Large-scale Residential Development (LRD) with respect to surface water.

This chapter has been prepared by JBA Consulting, on behalf of Genesis Planning Consultants. This chapter has been compiled by Conor O'Neill and David Casey.

Conor O'Neill BA (Mod) MSc Adv Dip has five years of environmental consultancy experience. He has been involved in all aspects of EIAR, from Screening and Scoping to EIAR co-ordination and chapter authoring for numerous projects, along with other developments including transport infrastructure, renewable energy, residential, and commercial. He has completed numerous EIAR chapters on water and hydrology for a range of development types, including LRDs.

David Casey BSc MSc MCIWEM has 14 years of experience in environmental and flood risk assessment, specializing in Strategic Flood Risk Assessments, Flood Risk Assessments, and Environmental Impact Statements, with a focus on Soils and Geology, and Hydrology and Hydrogeology. His work on Environmental Impact Assessments spans large residential, commercial, and port developments, involving significant collaboration with architects, engineers, and planners

10.2 Methodology

10.2.1 Criteria for rating of effects

This chapter has been prepared in accordance with the EPA's 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022) and the EU Commission's 'Guidance on the preparation of the Environmental Impact Assessment Report' (2017) and 'Notice on changes and extensions to projects' (2021).

The methodology used is in accordance with the following guidance documents:

- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Institute of Geologists of Ireland (IGI) (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; and
- National Roads Authority (NRA) (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- OPW / DoECLG planning guidance (2011), "The Planning System and Flood Risk Management".

The significance or sensitivity of Receptors and assessment of effects have been described following criteria outlined in the EPA's 2022 EIAR Guidelines.

In addition to the EPA (2022) Guidelines, the NRA (2009) criteria for assessing the importance of geological attributes are useful (Table 10-1). These criteria have been used to assist in rating the importance of features, which are then combined with the description of effects as shown below in the matrix of significance (Figure 10-1).

Table 10-1: Criteria for rating importance of hydrological attributes (NRA, 2009)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g., 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people

Note: "Very high", and "high" in Table 10-1 all correspond to "high" significance or sensitivity of a feature in the effects significance matrix (EPA, 2022).

To determine the significance of an effect, the description of the effect is compared to the previously mentioned sensitivity of the receiving environment following the matrix shown in Figure 10-1. The significance or sensitivity of each Receptor will be ranked, as will the character of the predicted effect.

In accordance with Figure 10-1, for example, a high sensitivity value combined with a high character effect, would result in a "profound" effect; if both were low, the final result would be "slight" or "not significant".

There are seven generalised degrees of effect significance that are commonly used in the Environmental Protection Agency guidelines, as it is depicted on the figure: Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound.

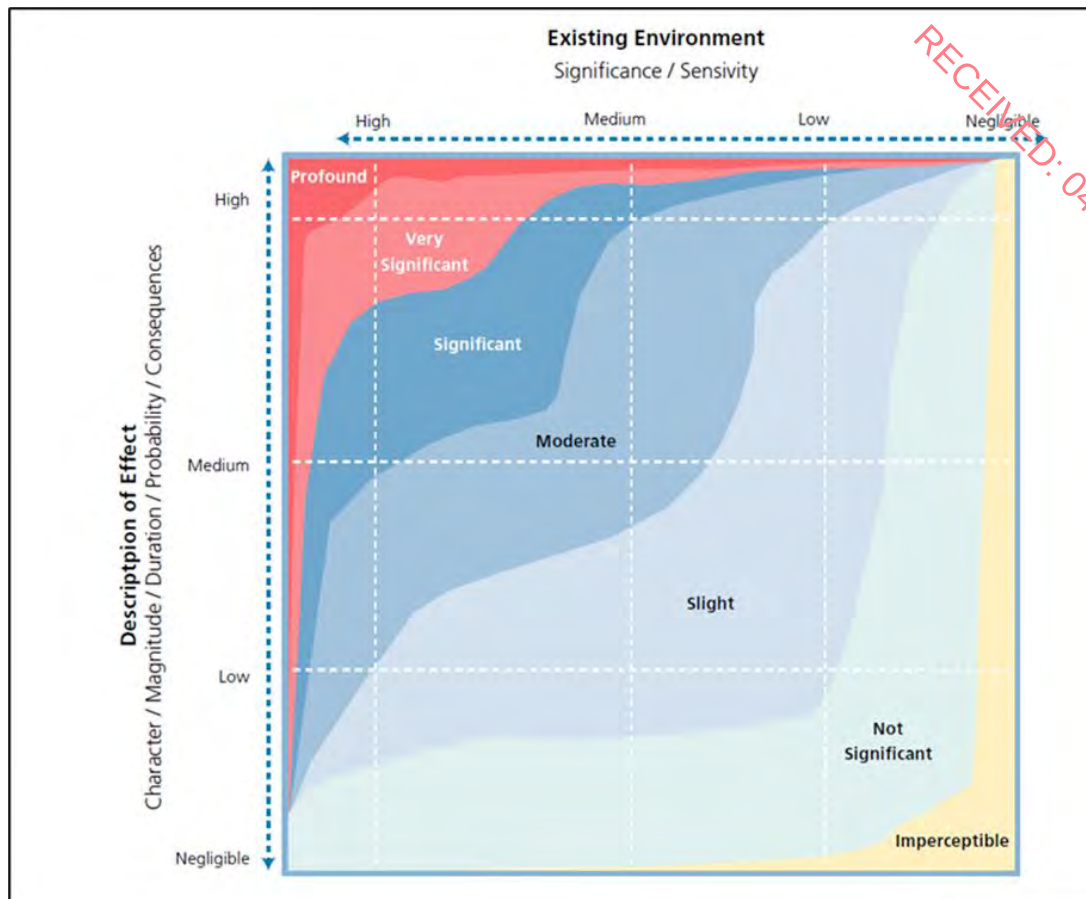


Figure 10-1: Assessment of significance of effects (Environmental Protection Agency, 2022)

The duration of each effect is either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are those which are construction related and last less than one year. Short term effects are effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

10.2.2 Sources of Information

The following sources of information and references were consulted in the preparation of this report:

- Latest EPA water quality monitoring data for watercourses in the area, available on www.epamaps.ie;
- Environmental Protection Agency Catchment website (www.catchments.ie);
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW);
- Office of Public Works flood mapping data (www.floodmaps.ie);
- Classification (regionally important, locally important) and extent of aquifers underlying the site perimeter area (www.gsi.ie);
- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site (www.gsi.ie);
- National Parks and Wildlife Services (NPSW) www.npws.ie on-line database; Protected Register; and
- River Basin Management Plan 2022-2027.
- Limerick Development Plan 2022-2028;
- Waste Classification Report by BHP;
- Water testing report by Eurofins;
- WAC Rilta report by Eurofins; and
- Site investigation report by Garland Consultancy.

10.2.3 Study Area

This chapter has considered all possible surface water and hydrological sources in the study area across the river sub-basin scale. This includes all surface waterbodies, such as rivers, streams, ditches, drains and the stormwater network, and transitional and coastal waterbodies further downstream, located within the relevant river sub-basin. Potential effects were assessed on this river sub-basin scale.

The wider context of the surface waters in terms of their designation as part of Water Framework Directive (WFD) bodies were also considered where relevant.

Hydrogeology is dealt with in Chapter 9 Land, Soils, Geology and Hydrogeology.

10.2.4 Relevant legislation

The following legislation was consulted during the preparation of this report:

- EIA Directive (2011/92/EU) as amended by Directive 2014/52/EU;
- Waste Management Act 1996, as amended;
- Habitats Directive (92/43/EEC);
- Water Framework Directive (WFD) (2000/60/EC);
- Classification of waste material that may be taken off-site for disposal is based on the Commission Decision of 18th December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and Council (2014/955/EEC) [the List of Waste (LoW)]. These enable waste to be classified as either hazardous, non-hazardous or minor (either hazardous or non-hazardous).
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9/2010 (European Communities Environmental Objectives (Groundwater) Regulations 2016);
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016;
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (Groundwater Directive);
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019; and
- Local Authority planning guidance as applicable.

10.3 Baseline Environment

10.3.1 Topography, Land Use and Setting

The proposed LRD is located in Castletroy, approx. 3km east of Limerick City. The subject site is greenfield, with an access road traversing the centre of the site from Monaleen Road. The site is bound by Monaleen Road and residential properties to the east, the R445 to the north, Newcastle Reservoir and residential properties to the west, and Castletroy Golf Club to the south.

The Groody River is located approx. 750m west and the River Mulkear is located approx. 1.044km east of the proposed development. Both are tributaries of the River Shannon, which is located 970m to the north. There are no surface watercourses on the site itself.

The site is served by one vehicular entrance, from the Monaleen Road on the eastern boundary.

The lands in the vicinity of the site are comprised mainly of low-density residential development in the form of detached, semi-detached and terraced dwellings on Monaleen Road and Golf Links Road. There is further detached and semi-detached housing on School House Road and Dublin Road (R445). Other uses in the vicinity of the site include Mary Magdalene catholic Church on Monaleen Road, Castletroy Golf course and Local Centre Areas at the junction of Dublin Road/ Milford Road and the Kilmurry Roundabout area.

The M7 motorway is situated 1.2km south of the site and is accessed via linkages from the Dublin Road c. 3km east and Groody Road, Ballysimon Road (R527) c. 1.6km to the south.

10.3.2 Hydrology

The site does not contain any surface water bodies, nor are there any in the immediate vicinity. No surface water bodies were recorded during the site visit. The nearest surface waterbodies are the Mulkear (Limerick)_050 and the Groody River/Shannon (Lower)_060. There were no drainage ditches observed on the site that may connect the site to these waterbodies.

The site is situated within the Lower Shannon WFD catchment, Shannon [Lower] sub-catchment_090 and the Shannon [Lower] sub-basin_060.

The Lower Shannon catchment is 1,041km sq. in area (EPA, 2021), with the main sub-catchments being the Shannon [Lower] sub-catchment_090 and the Mulkear_SC_020. The River Groody is contained entirely within the Shannon [Lower]_SC_090 sub-catchment. The River Shannon flows into the catchment from Lough Derg before branching into the Old River Shannon channel and the Ardnacrusa headrace at Parteen Weir. The Mulkear River and its main tributaries; the Dead, Bilboa and Kileengarrif Rivers drain the majority of the Lower Shannon catchment.

The sub-catchments are further divided into river sub-basins. River sub-basins act as the management and reporting units for the Water Framework Directive. The proposed development is located within SHANNON (LOWER)_090 sub-basin. Pressures acting on the SHANNON (LOWER)_090 sub-basin include urban runoff, agriculture, and Domestic Waste Water (EPA, 2021).

A Water Framework Directive (WFD) Assessment Report has been prepared for the proposed development. The report considers the potential for effects on designated WFD waterbodies as a result of the proposed development, and concludes that the development will neither lead to a deterioration in status of any WFD waterbody, nor jeopardise the attainment of good water status for any WFD waterbody. The WFD Assessment considers the mitigation measures outlined in this chapter, as well as in Chapter 9 Land, Soils, Geology and Hydrogeology, and Chapter 6 Biodiversity of the EIAR, and in the Construction Environmental Management Plan prepared by Garland Consulting.

10.3.3 Watercourses

There are three river waterbodies in the study area of the proposed development (Figure 10-2), however none are within or immediately adjacent to the planning boundary. The River Shannon is approx. 1km to the north, flowing generally from the north-east where it leaves Lough Derg, to the north-west where it drains into the River Shannon Estuary.

The River Groody is approx. 750m west of the site at its closest point, and flows north into the River Shannon. The Groody Valley has residential areas to the east, with mixed land uses to the west.

The River Mulkear is located approx. 1km east of the site at its closest point, flowing north towards the River Shannon. The River Mulkear rises in the Slievefelim and Silvermines mountains before joining the Shannon near Annacotty east of the site. In this area the River Mulkear is bound on the west by largely residential land use and on the east by agricultural land and St. Vincents Special School and the daughters of Charity Disability Support Services.

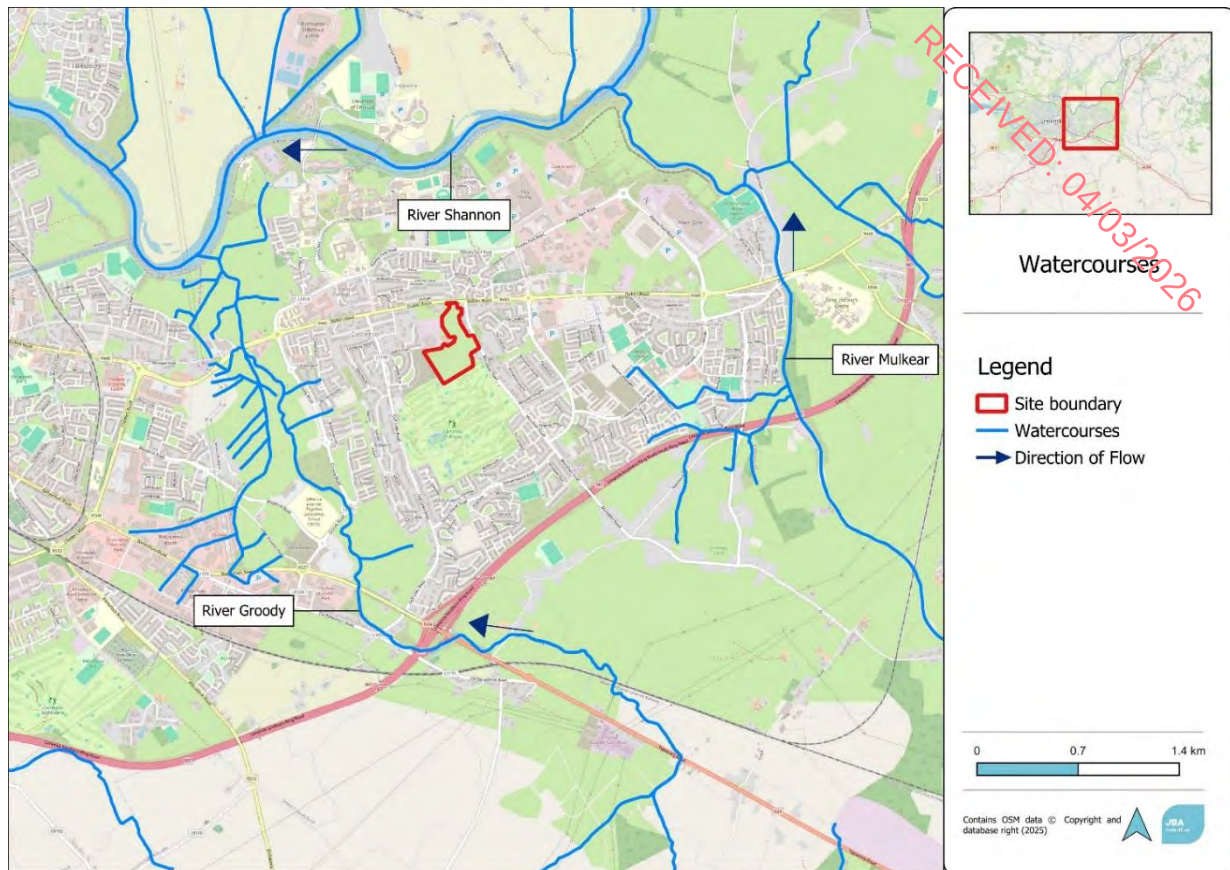


Figure 10-2 Watercourses in the vicinity

10.3.4 EPA Q Ratings

The Environmental Protection Agency's biological river water quality classification is based on macroinvertebrate biological sampling at water monitoring stations and their relative. The values and their interpretation are shown in Table 0-2 below.

Table 0-2: Environmental Protection Agency's biological river water quality classification

Q Rating	WFD Status	Pollution
Q5 or Q4-5	High	Unpolluted
Q4	Good	Unpolluted
Q3-4	Moderate	Slightly polluted
Q3 or Q2-3	Poor	Moderately polluted
Q2, Q1-2 or Q1	Bad	Seriously polluted

There are three Environmental Protection Agency water monitoring stations in the vicinity of the proposed development which have Q ratings for 2017-2021. One is upstream and two are downstream of the site. These are all detailed in Table 0-3 below, from upstream to downstream. The Lower Shannon monitoring station is included, however the site was last surveyed in 2002. The locations of the monitoring sites are shown in Figure 10-3.

Table 0-3: Q Environmental Protection Agency water monitoring stations in the vicinity of the proposed development which have Q ratings for 2002-2021

Station code	Location	Year measured	Q rating	Status
RS25M040590	Annacotty Br (Mulkear) 2.1km u/s and east	2021	4	Good
RS25G050150	Killonan Br (Groody) 3km u/s	2021	3-4	Good

Station code	Location	Year measured	Q rating	Status
	and south-east			
RS25G050200	Br in Ballysimon, (Groody) 1.8km u/s and south	2021	3-4	Moderate
RS25S012600	Athlunkard Br (Lower Shannon) 3.6km d/s and north-west	2002	3-4	Moderate

The Environmental Protection Agency River Quality Surveys: Biological report¹ records Q values at the monitoring stations, the trends have been detailed below and over page;

- RS25M040590 - Annacotty Br (Mulkear) from 1987 - 1993 is rated as high and falls to moderate in 1996. From 1999 - 2021 the rating alternates between good and high with most recently the classification was high in 2018 and good in 2021.
- RS25G050150 - Killonan Br (Groody) station from 1985 was classed as moderate, reducing to poor in 1987 and remaining at this classification until 2012 where the quality was classed as good. From 2015 - 2021 the Q rating has been classed as moderate.
- RS25G050200 - Br in Ballysimon, (Groody) was classified as good from 1971 until 1985 where the classification was poor, increasing to moderate in 1987 and returning to poor 1993 - 2002. From 2006 - 2021 the classification has mainly been moderate, apart from 2012 where the rating was good.
- RS25S012600 - Athlunkard Br (Lower Shannon) was classified as good from 1984 - 1990 and moderate 1993 - 2002. At the time of writing there was no further classification at the station since 2002.

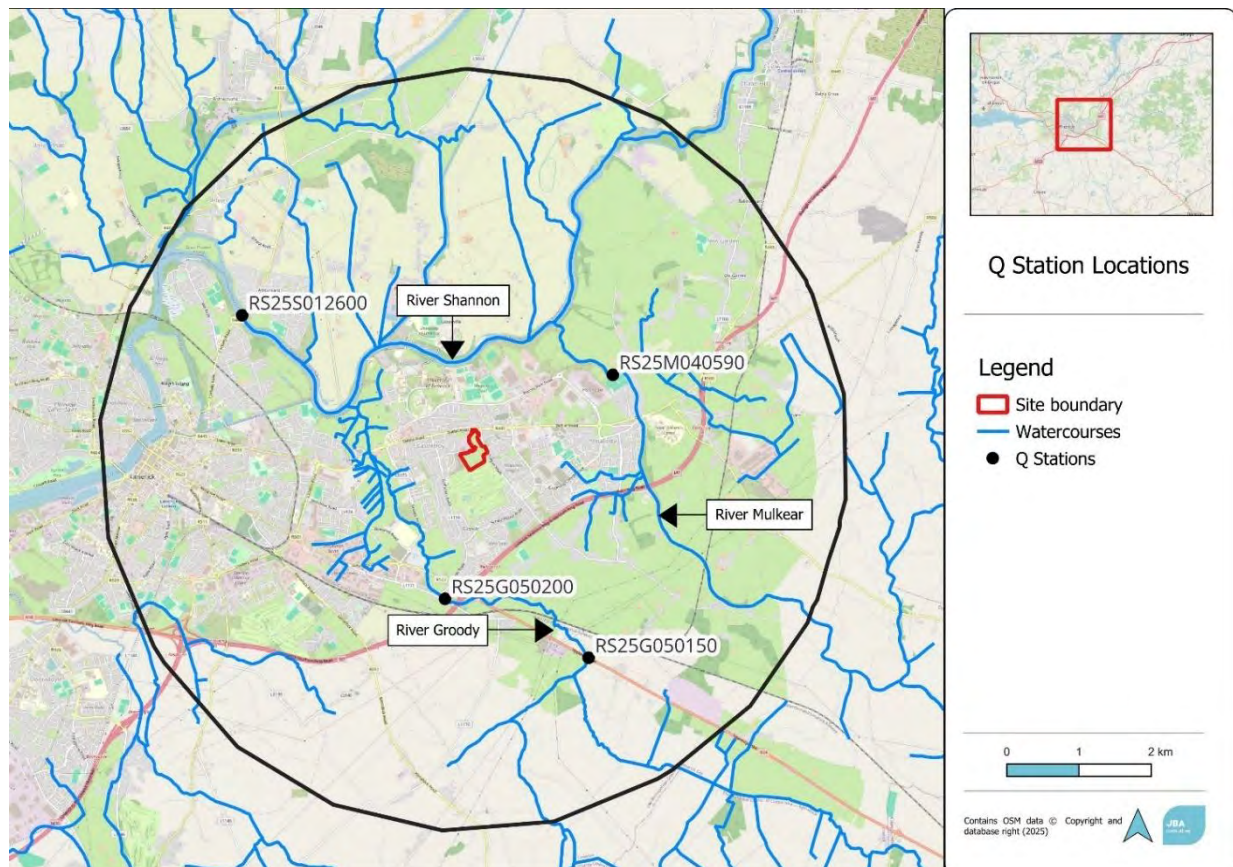


Figure 10-3: Q Station Locations Referenced.

10.3.5 Meteorological Data

¹ Environmental Protection Agency (2025) EPA River Quality Surveys: Biological. Ireland: EPA. Available from: [RiverQValue](#) [Accessed 08/05/2025].

Rainfall data, extracted from the Met Éireann 1981-2010 Annual Average Rainfall Grid, has been consulted. The 30-year annual average rainfall is a 1 x 1km grid, collated from 12 stations around the country. The nearest station to the site is at Shannon Airport.

The annual average over that period in the vicinity of the scheme is between 1015-1050mm.

10.3.6 Flood Risk

The Limerick Development Plan 2022-2028 includes a Strategic Flood Risk Assessment (SFRA). The SFRA showed the site is situated within Flood Zone C and is at low risk of flooding.

Historic and predicted flood risk mapping published by the OPW on the Flood Hazard Mapping Website has been reviewed for this assessment. Historic flood data indicates that there are no previous flood events within the proposed site area. There is flooding in the surrounding area, from the Rivers Shannon, Groody and Mulkear, with the closest flooding at Castletroy. This flood was located 1.4km to the north-east and did not directly affect the proposed site.

The CFRAM (Catchment Flood Risk Assessment and Management) study has outlined the predicted risk for fluvial and coastal flooding scenarios. The site is not indicated as being at risk of flooding for any of the three AEP scenarios. The site is also not at risk of flooding in the CFRAM Mid-Range Future Scenario (MRF5) or High-End Future Scenario (HEFS) Climate Change flooding. The site is at a local topographic high point, being approx. 10-30m higher than the surrounding land in all directions.

Figure 10-4 shows flood risk around the site, and contour lines at 10m intervals. The site is in Flood Zone C, with no historic or predicted flood events, and is not at risk under CFRAM flood scenarios. The site is also at a local high point of 40-60m, with the surrounding land in all directions being lower, and flood zones in the area being confined to land around 10-20m. With this in mind and considering the site's location in relation to the nearest waterbodies, the site is at low risk of flooding and no Flood Risk Assessment (FRA) is required for the proposed development.

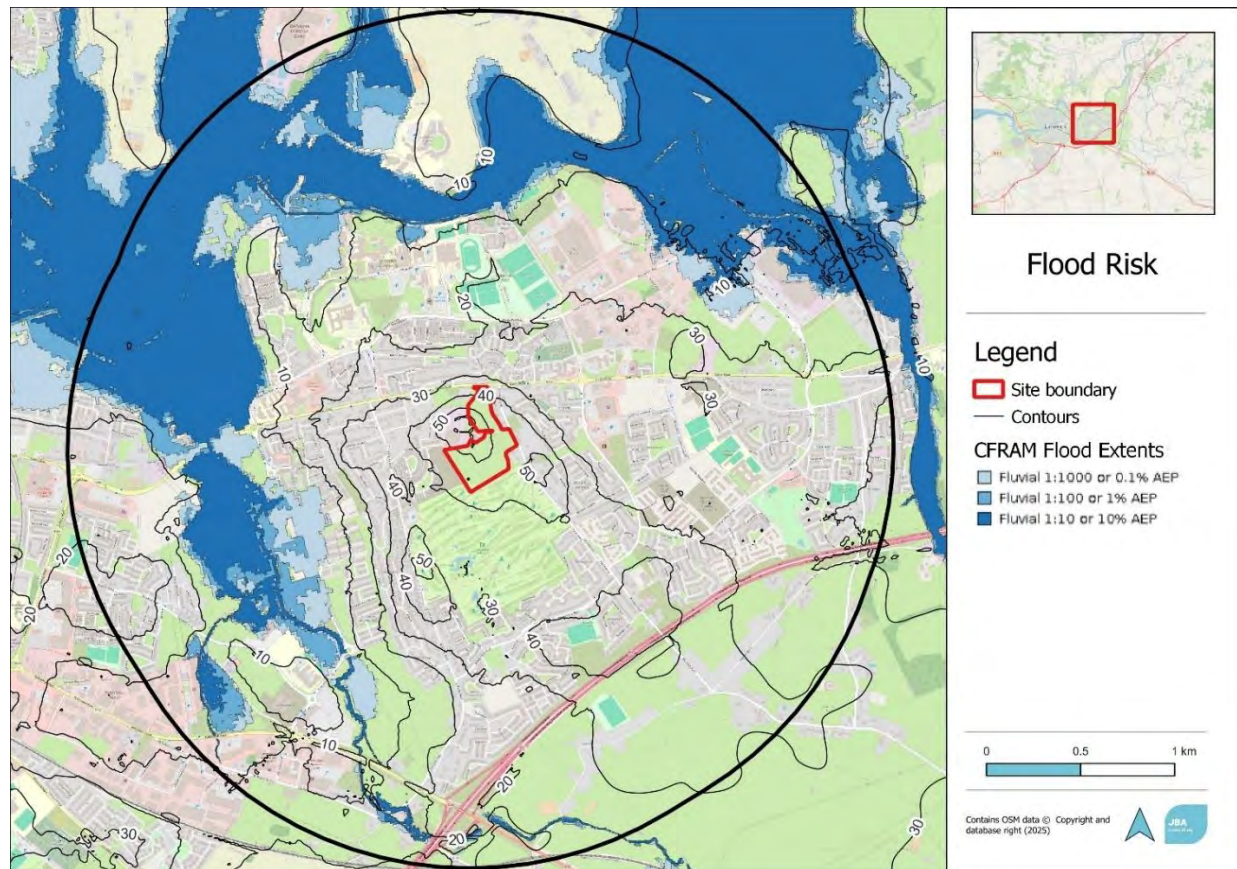


Figure 10-4: CFRAM Current Flood Zones in the Vicinity

10.3.7 Designated Sites

Sites designated under the EU Habitats and Birds Directives, known collectively as Natura 2000 sites, as well as those under the Wildlife Act, that are hydrologically connected to the proposed development are shown in Figure 10-5.

Lower River Shannon SAC [site code – 002165] is approximately 0.9km north of the proposed development. The SAC is designated for several habitats listed on Annex I of the EU Habitats Directive, including Mudflats and sandflats not covered by seawater at low tide, Mediterranean salt meadows and Coastal lagoons.

River Shannon and River Fergus Estuaries SPA [site code – 004077] is approx. 4.7km east, and is designated for multiple seabird species, including Cormorant, Ringed Plover, and Redshank.

The Proposed Natural Heritage Areas Fergus Estuary And Inner Shannon, North Shore pNHA [site code – 002048], Inner Shannon Estuary - South Shore [site code – 000435] and Knockalisheen Marsh pNHA [site code – 002001] are 4.1km and 5.6km east of the site, respectively.

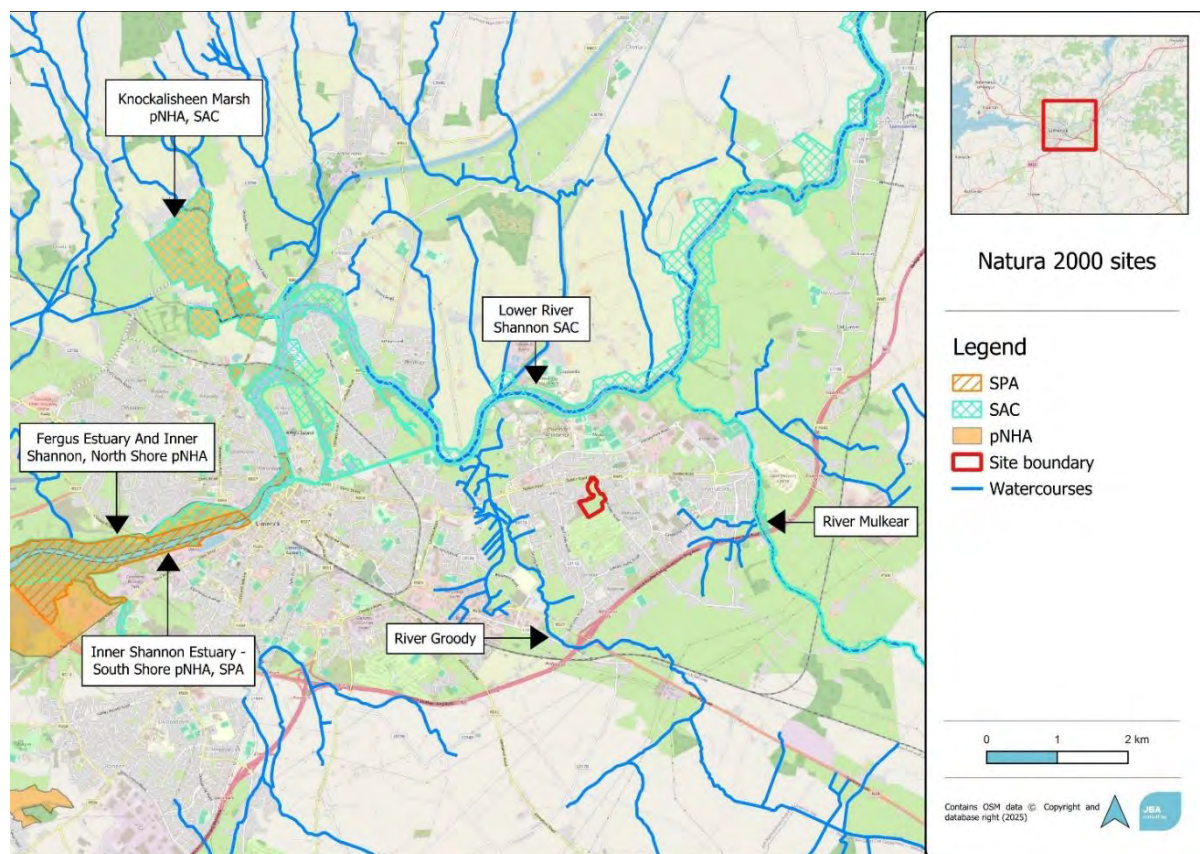


Figure 10-5: Natura 2000 Sites Within 6km Rating of Importance of Hydrological Attributes

10.3.8 Discharges, IPPC/IE licenced companies and WWTP

Castletroy Wastewater Treatment Plant (WWTP) is located approx. 1.5km north-west of the proposed site, at the confluence of the River Blackwater and Errina Canal. Based on Uisce Éireann's (UE) 2023 Annual Environmental Report, the WWTP has a Population Equivalent (PE) capacity of more than 45,000, while the current PE of its area is 39,844.

There are two Environmental Protection Agency licensed facilities within 2km of the proposed development:

- **Cook Ireland Limited** - Integrated Pollution Control License P0973-01. A medical device manufacturing facility located in the National Technology Park, 1.1km north-east of the proposed development.
- **Johnson & Johnson Vision Care Ireland Unlimited Company** - Industrial Emissions Licensing P0818-05. A manufacturing facility located in the National Technology Park, 1.6km east of the proposed development.

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10.4 Characteristics of the Proposed Development

The characteristics of the proposed development are described in detail in this section.

A 10 year permission for the construction of a total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214no. 2-3 storey residential dwellings which will consist of 10no. 2 bed units and 204no. 3 bed units.
- (c) The provision of a total of 309no. apartments units consisting of 159no.1 bed units, 141no.2bed units and 9no. 3bed units to be provided within 10no. apartment buildings. Apartment buildings 1, 2, 3, 4, 5, 8, 9 and 10 are 5 storeys in height and apartment buildings 6 and 7 are part 4 to part 5 storeys in height.
- (d) Provision of a creche at ground level in apartment building no. 10 and associated outdoor play space along with bin and bicycle storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartments.
- (f) Provision of a basement for apartment blocks 6-9 which incorporates parking, plant area, storage rooms and bicycle storage.
- (g) Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of associated ESB substations.
- (l) Provision of ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks to include for provision of a wastewater pumping station within the site and provision of a new wastewater connection along Monaleen Road.

The development is fully described in Chapter 2 Project Description and comprises a large-scale residential development.

The proposed development includes limited excavations for building foundations, drainage infrastructure, and basement. A section detailing building foundations and existing and proposed ground profiles is shown in drawing F0755-DE-GAR-CE-014. The proposed finished ground profiles are similar and in some cases higher than existing ground profile, with some areas where it is slightly lower.

10.4.1 Surface Water

The proposed surface water management system for the proposed development has been designed in accordance with the principles of Sustainable Drainage Systems (SuDS). Surface water will attenuate to 11 no. attenuation tanks, which provide greater capacity than the equivalent 100-year return period storm event. The attenuation outflows will be fitted with flow control devices which will limit discharge to the pre-development greenfield runoff rate.

The SuDS strategy includes a combination of measures such as gullies, private and public permeable paving, and bioretention areas. In addition to the natural filtering which will be provided by these measures, each surface water catchment on site will be fitted with a hydrocarbon interceptor to remove contaminants and silt from the surface water before discharging from the site.

The proposed drainage layout and location of SuDS features is shown in the drawings F0755-DR-GAR-CE-020 and F0755-DR-GAR-CE-021 by Garland Consulting.

10.4.2 Foul Water

A dedicated foul system has been provided as part of the proposed development. The design of this system is in accordance with the relevant guidelines and is shown on the drawings prepared by Garland Consulting. The foul system and surface water system are separate.

A Statement of Design Acceptance from Uisce Éireann will be submitted as part of the application.

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10.5 Predicted Impacts of the Proposed Development

10.5.1 Do-nothing Impact

In the event of the proposed development not being constructed, there would be no resulting effects on hydrology at the site, and the site would continue in use for agriculture. The existing drainage regime at the site would remain in place. The Do-Nothing effect would be **neutral** with regard to water and hydrology.

10.5.2 Construction Phase

Construction activities can pose a risk to watercourses and hydrology, particularly from contaminated surface water runoff entering nearby watercourses, or changes to watercourse morphology and flow patterns. The sections below outline the potential effects during construction on water and hydrology without any mitigation. Mitigation measures are discussed in the following section.

10.5.2.1 Fine Sediment Pollution

During construction, the water environment is at risk from fine sediment pollution from the following sources:

- Activities requiring excavation and stockpiling of soils and other ground material,
- Construction of access roads or hard standing areas which require the use of aggregate,
- Construction plant movement across disturbed soils,
- Temporary surface water pooling in excavations,
- Construction of culverts and stream realignments,
- Dispersion of dust either for hardstanding areas or from stockpiles,
- Washing out of concrete trucks and chutes.

There are several potential pathways for fine sediment to be mobilised from these sources to receptors. Given there are no surface waterbodies on the site or immediately adjacent, there would only be indirect pathways for fine sediment. Surface water runoff during rainfall could wash fine sediment from stores or exposed ground into the into surface runoff pathways or the stormwater drainage network. During construction, machinery may knock exposed sediment directly into the drainage network or move material to a position where, should a rainfall event occur, it would be more vulnerable to mobilisation by surface water runoff (either as sheet flow or slumping of sediment piles).

No instream works are needed, so there will be no direct mobilisation of fine sediment within a watercourse.

Fine sediment pollution refers to both the fine sediment itself and urban pollutants that can be adsorbed onto the fine particles and transported along with them. Once fine sediment enters the water, it can disperse through the water column as suspended sediment. Suspended sediment affects physico-chemical water quality parameters by increasing turbidity and reducing dissolved oxygen. Changes in these conditions, along with toxicity effects associated with adsorbed urban pollutants, can pose a risk to the life of aquatic species. Settlement of fine sediment over instream geomorphic features such as coarse sediment deposits (e.g., riffles and bars) can smother these important physical habitat environments, rendering them unsuitable for aquatic species.

A fine sediment pollution event would be expected to immediately impact the local environment, and to subsequently affect downstream environments as the fine sediment is flushed through the system during flushing flow conditions (e.g., winter high flow events). However, the lack of watercourses on the site or surrounding area has been taken into account. Fine sediment will most likely be contained on site within the existing grass and topsoil, or will be conveyed to the existing surface drainage network on the surrounding roads. Any fine sediment leaving the site would have a long indirect pathway to any waterbodies, and filtration and dilution will occur on this pathway. Taken together, the magnitude of potential impacts on water from fine sediment without mitigation measures in place is low, leading to a **slight, temporary, adverse impact** on the surface water environment. The overall effect is therefore **not significant**.

10.5.2.2 Accidental Spills and Leaks

During construction, there is a risk of localised accidental pollution incidences from the following sources:

- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site; and

There are several potential pathways for these pollutants from their sources to receptors. No direct hydrological link to surface water exists as there are no watercourses on or bordering the site. A spill or leak could discharge to the existing surface water drainage network and subsequently discharge to the river network further downstream. During construction, compaction of the soil or subsoil could occur due to the use of heavy machinery in green areas. This could reduce infiltration rates and increase surface water runoff, further acting as a pathway for potential pollutants.

The potential pollutants described above could negatively impact surface water quality if allowed to reach a waterbody. Concrete (specifically, the cement component) is highly alkaline, and any potential spillages can be detrimental to surface water quality. Changes in pH of the waterbody resulting from spills of concrete material would have a consequent effect on aquatic species. Spillage of oil or other similar contaminants which are likely to be in use during construction would similarly negatively impact the water environment.

An accidental spill or leak is likely to be an isolated event if it occurs, in a specific geographical area. The entire water environment as described above is therefore not likely to be affected, with effects likely on one reach and the immediate area downstream. Based on the likely length of construction at any single work site being not greater than one year, an unmitigated spill or leak would be temporary. The effect on water quality of such an unmitigated leak would be reversible. Finally, the long and indirect pathway via the surface water drainage network will further limit the likelihood of pollutants reaching a waterbody, with filtering and dilution likely to occur. According to the significance of effects matrix (EPA, 2022) the magnitude of potential impacts on water will be low, leading to a **slight, temporary, adverse impact** and **not significant** on surface water due to accidental spills and leaks.

10.5.2.3 Hydrological Impacts

Construction activities can affect the hydrological regime of the site and nearby connected waterbodies.

There are no instream works proposed, so there will be no direct hydrological impacts.

The potential effect on the hydrological regime on-site during the construction phase includes changes to runoff and flow pathways. Excavation of ground to formation level, excavation of services and foundations will impact on the hydrological regime at the site. As discussed, surface water runoff with entrained suspended solid material and hydrocarbons will affect surface water quality.

The proposed construction activities have the potential to temporarily alter water quality and the hydrological regime in the study area. With no mitigation measures in place the potential magnitude of these changes would be medium, leading to a **moderate, short-term, adverse** effect, which is **not significant**.

10.5.2.4 Potential Impacts on Water Framework Directive Status

A standalone WFD Assessment Report has also been prepared for the proposed development. The WFD Assessment concluded that there is no likelihood of a negative effect on WFD waterbodies as a result of the proposed development, nor is the development likely to prevent any WFD waterbody from achieving its WFD objectives.

The potential impact on water framework status during the construction phase is considered to be **neutral, imperceptible**.

10.5.3 Operational Phase

The proposed operational stage drainage has been designed by Garland Consulting and is described in full in the Engineering Services Report. A Stormwater Management Plan will be implemented for surface water discharge into the existing road drainage network. Surface water runoff from the site to the existing drainage network is not expected to increase during the operational stage, as the discharge rate from the site will be limited to the existing greenfield rate by flow control devices.

The design includes Sustainable Drainage Systems (SuDS) and tank systems. The use of these methods will ensure that runoff from the proposed development replicates the characteristics of the pre-development greenfield site, and the levels of hydrocarbons, suspended solids and metals discharging from the site are negligible.

Proposed SuDS measures include the following:

- Permeable paving will be placed where site conditions and uses allow. Each house will be provided with a permeable paving driveway.
- Gullies and bioretention areas will be used to increase attenuation storage and provide passive filtration of pollutants in surface water. These areas are shown on the Drainage Masterplan Drawing accompanying the planning application.
- Hydrocarbon/Petrol interceptors are included in the proposed drainage network. These will prevent contamination of nearby watercourses.

The proposed discharge from site is limited to the greenfield run-off rate, i.e., it replicates the existing conditions with regard to flow rates. In the operational stage, it is proposed that following interception and attenuation, stormwater will discharge to the existing surface drainage network on the adjoining roads.

Given the drainage design, use of SuDS measures and on-site treatment methods, and expected discharge rates from the site, the potential effect on surface water during operation is considered to be a **long term, imperceptible effect**, with a **neutral effect** on quality i.e., an impact capable of measurement but without noticeable consequences.

10.6 Mitigation Measures

In the impact assessment discussed above, a range of potential effects on water were identified. Mitigation measures in the construction and operational phase of the proposed scheme will be implemented to reduce these adverse effects. Most measures are required during the construction phase as it will pose the greatest level of risks due to the construction activity on site, plant construction and use of construction materials and the soil on site. In the sections below the mitigation measures for the do-nothing scenario, construction phase and operation phase are discussed.

10.6.1 Do Nothing Scenario

In the do-nothing scenario, no mitigation measures will be required.

10.6.2 Construction Phase

Mitigation measures during the construction phase are discussed below. These mitigation measures have been developed with the source-pathway-receptor links above in mind and are designed to break this link either by removing the source or disrupting the pathway for pollution.

10.6.2.1 Best Practice Construction Methods

A preliminary Construction Environmental Management Plan (CEMP) has been prepared for the proposed scheme and will be put in place by the appointed contractor. The preliminary CEMP was prepared in accordance with the following:

- National and International Legislation;
- Environment Liability Regulations; and
- Best Management Guidelines.

The CEMP will be used by the contractor to prevent and minimise environmental effects during construction. It includes the below to mitigate impacts on water:

10.6.2.2 Fine Sediment Pollution

Mitigation measures for the protection of water quality from fine sediment pollution involve silt control, particularly at any drains or open excavations.

At construction stage, the following mitigation measures will be implemented:

- The contractor will construct a site compound at a location remote from any drains.
- All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff/wind erosion. Vegetation will be established as soon as possible on all exposed soils.
- During extended dry periods, soil stockpiles will be dampened periodically to minimise the risk of airborne particles entering watercourses.
- Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and stored in receptacles where possible. To minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible.
- Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar.
- Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off.
- A variety of silt control methods, e.g., silt fencing and silt bags, dewatering, silt sumps, shall be put in place downstream of exposed soils or soil stockpiles to contain surface water runoff from the site, in accordance with Section 3.1 of the CEMP.
- Monitoring the cleanliness of the adjacent road network, implementation of dust suppression, and vehicle wheel wash facilities.

- Concrete batching for in situ concrete pours will occur off-site, and concrete truck wash down will be conducted off-site at an authorized concrete batching plant, ensuring full compliance with relevant planning and environmental consents.

10.6.2.3 Accidental Spills and Leaks

Mitigation measures for the protection of water quality from accidental spills and leaks involve environmental operating plans, chemical storage, and Emergency Response Procedures.

At construction stage, the following mitigation measures will be implemented:

- The contractor will construct a site compound at a location at least 10m remote from any drains. The exact location of the compound will be confirmed in advance of works and agreed with the local authority. The compound may be moved or altered dependent on construction needs over the course of the project;
- Any lubricants or hydraulic oils will be stored in bunded containers in designated bunded areas. Deliveries of fuel and chemicals will be supervised;
- Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager;
- All materials taken on-site will be clearly labelled and stored in sealable containers
- The diesel fuel tank will be adequately bunded (110%) and the filling nozzle will be stored within the bunded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager;
- Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the underlying geology;
- The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain. Should this situation arise emergency procedures will be activated;
- During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand;
- Concrete washout will not be allowed within 10 metres of an existing surface water drainage point. Washouts are only allowed to take place into containment in designated areas with an impervious surface;
- The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to inspect and maintain equipment to ensure efficiency and to minimise emission;
- Precast elements will be maximised to avoid wet concreting in close proximity to water.
- All storm water discharge during construction will be discharged through a mobile oil filter separator system, until construction programme has reached the stage when surface water discharges can be passed through the two specified newly installed hydrocarbon interceptors;

10.6.2.4 Changes to runoff and flow pathways

- Vegetation will be established as soon as possible on all exposed soils.

10.6.3 Operational Phase

The inclusion of the proposed SuDS features, as per the Engineering Design Report prepared by Garland Consulting, will help to mitigate against additional surface water runoff and pollution. The proposed discharge rate from the surface drainage network will be limited to the existing greenfield runoff rate through the use of a flow control device.

During the operational phase, regular visual inspection of the silt traps and hydrocarbon interceptors should be carried out to ensure they are operating correctly. No additional mitigation measures are required.

10.7 Residual Impacts

10.7.1 Construction Phase

With the implementation of the mitigation measures outlined above, the proposed development will have no negative effects on surface waterbodies during construction. The status of surface waterbodies in the area will not be deteriorated, nor will the proposed development jeopardise the attainment of good surface water status.

Following the implementation of the mitigation measures, the effects during the construction phase will be **imperceptible, adverse, temporary, to neutral**. The overall effect is therefore **not significant**.

10.7.2 Operational Phase

The design of the scheme has been such that there are no predicted effects on the surface water environment during the operational phase of the development. The proposed discharge rate does not exceed the existing greenfield runoff rate, while the proposed drainage design includes measures for the attenuation of surface water. Once operational, the proposed development will not lead to a deterioration of water status of either the surface waterbodies, nor will it jeopardise the attainment of good water status for either of these waterbodies.

Overall, the operational effects of the proposed development will be **imperceptible to neutral**, and **not significant**.

10.8 Worst Case Scenario

Worst case scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures including:

- Significant contamination event.
- Flooding due to extreme event or unsuitable drainage measures.

Given the scale of the site, low risk flood zoning and relatively standard nature of the works involved the likelihood of a “worst case” event is extremely low.

10.9 Monitoring Or Reinstatement

10.9.1 Construction Phase

During construction, visual and chemical monitoring of treated surface water will take place to ensure that water draining from the site is not affected by the proposed development. This will take place during the regular site audits during the construction process.

Surface water collected in sumps will be monitored prior to discharge. Samples will be taken and the pH, conductivity, chemical oxygen demand, total petroleum hydrocarbons, and suspended solids levels will be recorded. The monitoring results will be compared to the allowable limits given in the Surface Water Regulations. If the results show an exceedance in the allowable levels, then the appointed contractor will review the mitigation measures and remedy them to lower the levels of the pollutant. A record of these upgrades/changes to the mitigation measures will be recorded.

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

If the mitigation measures in place during construction are observed to be insufficient or inefficient (i.e., elevated suspended solids, pH, conductivity, chemical oxygen demand, or total petroleum hydrocarbons are detected during monitoring prior to discharge), the discharge will be halted, and the mitigation measures will be revised and reimplemented. Further sampling will verify the success of the revised/updated surface water management. The affected water will be conveyed to the revised/updated treatment train and put through a hydrocarbon interceptor and settlement tanks to ensure compliance with the required levels in the treated water.

10.9.2 Operational Phase

Once operational, silt traps and hydrocarbon interceptors will be visually inspected on a regular or annual basis. Any spillages onsite will be acted upon immediately. No other monitoring measures are required during the operational phase.

10.10 Interactions

The EIAR must also consider in-combination effects, or the interactions between the different factors discussed.

Effects on water quality or hydrology can have further effects on biodiversity and ecology, through the mobilisation of silts, dusts, suspended solids, oils, or chemicals. On entering watercourses, these can negatively affect fish and aquatic ecology, as well as have an effect on Natura 2000 sites further downstream. These effects are further discussed in the Biodiversity Chapter of this EIAR, and the NIS. Following implementation of mitigation measures outlined in this chapter, including the use of silt fences and settlement trains during construction, in Chapter 6, and in the NIS, effects on habitats, flora, and fauna from water and hydrology will be **temporary, imperceptible, neutral**.

Surface water effects are directly linked with hydrogeology or groundwater effects, with surface water pathways leading to groundwater and vice versa. Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids influencing soil fertility, aeration and contamination. These effects are further discussed in the Land and Soils chapter of this EIAR. Without mitigation measures, the interaction of these two elements could lead to a short-term significant negative effect. With the proposed mitigation measures outlined in this chapter and in the Land and Soils chapter of the EIAR, the potential interaction between these is reduced to a **short-term, imperceptible, neutral effect**.

10.11 Cumulative Impacts

Other projects which could have a cumulative effect with the proposed development are listed in Chapter 2 of this EIAR, Section 2.5.

Cumulative effects are the result of several minor effects combining to create a more significant effect. The assessment of cumulative effects considers existing stresses on the water environment (i.e., surface water runoff, urban wastewater drainage, from existing developments in the surrounding area) as well as developments close to this development that are in planning or are underway (which are outlined in Chapter 2).

The proposed development has been assessed in the preceding sections and is not expected to have a significant negative effect on the surface water environment. When considered with other nearby developments, the cumulative effect is also not likely to be significant. This is due to the design of the proposed development and the mitigation measures to be put in place during both construction and operation, and the non-significant effects which are likely to occur. The other nearby developments are of a size, design, and nature not likely to result in significant negative effects themselves. The cumulative effect of the proposed development will therefore not be significant.

10.12 Difficulties Encountered

There were no difficulties encountered during the preparation of this report.

10.13 Summary

There will be **no long-term residual impact** on hydrological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 11: BIODIVERSITY

**SUTTONS LRD
MONALEEN ROAD**

FEBRUARY 2026



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APPENDICES

- Appendix 11.1- Winter Bird Surveys

11. BIODIVERSITY

The Biodiversity assessment has been undertaken by JBA Consulting Engineers and Scientists Ltd (hereafter JBA) on behalf of Genesis Planning Consultants. It assesses the biodiversity value of the proposed development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZOI). Standard construction and operational phase control measures, in addition to biodiversity enhancement measures and post construction monitoring are proposed, to minimise potential impacts of the proposed development and to improve the biodiversity potential of the proposed development site.

11.1 Introduction

The programme of work in relation to biodiversity assessment was designed to identify and describe the existing ecology of the area and detail designated sites, habitats or species of conservation interest that could potentially be impacted by the proposed development. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements, and designs mitigation measures to alleviate identified impacts.

A separate Appropriate Assessment, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. The initial screening concluded that impacts to the Lower River Shannon SAC could not be excluded due to groundwater concerns. A suite of mitigation measures both embedded in the design and for the duration of construction, will allow for the minimisation of effects on the SAC. Provided that mitigation measures are implemented during construction, and considering the distance to the SAC and the groundwater pathway,

It concludes that *'The initial screening of the proposed site works indicated that Likely Significant Effects could not be excluded due to a surface water pathway to the Lower River Shannon SAC. Adverse effects may occur during the construction phase through groundwater pathways; the drainage design is such that operations phase impacts are not anticipated. Provided that standard construction practices and that mitigation measures to prevent water pollution, outlined above and in the CEMP are adhered to, adverse effects on site integrity are unlikely to occur.'*

11.1.1 Quality Assurance and Competence

JBA Consulting Engineers and Scientists Ltd (hereafter JBA) carried out the ecology surveys and assessment for the proposed development site. JBA is a leading environmental and engineering consultancy with 30 years of experience, part of the JBA Group.

11.1.2 Description of the Proposed Development

Columbia Estates Management (IE) Limited (the prospective applicant) intend to apply for a 10 year permission comprising of:

A total of 523no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 214 no. two-storey houses, comprising 10 no. two-bed units and 204 no. three-bed units.
- (c) The provision of a total of 309 no. apartment units consisting of 159 no. one-bed units, 141 no. two-bed units and 9 no. three-bed units, accommodated within a series of apartment buildings of up to five storeys in height. Apartment buildings include bicycle storage and bin storage at ground or podium level as appropriate. (d) Provision of a creche (514sq.metres) at ground level in apartment building no. 10 and associated outdoor play space.

- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for dwellings and via on-street parking for the creche and apartment block nos. 1-5 and block no. 10.
- (f) Provision of podium/basement parking for apartment blocks 6-9. The bicycle storage, bin storage, motorbike parking and provision of plant rooms for apartment block nos. 6-9 are incorporated at podium/basement level.
- (g) Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.
- (h) Provision of associated bicycle storage facilities at surface level throughout the site.
- (i) Provision of associated open space areas, residential communal open space areas to include formal play areas along with all hard and soft landscape works for private gardens and amenity spaces along with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.
- (j) Provision of an entrance and associated upgrade works from the Monaleen road for vehicles and pedestrians with a separate pedestrian access provided from the Dublin Road.
- (k) Provision of 2no. ESB substations.
- (l) Internal site works and attenuation systems.
- (m) All ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul, water and ESB networks.

Full description is provided in Chapter 2 Project Description.

11.2 Assessment Methodology

11.1.3 The EclA Team

The surveys for the baseline ecology were undertaken by JBA Senior Ecologist Anne Mullen BSc Env, MSc Eco, JBA Ecologists Dominic Tilley BSc, MSc, PhD and Johanna Healy BSc (Hons), MSc and Graduate Ecologists Olly Lynch Milner BSc (Hons), MSc Olly Lynch Milner and Mia Heigh BSc (Hons).

This EclA was completed by JBA Assistant Ecologist Mia Heigh BSc who has two years' experience in ecological consultancy, including carrying out field work and authoring reports. This report has been reviewed by Dominic Tilley BSc MSc PhD with over 10 years postgraduate experience and 4 years in ecological consultancy, including surveying, reporting and reviewing. Input from the wider JBA ecology team was also received.

These staff members thus fulfil the Environmental Impact Assessment (EIA) Directive personnel requirements of 'competent persons'.

11.1.4 Policy and Legislation

Policy and legislation for nature conservation; and protected and priority species relevant to the proposed project is provided in Appendix: Policy and Legislation.

11.1.5 Methods

This EclA assesses the ecological features present within the site and its surrounding area (the ZoI) in relation to the proposed works. This allows for identification of the potential impacts of the proposed works upon the ecological features of the site at an early stage, whilst identifying the potential ecological constraints upon the proposed works. The assessment is based on a desk-based assessment, which determines the baseline conditions at the site of the proposed works, and site surveys, which provided information on habitats and species present on the site and its surroundings.

This EclA will outline the findings of the desk-based assessment and the surveys and identify any potential impacts of the proposed works on ecological features within the Zol of the site; and propose mitigation measures to avoid or reduce impacts where necessary.

11.1.6 Guidance

This assessment was conducted in accordance with the following guidance documents:

- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM 2024).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022).
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al. 2011).

Bird species are categorised based on Birds of Conservation Concern in Ireland (BoCCI) (Gilbert et al. 2021).

11.1.7 Baseline

To determine the baseline conditions at the site a review of all available information was made. When determining the pre-work conditions on-site, including the presence or absence of protected habitats and/or species, the precautionary principle was used where limited information was available.

A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within close proximity to, the study area. This included a data search for protected and notable species using the National Biodiversity Data Centre (NBDC) Mapping System (NBDC, 2025). A customised 2km polygon was created to extract all the species data from the project site's locality.

Information for statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA) was collected from the online resources provided by the National Parks and Wildlife Service (NPWS).

Other information on the local area was obtained, including:

- The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary (NPWS 2025a).
- The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitats Assessment (NPWS 2025b).
- The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessment (NPWS 2025c).
- All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians and fish.
- Environmental Protection Agency online databases <https://gis.epa.ie/EPAMaps/>.
- Catchment data <https://www.catchments.ie/>.
- Aerial photography available from www.osi.ie and Google Maps <http://maps.google.com/>
- Online data available on Natura 2000 sites from www.npws.ie.
- National Biodiversity Data Centre (2025) – Species Distribution Maps; www.biodiversityireland.ie.
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species <http://www.iucnredlist.org>.

11.1.8 Zone of Influence

The Zol for the project is based on a judgement of the likely extent of the ecological impacts on key ecological receptors. This will vary for different ecological features, depending on their sensitivities to environmental change. Additionally, the Zol is informed using the Source-Pathway-Receptor (S-P-R) model as outlined in guidance (OPR 2021). Using the source-pathway-receptor model allows for the potential significant effects to be eliminated if no viable source, pathway, or receptor is present.

The S-P-R method uses an examination of the construction methods, nature of operation of project description and allows sources of impact to be determined. This also allows a zone of influence for the project to be generated based on the size, scale and nature of the works involved. The pathways for impact are also analysed to see if a functional pathway for impact is present.

This report analyses three pathways:

- surface water
- groundwater
- land (noise, visual, air pollution).

Using information gathered from desk sources and from field surveys, receptors within the zone of influence are identified. In some cases, sensitive receptors may also play a role in determining the zone of influence. If any of the three parts to the model (source-pathway-receptor) are not present the potential for a likely significant effect from the project on the Natura 2000 network or proposed Natural Heritage Areas (pNHAs) can be discounted.

In relation to terrestrial habitats, impacts will be limited to the lands within the site boundary of the proposed development, as well as the immediate surrounding environs (e.g., overshadowing and soil; root compaction and changes to local hydrological regimes).

Hydrological connections (e.g., drainage ditches, canals, wetlands and rivers) often receive the most far-reaching of impacts due to their lotic or semi-lotic nature. It becomes increasingly difficult to precisely predict the likely significance of adverse water-borne pollutants as they travel downstream from the pollution point source, given potential dilution and retention factors along the course of the impacted watercourse. Under the precautionary principle any designated sites (Natura 2000 and proposed NHA sites), protected habitats or species (flora and fauna) located downstream of the local watercourses, will be considered to be within the hydrological Zol of this proposed development.

In respect to Zol for air pollution (emissions and dust), designated sites within a 250m buffer zone of the development sites, were considered as per the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM 2024), including ex-situ foraging habitats utilised by protected species associated with the site. In relation to physical (vibration and trimming) works; audible and visual disturbance, faunal species will be considered on a species-by-species basis. Generally, smaller mammal species (e.g., Pygmy Shrew) will be given 100m disturbance zones, which is reflective of their relatively small territories. For larger mammals, such as Badger, a 150m disturbance zone can be established in the scenario where there is an active sett.

The Zol for local bats species is centred around lighting impacts within and adjacent to footprint of the development sites, as well as the developments' proximity of known bat roosts within the locality. Impacts are likely to occur within a 3km radius sustenance zone around each of these known bat roosts.

The Zol for bird species is generally linked with direct habitat loss within the footprint of the proposed development sites. Additional adverse impacts for these birds will likely arise from the disturbance from construction works, which can extend 500m (Cutts et al. 2013) with local designated sites.

The Zol for amphibians is linked to the foraging, commuting and refuge habitats within the site, which have the potential to be degraded as a result of the proposed development sites. Therefore, the Zol for these floral / faunal species will mirror that of the terrestrial habitats.

The Zol for terrestrial invertebrates is generally linked with direct habitat loss and degradation, as well as construction and operational disturbances. As the furthest impact pathway that can affect terrestrial habitats is 300m, this will also be the Zol distance for terrestrial invertebrate species.

11.1.9 Field Surveys

A suite of ecological surveys have been carried out. These surveys included a site walkover survey which included habitat mapping, checks for mammal signs, and preliminary bat roost feature (PRF) assessment for the site. Other surveys included general site walkover and habitat mapping, wintering bird surveys (x3), breeding bird surveys (x3),

mammal surveys (x3) and bat activity surveys (x3 transect surveys and x2 rounds of static detection). The timeline of these surveys are as follows:

- General site walkovers and habitat mapping Incorporated with all visits.
- Wintering Birds: 21 January, 10 February, 4 March 2025
- Mammal Surveys: 4 - 19 March, 28 April - 15 May 2025, 16-26 June
- Habitat mapping: 4 March 2025
- Breeding Bird Surveys: 28 April, 29 May, 6 August 2025
- Bat activity surveys: 15 May, 16 June, 6 August 2025
- Static Detection: 15 - 19 May and 16 - 25 June 2025

The ecological walkover surveys followed following guidance outlined in the documents below:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009)
- Best Practice Guidance for habitat Survey and Mapping. The Heritage Council. (Smith et al. 2011)
- Bat Surveys for Professional Ecologists: Good Practise Guidelines (4th Edition) (Collins 2024)

Aerial photographs and site maps assisted the habitat survey. Habitats have been named and described following A Guide to Habitats in Ireland by Fossitt (2000). Nomenclature for higher plants follows that given in The New Flora of the British Isles 4th Edition (Stace 2019). Identification of Irish plants generally follows Webb's An Irish Flora (Parnell and Curtis 2012).

11.1.10 Water Framework Directive

In response to the increasing threat of pollution and the increasing demand from the public for cleaner rivers, lakes and beaches, the EU developed the Water Framework Directive (WFD). This Directive is unique in that, for the first time, it establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation for all European member states.

The WFD (Directive 2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000. The overarching objective of the WFD is for the water bodies in Europe to attain Good or High Ecological Status. The Environment Protection Agency (EPA) is the competent authority in Ireland responsible for delivering the WFD. River Basin Management Plans (RBMP) have been created which set out measures to ensure that water bodies in the country achieve 'Good Ecological Status'.

Good Ecological Quality will depend on the quality of the individual quality elements on which the Ecological status is scored; namely the biological, chemical and morphological condition in a particular water body.

11.1.11 Screening of Ecological Features

The ecological features identified during the walkover surveys and from desk-based assessments were reviewed.

An informal screening process is presented at the start of the results section to ensure that the assessment focuses only on features where the impact could have important consequences for biodiversity (valued ecological features). Any features which are important beyond the site level were identified for further evaluation. Ecological features with little or no value beyond the site level were screened out and a short statement explaining this is given in the screening section.

11.1.12 Assessment of the Effects on Features

Ecological features include nature conservation sites, habitats, species assemblages/ communities, populations or groups of species. The assessment of the significance of predicted impacts on ecological features is based on both the 'value' of a feature, and the nature and magnitude of the impact that the project will have on it. The impact is based on the project which includes a certain amount of designed-in mitigation, including construction best practice measures that will be implemented with a high degree of certainty.

11.1.13 Valuation of Receptors

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations)
- Any social benefits that habitats and species deliver (e.g. relating to enjoyment of flora and fauna by the public).
- Any economic benefits that they provide.

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of a habitat depends on several factors, including the size of the habitat, its conservation status and quality. The assessment also takes account of connected off-site habitat that may increase the value of the on-site habitat through association. Valuation of species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

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Table 11-1: Examples of criteria used to define the value of ecological features (derived NRA, 2009)

Level of Value	Examples of Criteria
International	An internationally important site e.g. Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar (or a site considered worthy of such designation). A regularly occurring substantial population of an internationally important species (listed on Annex IV of the Habitats Directive). Designated shellfish waters. Major fisheries area.
National	A nationally designated site e.g. Natural Heritage Area (NHA), a proposed Natural Heritage Area (pNHA), statutory Nature Reserve, or a site considered worthy of such designation. A viable area of a habitat type listed in Annex I of the Habitats Directive or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. A regularly occurring substantial population of a nationally important species, e.g. listed on The Wildlife Act 1976 or The Wildlife (Amendment) Act 2000. A species included in the Irish Red Data Lists/Books. Significant populations of breeding birds.
Regional/County (E.g. Co. Limerick)	Species and habitats of special conservation significance within County Dublin. An area subject to a project/initiative under the County's Biodiversity Action Plan. A regularly occurring substantial population of a nationally scarce species.
Local (works site and vicinity)	Areas of internationally or nationally important habitats which are degraded and have little or no potential for restoration. A good example of a common or widespread habitat in the local area. Species of national or local importance, but which are only present very infrequently or in very low numbers within site area.
Less than local	Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. Common and widespread species.

Guidance published by CIEEM (2024) recommends breaking down the importance of ecological features in a geographic context similar to the NRA guidance shown in Table 11-1 with the following frame of reference to be adapted to local circumstances.

- International and European
- National
- Regional
- Metropolitan, County, vice-county or other local authority-wide area
- River Basin District
- Estuarine system/Coastal cell
- Local

The NRA (2009) guidance is congruent with this CIEEM guidance and includes a 'Less than local' level. The NRA (2009) guidance on geographic criteria for ecological valuation, as described in Table 11-1 is followed in this report.

Ecological Valuation may also be considered of Local Importance (higher value) or Local Importance (lower value) (Table 11-2).

Table 11-2: Examples of criteria used to define the value of ecological features of local importance (NRA, 2009)

Level of Value	Examples of Criteria
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (BAP), if this has been prepared Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive. Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data List. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Local Importance (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. Sites or features containing non-native species that are of some importance in maintaining habitat links

11.1.14 Magnitude of Impacts

Ecological effects or impacts can be described and categorised in a number of ways. Examples of relevant terms are listed in the table below.

Table 11-3: Categories of Effects (derived EPA, 2022b)

Description	Categories of Effects
Quality of Effects	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance)
Describing the Significance of Effects	Imperceptible An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a

Description	Categories of Effects
	sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects	Extent Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Describing the Probability of Effects	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	Indirect Effects (a.k.a. Secondary or Off-site Effects) Effects on the environment. Which are not a direct result of the project, often produced away from the project site of because of a complex pathway
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	Do-nothing Effects The environment as it would be in the future should the subject project not be carried out.
	Worst Case Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

Description	Categories of Effects
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

11.1.15 Significance of Impacts

The overall significance of an impact can be derived from the total description of the effect compared against the sensitivity and significance (value) of the receptor as shown overleaf in Figure 11-1 which is taken from the EPAs EIAR Guidelines (EPA 2022). The context and character of the receptor must also be assessed, such as its position in relation to the effect and its connectivity to the effect, however this should be determined before assessing the significance of the impact.

The total description of the effect includes the character, magnitude, probability and consequences of the effect which are combined to give a general description of the effect on an ordinal scale from Negligible to High. The sensitivity and significance of the receptor is also described on an ordinal scale from Negligible to High.

The placement of the general description of the effect, and the sensitivity/significance of the receptor on this scale is determined by a Competent Person (a qualified ecologist in this case) as they interpret the qualities of the effect, and the receptors sensitivity and significance. Level of significance, also described as value of the receptor is previously set out in sub-section 11.1.13 above. Sensitivity of the receptor is assessed by the Competent Person based on the receptor's characteristics and how susceptible to impact they are from the type of effect.

The overall significance of an effect is then categorised into one of the following seven classifications:

- Imperceptible
- Not Significant
- Slight
- Moderate
- Significant
- Very Significant
- Profound

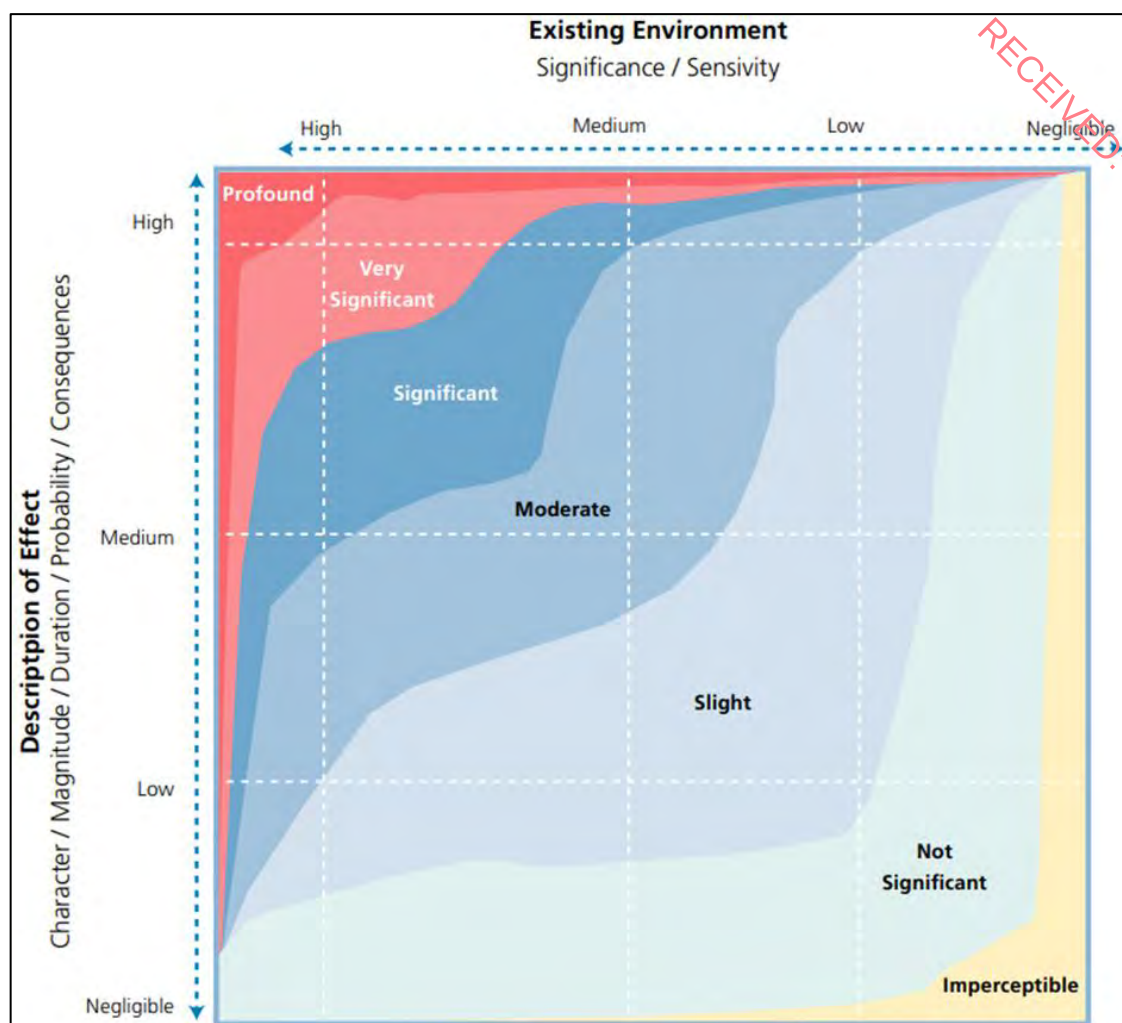


Figure 11-1: Chart showing the typical classifications of the significance of effects (EPA 2022)

11.3 Receiving Environment

11.3.1 Desk-based Assessment

11.3.1.1 Designated Sites

This section lists the designated sites of international and national importance.

Two EU designated Natura 2000 sites were identified within the ZOI following a SPR model (Table 11-4), and mapped in relation to the proposed site (Figure 11-2). The designated sites are assessed in the accompanying NIS.

Table 11-4: Natura 2000 sites within the ZOI of the proposed site

Site Name	Code	Direct Distance	Indirect hydrological Connection/Distance
Lower River Shannon SAC	002165	907 m	907 metres through a groundwater pathway
River Shannon and River Fergus Estuaries SPA	004077	4.7 km	10.4 km through a groundwater pathway to the River Shannon and then a surface water connection from here to SPA.

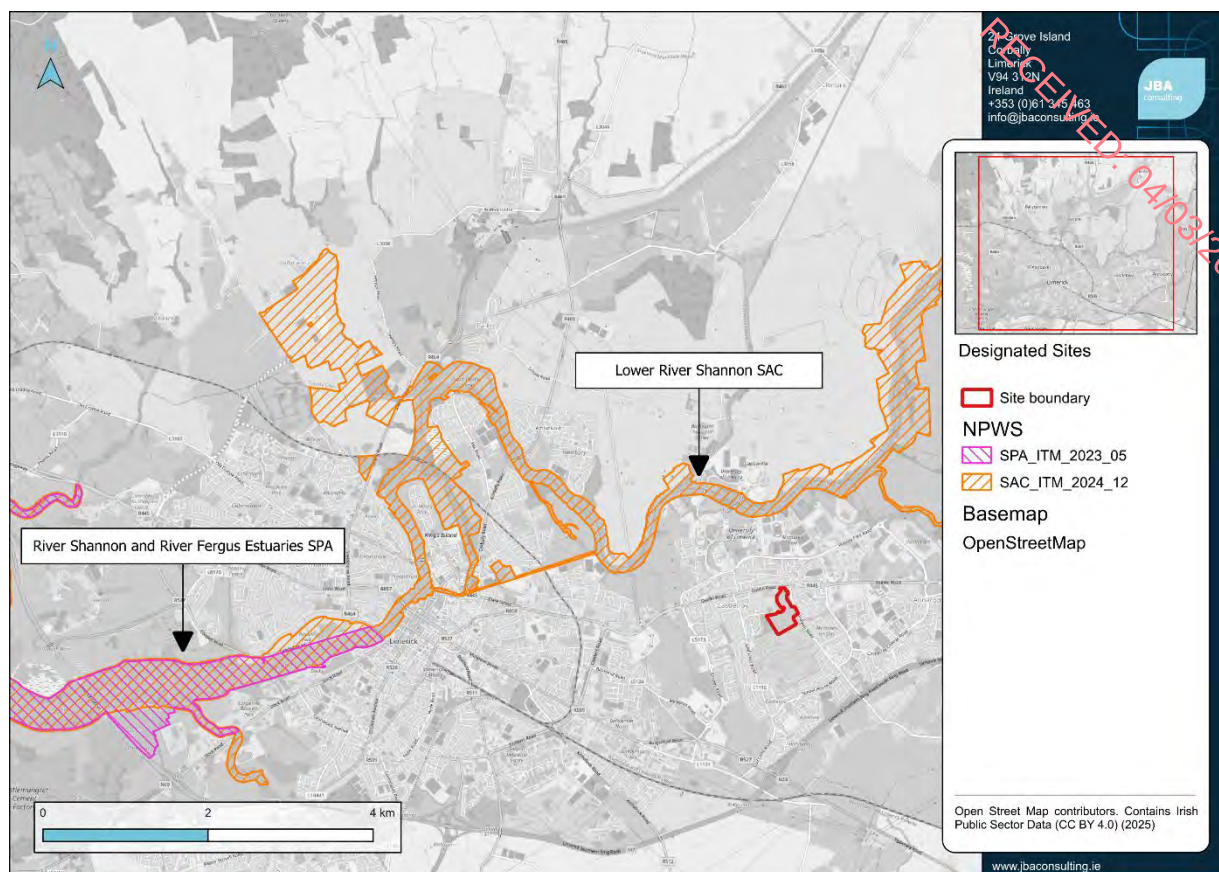


Figure 11-2: Natura 2000 sites within ZOI of the proposed project

There were six pNHAs of National Importance located within the 10km ZOI of the proposed project (Table 11-5 & Figure 11-3). Fergus Estuary and Inner Shannon, North Shore and Inner Shannon Estuary - South Shore pNHA are the only ones with a pathway. However, they both overlap and are assumed to be part of the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA and are considered under that heading in the NIS.

Table 11-5: Non-statutory conservation sites within a 10km radius of the proposed development

Name	Designation	Importance	Distance	Hydrological Distance
Castleconnell (Domestic Dwelling, Occupied)	pNHA	National	4.3 km	N/A
Fergus Estuary and Inner Shannon, North Shore	pNHA	National	4.4 km	Potentially through a surface-ground-surface water connection
Cloonlara House	pNHA	National	4.6 km	N/A
Knockalisheen Marsh	pNHA	National	5.1 km	N/A
Inner Shannon Estuary - South Shore	pNHA	National	5.5 km	surface-ground-surface water connection
Loughmore Common Turlough	pNHA	National	8.4 km	N/A

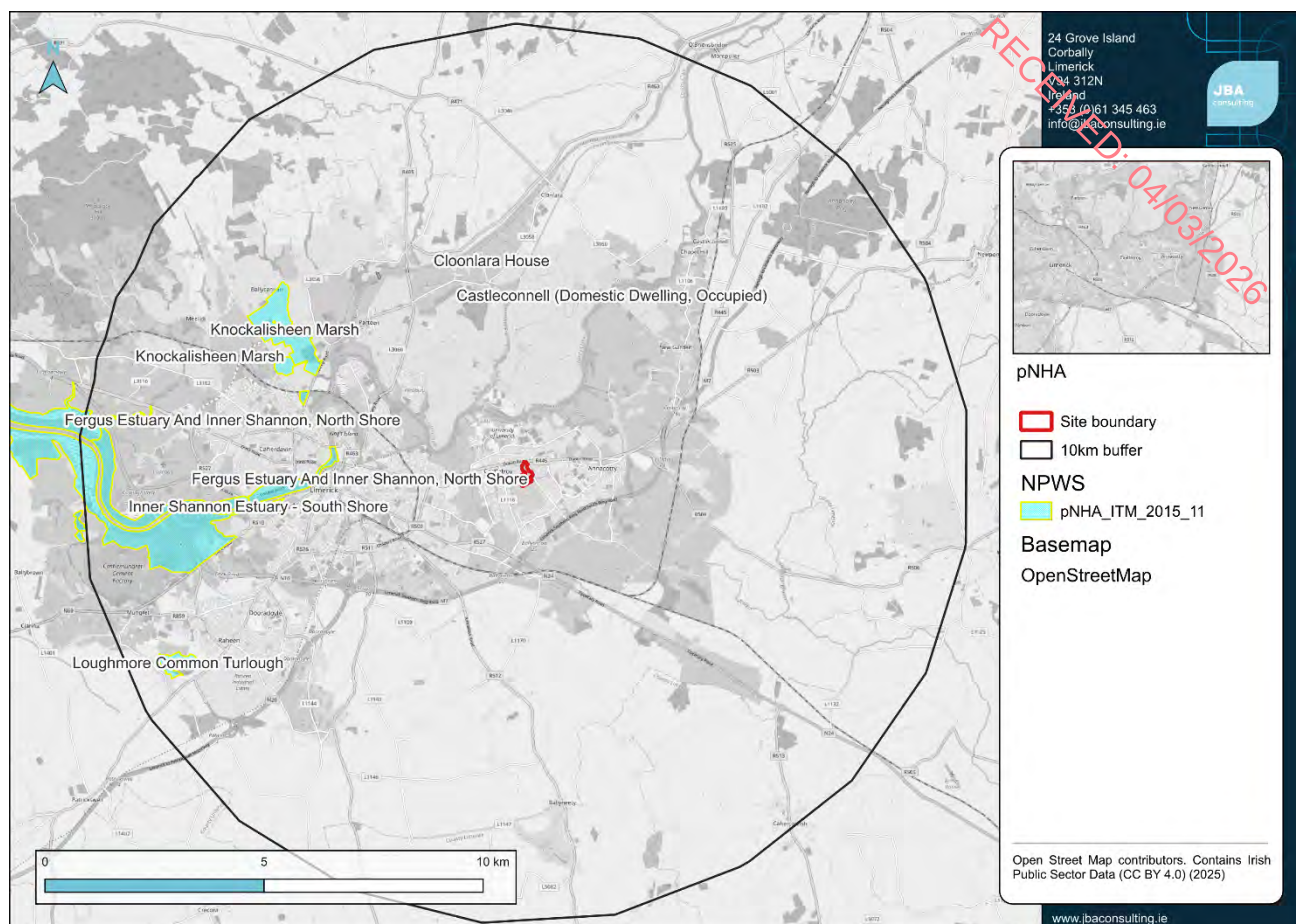


Figure 11-3: Non-statutory (by EU Directives) conservation sites within a 10km radius of the proposed development

11.3.1.2 Protected Species

Records of protected fauna and flora were collated from the NBDC (2025) database. The records were collected for a radius of 5km around the proposed development site over the past 10 years. Forty five bird species, seven bat species, eight terrestrial mammals, and one invertebrate were recorded.

Species	Last Record	Designation
Birds		
Barn Owl <i>Tyto alba</i>	07/03/2022	Wildlife Acts BoCCI- Red List
Barn Swallow <i>Hirundo rustica</i>	18/05/2023	Wildlife Acts Threatened Species: BoCCI- Amber List
Black-headed Gull <i>Larus ridibundus</i>	20/02/2023	Wildlife Acts BoCCI- Red List
Common Sandpiper <i>Actitis hypoleucos</i>	21/02/2020	Wildlife Acts BoCCI- Amber List
Common Coot <i>Fulica atra</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
Common Kestrel <i>Falco tinnunculus</i>	07/10/2022	Wildlife Acts BoCCI- Amber List
Cormorant <i>Phalacrocorax carbo</i>	10/03/2024	Wildlife Acts BoCCI- Amber List
Common Kingfisher <i>Alcedo atthis</i>	07/07/2021	Wildlife Acts EU Birds Directive>> Annex I Bird Species BoCCI- Amber List
Common Pheasant <i>Phasianus colchicus</i>	18/04/2020	Wildlife Acts
Common Snipe <i>Gallinago gallinago</i>	28/01/2023	Wildlife Acts BoCCI- Amber List
Common Starling <i>Sturnus vulgaris</i>	02/04/2023	Wildlife Acts BoCCI- Amber List
Common Swift <i>Apus apus</i>	19/07/2023	Wildlife Acts BoCCI- Amber List

Species	Last Record	Designation
Common Wood Pigeon <i>Columba palumbus</i>	18/05/2023	Wildlife Acts
Eurasian Curlew <i>Numenius arquata</i>	03/03/2020	Wildlife Acts BoCCI- Red List
Eurasian Wigeon <i>Anas penelope</i>	03/03/2020	Wildlife Acts BoCCI- Amber List
Goldcrest <i>Regulus regulus</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
Great Black-backed Gull <i>Larus marinus</i>	30/01/2018	Wildlife Acts BoCCI- Amber List
Greenfinch <i>Chloris chloris</i>	06/04/2020	Wildlife Acts BoCCI- Amber List
Grey Wagtail <i>Motacilla cinerea</i>	02/01/2024	Wildlife Acts BoCCI- Red List
Herring Gull <i>Larus argentatus</i>	28/01/2023	Wildlife Acts BoCCI- Red List
House Martin <i>Delichon urbicum</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
House Sparrow <i>Passer domesticus</i>	20/02/2023	Wildlife Acts BoCCI- Amber List
Lapwing <i>Vanellus vanellus</i>	05/01/2024	Wildlife Acts BoCCI- Red List
Lesser Black-backed Gull <i>Larus fuscus</i>	28/01/2023	Wildlife Acts BoCCI- Amber List
Little Egret <i>Egretta garzetta</i>	02/03/2024	Wildlife Acts EU Birds Directive>> Annex I
Little Grebe <i>Tachybaptus ruficollis</i>	14/01/2018	Wildlife Acts BoCCI- Amber List
Mallard <i>Anas platyrhynchos</i>	18/05/2023	Wildlife Acts
Meadow Pipit <i>Anthus pratensis</i>	20/02/2023	Wildlife Acts BoCCI- Red List
Mistle Thrush <i>Turdus viscivorus</i>	14/03/2023	Wildlife Acts
Mew Gull <i>Larus canus</i>	28/01/2023	Wildlife Acts BoCCI- Amber List
Mute Swan <i>Cygnus olor</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
Northern Lapwing <i>Vanellus vanellus</i>	09/01/2021	Wildlife Acts BoCCI- Red List
Peregrine Falcon <i>Falco peregrinus</i>	14/01/2018	Wildlife Acts EU Birds Directive>> Annex I Bird Species
Red-throated Diver <i>Gavia stellata</i>	03/03/2020	Wildlife Acts EU Birds Directive>> Annex I Bird Species BoCCI- Amber List
Redwing <i>Turdus iliacus</i>	20/02/2023	Wildlife Acts BoCCI- Red List
Ringed Plover <i>Charadrius hiaticula</i>	09/05/2021	Wildlife Acts BoCCI- Amber List
Robin <i>Erithacus rubecula</i>	10/03/2024	Wildlife Acts
Rock Pigeon <i>Columba livia</i>	07/03/2022	Wildlife Acts
Sand Martin <i>Riparia riparia</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
Sparrowhawk <i>Accipiter nisus</i>	24/08/2013	Wildlife Acts
Stonechat <i>Saxicola rubicola</i>	20/02/2023	Wildlife Acts
Tufted Duck <i>Aythya fuligula</i>	14/01/2018	Wildlife Acts BoCCI- Amber List
Whooper Swan <i>Cygnus cygnus</i>	04/12/2017	Wildlife Acts EU Birds Directive EU Birds Directive>> Annex I Bird Species BoCCI- Amber List
Wigeon <i>Mareca penelope</i>	03/03/2020	Wildlife Acts BoCCI- Amber List
Willow Warbler <i>Phylloscopus trochilus</i>	18/05/2023	Wildlife Acts BoCCI- Amber List
Invertebrates		
Freshwater White-clawed Crayfish <i>Austropotamobius pallipes</i>	26/08/2015	EU Habitats Directive >> Annex II >> Annex V Wildlife Acts
Bats		
Brown Long-eared Bat <i>Plecotus auritus</i>	04/08/2021	EU Habitats Directive >> Annex IV Wildlife Acts
Daubenton's Bat <i>Myotis</i>	25/08/2021	EU Habitats Directive >> Annex IV Wildlife Acts

Species	Last Record	Designation
<i>daubentonii</i>		
Lesser Horseshoe Bat <i>Rhinolophus hipposideros</i>	27/01/2015	EU Habitats Directive >> Annex II >> Annex IV Wildlife Acts
Lesser Noctule <i>Nyctalus leisleri</i>	07/08/2021	EU Habitats Directive >> Annex IV Wildlife Acts
Nathusius's Pipistrelle <i>Pipistrellus nathusii</i>	31/07/2021	EU Habitats Directive >> Annex IV Wildlife Acts
Pipistrelle <i>Pipistrellus pipistrellus sensu lato</i>	07/06/2022	EU Habitats Directive >> Annex IV Wildlife Acts
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	07/08/2021	EU Habitats Directive >> Annex IV Wildlife Acts
Mammals		
Eurasian Badger <i>Meles meles</i>	24/04/2017	Wildlife Acts
Eurasian Pygmy Shrew <i>Sorex minutus</i>	13/10/2016	Wildlife Acts
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	20/04/2023	Wildlife Acts
European Otter <i>Lutra lutra</i>	29/10/2018	EU Habitats Directive >> Annex II >> Annex IV Wildlife Acts
Irish Hare <i>Lepus timidus subsp. hibernicus</i>	08/02/2015	Wildlife Acts
Irish Stoat <i>Mustela erminea subsp. hibernica</i>	24/04/2025	Wildlife Acts
Pine Marten <i>Martes martes</i>	14/06/2021	EU Habitats Directive >> Annex V Wildlife Acts
West European Hedgehog <i>Erinaceus europaeus</i>	16/10/2023	Wildlife Acts

11.3.1.3 Invasive Non-native Species

Twenty-one invasive non-native species were recorded on the NBDC (2025) database, within the 5km buffer zone within the past 10 years. This includes 14 plants species, four mammals, two invertebrates and one bird.

Species	Last Record	Designation
Birds		
Greylag Goose <i>Anser anser</i>	28/01/2023	Invasive Species: Regulation S.I. 477/2011 (Ireland) Regulation S.I. 374/2024 (Ireland)
Plants		
Water Fern <i>Azolla filiculoides</i>	24/07/2024	Regulation S.I. 477/2011 (Ireland) Medium Risk Invasive Species (2013 Report) Regulation S.I. 374/2024 (Ireland) Invasive Species >> Moderate Risk
Butterfly-bush <i>Buddleja davidii</i>	03/07/2024	Invasive Species: Medium Risk
Cherry Laurel <i>Prunus laurocerasus</i>	18/04/2022	Invasive Species: High Risk
Common Broomrape <i>Orobancha minor</i>	16/07/2024	Invasive Species: Medium Risk
Field Penny-cress <i>Thlaspi arvense</i>	21/04/2021	Invasive Species: Medium Risk
Giant Hogweed <i>Heracleum mantegazzianum</i>	26/02/2025	EU Invasive Alien Species Regulation No. 1143/2014 Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk (2013 Report) Regulation S.I. 374/2024 (Ireland)
Himalayan Balsam <i>Impatiens</i>	21/08/2024	EU Invasive Alien Species Regulation No. 1143/2014 Regulation S.I.

Species	Last Record	Designation
<i>glandulifera</i>		477/2011 (Ireland) Invasive Species: High Risk Regulation S.I. 374/2024 (Ireland)
Japanese Knotweed <i>Reynoutria japonica</i>	17/05/2025	EU Invasive Alien Species Regulation No. 1143/2014 Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Regulation S.I. 374/2024 (Ireland)
Japanese Rose <i>Rosa rugosa</i>	19/06/2022	Invasive Species: Medium Risk
Narrow-leaved Ragwort <i>Senecio inaequidens</i>	04/09/2021	Invasive Species: Medium Risk
Sycamore <i>Acer pseudoplatanus</i>	06/04/2025	Invasive Species: Medium Risk
Three-cornered Garlic <i>Allium triquetrum</i>	20/04/2023	Regulation S.I. 477/2011 (Ireland) Invasive Species: Medium Risk Regulation S.I. 374/2024 (Ireland)
Traveller's-joy <i>Clematis vitalba</i>	27/08/2023	Invasive Species: Medium Risk
Wall Cotoneaster <i>Cotoneaster horizontalis</i>	27/08/2023	Invasive Species: Medium Risk
Invertebrates		
Common Garden Snail <i>Cornu aspersum</i>	11/04/2024	Invasive Species: Medium Risk
Jenkins' Spire Snail <i>Potamopyrgus antipodarum</i>	02/08/2018	Invasive Species: Medium Risk
Mammals		
American Mink <i>Neovison vison</i>	22/07/2016	EU Invasive Alien Species Regulation No. 1143/2014 Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Regulation S.I. 374/2024 (Ireland)
Greater White-toothed Shrew <i>Crocidura russula</i>	30/06/2020	Invasive Species: Medium Risk (2013 Report)
Grey Squirrel <i>Sciurus carolinensis</i>	30/10/2015	EU Invasive Alien Species Regulation No. 1143/2014 Regulation S.I. 477/2011 (Ireland) High Risk Invasive Species (2013 Report) Regulation S.I. 374/2024 (Ireland)
Rabbit <i>Oryctolagus cuniculus</i>	06/04/2023	Invasive Species: Medium Risk (2013 Report)

11.3.2 Water Framework Directive

A WFD assessment has been carried out and is presented in section XXX. The purpose of the assessment is to ensure that WFD objectives are not compromised.

The Scoping Assessment found that the proposed development, when considering all aspects of its design including the proposed drainage layout and design measures to be put in place during construction, is not likely to cause a deterioration in WFD status objectives for any of the screened in waterbodies.

11.3.2.1 Surface Water

The site is located in the Lower Shannon Catchment (WFD ID 25D), and the Shannon[Lower]_SC_090 sub-catchment (WFD ID 25D_9). There are no surface water bodies recorded in the immediate vicinity of the site. The nearest surface waterbodies are the Groody River (Shannon (Lower)_060 (WFD IE_SH_25S012600)) which lies 920 metres west of the site, the Mulkear ((Limerick)_050 (WFD IE_SH_25M040590)) 1.1 km south-east of the site and the River Shannon (Shannon (Lower)_060 (WFD IE_SH_25S012600)) (Figure 11-4). No drainage ditches are present on site, and therefore no indirect connections to the surrounding waterbodies exist.

As no watercourses are present on site and connected Natura sites have been assessed in the NIS, they are not considered further for assessment.

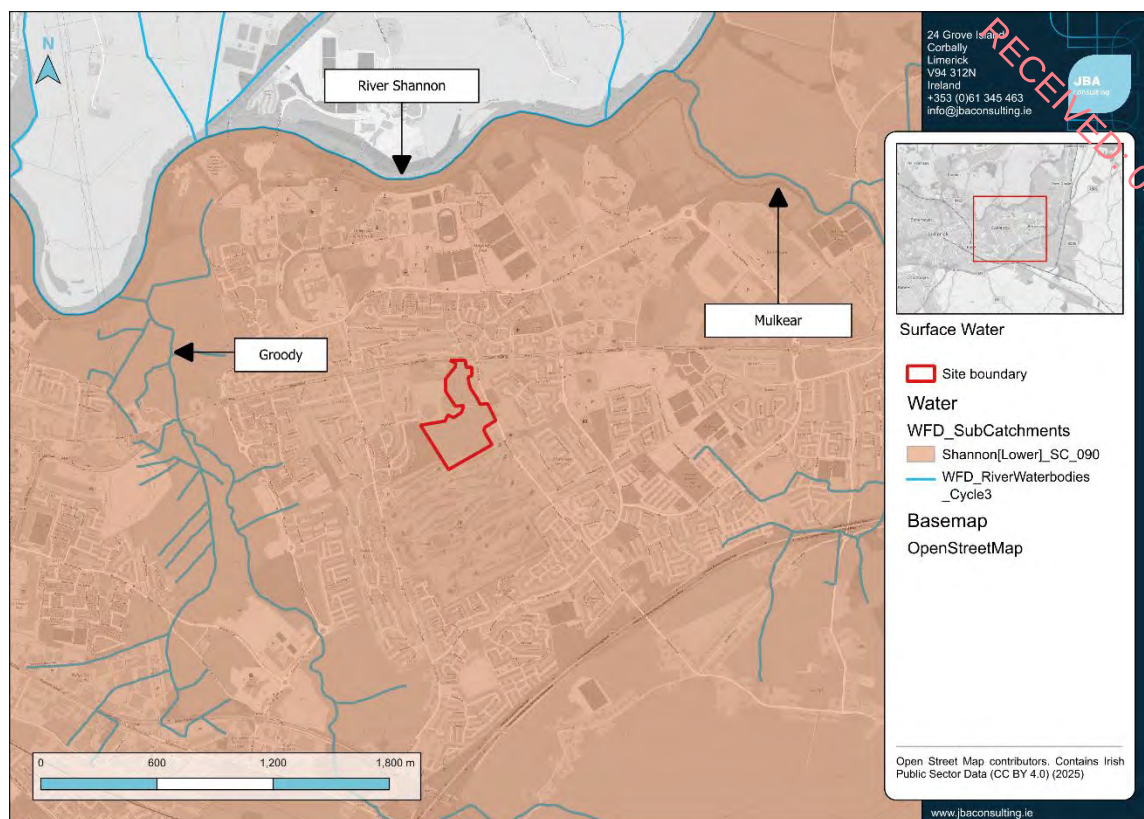


Figure 11-4: Surface water network in vicinity of site

Table 11-6: The WFD waterbodies within Zol of the proposed works

WFD Waterbody	WFD Status (2019-2024)	Risk Status
Shannon (Lower)_060	Moderate	Review
Mulkear (Limerick)_050	Good	Not at risk

11.3.2.2 Groundwater

The proposed project site is located within the Limerick City East (IE_SH_G_138) groundwater body (Figure 11-5). The GWB is of Good ecological status and At Risk as of the 2019-2024 monitoring period. The Lower River Shannon SAC shares this groundwater body with the proposed site. Table 11-7 details the underlying geology of the proposed site and groundwater and geological conditions.

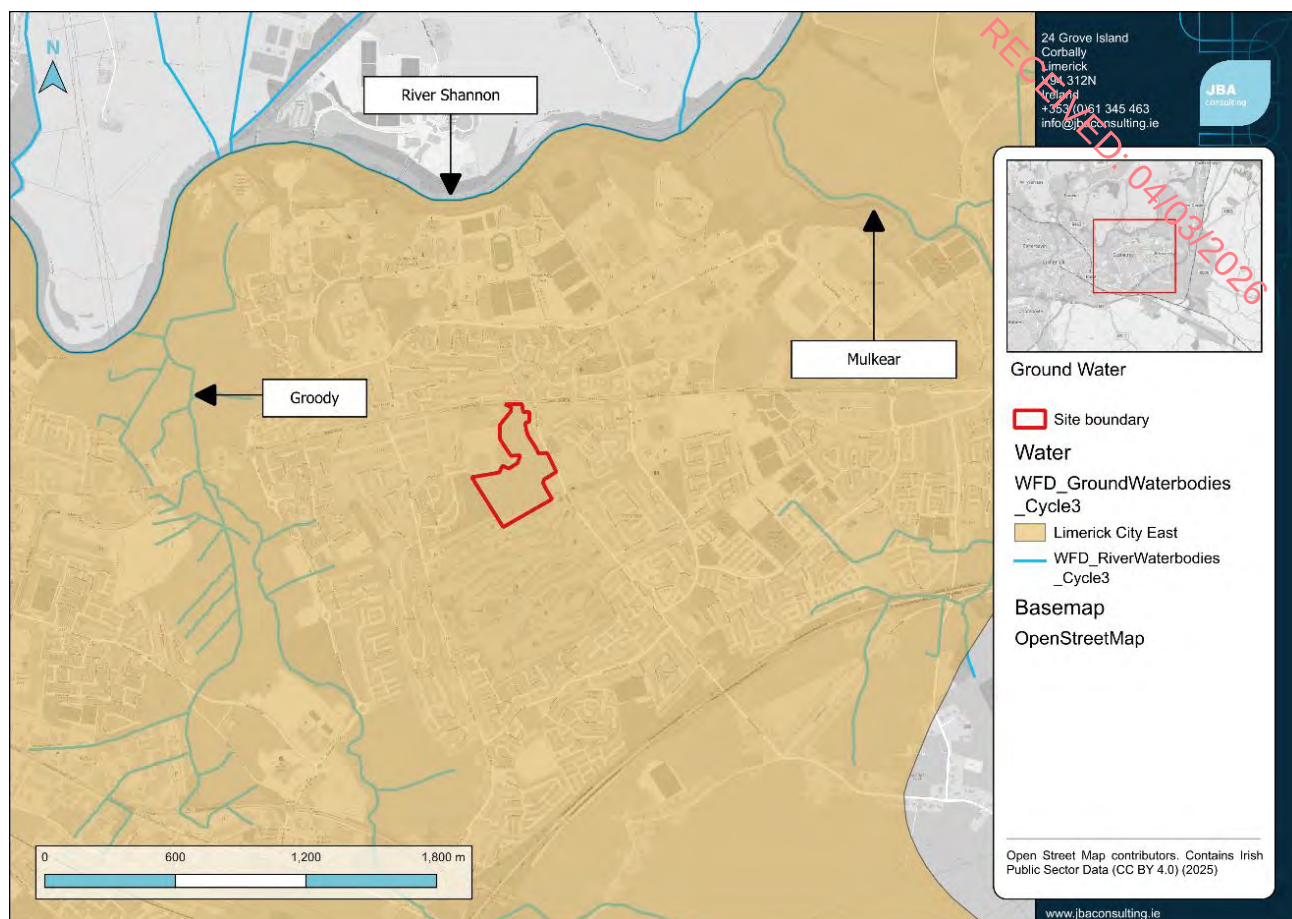


Figure 11-5: Groundwater bodies in relation to project site

Table 11-7: Underlying Groundwater, Geography and Geological Conditions

Feature	Source	
WFD Groundwater Body	EPA	Limerick City East
Teagasc Soils (Parent Material Name. Parent Material Description. Soil Group)	GSI	Not mapped - classified as Urban. However, during site visits, was observed to be of clays with associated water logging.
Subsoils (Quaternary Sediments)	GSI	Bedrock outcrop or subcrop. Till derived from basic igneous rocks. Gravels derived from Limestones.
Subsoil permeability	GSI	Not mapped at this site.
Bedrock Geology	GSI	Volcaniclastic Rocks.
Bedrock Aquifer	GSI/EPA	Locally Important Aquifer - Bedrock which is Generally Moderately Productive
Groundwater Recharge	GSI	60% Recharge Coefficient in majority of site. Small area of 85% Recharge Coefficient in the Northern section of the site. High permeability subsoil (sand & gravel) overlain by poorly drained soil or peat.
Groundwater Vulnerability	GSI/EPA	Extreme in Southern half of site. Rock at or near Surface or Karst in Northern section of site.

The Extreme groundwater vulnerability (Figure 11-6) is a reflection of the lack of quaternary deposits in the area. The bedrock is comprised of Volcanic Rock, with Locally Important Aquifer - Bedrock which is Generally Moderately

Productive. The recharge levels would imply limited infiltration at the site. Overall, this is a low groundwater sensitivity area.

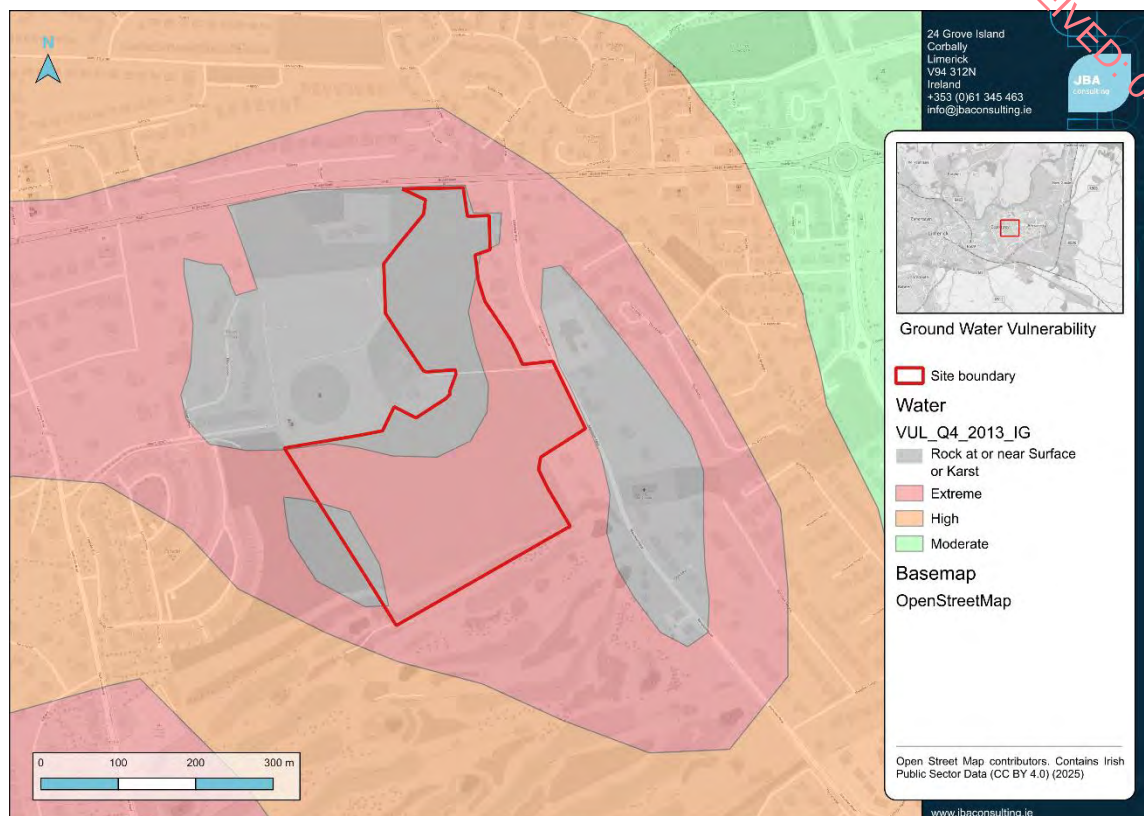


Figure 11-6: Groundwater Vulnerability at the project site

11.4 Site Visits and Surveys

A series of ecological surveys were conducted to inform this EclA, as outlined in the timeline provided in Section 0.

11.4.1 Wintering Bird

Wintering bird surveys were conducted on 21 January, 10 February, and 4 March 2025. The conditions were generally mild with temperatures ranging from 6°C to 13°C, with good visibility and some windy conditions.

Across the three surveys carried out, a total of 19 different species were recorded (Table 11-8), mainly expected garden and farmland birds of which 74% (14 species) are green listed, 16% (3 species) amber listed and 10 % red (2 species) listed. The most frequently recorded species include Woodpigeon, Robin, Blackbird and Rook, whilst the most numerous were Linnet and Chaffinch, with flocks of up to 15 birds. Redwing and Snipe, both red listed, made use of the area in the winter. Redwing tend to follow where food is available during winter months, and once food source is used up, they will move on. Snipe are relatively site faithful, however only very few individual birds were recorded 3-5 individuals.

No Annex I bird species were recorded using the site. One species, Redwing, is listed as Near Threatened on the IUCN Redlist.

No waders, waterbirds, gulls or raptors were recorded using the site.

Overall, the site is of Local importance lower for birds.

Table 11-8: Bird species recorded during surveys.

Species	Scientific name	BoCCi (Season)
Woodpigeon	<i>Columba palumbus</i>	Green (B)
Snipe	<i>Gallinago gallinago</i>	Red (B/W)

Magpie	<i>Pica pica</i>	Green (B)
Rook	<i>Corvus frugilegus</i>	Green (B)
Hooded Crow	<i>Corvus cornix</i>	Green (B)
Blue Tit	<i>Cyanistes caeruleus</i>	Green (B)
Great Tit	<i>Parus major</i>	Green (B)
Wren	<i>Troglodytes troglodytes</i>	Green (B)
Starling	<i>Sturnus vulgaris</i>	Amber (B)
Song Thrush	<i>Turdus philomelos</i>	Green (B)
Redwing	<i>Turdus iliacus</i>	Red (W)
Blackbird	<i>Turdus merula</i>	Green (B)
Robin	<i>Erithacus rubecula</i>	Green (B)
Pied Wagtail	<i>Motacilla alba</i>	Green (B)
Chaffinch	<i>Fringilla coelebs</i>	Green (B)
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green (B)
Greenfinch	<i>Chloris chloris</i>	Amber (B)
Linnet	<i>Linaria cannabina</i>	Amber (B)
Goldfinch	<i>Carduelis carduelis</i>	Green (B)

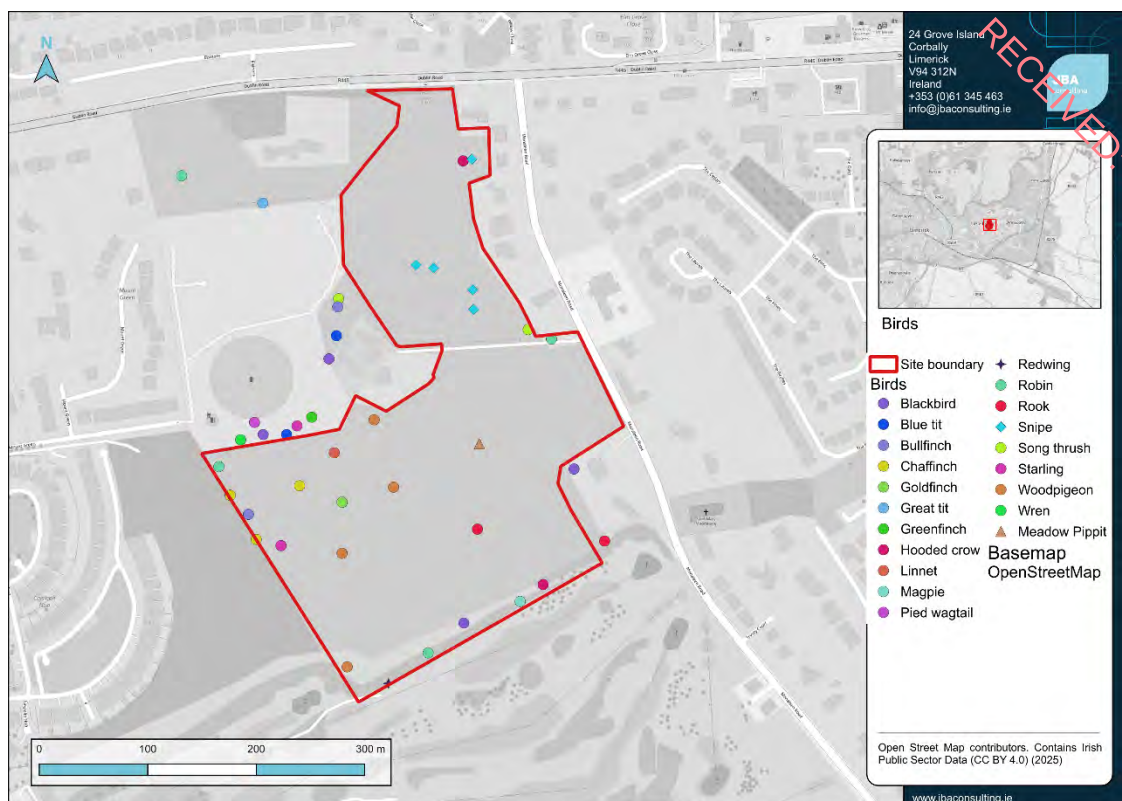


Figure 11-7: Wintering bird survey species distribution.

11.4.2 Breeding Bird

Breeding bird surveys were carried out on 28 April, 29 May, and 6 August 2025. The conditions were mild with temperatures ranging from 15°C to 21°C.

A total of 19 different species were recorded (Table 11-8), comprised of expected garden and farmland birds of which 74% (14 species) are green listed, 21% (4 species) amber listed, and 5 % red (1 species) listed.

Species of interest include:

- Meadow Pipit Red list (BoCCI) and Near Threatened (IUCN Red List).
- Willow Warbler, Greenfinch, Goldcrest and Linnet Amber list (BoCCI).

Only one Meadow Pipit was recorded, and nesting was not confirmed. Whilst the site holds some potential, management practices mean that they are unlikely to be successful breeders. Willow Warbler, Greenfinch, Goldcrest and Linnet all use rough grassland, scrub, bushes or trees for foraging and breeding.

No Annex I bird species were recorded using the site. One species, Meadow Pipit, is listed as Near Threatened on the IUCN Redlist.

Overall, the site is of Local Importance (Lower) for breeding birds.

Table 11-9: Breeding bird survey results.

Species	Scientific name	BoCCi (Season)
Woodpigeon	<i>Columba palumbus</i>	Green (B)
Buzzard	<i>Buteo buteo</i>	Green (B)
Blue Tit	<i>Cyanistes caeruleus</i>	Green (B)
Great Tit	<i>Parus major</i>	Green (B)
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber (B)

Species	Scientific name	BocCi (Season)
Chiffchaff	<i>Phylloscopus collybita</i>	Green (B)
Blackcap	<i>Sylvia atricapilla</i>	Green (B)
Goldcrest	<i>Regulus regulus</i>	Amber (B)
Wren	<i>Troglodytes troglodytes</i>	Green (B)
Song Thrush	<i>Turdus philomelos</i>	Green (B)
Blackbird	<i>Turdus merula</i>	Green (B)
Robin	<i>Erithacus rubecula</i>	Green (B)
Pied Wagtail	<i>Motacilla alba</i>	Green (B)
Meadow Pipit	<i>Anthus pratensis</i>	Red (B)
Chaffinch	<i>Fringilla coelebs</i>	Green (B)
Greenfinch	<i>Chloris chloris</i>	Amber (B)
Linnet	<i>Linaria cannabina</i>	Amber (B)
Common Redpoll	<i>Acanthis flammea</i>	Green (B)
Goldfinch	<i>Carduelis carduelis</i>	Green (B)

11.4.3 Mammal

During each site visit, any evidence of mammals was recorded. Furthermore, trail cameras were deployed at three locations across the site. These were left to record between:

- 4-19 March
- 28 April – 15 May
- 16-26 June

One of the camera traps was set to record over a hole in the base of the hedge. This revealed that there was a fox den present and triggered the camera 5515 times. These data were excluded from the overall counts.

A total of 13559 events were triggered, of which 698 were mammals (5%). Of these 93% were of foxes, 2% hedgehog, 1 % mice and rats, and 4% domestic cats.

The low diversity in recorded mammals, and low frequency of records would indicate low overall importance of the site to mammals. Fox are an adaptable species and can live in urban environments and successfully breed as recorded on site. Hedgehog is sensitive to habitat fragmentation but has adapted and can live in urban settings.

No signs of Badger use or Badger setts, or any other protected mammal species was recorded during the site visits. Other than Hedgehog, no sign of protected mammal was recorded during the site visits or on camera.

Overall, the site is of Local Importance (Lower) for mammals due to the low diversity and infrequent presence of species protected under the Wildlife Act.

11.4.4 Bats

Two approaches were taken to assess the level of bat activity within the site, this includes active bat surveys and the deployment of static bat detectors were deployed. Furthermore, trees and hedges that are to be removed were assessed for bat roost potential.

11.4.4.1 Active Surveys

Transect surveys were carried out on 15 May, 16 June, 6 August.

Transect surveys involved walking a set route around the whole site in order to detect activity across the different habitat types. The site was split between two surveyors, each working either North or South areas.

Bat activity was relatively consistent across the surveys indicating a likely local resident aggregation. Four bat species, Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Natterer's bat were recorded using the site.

The Pipistrelles and Leisler's bat are expected in this type of semi urban environment as they are relatively light tolerant.

Natterer's bat was unexpected due to its relative light intolerance and preference for woodland, mature hedgerow and pasture habitats. This species seems to be closely linked with agricultural practices (Boston et al. 2011).

Natterer's bat were only recorded in May, only recorded in low numbers.

Bats were recorded commuting and foraging mainly along the boundary features and around the edges of patches of tall scrub/ tree areas.

	15/05/2025	17/06/2025	07/08/2025
Natterer's bat	✓	✗	✗
Leisler's bat	✓	✓	✓
Common Pipistrelle	✓	✓	✓
Soprano Pipistrelle	✓	✓	✓

11.4.4.2 Passive surveys

Static bat detectors (Chorus, Titley Scientific) were left to record between 15 - 19 May and 16 - 25 June 2025.

Four bat species, Common and Soprano Pipistrelle, Leisler's Bat, and Natterer's Bat were recorded. Activity was dominated by Soprano Pipistrelle, peaking at 992 passes on 15 May. Soprano Pipistrelle accounted for 69% of the recorded calls, Common Pipistrelle accounted for 23%, Leisler's Bat for 7.5%, whilst Natterer's Bat accounted for less than 0.5%.

During the June recording, Soprano Pipistrelle accounted for 10% of the recorded calls, Common Pipistrelle accounted for 77%, Leisler's Bat for 12%, and Natterer's bat was not recorded.

Table 11-10: Bat echolocation passes recorded during 15-19 May 2025.

	15-May	16-May	17-May	18-May	19-May
Leisler's bat	106	13	19	169	11
Natterer's bat	6	0	0	1	2
Common Pipistrelle	83	328	213	274	72
Soprano Pipistrelle	992	523	576	458	333
Totals	1187	864	808	902	418

Table 11-11: Bat echolocation passes recorded during 16-25 June 2025.

	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun
Leisler's bat	56	88	110	79	51	63	40	136	110
Common Pipistrelle	368	416	427	260	581	684	599	636	654
Soprano Pipistrelle	34	52	76	18	79	107	56	81	108
Totals	458	556	613	357	711	854	695	853	872

11.4.4.3 Potential Roost Features

To facilitate and accommodate the proposed development individual trees, tree groups and hedges will likely need to be removed. All tree features to be removed as identified in the tree assessment report were investigated for potential roost features to determine whether any roost may be affected. Potential roost features include loose bark, cracked branches, holes and ivy cover. Based on the number of features, and type of feature different strategies for mitigation may be required. Trees presented few roost features. Broadleaf trees tended to have some ivy cover, of varying thickness. However, the ivy was generally young growth, providing generally poor-quality cover. The conifers, when individual trees presented dome broken limbs providing cracks and holes that could be exploited by bats. Some of the trees also had some ivy cover. The conifer hedges (e.g. TG4) presented a dense network of small branches, and whilst visibility was poor, they present overall negligible roost features. The hedgerow section (H1) is gappy, with a mix of Hawthorn, Sycamore and Willow. All the trees are small, with some Ivy growing on the hawthorn. However, this hedge provides little cover for roosting bats. Details of features are presented in TABLE CROSS REF.

Overall, the trees to be felled present negligible to low roost potential.

Table 11-12 List of trees to be removed from site with notes on bat roosting features

Tree ID	Tree Species	Number of Trees	PFR
569	Sycamore (<i>Acer pseudoplatanus</i>)	1	Light Ivy cover; negligible roost opportunities
570	Sycamore (<i>Acer pseudoplatanus</i>)	1	Light Ivy cover; negligible roost opportunities
571	Sycamore (<i>Acer pseudoplatanus</i>)	1	Light Ivy top to bottom cover; negligible roost opportunities
572	Sycamore (<i>Acer pseudoplatanus</i>)	1	Light Ivy top to bottom cover; adjacent to street light. negligible roost opportunities
582	Horse Chestnut (<i>Aesculus hippocastanum</i>)	1	No PRF – very light ivy cover
583	Sycamore (<i>Acer pseudoplatanus</i>)	1	No PRF – very light ivy cover
584	Leyland cypress (<i>Cupressus leylandii</i>)	1	No visible features; generally unsuitable type of tree.
585	Deodar Cedar (<i>Cedrus deodara</i>)	1	Light ivy cover. Negligible PFR
TG2	Leyland Cypress (<i>Cupressus leylandii</i>)	5	Generally featureless trees; unsuitable for PFR
TG3	Monterey Cypress (<i>Cupressus macrocarpa</i>)	Approx. 10	% large mature trees; 1 dead tree. Broken heads, branches. Ivy cover. PFR exist but low. Soft felling.
TG4	Lawson Cypress (<i>Chamaecyparis lawsonii</i>)	Approx. 14	Poor visibility; small dense branches. Some broken branches. Unlikely to support PFR.
593	Monterey Cypress (<i>Cupressus macrocarpa</i>)	1	Multistem mature tree. Some gaps/holes in bark fold; crevice in tree. Low PFR.
H1	Hawthorn (<i>Crataegus monogyna</i>)	15% of overall length	Hawthorn, sycamore willow hedge. Some ivy. Gappy hedges. Unlikely to support PFR

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Figure 11-8: Montrey Cypress tree ID 593



Figure 11-9: Sycamore row trees 569 to 572 along the Dublin Road

11.4.4.4 Summary

Four bat species were recorded across the site. Common and Soprano Pipistrelle and Leisler's bat are frequently encountered in urban and semi urban areas as they are relatively light tolerant. Natterer's bat was unexpected in this setting as they are light intolerant and more often associated with agricultural settings. However, this species may be under-recorded leading to knowledge gaps in habitat use and preference.

Whilst the site is used by bats, no clear evidence of roost was found on site.

Overall, the site is of Local Importance (higher value) for bats due to the presence in low numbers of nationally and internationally common species.

11.4.5 Habitats

The site was primarily composed of agricultural grassland, treelines, scrub, and adjacent small woodland areas (Table 11-13).

No EU Habitats Directive Annex I habitats were found to be present within the site, and no flora present on the Flora Protection Order 2022 were recorded.

Table 11-13: List of habitats recorded within and around the proposed project area

Habitat	Fossitt
Improved agricultural grassland	GA1
Buildings and artificial surfaces	BL3
Recolonising bare ground	ED3
Scrub/Treeline mosaic	WS1/WL2
Treelines	WL2

Improved agricultural grassland

This grassland was the dominant habitat at this site (Figure 11-10). While it was wet and waterlogged underfoot, it still had signs of recent improvement and management, with no dominant Rush *Juncus* cover. Hence, despite the wet conditions, this habitat at the time of the field visit is not considered to be wet grassland. The dominant species included Perennial Rye-Grass *Lolium perenne*, Cock's-foot *Dactylis glomerata*, Common Bent *Agrostis capillaris* and Yorkshire Fog *Holcus lanatus*. Occasional herbs included Common Sorrel *Rumex acetosa*, Dandelion *Taraxacum agg*, Creeping Buttercup *Ranunculus repens* and Broad-leaved Dock *Rumex obtusifolius*.

This habitat is of less than local value due to the common type of habitat and poor species diversity.



Figure 11-10: Improved agricultural grassland (GA1)

Recolonising bare ground (ED3)

Areas of recolonising bare ground were located among the GA1 grassland (**Error! Reference source not found.**). These areas were cleared prior to the site visits and were recolonising at the time of the site visit, hence the activities that arose to these areas of bare ground are unclear. The areas of recolonising bare ground were dominated by Broad-leaved Dock and Creeping Buttercup. This habitat is of less than local importance.

Buildings and artificial surfaces (BL3)

The entrance to the site was along a tarmacked track leading up to a set of buildings. These are not within the red line boundary. Bryophytes and grasses, as well as other annual species are starting to recolonise as a result of disuse. This is of no ecological value.

Scrub (WS1)

This area corresponds to a patch of vegetation dominated by Gorse *Ulex europaeus* and Raspberry *Rubus idaeus*, with some grassland understory, lying between the site and the reservoir. This habitat is of less than local importance.

Scrub/Treeline mosaic (WS1/WL2)

There were treelines located along some of the site boundaries. This habitat is considered as a mosaic due to an understorey of scrub that was often associated with these treelines (Figure 11-11). The predominant tree species were Willows *Salix spp.* The scrub layer was dominated by Bramble *Rubus fruticosus agg.*, Gorse *Ulex europaeus* and Raspberry *Rubus idaeus*. This habitat is of Local Importance (Lower).



Figure 11-11: Scrub/Treeline mosaic (WS1/WL2)

Treelines (WL2)

Treelines were the predominant site boundary (Figure 11-12). They were dominated by a mix of native and non-native species including Beech *Fagus sylvatica*, Oak *Quercus spp.*, Blackthorn *Prunus spinosa* and Hawthorn *Crataegus monogyna*. Non-native species included Lawson's Cypress *Chamaecyparis lawsoniana*. Bramble, Honeysuckle *Lonicera periclymenum*, Ivy *Hedera hibernica* and Nettle *Urtica dioica* were the main constituents of the understorey and ground layers of the treelines.

This habitat is of Local Importance (higher) due to its potential to support breeding and wintering birds, and foraging and commuting bats.



Figure 11-12: Treelines (WL2)

11.5 Screening of Features

Ecological features that are screened in are then assessed for potential impact during construction and operation in the following sections.

Table 11-14: Screening of ecological features

Designated Site/Ecological Feature	Value	Screening
Lower River Shannon SAC	International	Screened out – Assessed in NIS
River Shannon and River Fergus Estuaries SPA	International	Screened out – Assessed in NIS
Improved agricultural grassland	Less than local	Screened out – poor quality grassland, common habitat type
Scrub/Treeline mosaic	High Local	Screened in – habitat for birds, bats, mammals
Scrub	Low local	Screened in – habitat for birds, bats, mammals
Recolonising bare ground	Less than local	Screened out. Poor quality reverting habitat. Low species diversity.
Treelines	High Local	Screened in – habitat for birds, bats,

Designated Site/Ecological Feature	Value	Screening
		mammals
Protected Flora	NA	Screened out - none recorded
Bats	High Local	Screened in – Protected species
Mammals	Low Local	Screened in – Protected species
Breeding Birds	Low Local	Screened in – priority species
Wintering Birds	Low Local	Screened in – priority species
Invertebrates	Less than local	Screened out – site of low diversity to support invertebrates.

11.6 Cumulative Effects

Cumulative effects are the combined impacts on ecosystems, habitats, species, or ecological processes that result from the incremental effects of a proposed project or activity, when added to other past, present, or reasonably foreseeable future actions. These effects may be the sum of individual impacts; their interactions or a combination leading to outcomes that are greater, more persistent, or more widespread than anticipated

The following projects or plans were identified as potential sources of cumulative impacts:

- Limerick Development Plan 2022-2028
- Limerick Biodiversity Action Plan 2025-2030
- River Basin Management Plan 2018-2021
- Other projects granted planning permission in the vicinity of the site

11.6.1 Plans

11.6.1.1 Limerick Development Plan 2022-2028

This is the current development plan for Limerick and will continue to have effect until a new Development Plan for Limerick is prepared. The most recent plan was adopted by the Elected Members of Limerick City and County Council at a Special Meeting on 17th June 2022 and came into effect on 29th July 2022.

The purpose of each Development Plan or Strategy, is to set out the overall strategy for the proper planning and sustainable development of the area. The Plans seek to develop and improve, in a sustainable manner, the social, economic, cultural, and environmental assets of each county.

Biodiversity Conservation and Management supports are laid out in each Plan and Strategy to support these objectives. All Natura 2000 sites within the considered zone of influence of each Plan, must be assessed for potential to be impacted by each Plan and for there to potentially be in-combination impacts as a result of each Plan. County Development Plans are designed to be taken in conjunction with other similar plans and programmes, to have the overall effect of strengthening the management of and enhancing the protection and conservation of Natura 2000 sites. Specific statements, policies and objectives are formulated within each Plan to allow the Council to take appropriate steps to avoid the deterioration of Natura 2000 sites. Each Plan updates the policies and objectives of the Council in accordance with the Regional Planning Guidelines and National Policy. The outcomes of these Plans are Projects that will in themselves, require specific Natura Impact Assessments where relevant. Prior to any works commencing on a project that may impact the Natura 2000 network, the project shall be subject to a full Natura Impact Assessment in accordance with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC). This requirement is made explicit in each Plan.

Therefore, provided that any works that may occur as a result of the Plan are assessed for individually or included in the NIS for the Plan, the Plan should not significantly adversely affect relevant Natura 2000 sites in combination with the proposed project.

11.6.1.2 Limerick Biodiversity Action Plan 2025-2030

The Limerick Biodiversity Action Plan 2025-2030 sets out a five-year framework for urgent conservation, restoration, and community engagement, focusing on halting biodiversity loss and promoting ecosystem services across the region. It aims to create a Limerick where biodiversity thrives, with all sectors and stakeholders collaborating to restore, protect, and enhance nature.

These guidelines provide best practice guidance to local authorities on preparing and implementing biodiversity conservation actions within their functional area.

These actions to address biodiversity loss in the county, while fully intended to have a positive impact, may have the potential to have in-combination or cumulative effects with the current proposed project. A thorough list of these potential actions can be found in Table 2-1 of the Appropriate Assessment report that was conducted for this plan (Fehily Timoney 2024). Such planned actions could have the following impacts on the receiving environment and Natura 2000 sites (even if unintended consequences of a well-intended action):

- Habitat destruction/fragmentation/deterioration;
- Surface water run-off carrying suspended silt and contaminants, into local watercourses;
- Changes to groundwater quality, yield and/or flow paths;
- Plan related activities (noise, vibration, lighting, human presence, etc) leading to disturbance/displacement of species;
- Plan related activities leading to a reduction in species populations/density;
- Air pollution due to dust and other airborne emissions; and
- Disturbance and potential spread of invasive species.

Detailed assessment of the above impacts in relation to each action detailed in the BAP can be consulted in Table 3-1 of the (Fehily Timoney 2024) AA screening report.

As all actions contained in a BAP are planned to be a positive benefit to the receiving environment, especially in comparison to existing and baseline conditions, the actions, in and of themselves, are not anticipated to be a source of negative impacts on the receiving environment. The LBAP 2025-2030 was determined in the AA Screening to not likely have a significant effect on any European sites in Limerick.

Hence, this plan is not anticipated to have in-combination or cumulative effects with the proposed project.

11.6.1.3 River Basin Management Plan 2022-2027

The River Basin Management Plan (RBMP) for Ireland 2022-2027 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027 (DoHLGH 2022).

The WFD RBMP plans aimed to identify catchment measures to safeguard waters and meet the following environmental objectives of the WFD:

- Prevent deterioration of water body status
- Restore good status to water bodies
- Achieve protected areas objectives
- Reduce chemical pollution of water bodies

The River Basin Management Plan for Ireland 2022-2027 is not anticipated to contribute to cumulative or in-combination effects with the current project.

11.6.2 Projects

Planning applications in the vicinity of the proposed site which could act in combination with the proposed development were sought. Planning applications from the last three years that have been granted permission are considered. Applications for single one-off houses, home extensions, internal alterations and retention are not considered. These are presented in the table below.

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Table 11-15: Other projects granted planning permission within 2km of the proposed site within the last 3 years

Planning Reference	Summary of Development	Address	Application Status	Decision Date
2360263	A development comprising 13 no. residential units	Monaleen Heights, Newcastle, Castletroy, Co. Limerick	Conditional	20/09/2023
2360712	The redevelopment of an existing sports pitch changing rooms building, an additional surface water drainage system connecting to the existing campus system, a foul sewer connection from the changing rooms building to the adjacent existing campus system. A Natura Impact Statement (NIS) will be submitted to the Planning Authority with the application	University of Limerick, Castletroy, Limerick., V94T9PX	Conditional	22/11/2023

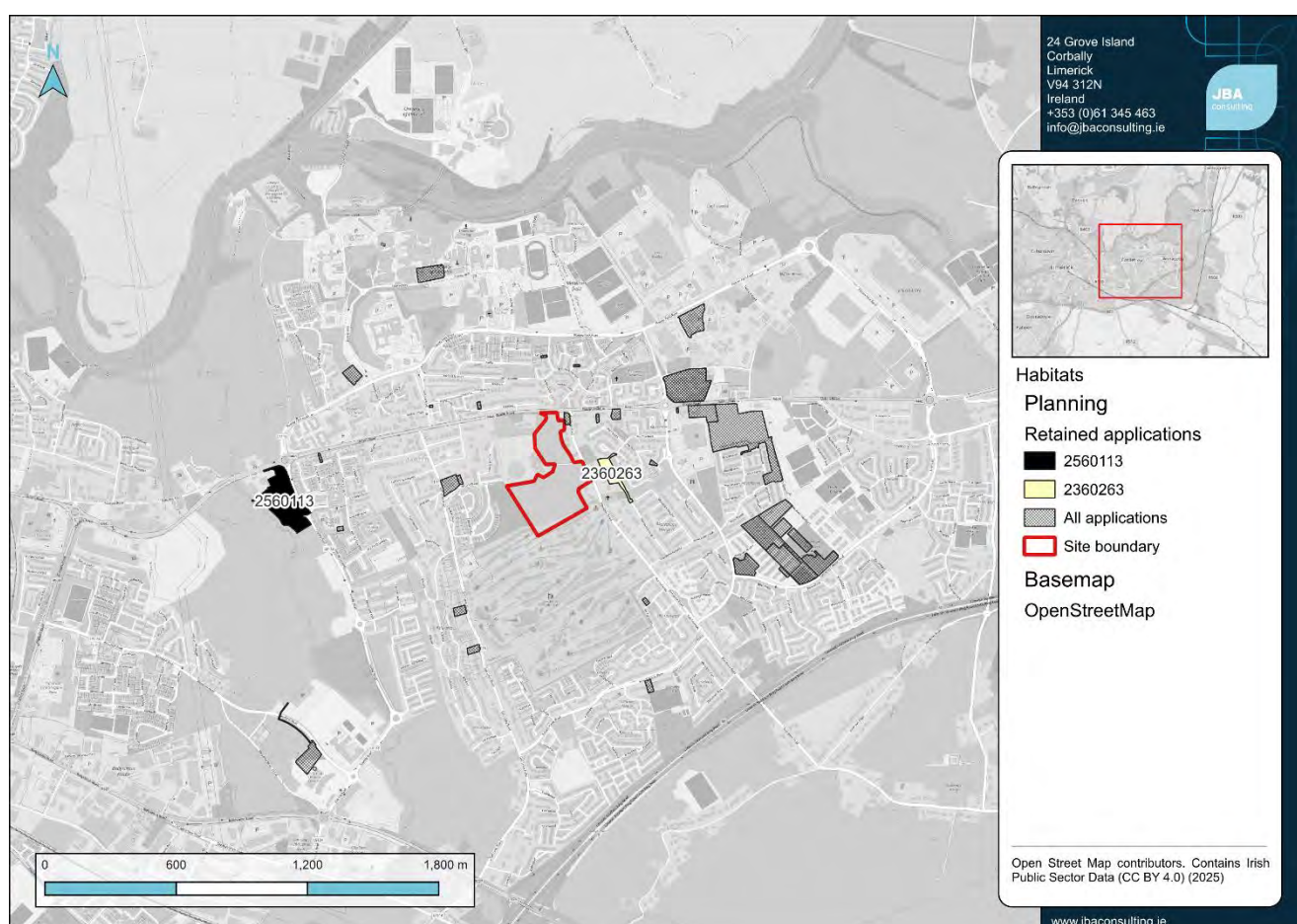


Figure 11-13: Planning application considered for cumulative impacts.

11.7 Potential Impact of the Proposed Development

11.7.1 Introduction

The potential impacts of the proposed project on the valued ecological features as described as screened in Table 11-14. The initial assessment considers the potential impact pathways and whether these apply to the ecological features. The impact assessment considers the project and the anticipated effects in the absence of any mitigation.

The potential impact from the construction works and the site's operation following the works are assessed under the following:

- Disturbance to habitats and species
- Habitat loss
- Impacts on water quality via surface-to-ground-to-surface water connection during construction.

The following sections describes the nature of immediate/short-term impacts, as well as any medium-or-long-term impacts, predicted for designated protected sites, habitats and species in the absence of implemented mitigation measures during the maintenance works.

11.7.2 Do Nothing Scenario

Do-nothing impacts are subject to a significant amount of uncertainty. In the absence of other interventions, the do-nothing option is likely to involve a slow regression of the area, with scrub and trees slowly progressing from existing locations. In the long term, impacts are likely to be modified by human responses to changes and no attempt is made here to predict these.

If the proposed works were not to go ahead and the present land management continues as is, then it would be expected that the land remained of agricultural use, the ecological value of the site would likely remain as recorded during the baseline assessment.

11.7.3 Construction Phase

The following sections describe the nature of the potential impacts predicted for protected sites, habitats and species in the absence of implemented mitigation measures during the project's construction phase.

11.7.3.1 Habitats

Treelines

The treelines around the site will experience disturbance to both the habitat and the species that rely on this treeline habitat.

There will be loss of approximately 160m of treeline to facilitate inclusion of pedestrian access and remove over hanging trees of low ecological value. A part from some Hawthorn, trees to be removed are non-native, and predominately ornamental species. Whilst there will be some tree planting in the urban landscape of the site, these will not hold the same role and function. Disturbance to the habitat and the species it supports will likely occur as a result of site lighting, noise from the excavation works and operation of machinery, and dust generation from the site excavations and construction. This dust can affect the growth of vegetation and/or make the habitat less desirable for birds and mammals that use it.

Parts of the treelines that are to be removed will have **Long Term Significant Effects**.

Overall, across the site, impacts on treelines due to disturbance is expected to have **temporary, slight negative effects**.

Scrub

Areas of scrub are going to be impacted through direct habitat loss during the site excavation and construction of the houses on the site. This habitat of low local importance can be of importance for bird species observed on the site; for

example, Linnet *Linaria cannabina*, Greenfinch *Chloris chloris* and Redwing *Turus iliacus*. However, scrubby areas in the broader context of the surrounding landscape are relatively well represented in both the surrounding countryside of Limerick, but also in areas of the city which have not yet been developed. Species may be displaced from the area, but population will not be threatened by the development of the site.

Hence, impacts on scrub habitat due to direct loss is expected to be **permanent, not significant negative effect**.

Scrub/Treeline mosaic

To the north-east of the site a mosaic of both scrub, largely of Gorse, and a treeline of Willow was present. This mosaic had many layers, including the tree and shrub layer, hence likely provided both foraging and potential breeding habitat for many bird species. Hence, it is a habitat of high local importance. As the boundary fringes this habitat, the potential impacts may include direct habitat loss, and disturbance due to noise, light and dust. These disturbances, during construction (regardless of whether the habitat is removed or retained) will make the habitat less desirable as a bird breeding habitat.

Hence, construction impacts on this habitat mosaic during construction are expected to be **temporary, slight negative effects**.

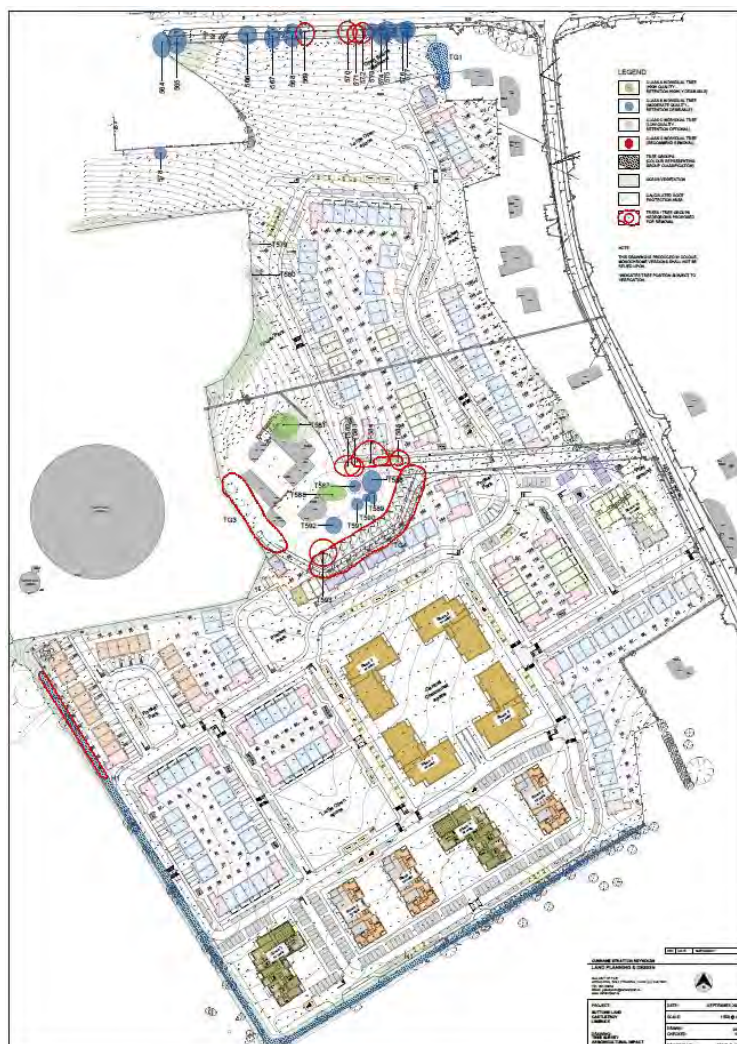


Figure 11-14: Proposed trees and treeline vegetation removal.

Fossitt Habitat Type	Potential impact type	M ² site / linear meter	M ² loss due to project / linear meter	M ² retained / linear meter	Percentage Retained

GA1 – Improved Agricultural Grassland	Significant. Permanent habitat loss.	98,000	98,000	0	0%
WS1 - Scrub	Significant. Permanent habitat loss. Impact on breeding birds and invertebrates.	725	725	0	0%
WL1 - Hedgerows	Moderate. No direct habitat loss anticipated. Light and noise disturbance to bats, birds and mammals.	390	0	390.	100%
WL2 - Treelines	Temporary, slight negative effects Some habitat loss; some compensatory planting.	490	160	330	70%
<i>WS1/WL2 Scrub/Treeline mosaic</i>	temporary, slight negative effects.	270	40	230	85%

11.7.3.2 Protected Species

Bats

The site exhibited low bat activity and low bat diversity, with the recorded species expected in this suburban environment. Some trees and treelines are to be removed which may impact on feeding and commuting corridors. The trees exhibited negligible to low potential for roosts.

There is potential for bat roosting activity in mature trees along the southern treeline and in the adjacent golf course, as well as an old church nearby, but these will not be affected by the development. Bat roosts are likely to be present in the area, but none were recorded on site.

The grasslands and treelines, provide commuting and foraging habitat for local bat species and therefore the site plays a functional role for local bat populations. Hence, construction impacts on bat species would be direct habitat loss of the grassland foraging area, and noise, light and dust disturbance to the adjacent treelines that may be used as commuting areas.

Construction activities are expected to result in direct habitat loss of grassland foraging areas and disturbance to adjacent treelines used for commuting. These include noise, artificial lighting, and dust generation, which may temporarily reduce habitat quality and deter bat activity. External lighting during the construction phase poses a potential minor impact on individuals using the site, although bats in this urban fringe setting may already be habituated to existing lighting along Monaleen Road. Noise effects will be limited to diurnal hours, with no nocturnal works planned, and dust-related impacts are expected to be short-term.

Therefore, in the absence of appropriate mitigation for lighting and noise during the construction phase, there **are likely to be temporary slight, negative impacts** for bats.

Mammals

There will be an overall loss of foraging habitat on site for local mammal species due to the main body of the site being altered. Construction impacts would be direct habitat loss of the grassland and scrub areas as well as indirect effects through noise and light disturbance from construction equipment.

During construction, removal of vegetation and excavation work could be detrimental to mammals on site, leading to loss of habitat and entrapment risk. However, there is a poor representation of mammal species, with only one confirmed species, Hedgehog, protected by the Wildlife Act. Small mammals such as Pygmy Shrew, Stoat or Pine Mammal may also use the site although none were recorded.

Therefore, in the absence of appropriate mitigation, **there is likely to be temporary slight, negative impacts** for these mammal species.

Birds

Bird surveys revealed the presence of a mix of common garden and farmland birds using the site either during the winter, during the summer or year-round. Breeding season surveys identified Willow Warbler and Stonechat, both listed as Amber on the Birds of Conservation Concern List. Both of these species were breeding on site.

Wintering surveys confirmed the presence of Snipe, red listed on the BOCCI list. Snipe typically utilise damp grassland and marginal habitats for feeding and roosting.

The proposed development will result in the loss of the main grassland area, removal of several trees, scrub, grassland, and a portion of hedgerow, leading to direct habitat loss. Furthermore, construction-related disturbance - including noise, artificial light, and vibration - may affect bird activity in retained habitats, particularly during sensitive periods such as breeding and overwintering. Dust deposition can reduce vegetation quality, while lighting may disrupt natural behaviours such as roosting and foraging.

The site and the habitats provide a small island of territory for these listed species, but the area is not of sufficient size or quality to support large aggregations of birds. And remains marginal.

In the absence of mitigation during the construction phase, the proposed development may result in displacement of sensitive species and reduced habitat suitability that are likely to have a **temporary slight, negative impact**.

Snipe will likely be subject to **permanent negative impact** through the change of habitat, however agricultural grasslands are common in the surrounds of Limerick and therefore they are unlikely to be affected on a population level..

11.7.3.3 Invasive Non-native Species

One Medium Impact Invasive species, Butterfly Bush, was observed along the site boundary to the North, adjacent to the water reservoir. This species is widely distributed in the urban areas of Limerick.

The proposed development has a likelihood of causing a further spread of invasive non-native species. This spread would be of a **long-term, slight negative impact**.

11.7.4 Operation Phase

11.7.4.1 Habitats

Treelines

Treelines may be impacted by additional lighting, cutting, and human disturbance affecting both the habitat and the species that depend on them. Landscaping will reinforce some of the treelines, with gaps being filled. Should landscaping species used not be of Irish origin, then there is the possibility of introducing pathogens, and species of genetics that are non-suitable to the area. However, this area is in an urban setting, surrounded by development and therefore subject to light and noise disturbance.

Impacts on treelines are expected to be **permanent, slight negative effects**.

Scrub/Treeline mosaic

The scrub-treelines mosaic may be impacted by additional lighting, cutting, and human disturbance affecting both the habitat and the species that depend on them.

Impacts on this habitat are expected to be **permanent, slight negative effects**.

11.7.4.2 Fauna

Bats

Operation of the site will lead to increased light in the area, with streetlighting and lighting from domestic dwellings illuminating the surroundings. None of the trees or treelines to be removed are likely to support roosts of significant numbers of bats. Some of the lost treelines will result in lost commuting habitat, and the loss of grassland area will result in the loss of foraging habitat. The site hosts a small diversity of bats, most of which are commonly found in urban areas.

As far as practical and being cognisant of safety concerns, the proposed lighting plan minimises illumination of the vegetated boundaries. Proposed light columns and fittings are in line with the bat lighting guidance.

The operational phase is expected to have **permanent moderate effects** due to change in site use, loss of some treelines, loss of foraging areas and introduction of lighting.

Mammals

Operational impacts include the loss of foraging habitat, loss of treelines, introduction of lighting and increased human population.

Increased human population will likely lead to an increase in pets which are likely to have an impact on wildlife, increased noise levels creating disturbance, and an increase in the number of vehicles potentially leading to wildlife strikes. Lighting may act as a deterrent to some species, although Fox and Hedgehog are commonly found in urban areas. The loss of the main grassland area will result in the loss of foraging, commuting and general inhabitation habitats.

As a result of the development **permanent, slight negative effects** on local mammals are expected.

Birds

Operational impacts include the loss of foraging habitat, loss of treelines, introduction of lighting and increased human population. Increased human population will likely lead to an increase in pets which are likely to have an impact on wildlife, increased noise levels creating disturbance. Lighting may act as a deterrent and/or interfere in the circadian activity of some species. The loss of the main grassland area will result in the loss of foraging, commuting and general inhabitation habitats.

There will be a loss of wintering habitat for Snipe, and Breeding Habitat for Meadow Pipit. However, the site is of marginal importance to these species.

As a result of the development **permanent, slight negative effects** on local bird species are expected.

11.7.4.3 Invasive Non-native Species

One Medium Impact Invasive species, Butterfly Bush, was observed along the site boundary to the North, adjacent to the water reservoir. This species is widely distributed in the urban areas of Limerick.

Hence, without mitigation measures, the proposed development has a likelihood of causing a further spread of invasive non-native species. This spread would be of a **long-term, slight negative impact**.

11.8 Mitigation Measures

The following mitigation is recommended to ensure that the proposed development does not adversely impact on the ecological receptors outlined in Section 4.

Mitigation measures for anticipated impacts on ecological features are outlined below.

11.8.1 Construction Phase

11.8.1.1 Water Quality

Relevant legislation and best practice guidance that have been considered includes but not limited to the following:

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- Local Government (Water Pollution) Acts 1977-1990
- CIRIA C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (www.ciria.org);
- CIRIA Guidance C750D: Groundwater control: design and practice (Preene et al., 2016) (www.ciria.org);
- CIRIA C515 Groundwater control – design and practice, 2nd ed. (CIRIA, 2021 - www.ciria.org)
- CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2020 - www.ciria.org)

While no surface waters exist in or adjacent to the site that may receive a direct water quality impact during the construction phase, the groundwater may receive contamination as a result of excavation works. As this groundwater potentially provides a pathway to the River Shannon, protecting the quality of the groundwater is key to preventing aquatic pollution and any receiving conservation sites. Detailed mitigation measures are presented in the NIS and the CEMP and are summarised here.

- Minimise areas of exposed bare soil to avoid sediment runoff
- Minimise exposure of bare rock to the elements to minimise risk of infiltration
- Seal excavations as soon as feasibly possible
- Pump water out of excavations and prevent infiltration
- Line excavations with membrane to prevent cementitious residues leaching into the water
- Excavations and earthworks should not be carried out in poor weather conditions and limited as far as reasonably practical to the drier months of the year.
- Any fuels or chemicals to be stored in double sealed tanks with bunds to capture any leakage.
- Refuelling of machinery or dispensing of chemicals will be conducted over drip trays or on an impermeable surface.
- Oil booms and oil soakage pads will be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. Such accidental discharges will be cleaned up and dealt with immediately.

A Surface Water Management Plan will be presented to the planning authorities, despite the lack of surface waters, as surface water generated on site, may ultimately end up picking up contaminants and entering the underlying groundwater body.

Where possible, stockpiles of excavated material should not be stored in areas where the groundwater permeability is high and/or the groundwater vulnerability is high.

Drainage ditches should be constructed in areas where groundwater penetration may be high to direct this water away from these areas, especially when excavations are taking place, subject to the details in the SWMP.

Drainage water should be attenuated in an area where there is at least 1m of till between the attenuation area and the groundwater. Alternatively, drainage water shall be pumped to a silt buster or to the foul water network and treated appropriately before being discharged.

Landscape and seeding of the site shall be carried out as early as possible.

11.8.1.2 Concrete Management Procedures

Cement can have serious detrimental effects on aquatic ecology and water quality through altering pH and increasing sediment load. This can lead to reduced growth rate of aquatic flora, increased toxicity towards fish and other organisms. Therefore, it is paramount that any concrete mixing on site is prevented from entering the waterways. This includes wash water from the cleaning of equipment (EirGrid 2016).

The following measures will be implemented to prevent liquid concrete/cement entering freshwater aquatic environments.

- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
- Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
- Raw, uncured, or waste concrete will be stored appropriately prior to disposal by licenced contractor.
- The contractor's construction methodology will require the use of precast elements where practical.
- The use of secondary protection shuttering for concrete pours.
- All pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.
- A geotextile sheet will be laid within the boundaries of the foundation to prevent pollutant entries into the groundwater, with permeability of less than 1×10^{-8} m/s.

The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in:

- EA (2011) *Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters*.

11.8.1.3 Pollution Control and Spill Prevention

In the event of a spill the Contractor will ensure that the following procedure are in place:

- Emergency response awareness training for all Project personnel on-site works.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment.
- Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency.

A minimum stock of spill kits will be maintained at all times and site vehicles will carry spill kits at all times. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:

- Absorbent granules.
- Absorbent mats/cushions.
- Absorbent booms.
- Track-mats, geotextile material and drain covers.
- All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.

- All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following:
- 110% of the capacity of the largest tank or drum within the bunded area, or
- 25% of the total volume of substances which could be stored within the bunded area.
- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.
- Designated locations for refuelling are within Site Compound.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Damaged or leaking containers will be removed from use and replaced immediately.

Disposal:

Used material disposed of in accordance with the Waste Management Plan. All used spill materials will be placed in a bunded container in the contractor's compound. The material will be disposed of by a licenced waste contractor at a licenced facility. Records will be maintained by the environmental site manager.

Plant:

- Absorbent material shall be used with pumps and generators at all times.
- Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.

11.8.1.4 *Terrestrial Mammals*

- A pre-construction site walkover will be carried by an experienced ecologist to ascertain that no setts, dens or other features supporting breeding mammals are on site.
- Should any be detected, then appropriate measures must be put in place. These will be determined by the site ecologist, following best practice guidelines.
- No clearance of scrub, treelines, trees and similar types of vegetation shall occur without prior checks for mammals.
- Areas to be cleared of vegetation shall be checked for the presence of mammals prior to removal of any vegetation.
- No excavation shall be left unprotected to avoid mammals become entrapped. Excavation shall be filled or covered, alternatively, an escape route will be provided. This can be in the form of a plank leading from the bottom to the top at an angle of no more than 45 degrees.
- Pipes will be capped when not in use
- Use of lighting will be limited to active areas of work, limited to normal working hours, and a minimum amount of dark hours will be maintained between 23:00 and 07:00.
- Quiet equipment shall be used as much as feasibly possible, using up to date, well serviced equipment.
- The site will be maintained free of waste; appropriate bins will be provided for different types of construction waste, and segregated food waste bins that will be kept in a closed position when not in use.

11.8.1.5 *Birds*

- No clearance of vegetation shall be carried out during the statutory bird nesting season – 1 March to 31 August inclusive. Should vegetation need to be cleared during that time, nest checks by competent ornithologists shall be carried out, and each nest will be marked off with no works permitted until the end of the nesting.
- Construction lighting shall be reflected downwards and only face the construction area. They will be cowed to prevent excessive light spillage during construction. They will be used only during normal construction hours.

The lighting will be directed away from sensitive ecological receptors and structures utilised by protected species.

- Noise will be kept to the minimum with machinery switched off when not in use.
- Quiet equipment shall be used as much as feasibly possible, using up to date, well serviced equipment.
- Sources of permanent construction noise such as pumps or generators shall be shielded with an acoustic barrier to minimise their effects.

11.8.1.6 Bats

- Use of lighting will be limited to active areas of work, limited to normal working hours, and a minimum amount of dark hours will be maintained between 23:00 and 07:00.
- The lighting will be directed away from sensitive ecological receptors and structures utilised by protected species.
- Trees will be soft felled, with no same day mulching of deciduous trees.
- Noise will be kept to the minimum with machinery switched off when not in use.
- Quiet equipment shall be used as much as feasibly possible, using up to date, well serviced equipment.
- Sources of permanent construction noise such as pumps or generators shall be shielded with an acoustic barrier to minimise their effects.

11.8.1.7 Mammals

- Use of lighting will be limited to active areas of work, limited to normal working hours, and a minimum amount of dark hours will be maintained between 23:00 and 07:00.
- The lighting will be directed away from sensitive ecological receptors and structures utilised by protected species.
- No excavations to be left unprotected.
- Quiet equipment shall be used as much as feasibly possible, using up to date, well serviced equipment.
- Sources of permanent construction noise such as pumps or generators shall be shielded with an acoustic barrier to minimise their effects.

11.8.1.8 Invasive Non-native Species

The stand of Butterfly Bush will be removed prior to construction beginning. The bush can either be treated through stem-injection of herbicide, or through the cutting down to the stump, followed by stump treatment, with annual follow-up checks over three years to ensure the plant(s) are dead. Flower heads should be removed, bagged, and disposed of in an appropriate facility or manner, prior to the rest of the plant being treated.

Due to the risk of the introduction of INNS species on construction machinery biosecurity measures will be followed at all times. Any machinery being brought on-site should be thoroughly cleaned beforehand and be free of any plant or vector material.

Any machinery and equipment leaving the site will be clean and free from any vector material.

11.8.2 Operational Phase

Mitigation and enhancement measures proposed in this section should be implemented being cognisant of health and safety precautions. Careful consideration should be given to the design and location of the mitigation.

11.8.2.1 Pollinator friendly planting

The loss of the grassland habitat can be replaced in-part by the incorporation of small areas of native wildflower meadows into the landscape plan. The full replacement is obviously not possible but these new areas of habitat will likely be more diverse and potentially support a more diverse ecological network. support a will not be achieved, the incorporation of these meadow areas, which will potentially be more diverse than the grassland habitat lost, would be an important source for pollinators and other invertebrates, and bird and bat species that may feed on these invertebrates.

However, considerations regarding sourcing of the wildflower species are recommended. Due to recent research, wildflower seed mixes that are available commercially and being advertised as being 'Native' are not recommended. This recent research highlighted that few of the included species were actually native to Ireland and were not of Irish origin. Hence, it is recommended to source seed locally, either through replacement of excavated topsoil and/or transfer of hay from a nearby site onto the land.

It is a slow process, but over time, through annual cutting and removal of the cut material, the meadow areas may naturally become species rich after a few years with no additional input of seed material required. While this is a slow process, the grasslands would be more resilient, and with once or twice a year management, it will provide a wildflower area for many years, in comparison to the short-lived species contained in the commercial seed mixes.

These native meadow habitats could be developed on the proposed green spaces in the site plan. For example, these include grassy areas that may be used for amenity grass areas, as well as areas of grassy verge, while small, can provide additional areas for the development of a native species meadow. If the lack of space to facilitate the development of a native meadow is a concern, a dual-purpose grassland mosaic could be facilitated where areas of the grassland are allowed to establish itself for pollinators, while other areas of the grassland are maintained as amenity recreational areas.

11.8.2.2 Tree and hedge planting

Trees and hedge planting shall favour native species of Irish origin. Exotic ornamental plants should be restricted to planters in public spaces.

Hedges should incorporate species such as Hawthorn, Blackthorn, Spindle, Apple, and Holly to provide a temporal diversity in flowering and fruiting to favour a wide range of fauna. These habitats will also provide refuge for small mammals, birds, and invertebrates. Ornamental varieties of these species should be restricted to the parks and gardens within the development.

No species that have an invasive tendency shall be used. No schedule species shall be used.

Diversity of It is positive to see tree planting proposed in the proposed site layout, especially as it may compensate for any treeline species that may be lost during the construction phase. However, in the view of biodiversity enhancement, opportunities exist. While landscape and planting plans are not available at this stage, it would be recommended to ensure that the species pool used for the tree planting are predominantly species that are native to Ireland (and sourced in Ireland) and well represented in the surrounding landscape. This would ensure a greater incorporation of the proposed development to the surrounding landscape and its existing ecology. The use of native Irish tree species is preferable over the use of non-native ornamental trees.

11.8.2.3 Birds

The change in use of the site will likely lead to some bird species, such as Snipe, abandoning the site. However, measures to increase opportunities for other species, and provide some biodiversity benefits will be implemented.

In order to improve nesting potential for birds the apartment blocks shall be equipped with swift bricks/ artificial nesting sites for swifts. As these birds require clear flight lines, final location must be agreed upon by the site ecologist. A target of at least 10 nest sites per apartment block should be set, with detailed installations and final numbers agreed upon by the site ecologist.

Note that this requires a caller system to be installed so that Swifts find the sites. A derogation licence from the NPWS will be required, and therefore consultation between the site ecologist, Council ecologist, NPWS and Birdwatch Ireland is necessary. This is to obtain the required licence and ensure that the best location for the swift bricks is used in order to maximise chance of adoption of the site. Birds may take a years before using the site.

Installation of hirundine cups: these will be installed under the eaves of tall buildings. As far as reasonably practical these should be installed on the side of the buildings away from doors and windows to minimise risk of conflict with

homeowners. These will provide habitat for House Martins. A target of 10% of the buildings will be equipped with hirundine cups.

Health and safety considerations should be taken into account. Any feature attached to the outside of the building should be done so using appropriate fittings for the weight of the fixture, and ensure that it is securely fitted. Periodical maintenance should also be carried out.

11.8.2.4 Bats

Mature trees, hedges and treelines shall be retained as much as feasibly practical to retain any foraging, commuting or roosting features.

Trees to be felled shall be felled during the winter months, using soft felling to minimise the risk to bats.

Treelines that are removed to facilitate construction will be replaced, as much as feasibly possible. Furthermore, hedges and treelines will be maintained, with gaps planted, in order to obtain continuous dark linear features to support foraging and commuting bats.

At least 6 bat boxes shall be installed on mature trees in the retained hedges and treelines to increase roosting potential for the species using the site. Bat boxes are more likely to be used if they are located where bats are known to feed. Ideally, several boxes should be put up facing in different directions on sunny aspects to provide a range of warm conditions. Boxes should be put as high as possible to try and avoid predation from cats on the ground or nearby structures. Final location of the bat boxes should be determined by the site ecologist.

Lighting shall follow guidelines provided in ILP8 REF. It is noted that the Limerick City lighting policy calls for 4000k light features. These are not acceptable, and not best practice when considering ecological features. Where these are required for road safety reasons e.g. junctions, they should be considered, but all other areas should apply guidance developed by the ILP to minimise disturbance to bats, obtrusive lighting, and support the dark skies initiatives.

- At minimum:
- All luminaires shall lack UV elements
- Metal halide, compact fluorescent sources will not be used in exterior settings
- LED luminaires will be used
- A warm white light source (2700Kelvin or lower) will be adopted to reduce blue light component
- Light sources should feature peak wavelengths higher than 550nm
- Internal luminaires should be recessed where installed in proximity to windows to reduce glare and light spill
- Waymarking inground markers should be favoured over columnar lighting to delineate path edges
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, will be used
- Luminaires will be mounted horizontally, with no light output above 90° and/or no upward tilt
- External security lighting should be set on motion sensors and set to as short a possible a timer as possible (e.g. 1 or 2 minute)
- Use of motion sensors and light dimming for streetlights should be considered. Dark hours with streetlights switched off between 00:00 and 05:00 should also be considered especially if motion sensors and dimming is not applied.

11.8.2.5 Mammals

The development offers several opportunities to support Hedgehogs and other urban mammals, through thoughtful design and biodiversity-sensitive landscaping. These species rely on vegetated corridors, boundary features, and undisturbed green spaces for foraging, nesting and commuting. To maintain and enhance habitat connectivity, the inclusion of hedgehog-friendly fencing - with small access gaps at the base - will allow free movement between gardens and green areas, preventing isolation of populations.

The use of native planting schemes that provide cover, shelter and food sources (e.g. berry-producing shrubs, leaf litter zones) will further support mammal activity across the site. The creation of wildlife corridors linking green spaces will

facilitate safe commuting routes. Avoiding full enclosure of landscaped areas and reducing artificial lighting near vegetated edges will help minimise disruption to nocturnal species.

The boundary between the site and the Golf course should be maintained as a treelines/ hedgerow with any gaps filled with native plants. Cutting of the feature should be kept to a minimum, and only where necessary (e.g. trim the edges along the bottom 2m and leave overhanging and taller branches) to allow for the wildlife benefits of the hedgerow.

11.9 Residual Impact of the Proposed Development

11.9.1 Residual Impact

Residual ecological impacts are those that remain once the development proposals have been implemented. The main aim of the ecological mitigation, compensation and enhancement is to minimise or eliminate residual impacts.

11.9.1.1 Construction Phase

Preparatory and construction works will result in disturbance to the foraging and commuting habitat for protected species such as ground-dwelling mammals, bats and birds.

Implementation of mitigation measures during the construction works phase, along with good site management and construction practices will help to minimise any significant and/or permanent impact on the environment.

With the proposed mitigation implemented the residual impact during the construction phase is assessed to be of temporary negative impact on account of the disturbance to habitats of high local ecological importance, as well as the local protected species.

11.9.1.2 Operational Phase

The proposed remedial planting within the development, i.e., tree, hedge and shrub planting; development of native species meadows will help maintain the overall floral and faunal biodiversity of the site. Overall, the works will have an imperceptible residual impact on the biodiversity within and adjacent to the site.

11.10 Summary of Impact Assessment

11.10.1 EclA Table

Table 11-16 presents a summary of the impacts envisaged when mitigation approaches are included. Residual impacts are also described.

All other ecological impacts can be avoided, mitigated or compensated so there is no anticipated significant impact for the remaining species considered in the assessment.

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Table 11-16: Summary of Impacts; Mitigations; Significance of Residual Impacts

Ecological Feature	Impacts	Importance of Feature	Significance of impact without mitigation	Mitigation	Significance of Residual Impacts
Treelines	Loss of individual trees Noise/light/dust pollution and disturbance. Degradation of the habitat and its suitability for use by breeding birds and commuting bats.	High Local	Slight, negative impacts. / Permanent negative impacts	Pollution control measures outlined in Section 11.8.1.3. Avoidance measures for birds outlined in Section 11.8.1.5. Remedial native tree planting as outlined in Section 11.8.2.2 for lost trees from treeline.	Neutral to Slight positive residual impact during operational phase due to remedial planting.
Treeline/Scrub mosaic	Loss of habitat Noise/Light/Dust pollution or disturbance Degradation of habitat and its suitability for use by breeding birds	Low Local	Slight, negative impacts	Avoidance measures for birds outline in Section 11.8.1.5. Remedial native tree planting as outlined in Section 11.8.2.2.	Neutral to slight positive impacts during operation due to remedial tree planting and other landscaping.
Bats	Disturbance by noise/light Loss of roosting /foraging/commuting habitat during construction.	High Local	Slight, negative impacts	Avoidance measures for bats outlined in Section 11.8.1.6.	Slight, minor negative effects.
Birds	Disturbance by noise/light/dust. Loss of breeding/foraging/commuting habitat during construction.	High Local	Slight, negative impacts	Avoidance measures for birds outlined in Section 11.8.1.5.	Neutral to slight positive impacts during the operation due to the remedial tree planting, supplemental nest boxes.
Mammal	Direct loss of commuting/foraging habitat. Disturbance by noise and additional lighting.	High Local	Slight, negative impacts	Avoidance measures for mammals outlined in Section 11.8.1.7 and 11.8.2.5	Permanent, moderate negative effects during the operation phase due to potential disturbance.

11.10.2 Cumulative Impacts

As there are no significant residual impacts on ecological features (following mitigation measures) from this development, there is therefore no potential for other plans or projects identified in Section **Error! Reference source not found.** to act in combination with it. Therefore, significant cumulative impacts are not expected to occur on the ecological features within the proposed site.

11.11 Conclusion

The proposed development has been shown to potentially impact a number of different habitats and species with local importance (grassland; breeding birds; visiting Snipe, Treelines; Scrub/Treeline mosaics and bats). As with the Appropriate Assessment screening, there are no impacts anticipated on sites and species of international importance (i.e. Natura 2000 sites; species protected under EU Habitats and Birds Directives). Potential construction impacts on these ecological features were identified to be either by direct habitat loss; removal of trees from treelines and disturbance from either noise, increased lighting and dust pollution. Operational impacts include increased noise and lighting from the housing development.

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Appendix: Policy and Legislation

Policy and Legislation

The legislation discussed below is intended as a guide only and does not replace formal legal advice.

Biodiversity Policy Guidance

Ireland's current Biodiversity Action Plan (NBAP) 2023-2030 (NPWS 2024) is the fourth national plan, aiming to reverse biodiversity decline through a "whole of government, whole of society" approach. Its five strategic objectives are to adopt a collaborative approach, meet conservation and restoration needs, secure nature's contribution to people, enhance the evidence base for action, and strengthen Ireland's international biodiversity contributions. The plan includes actions such as expanding National Parks, tackling invasive species, and strengthening wildlife crime efforts.

Designated Sites and Nature Conservation

Statutory Designated Nature Conservation Sites

Sites with statutory designations receive varying degrees of legal protection under Irish statute, Wildlife Act 1976 -2021 and Wildlife (Amendment) Act (2023) and European Directives, the EC Birds Directive (2009/147/EC) and EC Habitats Directive (92/43/EC). The EU directives were transposed into Irish national law and subsequent amendments were revised and consolidated in the European Communities (Birds and Natural Habitats) Regulations 2011 and Irish Statutory Instrument 477/2011

There are a number of statutory designations used for sites of high nature conservation value in Ireland, which are applied depending upon the importance of the site in a local, regional, national or international context. These include:

- **National:**
 - Natural Heritage Area (NHA)
 - Wildfowl Sanctuary
 - Statutory Nature Reserve
 - Refuge for Fauna
- **European:**
 - Special Protection Area (SPA)
 - Special Area of Conservation (SAC)
- **International:**
 - UNESCO Biosphere Reserve
 - Ramsar Convention Site
 - National Park (Category II) Sites

Non-Statutory Designations

Non-statutory sites are afforded no statutory legal protection, but are normally recognised by local planning authorities and statutory agencies as being of local nature conservation value

A proposed Natural Heritage Area (pNHA) is an area deemed to be of special interest containing important wildlife habitat and often containing rare or threatened species. They may also be selected on the basis of their geology or geomorphology.

Protected and Notable Species

A number of species are protected under Irish and international legislation. In Ireland, primary protection is provided under the Wildlife Act 1976 – 2021 and Wildlife (Amendment) Acts 2023. Species of European importance receive additional protection in Ireland under the Birds and Natural habitats Regulations 2011.

This includes:

- All bird species
- Badger

- Bat species
- Deer species
- Hare species
- Hedgehog
- Otter
- Pine Marten
- Red Squirrel
- Common Newt
- Pygmy Shrew
- Stoat
- Dolphin species
- Porpoise species
- Seal species
- Whale species
- Natterjack Toad
- Common frog
- Common lizard
- Marine turtle
- Freshwater crayfish
- Freshwater pearl mussel
- Kerry slug
- Basking Shark

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Animal Welfare

The Animal Health and Welfare Act 2013 is legislation that concerns the health and welfare of all vertebrate animals, regardless of their legal status. A key provision is the Prevention of Cruelty whereby *A person shall not—*

(a) do, or fail to do, anything or cause or permit anything to be done to an animal that causes unnecessary suffering to, or endanger the health or welfare of, an animal, or

(b) neglect, or be reckless, regarding the health or welfare of an animal.

15.—(1) *A person shall not organise or cause or permit to take place any performance involving —
(g) any other activity that may cause unnecessary suffering to an animal and is prohibited by animal health and welfare regulations.*

Invasive Non-native Species

Invasive Non-native Species or Invasive Alien species are regulated by:

- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011
- Regulation (EU) 1143/2014 on the prevention and management of the introduction and spread of invasive alien species
- European Union (Invasive Alien Species) Regulations 2024 ([SI 374/2024](#))
- Regulation (EU) 2025/1422 to update the list of invasive alien species of Union concern (EU 2025/1422)

Rules are set out to prevent and manage the introduction and spread of Invasive Alien Species (IAS). IAS are plants or animals which have been transported outside their natural ecological ranges by humans, both intentionally and unintentionally, into a new environment, which can cause significant ecological and economic damage.



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 12: NOISE & VIBRATION

PROPOSED RESIDENTIAL DEVELOPMENT SUTTON

MONALEEN & DUBLIN ROAD CASTLETROY, LIMERICK

MARCH 2026



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12 NOISE AND VIBRATION

12.1 Introduction

This EIAR chapter assesses the potential noise and vibration effects associated with the proposed residential development at Sutton, Monaleen and Dublin Road, Castletroy, Limerick. The assessment has been undertaken in accordance with the relevant standards and guidance documents referenced throughout this chapter.

This chapter includes a description of the receiving noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impact associated with the proposed Project, during both the short-term construction phase and the permanent operational phase, on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter.

Mitigation measures are included, where relevant, to ensure the proposed Project is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

The study has been undertaken using the following methodology:

- An environmental noise survey has been undertaken in the vicinity of the subject site in order to characterise the existing baseline noise environment;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed Project;
- Predictive calculations have been performed for the construction phase of the proposed Project at the nearest sensitive locations to the Project Site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the proposed Project at the most sensitive locations surrounding the Site; and
- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the proposed Project.
- An inward noise assessment has been carried out to determine internal noise levels arising from existing external sources, specifically road traffic on the R445 Dublin Road and Monaleen Road. The assessment considers both open and closed window scenarios in accordance with BS 8233:2014 and relevant guidance.

12.2 Statement Of Authority

This chapter was prepared by Robert Holohan who has a BA(Hons) in Geography and Business Marketing from Maynooth University, and an MSc in Coastal and Marine Environments from the University of Galway. He has completed noise monitoring campaigns across numerous sites and holds a certificate from the Institute of Acoustics (IOA) in environmental noise monitoring. He has also contributed to various residential, industrial and infrastructure projects across Ireland through surveying, noise modelling and impact assessment. Robert is currently studying a Diploma in Acoustics from the IOA.

This chapter was reviewed by Jennifer Harmon who holds a BSc in Environmental Science and a Diploma in Acoustics and Noise Control. She is a full member of the Institute of Acoustics. Jennifer has worked as a consultant since 2000, specialising in acoustics since 2001 and has extensive knowledge in the field of environmental noise and vibration impact assessments, having prepared numerous noise impact assessments for various large scale residential, commercial, industrial and infrastructural projects throughout the country.

12.3 References

The assessment of effects has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration, which are set out within the relevant sections of this report. The

following guidelines were considered and consulted for the purposes of this report:

- ANC, IOA & CIEH (2017). ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development (hereafter referred to as ProPG: Planning and Noise).
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise (hereafter referred to as BS 5228–1);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration (hereafter referred to as BS 5228–2);
- BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (hereafter referred to as BS 7385–2);
- British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound hereafter referred to as BS 4142;
- Department of Housing, Planning & Local Government, 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment;
- European Commission (EC), 2017 Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report ;
- EC - Directive on Outdoor Noise Emissions 2000/14/EC;
- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022). (Hereafter referred to as EPA EIAR Guidelines 2022).
- International Organization for Standardization (ISO) 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors (hereafter referred to as ISO 9613 – 2);
- ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise;
- Limerick Agglomeration Noise Action Plan 2024–2028 (2025) ;
- World Health Organisation (WHO) 1999: Guidelines for Community Noise;
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration)

12.4 Methodology

12.4.1 Construction Phase Criteria – Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In order to set appropriate construction noise limits for the Project Site, reference has been made to BS 5228-1 of this document provides guidance on selecting appropriate noise criteria relating to construction works.

BS 5228-1 sets out guidance on permissible noise levels relative to the existing noise environment. The approach calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities, depending on context.

12.4.1.1 Residential NSLs: ABC Method

The approach adopted in BS 5228-1 calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a Construction Noise Threshold (CNT) noise value that, if exceeded at a location, indicates a potential significant noise impact is associated with the construction activities, depending on the context. Note that, in accordance with BS 5228-1 guidance, these assessment criteria are only applicable to residential receptors.

Table 12-1 sets out the values which, when exceeded, signify a potential significant effect at the facades of residential receptors. These are construction noise levels only and not the cumulative noise level due to

construction plus existing ambient noise.

Table 12-1 Example Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A ^{Note A}	Category B ^{Note B}	Category C ^{Note C}
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends ^{Note D}	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Note A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Note C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

Note D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

12.4.1.2 Proposed Construction Threshold Noise Levels

Taking into account the documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 12.5), BS 5228-1 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development:

- For residential NSLs it is considered appropriate to adopt 65 dB(A) CNT for daytime periods and Saturday mornings in accordance with Category A set out in Table 12-1.

12.4.1.3 Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 12-2 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration and adapted to include the relevant significance effects from the EPA EIAR Guidelines 2022.

In accordance with the DMRB Noise and Vibration document construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of effect will occur for a duration exceeding.

- Ten or more days or nights in any 15 consecutive days or nights, or
- A total number of days exceeding 40 in any six consecutive months.

Table 12-2 Description of the magnitude of impacts.

Construction Noise Level (CNL)	Magnitude of Impact (DMRB)	EPA Significance of Effect	Determination
Below or equal Baseline Noise Level	Negligible	Not Significant	Depending on range of CNL, duration and baseline noise level
Above Baseline and below or equal to CNT	Minor	Slight – Moderate	
Above CNT and below or equal to CNT + 5dB	Moderate	Moderate – Significant	
Above CNT + 5dB	Major	Significant – Very Significant	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stages.

12.4.2 Construction Phase Criteria - Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential noise impact of additional traffic on the surrounding road network, the following two guidelines are referenced; DMRB Noise and Vibration and the EPA EIAR Guidelines 2022. For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB Noise and Vibration document. Table 12-3 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 12-3 Classification of magnitude of traffic noise changes in the short-term

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

The DMRB guidance outlined will be used to assess the predicted increases in traffic levels on public roads associated with the proposed Project and comment on the likely effects during the construction phase.

12.4.3 Construction Phase Criteria – Vibration

Vibration standards address two aspects: those dealing with cosmetic or structural damage to buildings and those with human comfort. For the purpose of this project, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

12.4.3.1 Building Response

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2; and
- British Standard BS 7385-2

BS 7385-2 and BS 5228-2 advise that, for soundly constructed residential properties and similar light-framed structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS 5228-2 might need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The recommended transient vibration thresholds from BS5228-2 for the avoidance of cosmetic damage to light framed and residential buildings are summarised in Table 12-4.

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Table 12-4 Recommended Vibration Criteria during Construction Phase

Allowable vibration (in terms of PPV) at the closest part of sensitive property to the source of vibration, at a frequency of:		
Less than 15 Hz	15 to 40 Hz	40 Hz and above
15 mm/s	20 mm/s	50 mm/s

12.4.3.2 Human Perception

Human response to vibration stimuli occurs at orders of magnitude below those associated with any form of building damage, hence vibration levels lower than those indicated in Table 12-4 can lead to concern. Table 12-5 presents the significance table relating to potential effects to building occupants during construction based on guidance from BS5228-2, the DMRB Noise and Vibration document and the associated EPA EIAR significant ratings.

Table 12-5 Guidance on Effects of Human Response to PPV Magnitudes

PPV range	BS 5228-2 (Note A, B, C)	DMRB Impact Magnitude	EPA Significance Ratings
≥10 mm/s PPV	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.	Major	Very Significant
≥1 to <10 mm/s mm/s	Increasing likelihood of perceptible vibration in residential environments but can be tolerated at the lower end of the scale if prior warning and explanation has been given to residents	Moderate	Moderate to Significant
≥0.3 to <1 mm/s	Increasing likelihood of perceptible vibration in residential environments	Minor	Slight
<0.3 mm/s PPV	Vibration is unlikely to be perceptible in even the most sensitive situations for most vibration frequencies associated with construction	Negligible	Not Significant

Note A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

Note B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

Note C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472 (BS1 2008), and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

12.4.4 Operational Phase Criteria - Noise

12.4.4.1 Building Services Plant Noise – Existing Receptors in Surrounding Environment

The standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment is British Standard Institute BS 4142. This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in “background” noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

ambient sound level, $L_{Aeq,T}$

equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.

residual sound level, $L_{Aeq,T}$

equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.

specific sound level, $L_{Aeq,T}$

equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T.

rating level, $L_{Ar,T}$

specific sound level plus any adjustment for the characteristic features of the sound.

background sound level, $L_{A90,T}$

A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

The assessment procedure in BS 4142 is outlined as follows:

- 1. determine the specific noise level;
- 2. determine the rating level as appropriate;
- 3. determine the background noise level, and;
- 4. subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10 dB or more is likely to be an indication of a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise impacts are typically considered to be neutral.

12.4.4.2 Building Services Plant Noise - Receptors Inside the Proposed Development

In order to determine an appropriate noise criterion for residential receptors within the proposed development that will be built in future, guidance is taken from BS 8233. Recommended internal noise levels for residential settings are set out in the standard as follows:

Table 12-6 BS 8233 Recommended Internal Noise Levels

Activity	Location	Day (07:00 to 23:00hrs) dB $L_{Aeq,16hr}$	Night (23:00 to 07:00hrs) dB $L_{Aeq,8hr}$
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

For the purposes of this assessment, it is appropriate to derive external limits based on the internal criteria noted

in the above. This is done by factoring in the degree of noise reduction afforded by a partially open window; typical 15 dB attenuation is noted in this British Standard. Using this correction value across an open window, the following external noise levels would achieve the internal noise levels noted in Table 12-6 above.

- Daytime (07:00 to 23:00 hours) 50 dB $L_{Aeq,16hr}$
- Night-time (23:00 to 07:00 hours) 45 dB $L_{Aeq,8hr}$

12.4.4.3 Additional Traffic on Public Roads

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 12-7 offers guidance as to the likely impact associated with any particular change in traffic noise level based on the DMRB LA 111 Noise and Vibration and the EPA EIA 2022 Guidelines.

Table 12-7 Classification of magnitude of traffic noise changes in the long term

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0.0 – 0.9	Inaudible	Negligible	Imperceptible
1.0 – 2.9	Barely Perceptible		Not Significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Significant
10+	Doubling of loudness and above	Major	Very Significant

12.4.5 Crèche Playground

A creche area is proposed within the development site. Activities associated with this activity are not governed by any specific noise guidelines or standards. For the purpose of this assessment, the external noise levels set out in Section 12.4.4.2 above have been used to provide context of acceptable external noise levels at nearby NSLs.

12.4.6 Operational Phase Criteria - Vibration

The proposed Project is residential in nature, therefore there are no operational sources with the potential to generate any vibration impacts.

12.4.7 Inward Noise Impact

12.4.7.1 Limerick Noise Action Plan (NAP)

The County Limerick Noise Action Plan 2024 – 2028 (NAP) states that in order to give effect to National Policy Objective 65 of the National Planning Framework 2040, that the following strategic approach will be adopted by the Council:

“In the absence of Irish planning guidance local authorities in 2021 prepared Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential under a subgroup of the NIECE National Local Authority Noise Working Group. This draft guidance includes an overarching aspiration that good acoustic design should be implemented from the outset of the design of new residential developments and recommends the use of the ProPG approach to bringing people to noise and cognisance of BS 8233:2014 and the AVO guidelines.”

In addition, the following is provided

“All new applications for residential developments shall be assessed in accordance with the LDP objective

TR O54 (Noise Sensitive Development) and where there is the likelihood of an adverse noise impact near major roads that planning applications should be supplemented by an Acoustic Design Statement carried out by appropriately qualified acousticians and competent persons. The Acoustic Design Statement should demonstrate that all facets of the 'Professional Practice Guidance on Planning and Noise: New Residential Developments' (ProPG) have been followed."

In accordance with this NAP policy, the following Acoustic Design Statement (ADS) has been prepared to comply with the requirements of this policy.

12.4.7.2 ProPG: Planning and Noise (2017)

The ProPG Planning and Noise document outlines a systematic risk-based two-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

Stage 1 – Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and

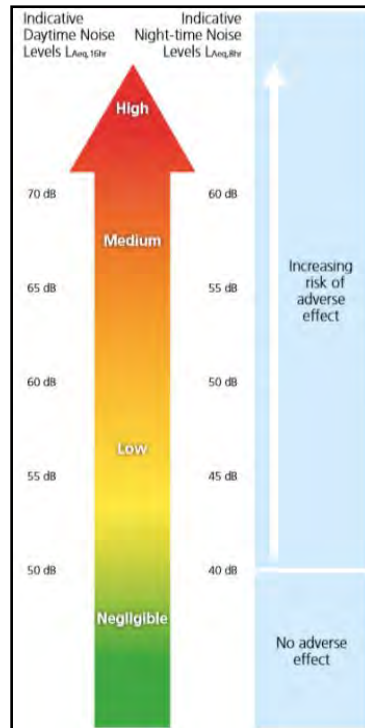
Stage 2 – Involves a full detailed appraisal of the proposed development covering four “key elements” that include:

- Element 1 – Good Acoustic Design Process;
- Element 2 – Noise Level Guidelines;
- Element 3 – External Amenity Area Noise Assessment; and
- Element 4 – Other Relevant Issues.

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium, or high risk, based on the pre-existing noise environment. Figure 12-1 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Element 2 of the ProPG Planning and Noise document sets out recommended internal noise targets derived from BS 8233. The recommended indoor ambient noise levels are set out in Figure 12-1 **Error! Reference source not found.** and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur. In addition to these absolute internal noise levels, the ProPG document provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.



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Figure 12-1 ProPG – Stage 1 Initial Risk Assessment Categories

The ProPG document provides the following advice with regard to external noise levels for amenity areas in the development:

“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed, and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$.”

12.5 BASELINE ENVIRONMENT

The site of the proposed Project is located within the Monaleen and Dublin Road, Castletroy, County Limerick. The surrounding environment is predominantly residential, bound to the north and east by residential areas along Monaleen Road and Dublin Road. To the south by Castletroy Golf Club and the west by Mount Green residential estate and a water tower and reservoir.

12.5.1 Baseline Noise Survey

12.5.1.1 Baseline Noise Survey Locations 2025

The noise measurement locations were selected to represent the noise environment at the NSLs surrounding the City North campus. The unattended and attended monitoring locations are discussed below and shown in Figure 12-2

The attended measurement locations are described as follows:

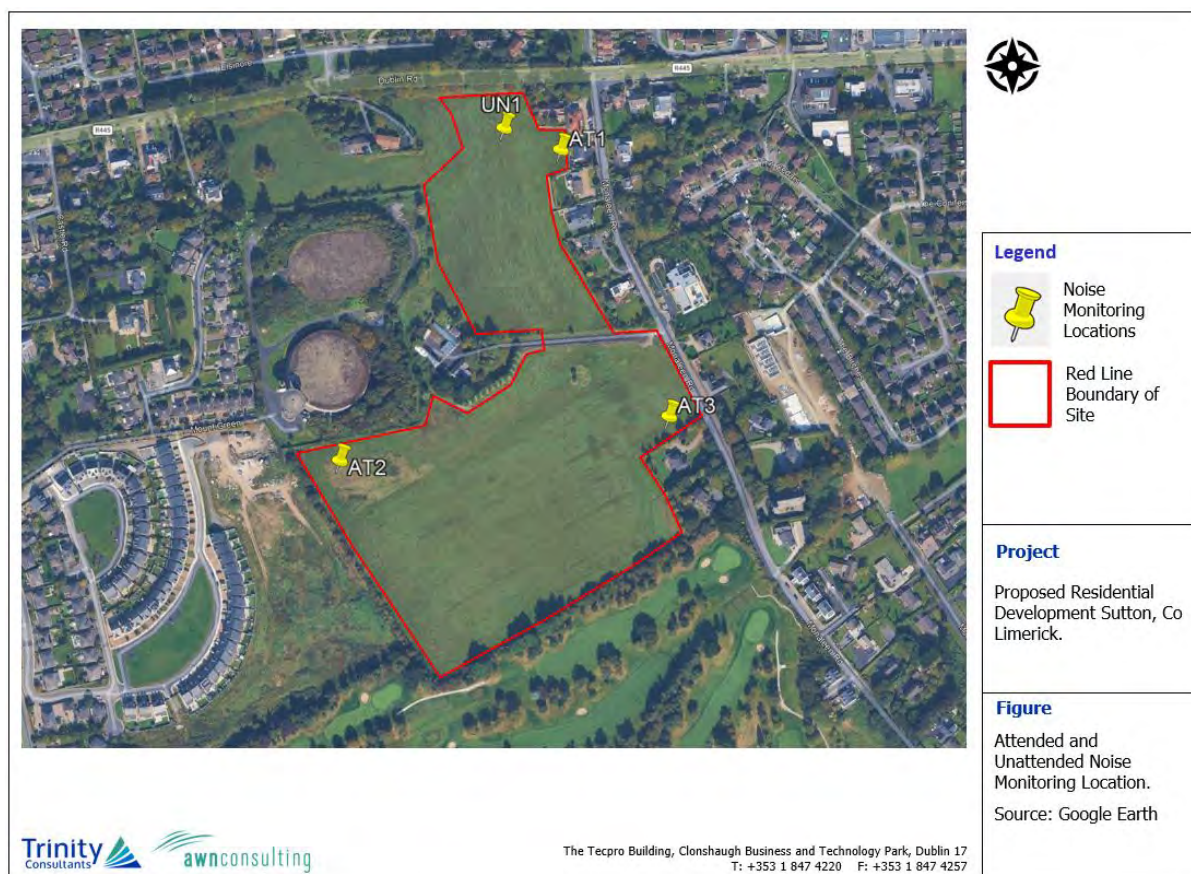


Figure 12-2 Attended and Unattended Noise Monitoring Locations

The unattended measurement location is described as follows:

- UN1 – Unattended location to capture the daytime and night-time noise levels at a location representing the noise environment at the residential homes along Monaleen Road and the R445 north east of the proposed site. This monitoring location is also representative of the closest residential dwellings within the proposed development to road traffic noise and has been used for the inward noise impact assessment.

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The attended measurement locations are described as follows:

- AT1 – This location represents the noise environment measured during the daytime period at the residential homes along Monaleen Road and the R445 north east of the proposed site.
- AT2 – This location represents the noise environment measured during the daytime period within the existing residential estate at Mount Green west of the proposed site.
- AT3 - This location represents the noise environment measured during the daytime period at the residential homes along Monaleen Road south east of the proposed site.

12.5.1.2 Survey Periods

The attended noise survey was carried out on Friday 1st July 2025. Noise levels were measured over 15-minute periods on a cyclic basis at each measurement location.

Unattended noise measurements were conducted between 13:00hrs on Tuesday 1st July and 09:45 hrs on Tuesday 8th July 2025. Noise levels were logged over consecutive 15-minute periods.

The weather during the survey period was dry with varying cloud cover. Wind speeds were moderate; however they were not considered to have had a detrimental effect on the noise measurements.

12.5.1.3 Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters.

- L_{Aeq}** is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- L_{A90}** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- L_{AFmax}** is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.
- L_{A10}** is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

The "A" suffix for the noise parameters denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

12.5.1.4 Personnel and Instrumentation

AWN carried out the noise surveys. The following instrumentation was used in conducting the noise measurements:

Table 12-8 Instrumentation Details

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	Rion NL-52	1076328	September 2025

Sound Level Meter	Rion NL-52	1076330	November 2024

12.5.1.5 Attended Survey Results

Noise level measurements of 15 minutes duration were taken at location AT1, AT2 and AT3. The results are presented in Table 12-9, Table 12-10 and Table 12-11.

Table 12-9 Summary of Measurement Results for Location AT1

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. 2×10^{-5} Pa)			
		L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
14:25	Road traffic and birdsong	50	59	52	47
14:45	Road traffic, hedge cutting and birdsong	50	57	52	46
15:05	Road Traffic and birdsong	50	56	52	46

Noise levels were of the order of 50 dB L_{Aeq,15min} and in the range 46 to 47 dB L_{A90,15min}. The main contributors to noise build-up were road traffic on the R445 Dublin Road and Monaleen Road. Other sources included brief distant hedge cutting and birdsong.

Table 12-10 Summary of Measurement Results for Location AT2

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. 2×10^{-5} Pa)			
		L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
10:07	Car horn at nearby water tower. Birdsong.	46	83	39	36
11:06	Vehicles at Mount Green estate.	38	49	39	36
12:07	Distant sawing noise. Birdsong.	38	53	40	34

Noise levels were in the range of 38 to 46 dB L_{Aeq,15min} and in the range 34 to 36 dB L_{A90,15min}. The main contributors to noise build-up were cars passing in Mount Green estate and birdsong. A car horn from a vehicle leaving a nearby water station provided higher results during the first measurement at AT2.

Table 12-11 Summary of Measurement Results for Location AT3

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. 2×10^{-5} Pa)			
		L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
10:26	Traffic from Monaleen Road and Distant R445 Dublin Road. Distant hammering.	48	65	50	37
11:28	Traffic from Monaleen Road and Distant R445 Dublin Road. Distant hedge cutting.	44	55	47	40
12:25	Traffic from Monaleen Road and Distant R445 Dublin Road. Distant dog barking and construction.	45	62	49	40

Noise levels were in the range of 44 to 45 dB L_{Aeq,15min} and in the range 37 to 40 dB L_{A90,15min}. The main contributors to noise build-up were traffic on the Monaleen Road and distant traffic on the R445 Dublin Road. Other sources

included brief distant hammering, hedge cutting and dog barking.

12.5.1.6 Unattended Survey Results

The results of the unattended monitoring survey at Location UN1 are summarised for 16 hour daytime period (07:00 to 23:00hrs) in

Table 12-12 and for the 8 hour night-time period (23:00 to 07:00hrs) in Table 12-13.

Table 12-12 Summary of Daytime Unattended Noise Measurements at UN1 (free-field)

Monitoring Period/ Range		Measured Noise Levels (dB re. 2x10 ⁻⁵ Pa)	
		L _{Aeq}	L _{A90}
Tuesday 01 July	Highest	58	53
	Lowest	53	42
	Average	56	51
Wednesday 02 July	Highest	58	54
	Lowest	54	45
	Average	57	51
Thursday 03 July	Highest	58	55
	Lowest	53	43
	Average	57	52
Friday 04 July	Highest	60	55
	Lowest	54	44
	Average	57	52
Saturday 05 July	Highest	59	55
	Lowest	54	45
	Average	57	51
Sunday 06 July	Highest	60	54
	Lowest	53	42
	Average	56	50
Monday 07 July	Highest	60	54
	Lowest	53	43
	Average	57	51
Tuesday 08 July	Highest	58	55
	Lowest	55	47
	Average	58	52

Table 12-13 Summary of Night-time Unattended Noise Measurements at UN1 (free-field)

Monitoring Period/ Range		Measured Noise Levels (dB re. 2x10 ⁻⁵ Pa)	
		L _{Aeq}	L _{A90}
Tuesday 01 July	Highest	55	47
	Lowest	45	34
	Average	52	38
Wednesday 02 July	Highest	58	48
	Lowest	44	31

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Monitoring Period/ Range		Measured Noise Levels (dB re. 2x10 ⁻⁵ Pa)	
		L _{Aeq}	L _{A90}
Thursday 03 July	Average	51	38
	Highest	56	49
	Lowest	44	31
	Average	50	37
Friday 04 July	Highest	55	47
	Lowest	45	32
	Average	51	38
Saturday 05 July	Highest	54	46
	Lowest	45	35
	Average	51	39
Sunday 06 July	Highest	56	45
	Lowest	44	33
	Average	51	38
Monday 07 July	Highest	56	46
	Lowest	43	30
	Average	50	35

During daytime periods, average noise levels were in the range 56 to 58 L_{Aeq,16hr} and 50 and 52 dB L_{A90,16hr}. During night-time periods, average noise levels were in the range 50 to 52 dB L_{Aeq,8hr} and 35 to 39 dB L_{A90,8hr}. These noise levels are considered representative of noise environment experienced along the north of the site in proximity to the R445 Dublin Road.

12.5.1.7 Review of Traffic Noise Maps

In addition to the site noise surveys, a desktop review of mapped road traffic noise in the vicinity of the Project has been undertaken. Mapped traffic noise data from the EPA Round 4 Road noise maps for the area near the site are presented for the long-term 24hour average L_{day} parameter and the 8hr night-time (L_{night}) in Figure 12-3 and Figure 12-4. The noise maps indicate the highest noise levels are along the road edges of the R455 Dublin Road to the north of the site. Mapped traffic noise levels are within the 55 to 60 dB L_{den} noise contour along the immediate northern boundary and reduce to below 55 dB L_{den} across the remainder of the site. For road traffic noise, the L_{den} parameter is typically 2 dB higher than the daytime 16hr period. The mapped L_{den} values are therefore show a strong correlation against the measured noise levels at UN1 presented in

Table 12-12.

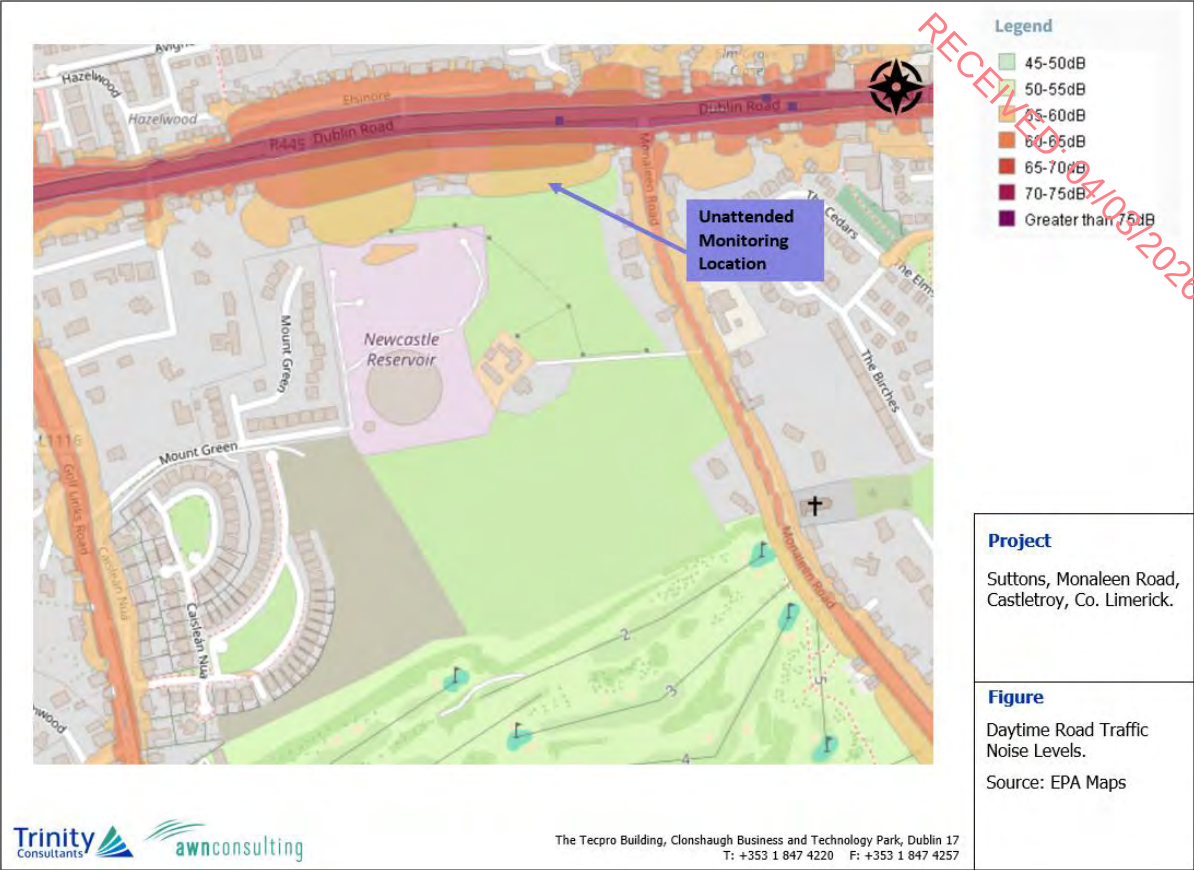


Figure 12-3 EPA Round 4 Noise Map for Lden

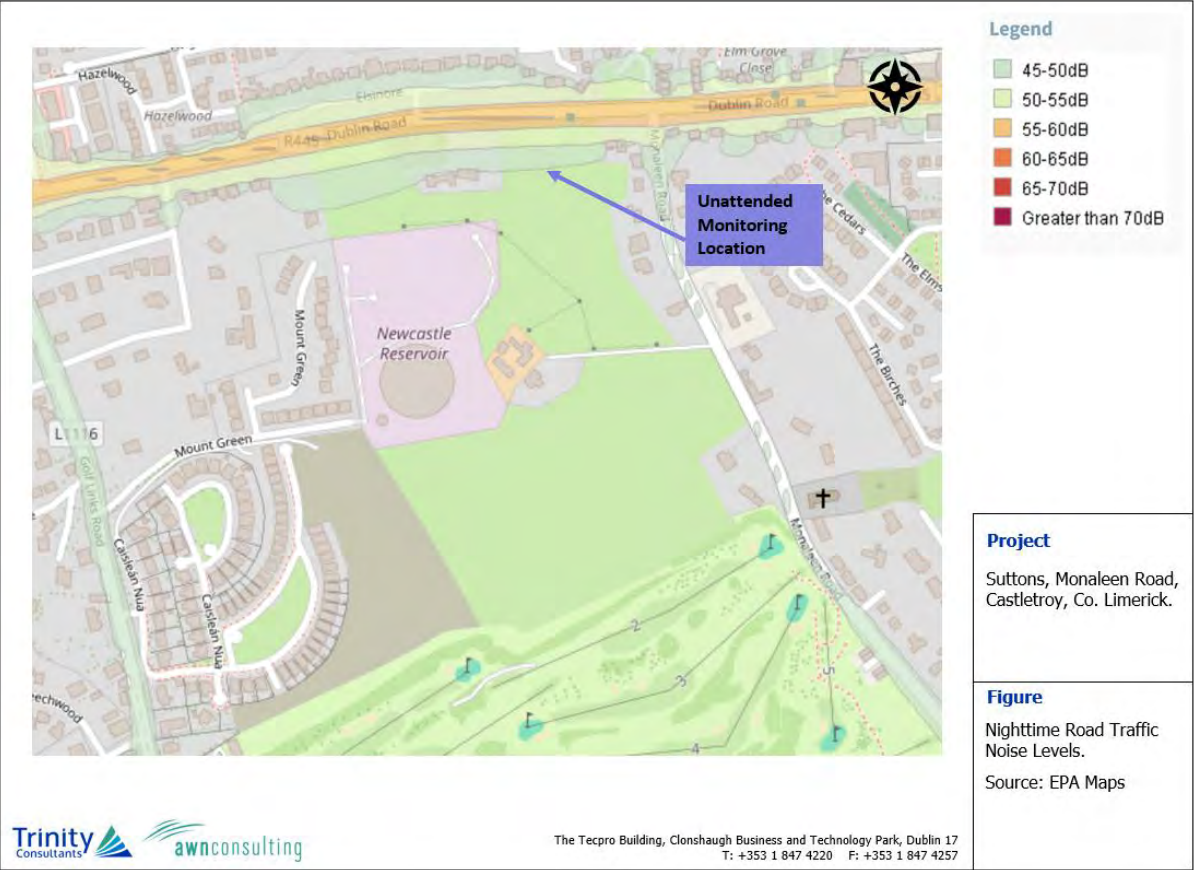


Figure 12-4 EPA Round 4 Noise Map for Lnight

Mapped traffic night-time noise levels are below 50dB L_{night} along the northern site boundary and reduce to below 50 dB L_{night} across the remainder of the site. The mapped L_{night} values therefore show a strong correlation against the measured noise levels at UN1 presented in Table 12-13.

12.6 Potential Impacts

12.6.1 Construction Phase Impacts

12.6.1.1 Construction Phase Noise Impacts

Noise levels generated by the construction site activities and experienced at local receptors will depend upon a number of variables.

- The amount of noise generated by plant and equipment being used at the development site, generally expressed as a sound power level;
- The periods of operation of the plant at the development site, known as the 'on-time';
- The distance between the noise source and the receptor;
- Attenuation due to ground absorption or barrier screening effects; and
- Reflections of noise due to the presence of hard vertical faces, such as walls.

The Construction Environmental Management Plan (CEMP) (Garland, 2026) sets out the general phasing for the construction of the proposed project. However, as with any project of this nature, works during the various construction phases will be transient in nature and will involve the use of several different plant items at any one time. As such, it is difficult at this stage of the assessment to state accurately what items of plant will be in use and what levels of noise will be experienced during construction works. The appropriate approach in this instance is to prepare indicative noise prediction calculations in relation to construction activities. The calculations have been undertaken in line with guidance set out in British Standard BS 5228-1.

A variety of items of plant will be in use for the purposes of site clearance, excavations and construction. There will be vehicular movements to and from the site that will make use of existing roads. Due to the nature of these activities, there is potential for generation of high levels of noise.

For the purposes of the calculation, the closest NSLs to construction works are the residential properties along Monaleen Road, located approximately 10 m from the site boundary, together with a single dwelling to the west located approximately 25 m from the boundary, and additional residential properties to the north along Dublin Road located approximately 30 m from the site boundary. Based on the noise levels measured during the baseline survey, a criterion of 65 dB L_{Aeq} is adopted for construction noise (i.e. Noise Category A from Table 12-1).

12.6.1.2 Ground Works, Excavation and Piling

For construction works associated with early-stage activities such as topsoil removal, excavation of overburden, controlled bedrock excavation, rock breaking, ripping and rock milling, noise levels are typically in the range of 80 to 90 dB L_{Aeq} at 10 m. These activities involve a combination of plant including excavators, loaders, dozers, hydraulic rock breakers (where required), rock milling/grinding equipment, cranes and concreting equipment, as described in the CEMP.

A total construction noise level of 92 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations for these activities representing a variety of plant items and activities over this stage. This would include, for example, two items of plant at 80 dB L_{Aeq} , one item of plant at 85 dB L_{Aeq} and one item of plant at 90 dB L_{Aeq} operating simultaneously within one work area resulting in a total noise level of 92 dB L_{Aeq} .

These early-stage excavation and rock-breaking activities represent the highest noise-generating phase of the works. However, as noted in the CEMP, excavation will be undertaken using controlled, low-vibration techniques, and plant will be operated in accordance with BS 5228-1, with acoustic covers/enclosures kept closed and engines switched off when not in use. Noise screening and careful plant positioning will also be employed where required to reduce noise levels at nearby receptors.

12.6.1.3 Structural Works, Basement Foundation and Concrete Works

For construction works associated with activities such as structural works, basement formation and concreting operations, noise levels are typically in the range of 70 to 82 dB L_{Aeq} at 10 m. These activities will involve loaders, dozers, cranes, generators and concrete pumps as outlined in the CEMP.

For ongoing construction activity associated with these works, a total construction noise level of 85 dB L_{Aeq} at 10 m has been used for the purposes of indicative calculations. This represents a realistic combination of plant items operating simultaneously during this phase, for example two items of plant at 80 dB L_{Aeq} and three items at 75 dB L_{Aeq} , resulting in a combined noise level of approximately 85 dB L_{Aeq} at 10 m.

12.6.1.4 General Construction, Superstructure and Fit-out

For construction work areas with lower noise levels, such as those associated with superstructure works, site compounds (including storage, offices and material handling), generators, smaller mobile plant (excavators, cranes, dozers), landscaping and general concreting works, noise emissions are typically lower than those generated during excavation and structural works. These activities generally fall within the range of 65 to 75 dB L_{Aeq} at 10 m.

For the purposes of indicative calculations, a total construction noise level of 78 dB L_{Aeq} at 10 m has been adopted to represent a realistic combination of plant operating simultaneously during this phase. This would include, for example, one item of plant at 75 dB L_{Aeq} and three items at 70 dB L_{Aeq} , resulting in a combined noise level of approximately 78 dB L_{Aeq} at 10 m.

Table 12-14 sets out the predicted construction noise levels associated with the different phases of work. The calculations assume that plant items operate for 66% of the time, consistent with BS 5228-1. A screening correction of 5 dB has been applied to account for the presence of site hoarding and existing boundary walls around the site, which will provide additional attenuation at nearby noise-sensitive locations.

Table 12-14 Typical Predicted Noise Levels Associated with Different Construction Activities and Phases

Activity	Predicted Construction Noise Level L_{Aeq} (1hour) (dB)						
	20m	35m	50m	75m	90m	125m	150m
Ground Works and Excavations	79	74	70	66	65	61	60
Structural works, Foundation and Concrete Works	72	67	63	59	58	54	53
General Construction, Superstructure and Fit-out	65	60	56	52	51	47	46

Reference to Table 12-14 indicates that during the most intrusive early-stage activities associated with ground works and excavation, the adopted CNT of 65 dB $L_{Aeq,1hr}$ has the potential to be exceeded when works are occurring within approximately 75 to 85 m of the nearest NSLs without mitigation. The calculated noise levels represent a reasonable worst-case scenario, as the assumed plant items will not be operating continuously or at the closest point to the site boundary at all times. At the closest NSLs, located approximately 20 m from the site boundary along Monaleen Road and Dublin Road, the impact without mitigation is assessed as **negative, significant to very significant and temporary** during periods when these early-stage activities are taking place.

During structural works, including, foundation construction and concreting works, the CNT also has the potential to be exceeded when works occur within approximately 35 to 40 m of NSLs without mitigation. At the closest NSLs (20 m), the impact without mitigation is assessed as **negative, significant to very significant and short-term during** this phase of work.

Once the most intrusive ground works have been completed, noise levels associated with the general construction of the superstructure and internal fit-out will be substantially reduced. During this phase, predicted noise levels at the closest NSLs (20 m) are equal to or below the CNT, with noise levels reducing with distance

and falling within well below CNT at distances of the order of 35 m and beyond. The impact at the nearest NSLs without mitigation is therefore assessed as **negative, slight to moderate and short-term**.

It should also be noted that construction works will not consistently take place along the site boundary; therefore, the predicted levels presented represent a reasonable worst-case scenario.

12.6.1.5 Construction Phase Vibration Impacts

Piling is not currently confirmed as part of the construction methodology; however, the CEMP notes that deeper vertical inclusions or piling may be required to support the structural loading of the apartment block. Should piling be required, CFA or cased bored piles will be used, which are recognised as low-vibration piling techniques.

BS 5228-2 provides empirical vibration data for bored piling. Typical measured vibration magnitudes for rotary bored piling (600 mm diameter) include:

- 0.54mm/s at a distance of 5m, for auguring;
- 0.22mm/s at a distance of 5m, for twisting in casing;
- 0.42mm/s at a distance of 5m, for spinning off, and;
- 0.43mm/s at a distance of 5m, for boring with rock auger.

Taking into account the distance to the closest off site sensitive buildings on all perimeters, vibration emissions from this activity will be significantly reduced. Vibration levels at the closest neighbouring buildings will be orders of magnitude below the limits set out in **Error! Reference source not found.** avoid any cosmetic damage to buildings and will be below the thresholds for human perception. The impacts are predicted to be **short-term, negative and not significant**.

During rock breaking, there is potential for vibration to be generated through the ground. Empirical data for this activity is not provided in the BS 5228-2 standard, however the likely level of vibration from this activity is expected to be significantly below the vibration criteria for building damage on experience from other sites. AWN Consulting Ltd have previously conducted vibration measurements under controlled conditions, during trial construction works, where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 PPV (mm/s) to 0.25 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.4 PPV (mm/s) to 0.24 PPV (mm/s) at distances of 10m to 50m respectively.

Whilst these measurements relate to a breaking of concrete, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity. The vibration levels experienced at surrounding receptors will be well below the criteria of cosmetic building damage, however, it will likely be perceptible when work is taking place at the closest locations to the receptors. Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in **Error! Reference source not found.**

In terms of disturbance to building occupants, works undertaken within close proximity to the residential receptors on the site perimeter have the potential to emit perceptible vibration levels. Vibration levels have the potential to be of the order of 1mm/s or below at buildings within 20m of breaking works. Vibration magnitudes of 1mm/s have the potential to generate moderate to significant effects to building occupants, depending on the duration of works and the absence of prior notice. Potential impacts are therefore, **temporary, negative, moderate to significant** at the closest NSLs within 20 m of rock breaking works.

At all other occupied sensitive buildings surrounding the site, impacts are expected to be **short-term, negative,**

and slight to moderate.

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria during all activities. Mitigation and management of these works are discussed in Section 12.8.1.

12.6.1.6 Construction Traffic

Traffic data provided by the traffic consultants indicates that the additional construction traffic on local roads will have a minimal impact. An increase in traffic volumes of around 25% would be needed to raise noise levels by just 1 dB. Based on this, and with reference to Table 12-3, the impact is considered **negative, imperceptible, and short-term**.

12.6.2 Operational Phase Impacts

12.6.2.1 Building Services Impacts

Once operational, there will be building services plant items required to serve the commercial and residential aspect of the proposed development. These will typically be limited to heating and cooling plant, pumps and extraction units, depending on the building design and user requirements. Certain areas are likely to require mechanical services during the daytime hours only, however, there may be requirement for night-time operational plant, depending on specific requirements.

The location or type of building services plant has not yet been established, therefore it is not possible to calculate noise levels to the surrounding environment. In this instance, it is best practice to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the development.

Receptors within the Development Site

The plant item required for the Proposed Development will be selected at a later stage, however, they will be designed and located so that there is no negative impact on sensitive receptors off-site or within the development itself. The cumulative operational noise level from building services plant at the nearest noise sensitive location within the development (e.g. apartments, etc.) will be designed / attenuated to meet the relevant BS 8233 noise criteria for day and night-time periods as set out in this assessment (i.e. the internal noise levels from Table 12-6.). The associated likely noise impact is described as **negative, not significant, local and long-term**.

Existing Receptors Outside of Development Site

Baseline monitoring at UN1 shows night-time background noise levels in the range of 35 to 39 dB $L_{A90,8hr}$. In accordance with BS 4142, external noise from building services should not exceed the prevailing background noise level by more than 5 dB. On this basis, an external design criterion of 40 dB L_{Aeq} at the façade of any off-site noise-sensitive location is considered appropriate.

As sensitive receptors within the development are located closer to the proposed plant than off-site receptors, achieving compliance with this criterion at the nearest on-site façades ensures that off-site noise levels will remain below the 40 dB threshold. The likely noise impact at existing receptors is therefore assessed as **negative, not significant, local and long-term**.

12.6.2.2 Additional Vehicular Traffic on Surrounding Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site and other planned developments on surrounding roads. The predicted change in noise levels due to an increase in road traffic has been calculated for each of these roads. Projected traffic data used for the purpose of this assessment includes committed developments in the vicinity of the project site, as listed in the Traffic and Transport Chapter of this EIAR.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise

level associated with traffic movements on existing roads surrounding the subject site with and without development using the Annual Average Daily Traffic (AADT) data. The change in traffic noise levels from the increase in traffic flows due to the proposed development has been calculated for the opening year 2035 and the design years of 2040 and 2050 relative to the 'Do Nothing' scenario along the sections of road detailed in Table 12-15.

Table 12-15 Predicted Change In Noise Level associated with Vehicular Traffic

Link	Description	Year 2035		Year 2040		Year 2050	
		Increase in Traffic Flow (%)	Change in Noise Level, dB(A)	Increase in Traffic Flow (%)	Change in Noise Level, dB(A)	Increase in Traffic Flow (%)	Change in Noise Level, dB(A)
Link 1	R445 East	2.3%	+0.1	2.2%	+0.1	2.4%	+0.1
Link 2	R445 West	2.8%	+0.1	5%	+0.2	5.6%	+0.2
Link 3	Monaleen Rd (North)	38.1%	+1.4	21.8%	+0.9	22.1%	+0.9
Link 5	Monaleen Rd (South)	44.1%	+1.6	48.4%	+1.7	54.7%	+1.9

The predicted increase in traffic flows associated with the proposed Project in 2035, 2040 and 2050 will result in an increase in noise levels ranging from +0.9 dB to +1.9 dB along all roads receiving traffic from the proposed development. With reference to Table 12-15, the likely effect is therefore **neutral, not significant, local and long-term**.

12.6.2.3 Crèche Playground

Measurement of noise levels generated by children playing outdoors at several crèches and kindergartens indicate typical noise levels in the order of 56 dB $L_{Aeq,1hr}$ at a distance of 5 meters. The nearest existing off-site noise sensitive locations to the east are approximately 35 m from the crèche play area. Considering the distance and screening from existing boundary treatments, activities from the crèche are calculated to be below 40 dB $L_{Aeq,1hr}$ and hence is well below the range of baseline noise levels recorded to the north of the site at Location UN1, representative of properties set back from road traffic. The resultant noise impact is therefore **negative, not significant and long-term**.

12.6.2.4 Operational Phase Vibration

There are no sources of vibration associated with the day to day operation of the development that will give rise to impacts at nearby noise sensitive locations. In terms of the operational phase of the development the associated effect is stated to be **neutral, imperceptible and long-term**.

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12.7 Inward Noise Impact

12.7.1 Stage 1: Noise Risk Classification of the Site

Noise levels across the proposed site have been identified through both noise surveying and reference to published maps. With reference to both the survey results within section 12.5 and the reference to the available EPA Noise Maps, noise levels for proposed residential dwellings at the site have been established, the initial site noise risk assessment has concluded that the level of risk across the site falls into the low to medium noise risk categories.

ProPG: Planning and Noise states the following with respect to low and medium risks:

Low Risk	At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
Medium Risk	As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

Given the above it can be concluded that the development site may be categorised as a Low to Medium Risk and as such an Acoustic Design Strategy will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG: Planning and Noise states the following with regard to how the initial site noise risk is to be used,

"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."

Therefore, following the guidance contained in ProPG: Planning and Noise does not preclude residential development on sites that are identified as having medium risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitably designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG: Planning and Noise is to ensure that the best possible acoustic outcome is achieved for a particular site.

12.7.2 ProPG Stage 2: Acoustic Design Statement

Element 1 – Good Acoustic Design Process

In practice, good acoustic design should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life or occupants or compromising other sustainable

design objectives. It is important to note that ProPG specifically states that good acoustic design is not equivalent to overdesign or “gold plating” of all new development but that it seeks to deliver the optimum acoustic environment for a given site.

Section 2.23 of the ProPG outlines the following checklist for Good Acoustic Design (GAD):

- Check the feasibility of relocating, or reducing noise levels from relevant sources;
- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;
- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

Relocation or Reduction of Noise from Source

The noise is generated by traffic volumes on the Dublin Road (R445) and Monaleen Road. It is beyond the scope of this development to introduce any traffic diversion or other mitigation at source.

Planning, Layout and Orientation

Consideration has been given to the location of both the buildings and external amenity areas. The orientation of the site is such that the buildings themselves screen the majority of common external amenity areas associated with the development.

Select Construction Types for meeting Building Regulations

Masonry constructions will be used in constructing the external walls of the development. This construction type offers high levels of sound insulation performance. However, as is typically the case the glazed elements and ventilation will be the weakest elements in the façade in terms of sound insulation performance.

Consideration will therefore be given to the provision of upgraded glazing and mechanical ventilation, where required. The proposal here will be to provide dwelling units with glazed elements that have good acoustic insulation properties so that when the windows are closed the noise levels internally are good.

A mechanical ventilation system ducted to the façade will be utilised as per Part F of the Building Regulations. This system provides a high level of sound insulation.

Impact of noise control measures on fire, health and safety etc

The good acoustic design measures that have been implemented on site, e.g. locating properties away from the road and placing outdoor space on the quiet side of buildings, are considered to be cost neutral and do not have any significant impact on other issues.

Assess Viability of Alternative Solutions

Alternative solutions typically involve reorientation or removal of sensitive facades and rooms from the noise source, or incorporating screening along external boundaries. It is not a viable solution to remove all sensitive facades from the streetscape in a dense urban environment and due to the height and location of the proposed buildings it is considered that any acoustic screens along the boundary of the site to attenuate traffic noise would

be ineffective.

Assess External Amenity Area Noise

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$.”

Noise levels across external amenity areas (i.e. courtyards) associated with the development are presented in Element 3 of this section.

Summary

Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of Good Acoustic Design have been applied to the development.

In terms of viable alternatives to acoustic treatment of façade elements, there are no further options for mitigation outside of proprietary acoustic glazing and mechanical ventilation.

Element 3 – Internal Noise Guidelines

Internal Noise Criteria

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 and the WHO Community Noise Guidelines. The recommended indoor ambient noise levels are set out in Table 12-6 and are based on annual average data.

Discussion on Open Closed Windows

In the first instance, it is important to note the typical level of sound reduction offered by a partially open window falls in the region of 10 to 15 dB.

Considering the design goals outlined in Table 12-6, and a sound reduction across an open window of 15 dB, the free-field noise levels that would be required to ensure that internal noise levels do not exceed good (i.e. at or below the internal noise levels) or reasonable internal noise levels (i.e. 5 dB above the internal noise levels) have been summarised in Table 12-16.

Table 12-16 External Noise Levels Required to Achieve suitable Internal Noise Levels with Windows Open

Level Desired	Day 07:00 to 23:00hrs	Night 23:00 to 07:00hrs
Good (i.e. at or below the internal noise levels)	50 – 55 dB $L_{Aeq,16hrs}$	45 dB $L_{Aeq,8hrs}$
Reasonable (i.e. 5 dB above the internal noise levels)	55 – 60dB $L_{Aeq,16hrs}$	50 dB $L_{Aeq,8hrs}$

Façade levels

Based on the measured noise levels presented in Section 12.5, incident façade noise levels across the development are generally in the range 50 to 55 dB $L_{Aeq,16hr}$ during the daytime and 45 to 50 dB $L_{Aeq,8hr}$ at night. At these levels, the ‘good’ or ‘reasonable’ internal noise criteria can be achieved with windows open and no specific acoustic mitigation is required for the majority of façades.

The northernmost 3-bed detached dwelling (No. 164) includes a north-facing façade oriented towards the R445 Dublin Road. This façade contains no habitable room windows; all bedrooms and living spaces have windows on the east and west façades, facing away from the R445 road. Predicted noise levels at these east and west façades

are 50 to 55 dB $L_{Aeq,16hr}$ by day and 45 to 50 dB $L_{Aeq,8hr}$ at night. Internal noise criteria for 'good' or 'reasonable' conditions can be achieved with windows open, so no additional acoustic mitigation or enhanced glazing is required.



Figure 12-5 Location of Proposed Dwelling No.164 and its Proximity to the R445 Dublin Road.

Glazing

Given the level of noise predicted at this development, the façade calculations indicate that standard double glazing is sufficient to achieve the recommended internal noise criteria across all residential units. A glazing system with a minimum sound reduction index of R_w 32 dB will provide adequate attenuation when windows are closed.

The only location where open-window criteria cannot be achieved is the north-facing façade of the northernmost 3-bed detached dwelling, which directly overlooks the R445 Dublin Road. At this façade, internal noise criteria are met with windows closed using standard double glazing. All other dwellings and façades across the development can achieve suitable internal noise levels with windows open, and no additional glazing upgrades are required.

Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 54 dB R_w for this construction.

Internal Noise Levels

The assessment has demonstrated that the recommended internal noise criteria can be achieved with windows

closed assuming standard double glazing. No further mitigation required.

ELEMENT 3 – EXTERNAL AMENITY AREA NOISE ASSESSMENT

In terms of the external amenity areas and courtyards proposed with the development,

Table 12-12 illustrates that noise levels across the development will range between <50 and 58 dB L_{Aeq,1hr}. The range of noise levels across the external amenity areas (gardens and common areas) are within the acceptable range as advised by ProPG Planning and Noise.

It is important to note that the highest baseline noise level measured at UN1 represents a worst-case location with direct line-of-sight to the R445, Dublin Road. In contrast, the private rear gardens of the nearest dwellings are set back from the road and acoustically screened by the houses themselves, resulting in significantly reduced exposure to road traffic noise. The orientation of these gardens away from the road, combined with the physical barrier effect of the dwellings, provides substantial attenuation relative to the UN1 measurement position.

Taking these factors into account, the predicted noise levels within the proposed amenity areas are considered appropriate and consistent with relevant guidance, and no significant adverse effects are expected.

12.8 Mitigation Measures

12.8.1 Construction Phase Mitigation Measures

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised. The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening,
- hours of work; and;
- liaison with the public.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

Rock extraction works, including hydraulic rock breaking, rock milling and controlled bedrock excavation, will be required at several locations across the site, including the apartment basement, deep service trenches, attenuation tank excavations and areas where bedrock occurs close to the existing ground surface. As these activities can generate higher noise levels than standard construction plant, enhanced mitigation measures will be implemented in accordance with BS 5228.

12.8.1.1 Selection of Quiet Plant

The potential for any item of plant to generate noise should be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

For rock extraction works, the contractor will prioritise the use of quieter breaking methods where practicable, including rock milling or non-percussive techniques in place of percussive hydraulic breaking. Where percussive breaking is required, plant with integrated sound attenuation will be selected where available.

12.8.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be implemented as needed:

- The lifting of bulky items, dropping and loading of materials will be restricted to normal working hours.
- Mobile plant should be switched off when not in use and not left idling.
- For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud.
- 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.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- 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.
- For percussive rock-breaking tools, additional source-control measures will be applied, including the use of mufflers or sound-reducing attachments, sealing of air leaks, damping of panels and covers, and the use of resilient materials between vibrating components. These measures reduce impulsive noise and are consistent with the guidance in BS 5228-1.

12.8.1.3 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Where required, the use of temporary hoarding or mobile screens will be used to aid in reducing noise levels from potential high levels of construction activity. The use of screening is recommended when works are occurring in proximity to noise sensitive dwellings, equine holdings, or high amenity areas during high noise activities. This can be undertaken using standard site hoarding or using mobile / demountable screens around noisy items of plant or works.

Where rock extraction and breaking is required in proximity to noise-sensitive locations, enhanced screening will be used. This will include mobile acoustic barriers or demountable enclosures positioned as close as possible to the breaker head, typically at least 2.4 m in height with a minimum surface mass of 7 kg/m², capable of achieving up to 10 dB(A) reduction when correctly positioned. Higher temporary hoarding (3–4 m) will be installed along boundaries closest to dwellings where required.

12.8.1.4 Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Prior to the commencement of rock-breaking works, the environmental liaison officer will notify nearby residents of the timing, duration and nature of these activities. Given the higher noise levels associated with rock

extraction, enhanced communication protocols will be followed, and all complaints will be logged and addressed promptly.

12.8.1.5 Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. While high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

12.8.1.6 Hours of Works

Construction works will be undertaken within the times below, taken from the Construction Environmental Management Plan:

- Monday to Friday: 07:00 to 18:00hrs
- Saturday: 07:00 to 13:00hrs
- Sunday and Public Holidays No noisy work on site.

However, it may be necessary for some construction operations to be undertaken outside these times, for example, to facilitate connections to public service systems or utilities. Such works will be agreed in advance with the local authority.

12.8.1.7 Monitoring

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion. Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

Vibration monitoring stations should continually log vibration levels using the Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions, in accordance with British Standards Institute / International Organization for Standardization (BS/ISO) *BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures* (BS/ISO, 2010) .

12.9 Operational Phase Mitigation Measures

12.9.1 Building Services Mitigation Measures

Plant rooms of apartment buildings and outdoor plant areas will be designed to ensure that noise levels at the façades of the noise-sensitive locations both within the site and in the surrounding area do not exceed the criteria of 50dB $L_{Aeq,15\text{ min}}$ day time and 45dB $L_{Aeq,15\text{ min}}$ for night time, outside any noise-sensitive location within the Proposed Development site, as discussed in Section 12.4.4.1.

During the detailed design of the Proposed Development, the selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission criterion of 45dB $L_{Aeq,15\text{ min}}$, outside any noise-sensitive location within the development site are not exceeded.

In addition to selecting plant with suitable noise levels, the Applicant shall ensure that the following best practice measures will be adhered to, insofar as possible, for all plant items, in order to minimise potential noise disturbance for residents of on-site and adjacent buildings during the operational phase:

- Where ventilation is required for plant rooms, consideration will be given to acoustic louvers or attenuated acoustic vents, where required to reduce noise breakout.
- Ventilation plant serving plant rooms and car parks will be fitted with effective acoustic attenuators to reduce noise emissions to the external environment.

- Perimeter plant screens will be used, where required, for roof top plant areas, to screen noise sources.
- Attenuators or silencers will be installed on external air handling plant, as required.
- All mechanical plant items (e.g. fans, pumps, etc.) shall be regularly maintained to ensure that excessive noise generated by any worn or rattling components is minimised.
- Any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from Site do not exceed the noise limits of 50dB $L_{Aeq,15\text{ min}}$ for daytime and 45dB $L_{Aeq,15\text{ min}}$ for nighttime, outside any noise-sensitive location within the Proposed Development.
- Installed plant will have no tonal or impulsive characteristics when in operation.

12.9.2 Additional Vehicular Traffic - Mitigation

During the operational phase of the Proposed Development, noise mitigation measures with respect to the effect of traffic due the development are not deemed necessary.

12.10 Residual Effects

12.10.1 Construction Phase Residual Effects

During the construction phase of the proposed development, there is the potential for temporary significant noise effects on nearby NSLs due to noise emissions from site activities. Predicted construction noise levels, in the absence of mitigation, indicate that the adopted construction noise threshold (CNT) of 65 dB $L_{Aeq,1hr}$ is likely to be exceeded at the closest receptors during the more intensive early works, particularly ground works and excavation activities within approximately 75 m of the site boundary.

The application of binding noise limits, restricted working hours and best practicable means in accordance with BS 5228-1, together with the use of site hoarding, appropriate plant selection and the careful management of particularly noisy activities (as outlined in Section 12.8), will reduce both the magnitude and duration of potential exceedances at nearby receptors. With these measures in place, residual noise effects during the most intensive ground works and structural phases at the nearest NSLs are assessed as **negative, significant to very significant, and temporary/short-term**, depending on proximity and the specific activities underway, reducing to **negative, moderate to significant and temporary/short-term** at distances beyond approximately 75 m from the site boundary.

During the Structural, foundation and concrete works, residual construction noise effects at the nearest NSLs are assessed as **negative, moderate to significant, and short-term**, reducing to **negative, slight to moderate and short-term** at distances greater than approximately 35 m from the site boundary.

During the subsequent general construction and internal fit-out phases, residual construction noise effects at the nearest NSLs are assessed as **negative, slight to moderate, and short-term**, reducing to **negative, not significant and short-term** at distances greater than approximately 35 m from the site boundary.

12.10.2 Operational Phase Residual Effects

12.10.2.1 Building Services

Noise levels associated with operational plant will be designed to be within the adopted day and night-time noise limits at the nearest noise sensitive properties. Once the design criteria in Section 12.3.2.1 are adopted, the resultant residual noise effects from this source will be of **negative, not significant, long-term** effect.

12.10.2.2 Additional Vehicular Traffic on Surrounding Roads

The predicted change in noise levels associated with additional traffic is predicted to be of neutral effect along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic are considered to be of **neutral, not significant, local and long-term** effect to nearby noise sensitive locations.

12.11 Interactions

There are interactions between the noise and vibration assessment and traffic assessment. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be **imperceptible** due to the low-level changes in traffic flows associated with the proposed development, along with other committed developments.

12.12 Monitoring

12.12.1 Construction Phase

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criteria in section 12.4.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

12.12.2 Operational Phase

After the construction of the development and commissioning of plant items, a post-completion noise survey will be carried out to ensure that noise from the site does not exceed the criteria in Section 12.4.4.1 in respect of building services noise, including the assessment of potential tonal and impulsive noise. If any exceedance were to be found, attributable to the proposed development, noise attenuation measures will be applied to the relevant noise source, and the survey repeated to confirm compliance with the noise criteria.

12.13 Cumulative Impacts

12.13.1 Construction Stage

In terms of construction noise, it's noted that construction works at an adjacent sites (i.e. 2560271, at Mount Green, Newcastle, Co. Limerick) may be ongoing simultaneous to this project. In this scenario slightly elevated construction noise emissions due to cumulative construction activities are likely to occur at receptor locations bounding the sites. Cumulative impacts will need to be considered and managed during the construction phase. It is recommended that liaison between both construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. For properties adjacent to the construction sites the cumulative construction noise impacts are expected to be **short-term, negative, slight to significant**, depending on the proximity of the works to the site boundary.

12.13.2 Operational Stage

There are no likely cumulative noise impacts associated with the proposed development and other developments in the areas. The noise limits set for off-site noise sensitive locations are designed to avoid any significant increase in the prevailing background noise environment. Operational noise limits included in this report refer to cumulative noise from all fixed installations on site. The design of plant and other fixed installations will be progressed during the design stage to ensure the noise limits at offsite noise sensitive locations are not exceeded.

In terms of increased traffic noise, the traffic noise assessment within this chapter takes into account the overall masterplan for Sutton and, hence, is a cumulative prediction.

12.13.3 Do-Nothing Impact

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain unchanged. The noise levels recorded during the baseline noise environment are considered representative of the Do-Nothing scenario.

12.14 Difficulties Encountered

No difficulty was encountered in the preparation of this chapter.

12.14.1 Conclusion

The assessment of construction noise and vibration has been undertaken in accordance with BS 5228-1 and BS 5228-2. Predicted construction noise levels indicate that exceedances of the adopted Construction Noise Threshold may occur at the nearest noise-sensitive locations during the most intensive early-stage works, particularly ground works, excavation and rock extraction activities undertaken within approximately 75 m of the site boundary. These exceedances will be temporary in nature.

With the implementation of the mitigation measures outlined in Section 12.8—including binding noise limits, restricted working hours, best practicable means, appropriate plant selection, enhanced screening for rock extraction, and careful phasing of high-noise activities, the magnitude and duration of exceedances will be reduced. Residual construction noise effects at the closest receptors during the most intensive phases are assessed as negative, significant to very significant, and temporary to short-term, reducing to negative, moderate to significant and temporary to short-term at distances beyond approximately 75 m from the site boundary. During structural, foundation and concrete works, residual effects reduce further to negative, moderate to significant and short-term, and during general construction and internal fit-out phases, residual effects are negative, slight to moderate and short-term, becoming not significant at distances greater than approximately 35 m.

The operational phase of the proposed development has also been assessed, including noise from building services plant, breakout noise from the crèche, and an inward noise assessment for proposed residential units. Provided that the design criteria and mitigation measures set out in this chapter are implemented, no significant operational noise effects are predicted. No significant vibration effects are associated with the operation of the site.

In summary, while some temporary and short-term significant construction noise effects are predicted at the nearest receptors during the most intensive early works, these will be appropriately managed through the mitigation measures identified. No significant long-term noise or vibration effects are expected, and the overall noise and vibration impact of the proposed development is not significant in the context of current national guidance.

12.15 References

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022);
- Limerick Agglomeration Noise Action Plan 2024–2028 (2025);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise;
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration;
- BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration;
- British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound;
- UK Highways England (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHE 2020);
- ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise;
- Guidelines for Community Noise (World Health Organisation, 1999); and
- EC Directive on Outdoor Noise Emissions 2000/14/EC.

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 13: AIR QUALITY

**SUTTONS LRD
MONALEEN ROAD**

FEBRUARY 2026



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13 AIR QUALITY

13.1 INTRODUCTION

This chapter identifies, describes and assesses the likely direct and indirect effects of the proposed development on air quality. A full description of the development is available in Chapter 2 Project Description.

This chapter was prepared by Tanmay Gojamgunde. Tanmay is an Environmental Consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He has over 1 year of experience in air quality and holds both a MSc in Air Pollution Management and Control from the University of Birmingham and BTech in Environmental Engineering. As part of the MSc, he worked on 'The Impact of bus-fleet electrification on air quality in Birmingham' utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi's first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and knowledge extending to broader aspects of environmental engineering. He has prepared air quality and climate impact assessments as part of EIARs for several residential developments some of which include Ennis LRD (Planning Application Ref. 17495), Cherrywood M1 Phase 2A LRD (Planning Application Ref DZ22A/0017), Maglin LRD (Planning Application Ref. LRD 2544222). He has also assisted and prepared air dispersion modelling assessments of emissions as part of EPA Industrial Emissions Licences.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 9 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

13.1.1 Aspects relevant to this development

13.1.1.1 Construction Phase

During the construction phase, construction dust emissions have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

13.1.1.2 Operational Phase

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of nitrogen dioxide (NO₂) and particulate matter (as PM₁₀ and PM_{2.5}). Operational phase impacts will be long-term in duration.

13.2 METHODOLOGY

13.2.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- Guidance on the Assessment of Dust from Demolition and Construction v2.2 (Institute of Air Quality Management [IAQM] (hereafter referred to as the IAQM Guidelines) (IAQM, 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020); and
- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland [TII], 2025a).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

13.2.2 Criteria for Rating of Impact

13.2.2.1 Ambient Air Quality Standards

National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants to reduce the risk to health from poor air quality. These limit values or “*Air Quality Standards*” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast). This directive supersedes EU Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (CAFE Directive). It sets out new air quality standards for pollutants to be achieved by 2026 and by 2030.

The Ambient Air Quality Standards Regulations 2022 (S.I. 739 of 2022) (the Air Quality Standards Regulations 2022) further transposed the CAFE Directive and revoked the Air Quality Standards Regulations 2011, as amended. With the adoption of Directive (EU) 2024/2881, Ireland must similarly transpose this directive into national law within the statutory two-year period, i.e. update the Air Quality Standards Regulations, before December 2026.

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for pollutants to be achieved by 1 January 2030, these are more closely aligned with the Interim Target 4 in the 2021 WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11 December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

In relation to the proposed development, the applicable limit values are for nitrogen dioxide (NO₂) and

particulate matter (PM₁₀ and PM_{2.5}). Table 13.1 outlines the limit values pre-2030 and post-2030 for the specified pollutants.

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value (to be attained by 2030)
Nitrogen Dioxide (NO ₂)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m ³
	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM ₁₀)	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM _{2.5})	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m ³
	Annual limit for protection of human health	25 µg/m ³	Annual limit for protection of human health	10 µg/m ³

Table 13.1 Ambient Air Quality Limit Values

13.2.2.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (WHO, 2021) (Table 13.2 WHO Air Quality Guidelines (WHO, 2021)).

The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final PM_{2.5} target of 5 µg/m³. The strategy also acknowledges that “meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both PM_{2.5} and NO₂”.

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that “Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II”.

These assessment thresholds relate to monitoring of ambient air quality by Member States, where “exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years”.

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO ₂	24-hour limit for protection of human health	-	-	25µg/m ³
	Annual limit for protection of human health	20µg/ m ³	-	10µg/m ³
PM (as PM ₁₀)	24-hour limit for protection of human health	75µg/ m ³	50µg/m ³	45µg/m ³
	Annual limit for protection of human health	30µg/ m ³	20µg/ m ³	15µg/m ³
PM (as PM _{2.5})	24-hour limit for protection of human health	37.5µg/m ³	25µg/m ³	15µg/m ³
	Annual limit for protection of human health	15µg/m ³	10µg/m ³	5µg/m ³

Table 13.2 WHO Air Quality Guidelines (WHO, 2021)

The applicable air quality limit values for the purposes of this assessment are those set out in Table 13.1. The limit values stipulated in Table 1 of Annex I of Directive (EU) 2024/2881 are applicable for the Opening Year 2035 and Design Year 2050 for the proposed development.

13.2.2.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}). The EU ambient air quality standards outlined in Table 13.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled*

Minerals) (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m²/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

13.2.2.4 Air Quality & Traffic Significance Criteria

The Transport Infrastructure Ireland document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do-Nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a) and reproduced in Table 13.3. These criteria have been adopted for the proposed development to predict the impact of NO₂ and PM₁₀ emissions as a result of the proposed development.

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2025a)

Table 13.3 Air Quality & Traffic Significance Criteria

As per Table 13.3 a neutral effect is one where a change in concentration at a receptor is:

- 5% or less where the Opening Year, without the proposed development, annual mean concentration is 75% or less of the standard; or
- 1% or less where the Opening Year, without the proposed development, annual mean concentration is 94% or less of the standard.

Where an effect does not meet the criteria for neutral, as described above, the effect can either be positive or negative. The TII guidance (TII, 2025a) states that “*the evaluation of significance of effects for the operational phase should be undertaken for the Opening Year only as the Design Year is likely to show lower total pollutant concentrations and changes in concentration*” (TII, 2025a).

Non-significant effects (i.e. of local importance only) are ‘neutral’ or ‘slight’ changes in concentrations while significant effects can be changes in pollutant concentrations that are either ‘moderate’ or ‘substantial’. However, the TII guidance (TII, 2025a) states that these must be considered in the context of the project and ‘moderate’ or ‘substantial’ increases are not necessarily always significant effects.

The impact descriptors in Table 13.3 are used to describe the impact at each modelled receptor location, and the significance of the impacts is then determined, aligning with the terminology in the EPA guidelines (EPA, 2022). Whilst it may be determined that there are ‘slight’, ‘moderate’ or ‘substantial’ impacts at one or more receptors, an overall judgement should be made of whether the proposed development is ‘significant’ or ‘not significant’ in terms of air quality. Factors to consider when determining the overall significance of a proposed development are provided in Table 4.10 of the TII guidance (TII, 2025a).

13.2.3 Construction Phase Methodology

13.2.3.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology will be applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition of existing structures;
- Earthworks;
- Construction of new structures; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into large, medium or small scale depending on the nature of the activities involved. The criteria for determining the category for the works involved are outlined in Table 13.4. These are based on the IAQM guidance (IAQM, 2024). The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Dust Emission Magnitude		
Small	Medium	Large
Demolition		
- Total building volume <12,000 m³ - Construction material with low potential for dust release (e.g. metal cladding or timber) - Demolition activities <6 m above ground - Demolition during wetter months.	- Total building volume 12,000 - 75,000 m³ - Potentially dusty construction material - Demolition activities 6 – 12 m above ground level	- Total building volume >75,000 m³ - Potentially dusty construction material (e.g. concrete) - On-site crushing and screening - Demolition activities >12 m above ground level
Earthworks		
- Total site area <18,000 m² - Soil type with large grain size (e.g. sand) <5 heavy earth moving vehicles active at any one time - Formation of bunds <3 m in height - Earthworks during wetter months	- Total site area 18,000 m² - 110,000 m² - Moderately dusty soil type (e.g. silt) 5 – 10 heavy earth moving vehicles active at any one time - Formation of bunds 3 – 6 m in height	- Total site area >110,000 m² - Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) >10 heavy earth moving vehicles active at any one time - Formation of bunds >6 m in height
Construction		
- Total building volume <12,000 m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)	- Total building volume 12,000 - 75,000 m³ - Potentially dusty construction material (e.g. concrete) - On-site concrete batching	- Total building volume >75,000 m³ - On-site concrete batching - Sandblasting
Trackout (Truck Movements)		
<20 HDV (>3.5 t) outward movements in any one day - Surface material with low potential for dust release - Unpaved road length <50 m	20 – 50 HDV (>3.5 t) outward movements in any one day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50 – 100 m	>50 HDV (>3.5 t) outward movements in any one day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100 m

Table 13.4 IAQM Criteria to Determine Dust Emissions Magnitude

The sensitivity of the area must be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

Dust emissions also have the potential to impact sensitive ecology. Dust can affect vegetation through chemical means such as chemical changes like increased acidity in soils or watercourses. Physical affects include reduced photosynthesis, respiration and transpiration through smothering. These changes are likely to occur only as a

result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease. High sensitivity ecological receptors are those with international or national designation (SPAs, SACs, NHAs) and where the designated feature is dust sensitive. Effects to ecology can occur up to 50m from the source.

Table 13.5 outlines the criteria for determining the sensitivity of the area to dust soiling and dust-related human health effects as per the IAQM guidance (IAQM, 2024).

Sensitivity of the Area to Dust Soiling Effects on People and Property						
Receptor Sensitivity	Number of Receptors	Distance from Source (m)				
		<20	<50	<100	<250	
High	>100	High	High	Medium	Low	
	10 - 100	High	Medium	Low	Low	
	1 - 10	Medium	Low	Low	Low	
Medium	>1	Medium	Low	Low	Low	
Low	>1	Low	Low	Low	Low	
Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<250
High	< 24 µg/m ³	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low
Sensitivity of the Area to Ecological Impacts						
Receptor Sensitivity	Distance from Source (m)					
	<20		<50			
High	High		Medium			
Medium	Medium		Low			
Low	Low		Low			

Table 13.5 Criteria for Determining the Sensitivity of the Area

Once the dust emission magnitude and sensitivity of the area have been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 13.6.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 13.6 IAQM Criteria to Determine Risk of Dust Impacts

13.2.3.2 Construction Traffic Assessment

Construction phase traffic has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

Roadplan Consulting have prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 6 Material Assets (Traffic and Transport) this EIAR. As per Chapter 6, it has been determined by Roadplan Consulting that the construction phase traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction phase traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality with respect with human or ecological receptors. The impact of construction traffic has been qualitatively assessed.

13.2.4 Operational Phase Methodology

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 13.2.2.4 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. Roadplan Consulting have prepared a Traffic and Transport Impact Assessment for the proposed development, enclosed separately, and have prepared Chapter 6 Material Assets – Traffic and Transport. There is predicted to be a greater than 1,000 AADT increase on 2 no. of road links. As a result, an

assessment of traffic related emissions was conducted. Additionally, traffic associated with other cumulative developments in the vicinity of the proposed development was included in the figures supplied to ensure a full cumulative assessment was conducted. See Traffic and Transport Assessment and Chapter 6 Material Assets – Traffic and Transport for further details.

The impact of traffic emissions on air quality is assessed for both human and ecological receptors within 200 m of impacted roads as per the TII PE-ENV-01106 guidance (TII, 2025a). The following sections describe the methodology for each assessment.

The impact to air quality as a result of changes in traffic is assessed at sensitive human receptors in the vicinity of affected roads. These are discussed in further detail within Section 13.3.3.2. and shown graphically in Figure 13.3.

The TII guidance (2025) states that modelling should be conducted for NO₂, PM₁₀ and PM_{2.5} for the Base, Opening and Design Years for both the Do Nothing, i.e. assuming the proposed development is not in place, and Do Something (with the proposed development in place) scenarios. Modelling of operational NO₂, PM₁₀ and PM_{2.5} concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2025b).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), heavy duty vehicles (HDV) AADT (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The Default fleet mix option was selected which includes the following assumptions for fleet composition:

- Cars - Climate Action Plan (CAP), this is based on defined objectives to increase adoption of alternative technologies to reduce emissions with increased electrification.
- LGV - Business as Usual (High Ambition), this is based on a review of market capacity for different technologies within each category. This is broken down further into “high ambition” in the LGV fleet, where the distinction is the rate of adoption of low emissions technologies based on available and emerging technologies, adjusted to recognise the unique conditions, constraints and opportunities in the Irish market.
- HGVs - EU target projections for HGVs, this represents interim targets for emissions from sales of new HGVs.

The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM₁₀ emissions associated with brake and tyre wear (TII, 2025b).

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII guidance (2025) also states that impacts to sensitive ecology due to traffic emissions should be considered. Consideration should be given to designated sites within 2km of the proposed development. However, a detailed assessment is only required at a local level, where there is a designated site within 200m of impacted road links. The TII guidance (TII, 2025a) notes that only sites that are sensitive to nitrogen and acid deposition need to be included in the assessment. It is not necessary to include sites, for example that have been designated as a geological feature or water course. There are no designated ecological sites within 200m of the site or impacted road links and therefore no assessment was required as there is no potential for significant impacts to the designated sites due to changes in air quality.

13.2.4.1 Traffic Data used in Modelling Assessment

Traffic flow information is detailed in Table 13.7 was obtained from Roadplan Consulting for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the Opening Year 2035 and Design Year 2050 were provided. The traffic data included traffic associated with the development site and other cumulative sites as relevant (see Chapter 6 for further details).

The modelling assessment has been undertaken for 2 no. road links that were within 200 m of receptors. Background concentrations have been included as per Section 13.3.2 of this chapter based on available EPA background monitoring data (EPA, 2025).

Road Name	Speed (kph)	Opening Year		Design Year	
		Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Monaleen Rd (south)	50	2126 (0)	2381 (0)	3430 (0)	0 (0)
Development Access	30	0 (0)	0 (0)	1102 (0)	2260 (0)

Table 13.7 Traffic Data used in Operational Phase Air Quality Assessment

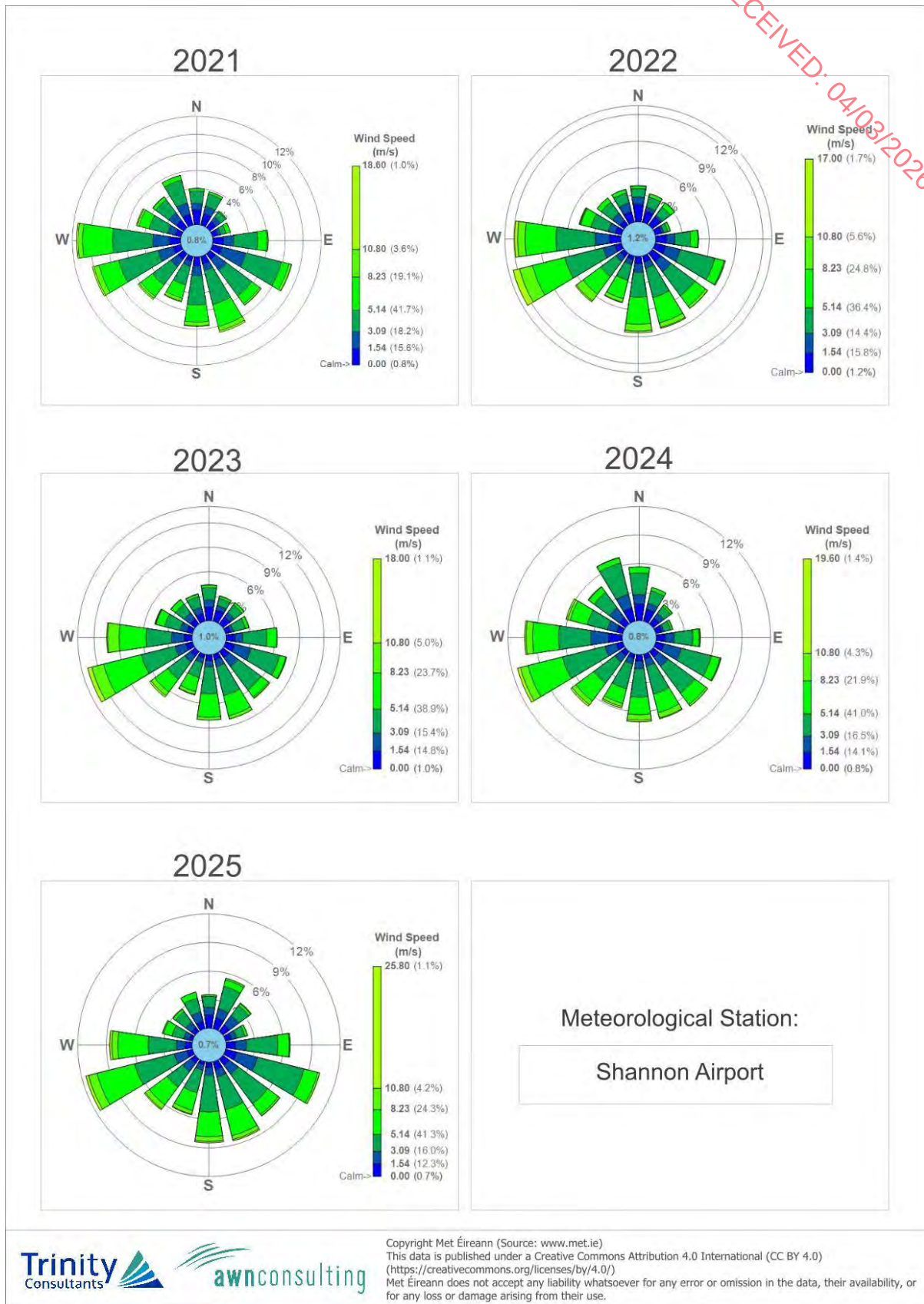
13.3 BASELINE ENVIRONMENT

13.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2021). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Shannon Airport meteorological station, which is located approximately 23 km west of the site. Shannon Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 13.1)(Met Éireann, 2026). For data collated during five representative years (2021 – 2025), the predominant wind direction is westerly to south-westerly with a mean wind speed of 4.68 m/s over the 30-year period of 1991 - 2020 (Met Éireann, 2026).

Figure 13.1 Shannon Airport Windrose 2020-2024



13.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is 'Air Quality In Ireland 2024' (EPA, 2025). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2025). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland and all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone C (EPA, 2025). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). The use of publicly available long-term datasets is recommended by TII in their PE-ENV-0016 guidance (2025a). This use of long-term data sets is preferred over on-site baseline air monitoring surveys as it gives a better indication of long-term trends in air quality.

Continuous monitoring by the EPA is carried out at a number of monitoring stations within Zone C; these include urban background sites, roadside (traffic) sites and suburban background sites. It is necessary to select monitoring stations that are representative of the site location. Not all monitoring stations are considered suitable for determining background pollutant concentrations and must be reviewed on a case-by-case basis to determine the most appropriate EPA monitoring sites for the current assessment.

The EPA, on their website (EPA, 2026), state that background sites generally represent overall area-wide exposure more closely than roadside sites. Roadside monitoring sites are heavily influenced by traffic emissions and are not considered representative of area-wide pollutant levels.

The full suite of EPA Zone C monitoring locations were reviewed. Suburban background was determined to be the most representative background for the area of the proposed development. Influences from traffic emissions will be captured within the traffic modelling assessment and therefore, suburban background concentrations give the best indication of other, non-traffic derived sources of pollutants.

13.3.2.1 NO₂

Long-term NO₂ monitoring was conducted at the Zone C background locations of Dundalk, Kilkenny Seville Lodge, Portlaoise and Limerick People's Park, which are considered representative of the area, for the period 2020 – 2024 (EPA, 2025).

Annual mean concentrations of NO₂ range from 4 – 11 µg/m³ over the 2020 – 2024 period (Table 13.8), with an average of 8 µg/m³ over this period. Long term average concentrations are significantly below the current annual average limit of 40 µg/m³. Based on the above information, a reasonably conservative estimate of the current background NO₂ concentration in the region of the proposed development is 8 µg/m³.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Dundalk	Annual Mean NO ₂ (µg/m ³)	10	11	10	9	10
	1-hr Mean > 200 µg/m ³ (days)	1	0	1	1	0
Kilkenny Seville Lodge	Annual Mean NO ₂ (µg/m ³)	4	4	5	4	5
	1-hr Mean > 200 µg/m ³ (days)	0	0	0	0	0
Portlaoise	Annual Mean NO ₂ (µg/m ³)	8	8	9	8	8
	1-hr Mean > 200 µg/m ³ (days)	0	0	0	0	0
Limerick People's Park	Annual Mean NO ₂ (µg/m ³)	10	10	10	9	9

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
	1-hr Mean > 200 µg/m ³ (days)	0	0	0	0	0

Table 13.8 Background Air Quality – Nitrogen Dioxide (NO₂)

13.3.2.2 PM₁₀

Continuous PM₁₀ monitoring was conducted at the Zone C background locations of Athlone, Carlow Town, Ennis, Galway Ragoon, Kilkenny Seville Lodge, Portlaoise and Limerick People's Park, which are considered representative of the area, from 2020– 2024 (EPA, 2025).

Annual average concentrations range from 10 – 20 µg/m³ over the period (Table 13.9). Hence, long term concentrations are significantly below the current annual limit value of 40 µg/m³. There were at most 21 exceedances of the daily limit of 50 µg/m³ in 2022 (35 exceedances are permitted per year). The average PM₁₀ concentration at the suburban background Zone C sites over the 2020 – 2024 period is 13 µg/m³. Based on the EPA data, a reasonably conservative estimate of the current background PM₁₀ concentration in the region of the proposed development is 13 µg/m³.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone	Annual Mean PM ₁₀ (µg/m ³)	16	12	12	12	12
	24-hr Mean > 50 µg/m ³ (days)	3	2	3	1	-
Carlow Town	Annual Mean PM ₁₀ (µg/m ³)	11	10	11	10	11
	24-hr Mean > 50 µg/m ³ (days)	1	0	0	0	-
Ennis	Annual Mean PM ₁₀ (µg/m ³)	20	19	20	16	16
	24-hr Mean > 50 µg/m ³ (days)	19	17	21	11	-
Galway Ragoon	Annual Mean PM ₁₀ (µg/m ³)	13	11	13	13	12
	24-hr Mean > 50 µg/m ³ (days)	1	1	0	0	-
Kilkenny Seville Lodge	Annual Mean PM ₁₀ (µg/m ³)	18	17	18	14	12
	24-hr Mean > 50 µg/m ³ (days)	1	2	2	0	-
Portlaoise	Annual Mean PM ₁₀ (µg/m ³)	12	11	12	11	12
	24-hr Mean > 50 µg/m ³ (days)	0	1	0	0	-
Limerick People's Park	Annual Mean PM ₁₀ (µg/m ³)	13	13	14	11	12
	24-hr Mean > 50 µg/m ³ (days)	1	2	2	0	-

Table 13.9 Background Air Quality – PM₁₀

13.3.2.3 PM_{2.5}

Long-term PM_{2.5} monitoring was conducted at the Zone C background locations of Athlone, Carlow Town, Ennis, Naas, Portlaoise, Galway Briarhill and Limerick People's Park, which are considered representative of the area, over the period 2020 – 2024 (EPA, 2025). Average concentrations ranged from 6 – 16 µg/m³ (Table 13.10) which is in compliance with the current annual mean limit value of 25 µg/m³. The overall annual average concentration for this 5-year period is 9 µg/m³. Based on the EPA data, the existing PM_{2.5} concentration in the region of the proposed development was estimated at 9 µg/m³.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone	Annual Mean PM ₁₀ (µg/m ³)	12	9	9	8	9
Carlow Town	Annual Mean PM ₁₀ (µg/m ³)	7	7	7	6	7
Ennis	Annual Mean PM ₁₀ (µg/m ³)	14	15	16	12	12

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Naas	Annual Mean PM ₁₀ (µg/m ³)	-	7	8	7	7
Portlaoise	Annual Mean PM ₁₀ (µg/m ³)	8	8	8	7	8
Galway Briarhill	Annual Mean PM ₁₀ (µg/m ³)	-	-	10	7	7
Limerick People's Park	Annual Mean PM ₁₀ (µg/m ³)	9	9	9	7	8

Table 13.10 Background Air Quality – PM_{2.5}

13.3.2.4 Summary

Based on the above information the air quality in the Zone C suburban area is generally good, with concentrations of the key pollutants generally well below the relevant limit values set out in Table 2 of Annex I of Directive (EU) 2024/2881. The current pollutant concentrations at the majority of monitoring sites are also in compliance with the 2030 limit values set out in Table 1 of Annex I in Directive (EU) 2024/2881 and the clean air strategy, however, concentrations are exceeding or approaching the limit values at some sites. Further measures will be needed at a national scale to reduce air pollution in future years. The EPA have indicated that road transport emissions are contributing to increased levels of NO₂ with the potential for breaches in the annual NO₂ limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM₁₀ and PM_{2.5}). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2025).

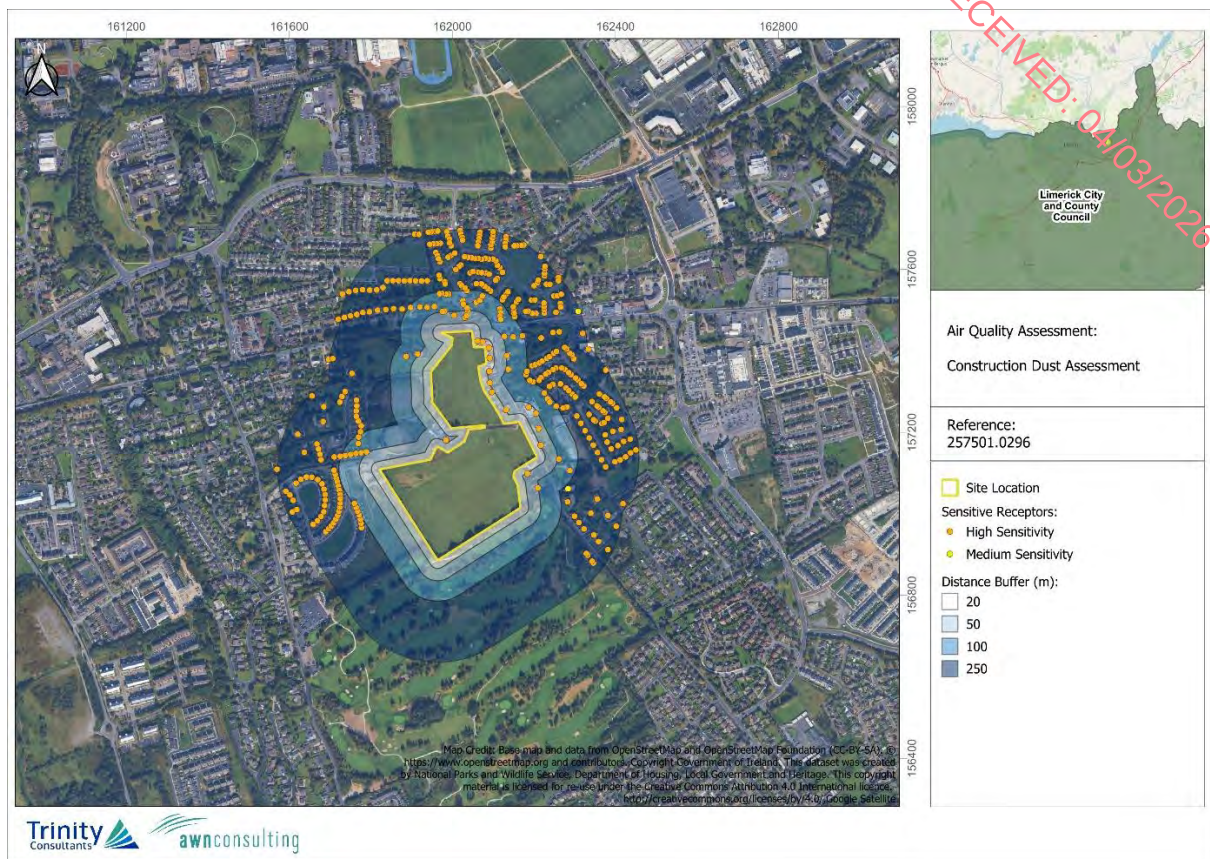
13.3.3 Sensitivity of the Receiving Environment

13.3.3.1 Construction Phase

The impact to air quality due from construction phase activities is assessed at sensitive receptors within 250m of the development boundary. In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 13.2). There are 1-10 high sensitivity residential properties within 20m of the site boundary, and there are a further 10-100 within 50m and more than 100 properties within 100m of the site boundary.

Figure 13.2 shows the sensitive receptors in the construction dust study area within 250m of the site.

Figure 13.2 Sensitive Receptors within 250m of Site



13.3.3.2 Operational Phase

The impact to air quality due to changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2025) states that a proportionate number of representative receptors, which are located in areas which will experience the highest concentrations or greatest improvements because of the proposed development, are to be included in the modelling. The TII criteria state that receptors within 200 m of impacted road links should be assessed; roads which are greater than 200 m from receptors will not impact pollutant concentrations at that receptor (TII, 2025a). The TII guidance (2025a) defines sensitive receptor locations for the purposes of modelling annual mean pollutant concentrations as: residential housing, schools, hospitals, care homes and short term-accommodation such as hotels, i.e. locations where members of the public are likely to be regularly present for 24 hours. A total of 2 no. high sensitivity residential receptor (R1 and R2) were included in the modelling assessment (see Figure 13.3). 1 potential development receptor (P1) was included in the assessment to determine concentration levels at the proposed development in the opening and design years.

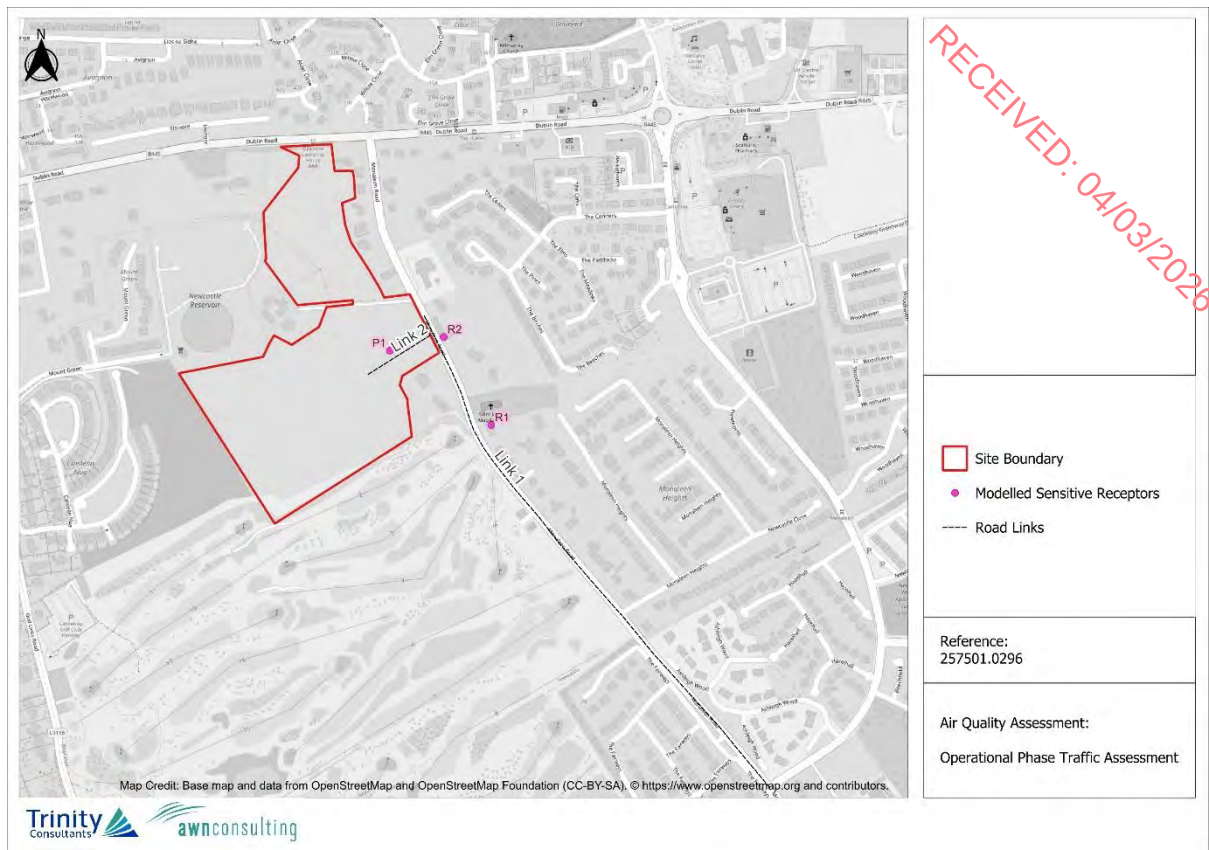


Figure 13.3 Location of Sensitive Receptors used in Operational Phase Air Quality Assessment

13.4 IMPACT ASSESSMENT

13.4.1 Construction Phase

13.4.1.1 Construction Phase Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250m of a construction site, the majority of the deposition occurs within the first 50m (IAQM, 2024). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Shannon Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 13.3.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Shannon Airport meteorological station indicates that on average 223 days per year have rainfall over 0.2 mm (Met Éireann, 2025). Therefore, it can be determined that 61% of the time dust generation will be reduced due to natural meteorological conditions.

To determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (Section 13.3.3). The major dust generating activities are divided into four types within the (IAQM, 2024) guidance to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (movement of heavy vehicles).

Determining the Potential Dust Emission Magnitude

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity (Table 13.11) has been determined below for the proposed development using the criteria in Table 13.4.

Activity	Dust Emission Magnitude	Justification
Demolition	n/a	No buildings to be demolished
Earthworks	Medium	Total site area is between 18,000 and 110,000 m ²
Construction	Large	More than 75,000 m ³ of building to be constructed
Trackout	Medium	Approximately 20-50 outward vehicle movements per day from construction site activities

Table 13.11 Potential Dust Emission Magnitude

Determining The Sensitivity Of The Area

In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 13.2). There are 1-10 high sensitivity residential properties within 20m of the site boundary, and there are a further 10-100 within 50m and more than 100 properties within 100m of the site boundary. Based on these receptor numbers and using the IAQM criteria in Table 13.5, the sensitivity of the area to dust soiling impacts from the proposed development is medium.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the proposed development is 13 µg/m³. There are 1-10 high sensitivity receptors within 20 m of the proposed development boundary. Based on the IAQM criteria outlined in Table 13.5 the worst-case sensitivity of the area to dust-related human health effects is low.

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant, as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site, and 50 m from site access roads, up to 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. There are no sensitive ecological receptors that meet these criteria within the study area and there is no potential for impacts to sensitive ecology from construction dust emissions and no further assessment is required.

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	n/a	Medium	Medium	Medium
Human Health	n/a	Low	Low	Low

Table 13.12 Sensitivity of the Area

Determining the Risk of Dust Impacts

As detailed in Table 13.6, the predicted dust emission magnitude is combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation.

Table 13.13 below provides a summary of the risk of dust impacts for the proposed development.

There is at most a medium risk of dust impacts from dust soiling resulting from construction, earthworks and trackout activities due to a medium receptor sensitivity and a medium to large dust emissions magnitude associated with the proposed works. There is at most a low risk of dust-related human health impacts associated with the proposed works, due to the low receptor sensitivity for human health effects and the low background concentrations of PM₁₀.

Without mitigation in place, construction dust will have a **short-term direct, localised, negative, and slight** impact on air quality, which has the potential to be **significant**. As a result, best practice dust mitigation measures associated with medium works will be implemented to ensure there are no significant impacts at nearby sensitive receptors (see Section 13.6).

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	n/a	Medium Risk	Medium Risk	Medium Risk
Human Health	n/a	Low Risk	Low Risk	Low Risk

Table 13.13 Risk of Dust Impacts used to Define Site-Specific Mitigation

13.4.1.2 Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality with respect to human health and ecology in the short-term over the construction phase, particularly, due to the increase in HGVs accessing the site. The construction phase traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII assessment criteria in Section 13.2.3.2.

Therefore, it can be determined that the construction phase traffic will have an **imperceptible, neutral, short-term** and **not significant** impact on air quality.

13.4.2 Operational Phase

There is the potential for vehicles accessing the site to result in emissions of NO₂, PM₁₀ and PM_{2.5}.

13.4.2.1 Operational Phase Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated due to the development. The traffic data has included specific cumulative developments within the area to provide for a worst-case assessment and to assess potential cumulative impacts (see Transport Assessment and Chapter 6 Traffic & Transportation, both prepared by Roadplan Consulting for further details).

The traffic data includes the Do Nothing (DN) scenario and Do Something (DS) scenario. The impact of NO₂, PM₁₀ and PM_{2.5} emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the impacted road links. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined. Proposed receptor (P1), representative of worst-case sensitive receptors introduced with the development, was also included in the assessment. However, for this receptor no impacts can be described, as the receptor does not exist in a DN scenario. For the proposed receptor, only predicted concentrations for the DS scenario are reported and compared with the relevant limit values.

The TII guidance PE-ENV-01106 (TII, 2025a) details a methodology for determining air quality impact significance

criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do Nothing' scenario, which assumes that the proposed development is not in place in future years, to determine the degree of impact.

Traffic related air emissions have the potential to impact air quality which can affect human health. The following details the results of the air dispersion modelling assessment of traffic emissions to determine the impact to human health. The predicted pollutant concentrations have been compared against the ambient air quality limit values set out in Table 13.1. The limit values set out in Table 1 of Annex I of Directive (EU) 2024/2881 are applicable to both Opening Year 2035 and the Design Year 2050 as the assessment years are post-2030.

NO₂

The results of the NO₂ modelling are shown in Table 13.14. In the Opening Year 2035, predicted annual mean concentrations of NO₂ are in compliance with the annual mean limit value of 20 µg/m³ reaching at most 40% of the limit. In addition, the TII guidance (2025) states that the hourly limit value for NO₂ of 200 µg/m³ is unlikely to be exceeded where the annual mean is below 30 µg/m³. The daily NO₂ limit value of 50 µg/m³ is unlikely to be exceeded where the annual mean NO₂ concentration is below 25 µg/m³. As predicted NO₂ concentrations are significantly below 30 µg/m³ and 25 µg/m³ (Table 13.14), it can be concluded that the short-term NO₂ limit value will be complied with at all receptor locations. Some increases in NO₂ concentrations are predicted at the worst-case receptors assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 13.14). Concentrations are predicted to increase by at most 0.04 µg/m³ at receptor R2. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 0.20% at receptor R2. The other receptors in the area will experience similar or lesser impacts and all increases are considered 'neutral' as per the TII criteria in Table 13.3.

In the Design Year 2050, predicted annual mean NO₂ concentrations are in compliance of the limit value of 20 µg/m³ at the worst-case receptors assessed, reaching at most 40% of the limit. The short-term NO₂ limit value will be complied with at all receptor locations in the Design Year based on the low annual mean concentrations. The proposed development will result in 'neutral' increase in NO₂ concentrations according to the TII significance criteria in Table 13.3, with concentrations increasing by at most 0.02 µg/m³ (at receptor R1, see Table 13.14) which is an increase of 0.10% when compared with the applicable annual mean limit value for NO₂.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	8.1	40%	8.1	40%	0.03	0.15%	Neutral
R2	8.0	40%	8.0	40%	0.04	0.20%	Neutral
P1	n/a	n/a	8.1	40%	n/a	n/a	n/a
Receptor	Impact Design Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	8.0	40%	8.0	40%	0.02	0.10%	Neutral

R2	8.0	40%	8.0	40%	0.01	0.05%	Neutral
P1	n/a	n/a	8.0	40%	n/a	n/a	n/a

Note: As P1 is a potential development receptor, no associated DN concentrations or impacts have been predicted as they will not exist without the development in place.

Table 13.14 Predicted Annual Mean NO₂ Concentrations (µg/m³)

PM₁₀

The results of the PM₁₀ modelling can be seen in Table 13.15 for the Opening Year 2035 and Design Year 2050.

In the Opening Year 2035, annual mean PM₁₀ concentrations are in compliance with the annual mean limit value of 20 µg/m³ reaching at most 68% of the limit. In the Design Year 2050 annual mean PM₁₀ concentrations are also in compliance with the annual mean limit value of 20 µg/m³ reaching at most 68% of the limit. In addition, the proposed development will not result in any additional days of exceedance of the daily PM₁₀ limit value of 45 µg/m³ in both the opening and design years.

The changes in PM₁₀ concentrations as a result of the proposed development can be assessed relative to the 'Do Nothing' (DN) levels. In the Opening Year 2035 annual PM₁₀ concentrations will increase by at most 0.18 µg/m³ at receptor R2, this is a 0.45% increase when compared with the annual mean limit value of 20 µg/m³. This is considered a 'neutral' impact as per the TII criteria in Table 13.3. The other receptor in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 13.3

In the Design Year 2050 the proposed development will result in some minor increased concentrations. There is predicted to be a maximum increase of 0.18 µg/m³ at receptor R1, which is a 0.90% increase when compared with the annual mean limit of 20 µg/m³. The changes in concentrations in the Design Year are considered from 'neutral' based on the TII criteria in Table 13.3.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	13.4	67%	13.5	68%	0.15	0.75%	Neutral
R2	13.0	65%	13.2	66%	0.18	0.45%	Neutral
P1	n/a	n/a	13.2	66%	n/a	n/a	n/a
Receptor	Impact Design Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	13.3	67%	13.5	68%	0.18	0.90%	Neutral

R2	13.0	65%	13.2	66%	0.17	0.85%	Neutral
P1	n/a	n/a	13.2	66%	n/a	n/a	n/a

Note: As P1 is a potential development receptor, no associated DN concentrations or impacts have been predicted as they will not exist without the development in place.

Table 13.15 Predicted Annual Mean PM₁₀ Concentrations (µg/m³)

PM_{2.5}

In relation to changes in PM_{2.5} concentrations as a result of the proposed development, the results of the assessment can be seen in Table 13.16 for the modelled Opening Year 2035 and Design Year 2050.

In the Opening Year 2035, predicted annual mean concentrations of PM_{2.5} are in compliance with the annual mean limit value of 10 µg/m³ reaching at most 93% of the limit. The proposed development will result in 1 additional exceedance of the daily limit value of 25 µg/m³, however 18 exceedances are permitted per year. There is predicted to be an increase in PM_{2.5} concentrations at the worst-case receptors assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 13.16). Concentrations are predicted to increase by at most 0.09 µg/m³ at receptor R2. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 0.9% at receptor R2. This is considered a 'neutral' impact as per the TII criteria in Table 13.3. The other receptors in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 13.3.

In the Design Year 2050, predicted annual mean PM_{2.5} concentrations are in compliance with the limit value of 10 µg/m³ at all receptors assessed. Concentrations reach at most 93% of the annual mean limit value. The proposed development will result in 1 additional exceedance of the daily limit value of 25 µg/m³, however 18 exceedances are permitted per year. The proposed development will result in a 'neutral' increase in PM_{2.5} concentrations according to the TII significance criteria Table 13.3, with concentrations increasing by at most 0.9 µg/m³ (at receptor R2, see Table 13.16) which is an increase of 0.9% when compared with the applicable annual mean limit value for PM_{2.5}. This is considered a 'neutral' impact as per the TII criteria in Table 13.3. The other receptors in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 13.3.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	9.2	92%	9.3	93%	0.08	0.80%	Neutral
R2	9.0	90%	9.1	91%	0.09	0.90%	Neutral
P1	n/a	n/a	9.1	91%	n/a	n/a	n/a
Receptor	Impact Design Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description

R1	9.2	92%	9.3	93%	0.09	0.90%	Neutral
R2	9.0	90%	9.1	91%	0.09	0.90%	Neutral
P1	n/a	n/a	9.1	91%	n/a	n/a	n/a

Note: As P1 is a potential development receptor, no associated DN concentrations or impacts have been predicted as they will not exist without the development in place.

Table 13.16 Predicted Annual Mean PM_{2.5} Concentrations (µg/m³)

Significance of Changes in NO₂, PM₁₀ and PM_{2.5} Concentrations

As outlined in Section 13.2.2.4, the TII guidance (2025) states that the significance of effects should be assessed based on the opening year only. Non-significant effects are 'neutral' or 'slight' changes in concentrations while significant effects can be changes in pollutant concentrations that are either 'moderate' or 'substantial'. However, the TII guidance (2025) states that these must be considered in the context of the project and 'moderate' or 'substantial' increases are not necessarily always significant effects.

In relation to NO₂, PM₁₀ and PM_{2.5} the predicted changes in concentrations are 'neutral' at the worst-case receptor assessed. Therefore, according to the TII criteria as outlined in Section 13.2.2.4, the impact is not significant.

For the purposes of this assessment, it has been assumed that the current estimated background pollutant concentrations are applicable for both the opening and design years, with no decreases in future background concentrations allowed for. There will be some decreases in background concentrations in future years. However, at present there is no guidance-based methodology available for estimating future year background concentrations and therefore, as a conservative approach, the current estimated background concentrations have been applied to future years.

Due to the large uncertainty in future improvements in fleet composition and emissions, such as projected changes to vehicle registration and electric vehicle uptake, the future year emission rates utilised by the TII REM tool do not account for the full implementation of these improvements in fleet composition. Predicted design year concentrations are therefore currently overly conservative as future emissions improvements are not fully taken into account, as well as no improvement in background concentrations being assumed.

As a result, the opening year predicted concentrations are the most appropriate for determining the significance of effects as per Section 13.2.2.4.

It can be concluded that the impact of traffic emissions on air quality and human health during the operational phase is **long-term, direct, localised, negative** and **not significant** in EIA terms.

The measures set out in the Clean Air Strategy for Ireland (Government of Ireland 2023) aim to work 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 continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved. The estimated background concentrations used in the assessment are the largest contribution to predicted pollutant concentrations, rather than pollutant contributions associated with the proposed development. Strategies to improve air quality at a national level in future years will contribute to reducing background concentrations and therefore it is envisioned that air quality will improve in the future.

13.5 DO NOTHING

In the Do-Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 13.4.2, concentrations of the key pollutants in future years are predicted to be in compliance with the relevant air quality limit values.

13.6 MITIGATION MEASURES

13.6.1 Construction Phase

The proposed development has been assessed as having a medium-risk of dust soiling impacts and a low-risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 13.4.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities. Mitigation measures for medium-risk sites as recommended by IAQM construction dust guidance are detailed in Table 13.17.

Category	Mitigation Measures
Communications	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. - Display the head or regional office contact information - Develop and implement a Dust Management Plan (DMP), which will include measures to control other emissions, approved by the Local Authority.
Site Management	- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. - Make the complaints log available to the local authority when asked. - Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Preparing and Maintaining the Site	- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. - Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period - Avoid site runoff of water or mud. - Keep site fencing, barriers and scaffolding clean using wet methods. - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. - Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery	- Ensure all vehicles switch off engines when stationary – no idling vehicles. - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Category	Mitigation Measures
and sustainable travel	• Impose and signpost a maximum-speed-limit of 25 kmph on surfaced and 15 kmph on unsurfaced 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) • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	• Bonfires and burning of waste materials are legally prohibited.
Measures Specific to Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable. • Only remove the cover in small areas during work and not all at once.
Measures Specific to Construction	• Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.
Measures Specific to Trackout	• 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. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site logbook. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit. • Access gates to be located at least 10 m from receptors where possible.

Table 13.17 Construction Phase Dust Mitigation Measures.

13.6.2 Operational Phase

No site-specific mitigation measures are proposed for the operational phase as impacts to air quality will be non-significant.

13.7 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

13.7.1 Construction Stage

13.7.1.1 Air Quality

Once the dust mitigation measures outlined in Section 13.6.1 are implemented, the impact of the proposed development in terms of dust soiling will be **direct, short-term, negative, localised** and **not significant** at nearby receptors.

13.7.1.2 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be **direct, short-term, negative, localised** and **not significant** with respect to human health.

13.7.2 Operational Stage

13.7.2.1 Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO₂, PM₁₀ and PM_{2.5} at nearby sensitive receptors as a result of the proposed development will be 'neutral' in line with the TII assessment criteria (13.2.2.4). Therefore, the operational phase impact to air quality is **long-term, direct, negative**, and **not significant**.

13.7.2.2 Human Health

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the TII assessment criteria which is based on the impacts in the opening year. Section **Error! Reference source not found.** determined that the impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be **localised, direct, long-term, negative** and **not significant** for the opening year. However, Ireland will need to develop measures to ensure continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved.

13.8 CUMULATIVE

13.8.4 Construction Phase

There is the potential for cumulative construction dust impacts to nearby sensitive receptors if the construction phase of the proposed development coincides with that of other large-scale developments within 500 m of the site.

A review of the planned and permitted projects within the vicinity of the site was undertaken in order to identify

developments with the potential for cumulative construction phase impacts.

The following development was identified of sufficient scale to potentially generative cumulative dust impacts with the proposed development.

- Planning Ref. No. 2360263 - Development comprising 13 no. residential units, (2 no. semi-detached houses & 11 no. Terrace houses).

The dust mitigation measures outlined in Section 13.6 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. Similar dust mitigation measures are required for other permitted developments as per their respective impact assessments and planning conditions.

With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development is **short-term, direct, negative** and **not significant**.

13.8.5 Operational Phase

Air dispersion modelling of operational traffic emissions associated with the proposed development and cumulative developments in the wider area was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO₂, PM₁₀ and PM_{2.5} at nearby sensitive receptors as a result of the proposed development in combination with cumulative developments will be neutral as per the TII descriptors in Table 13.3. Therefore, the operational phase impact to air quality is **long-term, direct, negative**, and **not significant**.

13.9 DIFFICULTIES ENCOUNTERED

There were no significant difficulties encountered when compiling this assessment.

13.10 INTERACTIONS

13.10.1 Air Quality and Population & Human Health

13.10.1.1 Construction Phase

An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the proposed development. Best practice mitigation measures will implemented during the construction phase to ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is **direct, short-term, negative, localised** and **not significant** with respect to Population and Human Health during the construction phase.

13.10.1.2 Operational Phase

Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the proposed development will not cause a significant change in air pollutant emissions in the locality. It has been assessed that emissions will be in compliance with the ambient air quality standards which are set for the protection of human health. Impacts will be **long-term, localised, direct, negative** and **not significant**.

13.10.2 Air Quality and Climate

Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

13.10.3 Air Quality and Land & Soils

13.10.3.1 Construction Phase

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase.

13.10.3.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Land & Soils during the operational phase.

13.10.4 Air Quality and Biodiversity

13.10.4.1 Construction Phase

Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. There are no designated ecological sites within 250 m of the proposed development site area. Significant dust impacts are not predicted beyond this distance. Dust mitigation measures will be implemented on site as set out in Section 13.6.1. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be **direct, short-term, negative, localised** and **not significant** with respect to biodiversity.

13.10.4.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Biodiversity during the operational phase.

13.10.5 Air Quality and Material Assets – Traffic & Transport

13.10.5.1 Construction Phase

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between Traffic and Air Quality are linked but there is no potential for significant impacts from traffic on air quality. The effects are considered to be **direct, short-term, neutral, localised** and **not significant** during the construction phase.

13.10.5.2 Operational Phase

The impact of the interactions between Traffic and Air Quality are considered to be **long-term, direct, negative** and **not significant** during the operational phase.

13.11 MONITORING

13.11.4 Construction Phase

The following monitoring measures are proposed to ensure the dust mitigation measures are working satisfactorily:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

13.11.5 Operational Phase

There is no monitoring recommended for the operational phase of the proposed development as impacts to air quality are predicted to be **not significant**.

13.12 REFERENCES

Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)

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

Environmental Protection Agency (2025) Air Quality in Ireland 2024 (& previous annual reports 2020-2023)

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Government of Ireland (2023) Clean Air Strategy for Ireland

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Met Éireann (2026a) Irelands' 30-year averages

Met Éireann (2026b) Met Éireann website: <https://www.met.ie/>

Transport Infrastructure Ireland (2025a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2025b) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

World Health Organisation (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 14: CLIMATE

**PROPOSED LARGE-SCALE RESIDENTIAL
DEVELOPMENT ON LANDS AT MONALEEN ROAD,
CASTLETROY, LIMERICK**

February 2026



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14 CLIMATE

14.1 INTRODUCTION

This chapter assesses the likely climate impacts associated with the proposed development of the lands located on Monaleen Road in the Castletroy area of Limerick (hereafter 'proposed development'). A full description of the development is available in Chapter 2 (Description of the Proposed Development).

The climate assessment is divided into two distinct sections:

- The Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the greenhouse gas (GHG) emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- The Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a project's vulnerability to climate change and identifies adaptation measures to increase project resilience.

14.2 EXPERTISE AND QUALIFICATIONS

This chapter was compiled by Sarah Berry. Sarah is a Principal Environmental Consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. Sarah holds a BSc in Physical Geography from the University of Leeds. She has 9 years' experience in climate change and sustainability, with expertise in greenhouse gas permitting, accounting and verification. Her experience includes conducting strategic sector-specific GHG audits across a range of industries (data centres, industrial facilities, hospitals, manufacturing, power stations and airports). She has prepared climate chapters for EIARs for proposed developments across Ireland including large residential developments, windfarms, industrial developments and wastewater treatment works.

This chapter was reviewed by Lee Shelton. Lee is a Principal Environmental Consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. Lee is a Chartered Environmentalist with 11 years' experience in environmental assessment and holds a BSc (Hons) in Environmental Protection from Scotland's Rural College through the University of Edinburgh. Lee has a specialism in air quality assessment having worked on a number of projects requiring the quantification of emissions specific to local air quality, a skill transferrable to climate assessment. Lee undertook early assessments in the history of climate assessment such as those for the Design Manual for Roads and Bridges Stage 2 assessment for the A47 Improvements at Tuddenham and Guyhirn in England and latterly was involved in the Midlands Connect Transport Carbon Quantification in England. Lee's recent air quality assessment projects include the Grangemouth Air Quality Assessment in support of the revocation of the Grangemouth Air Quality Management Area in Falkirk, Scotland involving quantification of emissions from multiple different sources. Lee specialises in air quality dispersion modelling and assessment of emissions, odour and accidental releases, emission inventories, air quality and odour monitoring and geographical information systems.

14.2.1 Aspects Relevant to this Assessment

Construction and operational phase greenhouse gas (GHG) emissions have been assessed with respect to this project. The embodied carbon within the construction materials makes up the greatest proportion of emissions and therefore has the highest potential to impact climate through the release of CO₂e. Other relevant aspects include transport of materials to site, clearance, demolition and excavation of existing land, construction waste and disposal and emissions associated with the transport of workers over the construction period. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

During the operational phase, materials required for maintenance of the site emit GHG emissions. Engine emissions from vehicles accessing the site also have the potential to impact climate during the operational phase of the development through the release of CO₂. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

14.3 GUIDANCE, LEGISLATION & POLICY

In common with all environmental legislation, in Ireland climate legislation is driven primarily by international agreements or European Directives that are then transcribed into domestic law by the Government of Ireland. This is then interpreted through European and domestic policy instruments that clarify aspects, objectives, targets and requirements described in the legislation.

14.3.1 Legislation

The **United Nations Paris Agreement** (United Nations, 2015) treaty binds signatory nations to a commitment to hold global average temperature increase well below 2°C above pre-industrial levels with efforts to limit the increase to 1.5°C below pre-industrial levels. Signatories commit to Nationally Determined Contributions (NDCs) which are self-defined climate pledges made by countries in response to climate change, which also includes the direction of finance. Adaptation to the adverse impacts of climate change and lowering greenhouse gas emissions should be undertaken in an equitable manner so as not to disadvantage populations on lower incomes or those most at risk from climate change.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (European Parliament and Council, 2021) follows from the Paris Agreement and writes into EU law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas (GHG) emissions by at least 55% by 2030, compared to 1990 levels. These targets are also applied to member states.

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (European Parliament and Council, 2014) acknowledges that climate change will play a crucial role in the sustainable development of society. Directive 2014/52/EU requires assessment of the impact of specific types of new development on the climate. There is a requirement for the quantification of greenhouse gases from a development, and an assessment of the risk posed to specific types of new development by the adverse effects of climate change.

The **Climate Action and Low Carbon Development Act 2015** (Government of Ireland, 2015) enables Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050'. This is referred to in the 2015 Act (as amended) as the '*national transition objective*'. The 2015 Act (as amended) made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The **Climate Action and Low Carbon Development (Amendment) Act 2021** (Government of Ireland, 2021) provides the framework for Ireland to achieve a climate resilient and climate neutral economy by the end of the year 2050. The Act allows for the setting of carbon budgets and sectoral emissions ceilings to apply to sectors of the economy whilst promoting climate justice and just transition to the climate resilient and climate neutral economy. Carbon budgets are determined based on the requirements for reductions in GHG described in *EU Regulation 2018/842* and *EU Regulation 2018/842*. The Climate Action and Low Carbon Development (Amendment) Act 2021 should be read together with the Climate Action and Low Carbon Development Act 2015, and together are referred to in this report as the "Climate Act".

14.3.2 Policy

The **European Green Deal** published by the European Commission in December 2019, provides an action plan which aims for the EU to achieve climate neutrality by 2050. The EU Green Deal highlights a reduction in emissions of 55% in comparison to 1990 levels by 2030 and 90% by 2040. The deal outlines plans for a just and fair transition to a climate neutral society through funding and social investment, carbon pricing, the Emissions Trading Scheme, green industry, the circular economy and stakeholder engagement in the processes at every

level.

The **2021 EU Strategy on Adaptation to Climate Change** (European Commission, 2021a) sets out the pathway to prepare for the unavoidable impacts of climate change. The aim is that “by 2050, when we aim to have reached climate neutrality, we will have reinforced adaptive capacity and minimised vulnerability to climate impacts...”

The latest iteration of the Government of Ireland’s **Climate Action Plan** (CAP25) (Government of Ireland, 2025a) was published in 2025 updating many of the suggested measures and actions required to achieve carbon budgets and sectoral emissions ceilings from CAP24 (Government of Ireland, 2024a). Both CAP24 and CAP25 should be read together. The plans taken together provide the roadmap for halving Ireland’s emissions by 2030 and achieving carbon neutrality by 2050. The CAP25 advances sector-specific measures including decarbonising the residential building sector. This includes the complete phase-out of fossil fuel heating for both new builds and retrofits. CAP25 details the 5-year carbon budget periods, shown in Table 14-1 and the Sectoral Emissions Ceilings, shown in Table 14-2, as required by the Climate Act.

Table 14-1 Carbon Budgets for the CAP25 5-Year Periods

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO ₂ e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO ₂ e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 14-2 CAP25 Sectoral Emission Ceilings for 2030

Sector	Baseline (Mt CO ₂ e)	Carbon Budgets (Mt CO ₂ e)		2030 Emissions (Mt CO ₂ e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021- 2025	2026- 2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP25 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030	-	295	200	-	51

Sector	Baseline (Mt CO ₂ e)	Carbon Budgets (Mt CO ₂ e)		2030 Emissions (Mt CO ₂ e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021- 2025	2026- 2030		
Emission Reduction Targets					

The **Long-Term Strategy on Greenhouse Gas Emissions Reductions** (Government of Ireland, 2023) provides the indicative pathways beyond 2030 on how Ireland will transition towards carbon neutrality by 2050. The strategy is intended to bridge the gap between the short-term objectives of the Climate Action Plans and the longer-term objectives of EU Climate Law and Ireland's National Climate Objective.

The **National Planning Framework (First Revision)** (Government of Ireland, 2025b) specifies policies relevant for the Proposed Development:

- National Policy Objective 69: Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions reductions as expressed in the most recently adopted carbon budgets.
- National Policy Objective 70: Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a climate neutral economy by 2050.
- National Policy Objective 71: Support the development and upgrading of the national electricity grid infrastructure, including supporting the delivery of renewable electricity generating development.
- National Policy Objective 78: Promote sustainable development by ensuring flooding and flood risk management informs place-making by avoiding inappropriate development in areas at risk of flooding that do not pass the Justification Test, in accordance with the Guidelines on the Planning System and Flood Risk Management, and taking account of the potential impacts of climate change on flooding and flood risk, in line with national policy regarding climate adaptation.

14.3.3 Climate Change Vulnerability Policy

The **Second National Adaptation Framework (NAF)** (Government of Ireland, 2024b) outlines a comprehensive, whole-of-government and whole-of-society approach to climate adaptation. Its core objective is to enhance Ireland's resilience to a wide range of climate risks, including extreme weather events, flooding, drought, biodiversity loss, sea level rise, and rising temperatures. The NAF sets out the roles of the Taoiseach, Government and non-governmental organisations, incorporates an evidence base for climate change and incorporates sectoral and local requirements and indicators for adaptation planning.

In relation to the built environment, the NAF states in Chapter 3, "deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment". Within the NAF it mentions that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future, which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards (to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms for example).

The **National Climate Change Risk Assessment (NCCRA)** (Environmental Protection Agency, 2025) was required as part of the 2021 CAP. The NCCRA approached the risk assessment through:

- Hazard - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- Exposure - the presence of people, livelihoods, species or ecosystems, environmental functions,

services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected

- Sensitivity - refers to the degree to which a system or asset is affected by climate hazards. It reflects how vulnerable something is to changes such as temperature extremes, flooding, or drought, based on its physical, functional, or ecological characteristics
- Vulnerability - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- Risk - the potential for adverse consequences for human or ecological systems

Compilation of the NCCRA was undertaken using scenarios from the fifth Intergovernmental Panel on Climate Change Assessment Report (AR5). The NCCRA used a high concentration scenario resulting a predicted average global temperature increase of 4.3°C by 2100 (RCP8.5) generally accepted as an extreme worst-case scenario, and a moderate scenario (RCP4.5) where emissions are predicted to peak by 2040 and then decline resulting in an average global temperature increase of between 2.5°C and 3°C. Both scenarios are considered conservative for Ireland as they assume that emissions targets are not met.

14.3.4 Local policy

The Limerick City and County Council Climate Action Plan 2024–2029 (LCCC, 2024) outlines the council’s strategic approach to climate mitigation and adaptation, aiming to reduce greenhouse gas (GHG) emissions by 51% by 2030 (from a 2018 baseline) and to achieve climate neutrality by 2050. The plan is structured around a place-based approach, aligning with national and EU climate objectives, and is designed to support a just transition for communities across Limerick.

- The plan is built on five key thematic areas:
- Buildings and Energy
- Transport
- Environment and Nature-Based Solutions
- Flood Resilience
- Circular Economy and Resource Management

Strategic vision of LCC – “A Green City Region on the Waterfront By 2030, Limerick will become a green City region on the Shannon Estuary connected through people and places. This will be achieved through engagement, innovation, resilient urban development and self-sustaining rural communities”.

The plan also includes a Climate Change Risk Assessment, which identifies key hazards for Limerick, including increased frequency of heavy rainfall, flooding, heatwaves, and droughts.

14.3.5 Guidance

The following guidance is considered relevant to this assessment:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (Environmental Protection Agency, 2022)
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (hereafter referred to as the EU Guidance) **Invalid source specified.**
- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (Transport Infrastructure Ireland, 2022);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (Transport Infrastructure Ireland, 2025)
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as Institute of Environmental Management & Assessment (IEMA)) Environmental Impact Assessment

Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEP 2022 GHG Guidance) (Institute of Sustainability & Environmental Professionals, 2022);

- ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP 2020 EIA Guide) (Institute of Sustainability & Environmental Practitioners, 2020a)
- ISEP GHG Management Hierarchy (hereafter referred to as the ISEP 2020 GHG Management Hierarchy) (Institute of Sustainability & Environmental Practitioners, 2020b)
- Carbon Management in Infrastructure and Built Environment - PAS 2080 (The British Standards Institution, 2023)
- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021b)

14.4 METHODOLOGY

14.4.1 Greenhouse Gas Assessment

14.4.1.1 Construction Phase

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period (i.e. the assumed building life expectancy) for the purposes of the assessment is 60 years. Embodied carbon emissions are attributed to four main categories, taken from BS EN 15978. The categories are:

- **Product Stages (Category A1 to A3)**
The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products.
- **Construction (Category A4 to A5)**
These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building.
- **Use Stage (Category B1 to B7)**
This covers a wide range of sources from the GHG emissions associated with the operation of the building (B1), maintenance (B2), repair (B3), refurbishment (B4) and replacement (B5) of materials, and operational energy use (B6) and water use (B7).
- **End of Life Stages (Category C1 to C4)**
The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No “credit” is taken for any future carbon benefit associated with the reuse or recycling of a material into new products.

PE-ENV-01104 (TII, 2022) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool or an appropriate alternative tool. Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland’s CAP25 goal of achieving carbon neutrality by 2050.

The TII Online Carbon Tool (TII, 2025a) has been commissioned by TII to assess GHG emissions associated with

road or rail projects in Ireland. The TII Carbon Tool (TII, 2025a) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080.

The TII Carbon Tool was utilised to estimate the GHG emissions associated with the non-building elements of the proposed development including construction activities, land clearance activities and construction wastes.

For the building elements of the proposed development, the OneClick LCA 3D Designer tool was utilised. OneClick LCA is certified to EN 15978, EN 15978, ISO 21931 – 1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at various stages of design. The tool includes a detailed product and material list based on Irish materials as well as materials from the UK and Europe. The OneClick LCA 3D Designer option allows for a high-level assessment of the embodied carbon impact of a development at early design stages when specific detailed design information is not known and is suitable for EIAR stage assessments.

Inputs into the tool include gross floor areas for the building types (houses/duplexes/apartments), building frame type, number of above ground floors and building size and shape. The tool then makes necessary default assumptions based on these parameters and a typical build-up with the option to refine the default assumptions where project specific information is available. The tool allows for optioneering and optimization of the carbon impact, it highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials.

Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories, and these must be compared separately to the relevant sectoral emissions budgets, which are detailed in Table 14-2. The relevant sectoral emissions for the proposed development comparison include the Industry sector, Transport sector, and Waste sector. The predicted emissions for the proposed development are annualised over the assumed 60-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

14.4.1.2 Operational Phase

Traffic Emissions

Emissions from road traffic movements associated with the operation of the proposed development have the potential to emit CO₂ which impacts climate. Screening of the movement of road traffic on public roads is undertaken using the criteria described in the TII Guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022b), considered valid for any development where a change in traffic occurs. An assessment should be undertaken where any of the following criteria are met:

- Annual Average Daily Traffic (AADT) changes by 1,000 vehicles or more
- Heavy Duty Vehicle (HDV) (vehicles greater than 3.5t) AADT flows change by 200 vehicles or more
- Daily average speed changes by 10 kmh or more
- Peak hour speed changes by 20 kmh or more.

Traffic data provided for the assessment includes the cumulative flows from background plus additional flows from confirmed developments and local development plans (see Table 14-3). This includes the contribution from other phases of the wider development site of which the proposed development is part. Cumulative flows are described in detail within Chapter 6 Material Assets - Transportation. Data is provided for the following scenarios relevant to this assessment:

- Baseline year
- Opening year without the development in place (Do-Nothing)
- Opening year with the development in place (Do Something)

- Design year without the development in place (Do-Nothing)
- Design year with the development in place (Do Something)

Emissions from road traffic were calculated using the TII Road Emissions Model (REM) online calculator tool and are provided in terms of tCO₂e. The TII REM uses Annual Average Daily Traffic (AADT) values for Light Duty Vehicles (LDV) (<3.5t), Heavy Duty Vehicles (HDV) (>3.5t), average road link speed (kmh) and road link length. The road type is determined based on the road types present in Ireland and the fleet option is based on the county selection with future year scaling to reflect uptake of new technologies and fleet replacement. Full details can be found in Chapter 13 Air Quality.

Road Number	Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
				Do Nothing	Do Something	Do Nothing	Do Something
			LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
1	Monaleen Rd (south)	50	2126 (0)	2381 (0)	3430 (0)	0 (0)	3497 (0)
2	Dev Access	30	0 (0)	0 (0)	1102 (0)	2260 (0)	1102 (0)

Table 14-3 Traffic Data used in Operational Phase GHG Assessment

Operational Phase Energy Use

The EU *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) also states that indirect GHG emissions as a result of a development must be considered, which include emissions associated with energy usage. A Climate Action and Energy Statement was prepared by IN2 in relation to the proposed development and is submitted separately as part of the planning application. The report outlines a number of measures which have been incorporated into the overall design of the development directly in relation to operational phase energy use. These measures will have the benefit of reducing the impact to climate where possible during operation.

14.4.1.3 Significance Criteria for GHGA

The significance of the impacts of GHG emissions on the climate is an area of scientific consensus that is described clearly in the IPCC AR5 reports, and as such all GHG emissions are considered to contribute adversely towards climate change.

In accordance with ISEP and TII guidance, the significance of the impacts of GHG emission resulting from a given project is based on how it contributes to the overall GHG emissions within the sectoral and national carbon budgets and whether that project contributes or not to the CAP25 objective for Ireland to achieve carbon neutrality by 2050, that is that a project contributes to reducing GHG emissions. This process requires an assessment of the quantified GHG emissions against the sensitivity of receptors (Ireland's national GHG targets or National Climate Objective), qualification of the potential measures that might mitigate against GHG emissions, and a degree of professional judgement that takes account of the balance of all of these factors. Both the ISEP and TII guidance documents are explicit in this concept, however the TII document also highlights the issue of significance in the context of how a project mitigates its GHG emissions.

In order to streamline the process and provide accountability, the criteria outlined in PE-ENV-01104 (TII, 2022) and reproduced in ISEP 2022 (Table 14-4) are used together with the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050
- The level of mitigation taking place.

Table 14-4 GHGA Significance Criteria

Effects	Significance Level	Description
Significant Adverse	Major Adverse	The project's GHG impacts are not mitigated. The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate Adverse	The project's GHG impacts are partially mitigated. The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor Adverse	The project's GHG impacts are mitigated through 'good practice' measures. The project has complied with existing and emerging policy requirements; and Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	The project's GHG impacts are mitigated beyond design standards. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

14.4.2 Climate Change Risk Assessment

As per the TII PE-ENV-01104 guidance (2022), an initial screening of risk during the operational phase is conducted. This is carried out by determining the sensitivity of Proposed Development assets (i.e. receptors) and their exposure to climate change hazards.

The Proposed Development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories:** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards:** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

First an initial screening of physical hazards is carried out based on the proposed site location. This is a qualitative screening which intends to only proceed with relevant hazards (e.g., sea level rise is not an applicable hazard to inland areas or wildfire is not considered a hazard in an urban location). Following this, all-relevant hazards are assessed on their exposure under future climate change.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** - The climate hazard will or is likely to have a major impact on the asset category. This

is a sensitivity score of 3.

- **Medium Sensitivity** - It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** - It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure:** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure:** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure:** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

14.4.3 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

The vulnerability assessment takes any proposed mitigation into account. Table 14-5 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the Proposed Development can be considered as not significant.

Table 14-5 Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 – Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening and Climate Change Vulnerability Assessment detailed in Section **Error! Reference source not found.** did not identify any residual medium or high risks to the Proposed Development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in as outlined in Section 14.8.

14.5 RECEIVING ENVIRONMENT

14.5.1 Current GHG Baseline

Data published in Ireland's Provisional Greenhouse Gas Emissions 1990-2024 (EPA, 2025a), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 1.03 MtCO₂e. However, the 2024 emissions represent the second consecutive year in which Ireland's emission were below (-4.2%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-7.4%) and ESR (Effort Sharing Regulation) emissions decreased (-0.5%). Ireland's target is an emission reduction of 626 kt of CO₂e by 2030 on an average baseline of 2016 to 2018.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 2.0% on 2023 levels to 53.82 Mt CO₂e, with a 0.7 Mt CO₂e (-8.9%) reduction in electricity industries alone. This was driven by a 39.7% share of energy from renewables in 2024 and the complete phase-out of peat for electricity generation. Manufacturing combustion and industrial processes decreased by 4.6% to 6.0 Mt CO₂e in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 38% of the total, followed by transport at 20.8%. For 2024, total national emissions (including LULUCF) were 57.65 Mt CO₂e (EPA, 2025a, shown Table 14-6.

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12.0% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2024 Ireland has used 82.8% of the 295 Mt CO₂e Carbon Budget for the five-year period 2021-2025. This leaves 17.5% of the budget available for 2025, requiring a substantial 10.3% annual emissions reduction for 2025 to stay within budget.

Table 14-6 Trends in Total National GHG Emissions 2021 – 2024

Sector <i>Note 1</i>	Annual Total Emissions for Carbon Budget 1 (Mt CO ₂ e)				Total Budget (Mt CO ₂ e) (2021-2025)	% Budget 2021-2025 Used	Annual Change 2024	% 2023-
	2021	2022	2023	2024				
Electricity	9.89	9.69	7.57	6.95	40	85.27	-8.26	
Transport	11.09	11.76	11.79	11.65	54	85.72	-1.18	
Buildings (Residential)	6.87	5.75	5.35	5.61	29	81.33	+4.94	
Buildings (Commercial and Public)	1.44	1.42	1.38	1.49	7	82.03	+7.92	
Industry	7.09	6.65	6.30	6.01	30	86.84	-4.58	
Agriculture	21.95	21.79	20.75	20.41	106	80.10	-1.67	
Other Note 2	1.77	1.79	1.70	1.63	9	76.44	-4.01	
LULUCF	4.30	3.66	3.89	3.89	-	-	-	
Total including LULUCF	64.41	62.52	58.74	57.65	295	82.48	-1.86	

Note 1 Reproduced from latest emissions data from the EPA (EPA, 2025a).

Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

14.5.2 Future GHG Baseline

The future GHG baseline is considered in relation of the ability of the proposed development to contribute positively or negatively to the ability of Ireland to meet the binding commitment as part of the Climate Act for carbon neutrality by 2050.

The targets for 2030 and 2050 are described in CAP24 and CAP25 as required by the Climate Act that codified the GHG reductions required by EU Regulation 2018/842 amended by EU Regulation 2023/857 put in place to enable European Member States to meet their obligations under the Paris Agreement. The future baseline is determined by Ireland being able to meet its requirements under these regulations.

Ireland's Greenhouse Gas Emissions Projections 2024-2055 (Environmental Protection Agency, 2025) summarises total projected emissions and a breakdown of projected emissions per sector under the 'With Existing Measures' and 'With Additional Measures' scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

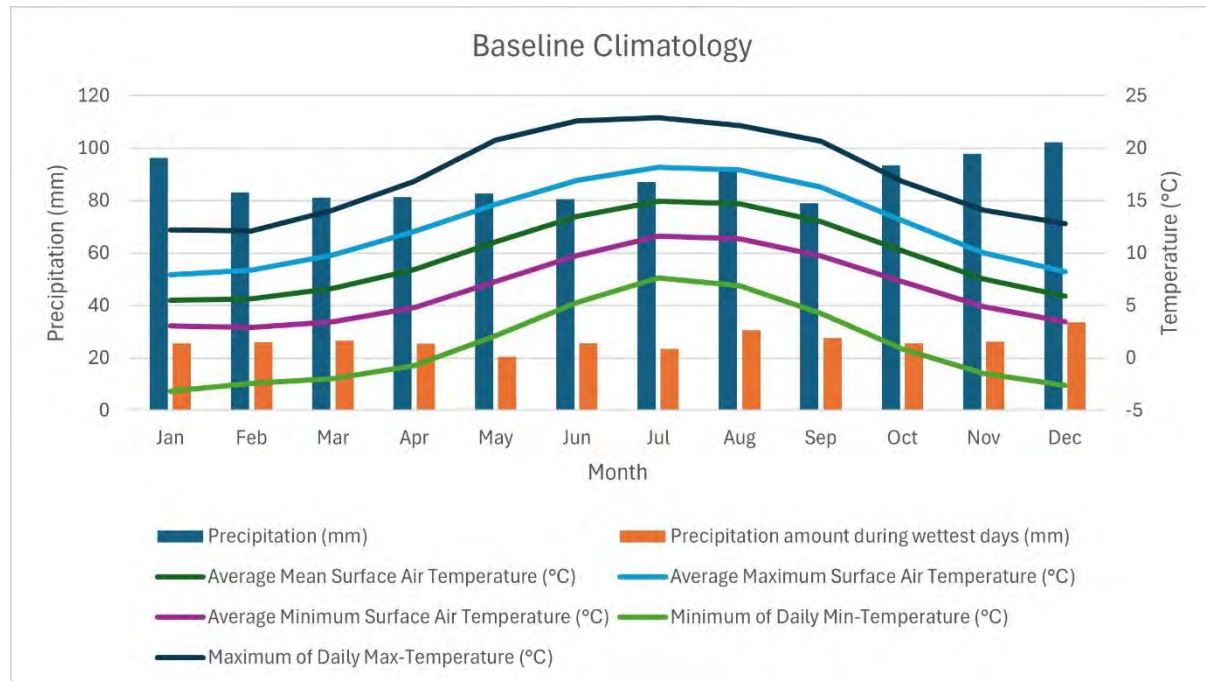
14.5.3 Current CCRA Baseline

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and relatively cooler summers when compared with continental Europe. This baseline data is derived from the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5 data reanalysis (ECMWF, 2023) which includes observed data from individual meteorological weather stations across Ireland from 1950-2023. This data is reanalysed to model a complete picture of Ireland's historical climate accommodating for gaps in observational meteorological data records and data discrepancies between weather stations. This method has been chosen to ensure data can be analysed at the monthly level to provide a more detailed analysis of climatology across the seasons. The baseline time-period referred to in this assessment was from 1991-2020 and is specific to county Limerick and the location of the development in question.

Figure 14.1 below shows the climatology for the 30-year baseline period from 1991 to 2020 indicating the wettest months are from October through to January, with December being the wettest month (102mm) with average

monthly precipitation $\geq 90\text{mm}$ across the winter period. The driest month on average was September (79mm), with February through to July all experiencing lower than average rainfall ($\sim 80\text{mm}$). Ireland and Limerick's precipitation patterns are strongly influenced by its oceanic climate, with the wettest months typically coinciding with periods of frequent low-pressure Atlantic storm systems. In the cases of July and August however, rainfall increases slightly to 87mm and 91mm respectively. This may be a factor of convection and frontal rainfall; whereby warm continental summer air is pressed against colder air moving across the Atlantic.

Figure 14.1 Baseline Climatology (Limerick County) 1991-2020



July and August are the warmest months with marginal differences in mean temperature (14.9°C & 14.6°C respectively) with average mean surface temperatures across the summer months (June – August) $>13.4^{\circ}\text{C}$. Across the summer months (June – August) maximum daily temperatures exceed 22°C which showcases the higher value ranges recorded during a particular month. From May – September average maximum temperatures exceed 16°C .

January is the coldest month with average mean surface air temperatures of 5.5°C and average minimum temperatures of 3°C . For daily minimum temperatures which reference the lowest range values (10th percentile range) of the data, January (-3.1°C) and February (-2.4°C) also remain the coldest with marginal difference. Several other winter and early spring months (November - March) also experience daily minimums of $\leq 0^{\circ}\text{C}$.

Historical records show Limerick and the site of the proposed has experienced and been exposed to several severe storms, with wind speeds exceeding 100 km/h , and record braking wind speeds set during Storm Éowyn in January 2025. Storm activity is concentrated in winter (December–February), with an average of eight named storms annually (Met Éireann, 2025). Historical data was taken from Shannon Airport between 1991-2020, approximately 24km from the proposed development site and the closest with complete data, and indicates a mean 10m wind speed of 9 knots (16 km/hr) and maximum gusts ranging across the 90th percentile range from $58\text{-}86$ knots ($107\text{-}159\text{ km/h}$) (Met Éireann, 2025).

Overall, the baseline climatology for the proposed development site and region shows evidence of high rainfall across the year high. Mild winters with average minimums $>3^{\circ}\text{C}$ and relatively mild summers with average maximums of 18°C . Notable high temperature events have occurred in recent history such as 32°C in 2018 and $>30^{\circ}\text{C}$ in 2022 (Met Éireann, 2025). However, these anomalies do not represent the average maximums ($\sim 25^{\circ}\text{C}$) which is not significant for extreme heat or prolonged drought impacts.

14.5.4 Future CCRA Baseline

Climate Change Impacts and Projections for Ireland

Ireland is already experiencing increased annual rainfall in the north and west, with more variable patterns in the south and east including the area of the proposed development (EPA, 2021a). Key risks identified by the EPA relevant to the proposed project include:

- Increased likelihood of more frequent and intense North Atlantic low-pressure systems bringing high rainfall and high winds.
- More intense rainfall periods which may lead to pluvial flooding and elevated fluvial levels.
- Longer dry spells and increased temperatures, increasing the risk of wildfire and drought while reducing the likelihood of cold and ice.

Climate Modelling and Planning

International best practice and national policy such as that outlined by the IPCC (2023), NCCRA (2024a), and Transport Infrastructure Ireland (TII, 2022a) recommends using two contrasting emission scenarios to project future climate change. The approach taken by this assessment follows such guidance and includes a moderate and high emission scenario (RCP4.5 and RCP8.5) for future climate resilience assessment and planning. These Representative Concentration Pathways (RCPs) reflect varying levels of global climate mitigation and are explained below.

- RCP 4.5 (a 'moderate' scenario) represents an approximate 2.4°C increase in global average temperatures (1.7-3.2°C). It assumes moderate mitigation efforts leading to stabilisation of emissions by mid-century and is generally aligned with current policies for emission reduction.
- RCP 8.5 (a 'worst case' / high emissions scenario) represents an approximate 4.3°C increase in global average temperatures (3.2-5.4°C) and assumes continued high emissions with minimal mitigation. This high-end scenario is useful for understanding potential impacts of current emission trends continue. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

This climate change assessment uses the latest climate change projections standardised and bias corrected for Ireland available through the EPA and the TRANSLATE project (EPA, 2025c).

14.5.4.1 Key Findings from Future Climate Change Projections

presents the key findings from the analysis of future climate projections under two scenarios: a medium-emissions pathway (RCP4.5) and a high-emissions 'worst-case' pathway (RCP8.5). Both scenarios are compared against the site-specific baseline (1976–2005) derived from the Ireland TRANSLATE projections (EPA, 2025c) dataset and historical data taken from Shannon Airport (Met Eireann, 2007). The table details the principal climate hazards and their projected changes under each scenario.

Projected changes include:

- Overall mean temperatures increasing 1.1°C and 1.5°C by mid-century under RCP4.5 and RCP8.5 respectively.
- Summer rainfall is decreasing while winter rainfall increases sharply, attributing to an overall increase in rainfall annually for the proposed development location.
- Fewer cold winter nights, significant reduction in the number of frost days annually (minimum daily temperature <0°C).
- Increased likelihood of short heatwaves (≥5 consecutive days >25°C).
- Increased likelihood of extended dry spells and possible drought which may elevate the risk of wildfire.
- Increased likelihood of more storms which may increase the risk of flooding due to deluge of rainfall which may be a factor into increased Max 1-day precipitation projections which increase across the projections.

Impacts resulting from climate change hazards will evolve and have the potential to include increases in global temperatures. This may result in increases in the intensity and frequency of rainfall days per year combined with increases in the intensity and frequency of low-pressure systems in the north Atlantic during the winter storm period. Therefore, it is expected that the climate over the Proposed Development site will evolve over time and consideration is needed with respect to this within the design of the Proposed Development.

Table 14-7 Site Specific - Future Climate Change Summary of Projections under both RCP scenarios for 2050 period (2040-2070) taken from the EPA Climate Ireland Translate Projections.

Climate Hazard	Indicator	Baseline	RCP4.5	RCP8.5
		(1976-2005)	(2040-2070)	(2040-2070)
Temperature	Mean temp (°C)	10.2	11.3	11.7
	Mean Max temp (°C)	13.9	14.9	15.4
	Mean Min temp (°C)	6.4	7.6	8.0
	Average of Daily Max temp (°C)	25.9	28.5	29.1
Precipitation and Flooding	Annual precipitation (mm)	984	1,013	1,030
	Max 1-day (mm)	28	33	33
Storms and high winds	Storm Frequency and Average speed	On Average 8 named storms annually with speeds exceeding 100km/hr ^{N.1}	Winter storm frequency is projected to increase, with a possible extension of the storm season. While the intensity of individual storms cannot be accurately projected, storm wind speeds are likely to remain above 100 km/hr.	
	(Descriptive)			
	Max gust Speed (knots)			
	(90 th percentile range) (knots) ^{N.2}			
Wildfire	No. of Wildfires (Descriptive)	Low	Rising temperatures and prolonged dry spells can cause increased wildfire risk.	
Drought	Absolute Drought (≥15 days with less than 1mm)	Rare	Marginal increase	Increased Likelihood
Lightning	Qualitative (Descriptive)	Occurring during summer periods	This hazard may modestly increase in the future due to more favourable conditions, such as rising temperatures and extended warm periods beyond the traditional summer season	
Note-1: Data from combined Met Éireann, UK Met Office and Dutch Meteorological services.				
Note-2: Data from Shannon Airport (~25km from site) between 1976-2005				

14.6 IMPACT ASSESSMENT

14.6.1 Greenhouse Gas Assessment

14.6.1.1 Construction Stage

The results of the GHGA are shown in Table 14-8. This includes both the outputs from the OneClick LCA tool and the TII Carbon Tool. Construction materials make up the majority of GHG emissions for the proposed development, accounting for approximately 93% of the total construction phase GHG emissions. The second highest contribution comes from energy used on site at 2%, material transport at 1% and construction waste at 1%. 76% of the material GHG emissions are associated with the residential dwellings, 24% of the GHG emissions are associated with the non-building elements for example concrete used for permeable paving and HDPE plastic used for pipe networks. Although it is early in the design process, the design team were able to provide a highly detailed list of materials to be used at the proposed development, strengthening the robustness of the assessment.

It has been calculated that the total construction phase (A1-A5) embodied carbon for the proposed development will be 36,215 tonnes CO₂e.

Table 14-8 GHG Assessment Results

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO ₂ e)	Predicted GHG Emissions as % of Project Total	Relevant Sector for Carbon Budget Comparison
A1-A3	Construction Materials	33,854	81%	Industry
A4	Transportation to Site	476	1%	Transport
A5	Clearance & demolition	4	<1%	Industry
	Excavation	64	<1%	Industry
	Energy used on site	904	2%	Energy
	Construction Site Material Wastage	461	1%	Industry
	Construction Site Material Wastage Transport	452	1%	Transport
B4 - B5	Material Replacement and Refurbishment	5,635	13%	Industry
Total		41,849.65		

In Table 14-9, GHG emissions have been compared against the carbon budget for the industry, transport, waste and energy sectors in 2030 (DECC, 2024), against Ireland's total GHG emissions in 2024, and against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO₂e) (set out in Regulation EU 2018/842). The predicted emissions for the proposed development are annualised over the assumed 60-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

Table 14-9 Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget	(tCO ₂ e)	Annualised Development GHG Emissions (tCO ₂ e)		% of Relevant Target/Budget
Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	Total GHG Emissions	697	0.001%
Non-ETS 2030 Target	27,721,670			0.003%

Target/Sectoral Budget	(tCO ₂ e)	Annualised Development GHG Emissions (tCO ₂ e)		% of Relevant Target/Budget
2030 Sectoral Budget (Industry Sector)	4,000,000	Total Industry Emissions	659	0.02%
2030 Sectoral Budget (Transport Sector)	6,000,000	Total Transport Emissions	15	0.0003%
Waste	1,000,000	Total Waste Emissions	8	0.0008%
Energy	3,000,000	Total Energy Emissions	15	0.0005%

14.6.1.2 Operational Stage GHG emissions

Replacement and refurbishment emissions have been calculated as part of the OneClick analysis as shown in Table 14-8. These emissions will occur over the lifecycle of the proposed development.

The proposed development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section 14.8 and are based on information provided within the Energy Analysis Report prepared by IN2 Engineering in relation to the proposed development.

During the operational phase, the building's energy requirements will be low. The buildings will be constructed as Nearly Zero Energy Buildings (NZEB), in line with the Building Regulations Part L 2022 requirements, which means a building that has a very high energy efficiency performance. This ensures a very high level of energy performance, with a substantial reduction in primary energy demand—70% below the Part L 2005 benchmark—and a significant proportion of energy (20%) coming from renewable sources, either on-site or nearby.

Target U-values have been set out in the Energy Analysis Section of IN2 Engineering's report. The U-Value of a building element is a measure of the amount of heat energy that will pass through the constituent element of the building envelope. The proposed development includes high-performance glazing (U-value 1.20 W/m²K), insulated external walls (0.18 W/m²K), and roof with a U-value of 0.15 W/m²K, which surpass Part L 2021 Regulations. The enhanced thermal envelopes will minimise heat loss, improving energy efficiency and therefore reducing associated carbon emissions and heating costs to residents.

Overall, the development incorporates a robust sustainability strategy that ensures compliance with NZEB standards, reduces operational carbon emissions, and integrates future-proofing measures to adapt to climate change.

14.6.1.3 Operational stage traffic

The use of fossil fuel powered vehicles by new occupants of the proposed development will result in GHG emissions. Traffic data was provided by Roadplan Consulting and is included in Chapter 6 Material Assets - Transportation. The data include the cumulative flows of the proposed development, committed developments from the surrounding area and background, existing traffic flows.

The predicted transport GHG emissions for 2030 and 2045 shown in

Table 14-10 demonstrate that the operational emissions from transport are a small fraction of the transport sector emission ceiling, and a smaller fraction of the national emission ceiling. The values for the Do Nothing and Do Something scenarios are presented for the opening year and design year along with the difference between

the Do Nothing and Do Something scenarios.

Table 14-10 Summary of Transport related GHG Emissions

Year	Scenario	CO ₂ e (tonnes/annum)
2035	Do Nothing	70
	Do Something	106
2050	Do Nothing	64
	Do Something	103
Increment Change in 2035		36
National Emission Ceiling 2035 (Tonnes)*		37,869,352
Impact in 2035 (as % of national emissions ceiling)		0.0001%
Transport Sector 2030 Emission Ceiling		6,000,000
Impact in 2035 (as % of transport sector emissions ceiling)		0.001%
Increment Change in 2050		39
National Emission Ceiling 2030 (Tonnes)*		33,381,312
Impact in 2050 (as % of national emissions ceiling)		0.000%
Impact in 2050 (as % of transport sector emissions ceiling)		0.001%
* Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council.		

14.6.1.4 GHG Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 14.8 has been taken into account when determining the significance of the proposed development of GHG emissions. According to the TII significance criteria described in Section 14.4.1 and Table 14-4, the significance of the GHG emissions during the construction and operational phase is **minor adverse**.

The ISEP GHG guidance (ISEP, 2022) (which has been embraced by the updated TII Guidance (TII, 2022) in Section 6.7.2) states as follows:

"A minor adverse not significant impact is described with: A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that has a minor adverse effect that is not significant. The project may have residual impacts but is doing enough to align with and contribute to the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050."

The proposed development aligns with the following GHG significance criteria as per Section 14.4.1.3

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- The project's GHG impacts are mitigated through 'good practice' measures.
- The project has complied with existing and emerging policy requirements; and
- Fully in line to achieve Ireland's trajectory towards net zero.

In accordance with the EPA Guidelines (EPA, 2022), the above criteria equates to an impact of GHG emissions during the construction and operational phase of a **direct** impact due to its presence, that is **long-term** as a result of the estimated lifetime of the buildings and **negative** due to the emission of GHGs. Due to the mitigation measures in place and the fact that the proposed development does not impede the trajectory to carbon neutrality, the impact on the climate is considered to be **not significant**.

14.6.2 Climate Change Risk Assessment

14.6.2.1 Construction Stage

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 14.4.2. Therefore, a detailed CCRA is not required (TII, 2022a). However, consideration has been given to the proposed development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 14.8:

- Pluvial flood risk due to increased precipitation, and intense periods of rainfall.
- Increased temperatures, potentially causing water scarcity and prolonged periods of hot weather.
- Reduced temperatures resulting in ice or snow resulting in a possible hazard to working conditions.
- Major storm damage, including wind damage, fallen objects and flooding from intense rainfall.

14.6.2.2 Operational Phase

Climate Hazard Screening

To determine the vulnerability of the Proposed Development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined.

Table 14-11 presents the initial qualitative climate hazards screening relevant to the Proposed Development. A number of climate hazards have been screened out of the assessment due to the Proposed Development location.

Table 14-11 Climate Hazard Screening

Climate-related Hazard	Hazard Screening Rationale	Screening
Extreme Heat temperatures	High temperatures are a key consideration for both construction and long-term operation of the proposed development. Historical data combined with future projections shows rising temperatures in Ireland. Heat and thermal expansion can damage electrical equipment, materials, and infrastructure, and affect the lifecycle of assets.	Screen in
Extreme Cold Temperature	Snow and ice events pose significant risks to health, safety, and site operations. Road access may be disrupted, and low temperatures can affect assets such as fuel tankers, workers, and infrastructure. Freeze-thaw cycles may cause cracking in concrete while impact the operations of the substation equipment, requiring snow clearance and ice management.	Screen in
High precipitation and	Surface water remains a key vulnerability for any proposed	Screen in

pluvial flooding	development during both construction, and operational phases due to the sensitivity of construction materials, site access, and site assets to water exposure.	
Fluvial flooding	Given the elevated position of the site related to surrounding areas and OPW mapped flood areas and those of the Limerick City and County Council Development Plan Strategic Flood Risk Assessment, fluvial flooding is not a risk for this site.	Screen out
Drought	Although, droughts have occurred across Ireland, previously impacting water supply, future reductions in water availability would not directly impact the proposed development.	Screen out
Wildfire	Wildfire is not considered a risk for the proposed development due to the proximity to urban centres and monitored grasslands.	Screen out
High winds and storms	The site is elevated in relation to surrounding areas and therefore may be exposed to high winds. Historically, Ireland has experienced several notable storm events including Storm Éowyn (2025) and Storm Darragh (2024), which caused widespread damage across Ireland. These storms often bring heavy rainfall and flood warnings, increasing overall risk.	Screen in
Fog	Fog is not considered a significant hazard for this development, as it does not involve transport, aviation, or activities requiring high visibility.	Screen out
Lightning	The proposed design is elevated in relation to surrounding areas, making it prone to lightning which can have significant impacts on the operation.	Screen in
Landslides and Subsidence	The Geological Survey Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) indicates that the proposed development site is classified as having low landslide susceptibility. This assessment assumes that ground stabilisation works will be carried out in accordance with Irish standards and requirements, taking into account the geological findings. On this basis, landslide risk can be reasonably screened out from further consideration in the assessment	Screen out
Sea level rise and coastal flooding	The location of the development is a considerable distance from the coast and not exposed.	Screen out

14.6.2.3 Climate Change Vulnerability Assessment

The sensitivity and exposure of the development to the screened in climate hazards must first be determined to then determine the vulnerability of the proposed development to climate change. The screened in hazards have been considered as relevant climate hazards in the context of the proposed development.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. Table 14-2 **Error! Reference source not found.** details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been determined, the exposure of the proposed development to each of the climate hazards is determined, this reflects on the possible likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed

development to each of the climate hazards. The results of the vulnerability assessment are detailed in Table 14-12.

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flood (pluvial)	2 (Low)	1 (Low)	2 (Low Risk)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low Risk)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low Risk)
High winds and storms	1 (Low)	2 (Medium)	2 (Low Risk)
Lightning	1 (Low)	1 (Low)	1 (Low Risk)

Table 14-12 Climate Change Vulnerability Assessment

The sensitivity and exposure of the area was determined with reference from various discipline specialists on the project team. It was concluded that the proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

Flooding

A Site-Specific Flood Risk Assessment (SSFRA) was not undertaken for the proposed development. Given the elevated position of the site related to surrounding areas and OPW mapped flood areas and those of the Limerick City and County Council Development Plan Strategic Flood Risk Assessment, coastal and fluvial flooding is not a risk for this site. The site meets the requirements of The Planning System and Flood Risk Management Guidelines.

Future increases in rainfall due to climate change may elevate the risk of pluvial flooding, particularly if local drainage is overwhelmed or blocked. The surface water for the site has been designed in accordance with The Development Plan and Greater Dublin Draining Strategy and SuDS manual. The site will discharge at the greenfield run off rate to avoid peak run causing flooding downstream of the site. The site contains a number of SuDS features such as bio-retention areas, permeable paving, tree pits, rain gardens, attenuation tanks, treatment systems and flow control. The surface water has been designed for 30% climate change allowance and also a 10% urban creep allowance. Risk of pluvial flooding is therefore considered low.

Extreme Temperatures (Heat & Cold)

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure. However, high quality, durable building materials will be selected for the proposed development. Local and native plants and trees will be planted, including Acer Campestre which is moderately tolerant to drought. Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including; the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest available IPCC report. In addition, should updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be taken into account. The proposed development has been designed to reduce the impact to climate where possible.

Extreme temperatures, both hot and cold, can affect building materials and infrastructure; however, the project will use materials that comply with current standards and are designed to withstand projected climate extremes. Cold events are expected to decline, reducing the risk of cracking from freeze thawing of road surfaces and deterioration of auxiliary systems and infrastructure. While potential heat-related impacts such as road surface softening are possible during heatwaves however projected extremes are not expected to reach critical thresholds for infrastructure failures seen in other European countries.

The building has been designed to accommodate both elevated and low temperature conditions in accordance with current best practice and applicable standards. Structural design considers thermal actions in line with I.S. EN 1991-1-5 (Eurocode 1: Thermal Actions), together with the relevant material Eurocodes and Irish National Annexes.

The design also aligns with the requirements of the Irish Building Regulations, including:

- Part A – Structure, ensuring structural safety and durability
- Part L – Conservation of Fuel and Energy, addressing thermal performance and overheating risk

Building materials and components will be specified in accordance with harmonised European standards and are suitable for the anticipated temperature ranges and exposure conditions in Ireland, ensuring durability and long-term performance. Overall, extreme temperatures are not considered a significant risk.

High wind and storms

In relation to extreme winds, residential buildings and urban infrastructure are generally impacted by flying debris rather than direct impacts of extreme weather.

Whilst winds in general are predicted to reduce in intensity, with future climate change storms are likely to become more extreme. Storms in RCP8.5 likely to be even more extreme than in RCP4.5.

The proposed development will be designed in accordance with I.S. EN 1991-1-4 (Eurocode 1: Actions on Structures – Wind Actions) and the relevant Irish National Annex.

Wind loads appropriate to the site location, terrain category, altitude, and building geometry will be applied in the structural design to ensure stability and robustness under extreme wind events.

Any roof-mounted equipment will be designed and detailed to resist site-specific wind loads in accordance with Eurocode requirements. Fixings and support systems will be specified by the relevant specialist contractors and reviewed to ensure compliance with structural design criteria. Wind and storms are therefore considered low risk to the proposed development.

Lightning

Lightning protection requirements have been assessed in accordance with I.S. EN 62305 (Protection Against Lightning).

Where required following risk assessment, a lightning protection system (LPS) will be incorporated into the building design, including air termination, down conductors, and earthing arrangements.

Alternatively, where a formal risk assessment indicates that lightning protection is not required, the building will rely on inherent protection measures in accordance with the standard.

Summary

Overall, the climate change hazard vulnerabilities identified for the proposed development are not considered significant. Therefore, no detailed risk assessment is required.

14.6.2.4 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are **direct** as climate extremes have a direct physical effect on buildings and infrastructure, **long-term** due to the response times of the climate in relation to changes in anthropogenic emissions, **negative** as climate extremes have been shown to damage or adversely affect infrastructure, and **not significant** due to the low vulnerability of the location of the proposed development to the effects of climate change, which is overall **not significant** in EIA terms.

14.7 DO NOTHING IMPACT

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc.).

14.8 MITIGATION MEASURES

14.8.1 Incorporated Design Measures

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate drainage and raised floor and ground levels to accommodate additional flood risk have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. Other proposed measures include the use of Green Roofs to reduce internal overheating and the urban heat island effect and help to mitigate peak surface water runoffs during heavy rainfall. For full details please refer to SuDS proposals in civil engineering reports.

14.8.2 Construction Phase

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Measures to reduce the embodied carbon of the construction works are:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Consolidation of delivery loads to/from the site and management of large deliveries on site to occur outside of peak periods.
- Ensuring 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.
- Encouraging the use of HVO fuel, which is required near by the site. All machines are to (where possible) use HVO fuel at construction stage.
- Sourcing materials locally where possible to reduce transport related CO₂ emissions.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.

14.8.3 Operational Phase

In relation to operational energy usage, information as detailed in the Building Life Cycle Report prepared by Genesis Planning Consultants and information as detailed in the Energy Analysis Report prepared by IN2 Engineering, has been used to inform this assessment.

The development has been designed in line with the requirements of Nearly Zero Energy Buildings (NZEB) Standards and the requirements of the Limerick City and County Council Climate Action Plan 2024–2029 objectives for energy efficiency, greenhouse gas reduction, and increased renewable energy integration. The incorporated design measures as part of the proposed development's sustainability strategy are outlined below:

- As per the Apartment Guidelines and BRE guide, all apartments and circulation areas designed to maximise daylight provision, avoiding the need to continuous artificial lighting

- Natural/passive ventilation systems to circulation areas avoiding costly mechanical ventilation systems and associated maintenance
- BER (Building Energy Rating) A2/A3 demonstrating energy efficiency and lower running costs
- Building Regulations Technical Guidance Part L 'Conservation of Fuel and Energy Buildings other than Dwellings' alignment for U-values and air tightness testing will minimise heat loss and therefore required energy consumption, reducing carbon emissions.
- Exhaust Air Heat Pump technology to meet the thermal load for each apartment in the development. This will also allow for the complete elimination of Fossil Fuels from the site, while maximising operational efficiencies.
- External paving materials will be from sustainable, robust materials which require no ongoing maintenance and are long lasting to reduce frequency of repair and replacement.
- Installation of composting facilities helping to reduce waste going to landfill
- The development is situated in close proximity to multiple public transport routes.
- A Mobility Management Plan to be implemented in the proposed development's operational phase, which stipulates measures to be taken to encourage and support the use of sustainable travel modes among visitors and staff.

These above identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals and relevant policies including the Climate Action Plan 2025 and objectives of the Limerick City and County Council Climate Action Plan 2024–2029.

14.9 RESIDUAL IMPACTS

14.10 PROPOSED DEVELOPMENT

The impact to climate due to 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 GHG emissions, an amount of which will occur regardless of mitigation due to the nature of the proposed development. The measure of impact is how the proposed development contributes to or impedes the ability of Ireland to reach carbon neutrality by 2050. This is supported by the ISEP guidance which states the significance should be assessed on *“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”*.

Best practise mitigation measures are put forward for the proposed development along with a commitment by the proposer, in common with other companies in Ireland, to reduce climate impacts where possible and practicable. As such, the proposed development is considered to have a **direct** impact due to its presence, that is **long-term** as a result of the estimated lifetime of the buildings and **negative** due to the emission of GHGs. Due to the mitigation measures in place and the fact that the proposed development does not impede the trajectory to carbon neutrality, the impact on the climate is considered to be **not significant** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the location and structure of the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered **direct** due to receptors presence, **long-term** due to the proposed development's lifespan, **negative** as the effects of climate change are exasperated by further GHG emissions, and **imperceptible** due to the low vulnerability of the location of the proposed development to the effects of climate change. Overall this is considered to be **not significant** in EIA terms.

14.10.1 Worst Case Impact

The GHG assessment conducted has been based on the best available information at the time of completing this assessment. Exact material types were not known when carrying out this assessment and a worst-case approach was applied when inputting materials which will potentially over-estimate associated GHG emissions. There is the potential for the development to have lower GHG emissions once constructed if lower carbon intensive materials are chosen as part of the detailed design. However, this assessment has been based on a conservative, worst-case approach.

With respect to the climate risk assessment, in accordance with TII's Guidance document PE-ENV-01104 (TII

2022a), the high risk (RCP8.5) future climate change scenario has been considered. Representative Concentration Pathways (RCPs) describe different 21st Century pathways of GHG emissions depending on the level of climate mitigation action undertaken. This is considered the worst-case scenario.

14.11 CUMULATIVE

In accordance with guidance from the ISEP (Institute of Sustainability & Environmental Professionals, 2022) and TII (Transport Infrastructure Ireland, 2022) the climate is not constrained by project, regional or national boundaries and therefore the GHG assessment has been presented in the context of the national and sectoral carbon budgets for the whole of Ireland and the ability of the proposed development to assist or impede the national relevant targets. Given the contribution of such targets to the global efforts to reduce the impact of society upon the climate the assessment is considered to be inherently cumulative.

In addition, the traffic data provided for the quantification of operational GHG emissions includes committed developments as far as they can be advised, and as such is considered to be cumulative.

In light of these statements, the residual cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

14.12 DIFFICULTIES ENCOUNTERED

The proposed development is still in the design stage and therefore materials used, construction and operational activities are subject to change. Data assumption for the GHG assessment are set out in the table below:

Table 14-13 Data limitations and assumptions

Category	Data limitations/ Assumptions
Materials	Quantified using a combination of OneClick for residential dwellings and the TII tool, completed by the design team for non- dwelling materials e.g. roads, pipe networks.
Material Transport	Construction transport data was not available from the design team therefore default values from OneClick were used.
Clearance and demolition	Area of land cleared was taken from Project Description
Excavation	Volumes submitted by the design team
Energy used during construction	Submitted by the design team
Construction worker travel to site	No data available
Construction waste	Default values calculated in One Click were selected due to the conservative approach taken
Construction waste transport	Default values calculated in OneClick to align with Construction waste volumes above.
Replacement and refurbishment	Replacement and refurbishment calculations were based on default values from OneClick were used.

14.13 INTERACTIONS

Climate has the potential to interact with a number of other environmental attributes.

14.13.1 Water and Hydrology

As discussed in Section 14.6.2 there is no risk of fluvial or coastal flooding. Although precipitation will likely increase in the future, there is little risk of pluvial flooding based on the topography of the site and range of SuDS features and drainage designs that have been considered for the site. Interactions between climate and water and hydrology are therefore not considered significant. The effect of the interactions between climate and land, soils and water (Chapter 10 Water and Hydrology) are **direct, short-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

14.13.2 Air Quality

Air quality (Chapter 13 Air Quality) and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

14.13.3 Traffic and Transport

During the construction and operational phase, there is the potential for interactions between climate and traffic as vehicles emit CO₂. See Chapter 14 Material Assets: Traffic and Transport for more information on changes to AADT. In this assessment, the effects of the interactions between traffic and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which is overall not significant in EIA terms.

14.13.4 Waste

Waste (Chapter 8 Material Assets: Waste) management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which is overall not significant in EIA terms.

No other significant interactions between climate and other environmental topics have been identified.

14.14 MONITORING

Monitoring and reporting of the embodied carbon in the construction phase will be conducted. The aim of monitoring will be to seek further ways to minimise climate impacts. Monitoring will include contractual obligations, in line with the most recent Climate Action Plan and sectoral targets, for the successful tenderer to ensure that the proposed development stays in line with updated aims. Commitments to monitor GHG emissions during the construction phase will also be secured through the final Construction Environmental Management Plan (CEMP). Monitoring will include embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates). Where monitoring shows that the proposed development is not meeting its targets, further mitigation will be put in place.

Monitoring should also include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

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