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Environmental Impact Assessment Report (EIAR)

Volume 2 Main Body -Part 2 Chapters 11-18

In respect of

**A Proposed Large-scale Residential
Development at Ratoath, Co. Meath**

On behalf of

Beo Properties Limited

June 2025

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11 Land, Soils, and Geology

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Table 11.1: Acronyms

Term	Meaning
AA	Appropriate Assessment
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CSM	Conceptual Site Model
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
GII	Ground Investigations Ireland Limited
GQRA	Generic Quantitative Risk Assessment
GSI	Geological Survey Ireland
GWB	Ground Water Body
IGI	Institute of Geologists of Ireland
mbGL	meters below Ground Level
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
OCSC	O'Connor Sutton Cronin and Associates Limited
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area
WAC	Waste Acceptance Criteria

11.1 Introduction

Chapter 11 (Land, Soils, and Geology) was completed by O'Connor Sutton Cronin and Associates Limited (OCSC) and assessed the likely and significant impacts associated with the proposed commercial development on the geological and hydrogeological environment.

The following topics will be assessed in this chapter of the EIAR:

- Soil and Bedrock
- Hydrogeology

This chapter provides a description of the project in connection with soils, geology, and hydrogeology; the baseline soils, geology, and hydrogeology for the project site; and a statement of the likely significant impacts associated with both the construction and operational phases of the development. A 'do nothing' scenario, as well as cumulative impacts, have also been considered. Mitigation measures are proposed in the form of avoidance, prevention, reduction, offsetting, and reinstatement or remedial measures. Recommendations for monitoring are included where appropriate predicted residual effects are described.

Assessments for the site are detailed in this chapter with relevant technical information from drawings and design reports for the proposed project, government agency websites, site investigations, and other sources as outlined in **Section** Error! Reference source not found..

11.1.1 Author Information

This chapter was prepared by Aideen O'Rourke, who has a Bachelor's degree in Environmental Bioscience and, Glenda Barry, who has a Bachelor's degree in Geosciences, a Master's degree in Environmental Marine

Science and is a Professional Geologist (PGeol) with the Institute of Geologists of Ireland and European Geologist (EurGeol) with the European Federation of Geologists (EFG), and who has over 30 years of experience in environmental consultancy in Ireland and the United States.

Example projects include:

- Nexus Distribution Park, The Ward, Co. Dublin: development of a greenfield site to create a logistics / distribution campus; pending under planning Reg. Ref. FW22A/0167.
- Newtown, Ratoath, Co. Meath Strategic Housing Development: development of a greenfield site to create 452 no. residential units located in 12 neighbourhoods; permitted under planning Reg. Ref. shd313658.
- Connolly Station: Blocks A, E, and D3: development of a brownfield site to create a new urban quarter beside Connolly Station in Dublin 1; permitted under planning Reg. Ref. 2723/20.

The authors have completed numerous Land and Soils Chapters for similar residential and commercial schemes and is, therefore, suitably qualified and experienced to undertake this assessment.

11.1.2 Scoping

The activities associated with the project which have the potential for impact are detailed in **Table 11-1** below.

Table 11.1: Aspects relevant to this chapter

Phase	Activity	Description
Construction	Discharge to Ground	Run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial and Bedrock Deposits	Excavation will take place at the Site for the provision of building foundations, the installation of services, and general site levelling.
	Storage of Hazardous Material	Fuel for re-fuelling on-site machines and chemical storage (such as for concrete curing) during the construction phase.
	Import/Export of Materials	All suitable surplus subsoil, if any exists, will be exported off Site to a reuse site subject to the requirements under the Waste Management Act (e.g. Article 27 or 28). Where material cannot be reused, it will be recovered or disposed of in accordance with the Waste Hierarchy and Waste Management Act. Approximately 135,000 to 140,000m³ of topsoil will be removed during the first stage of the earthworks. An estimated 35 to 50% of this to be retained on site for re-use and the balance to be removed off site. Following stripping of topsoil, the areas under buildings, yards, roads, and hardstanding will be regraded to provide the necessary working levels to commence the structural build-ups. Additional excavations will be required for foundations and below ground services. Due to the site topography and the relatively shallow depth at which rock is encountered on the site, it is envisaged that the regrading would require importing c.25,000-30,000m³ of appropriate fill material if the entire site was to be developed in a single phase. However, the proposed phasing of the works would lead to excavations for foundations and below ground services in the earlier phases of the works being used to offset this import requirement. Aggregates will be required for sub-base under roads and buildings. All sub-base materials must meet the relevant engineering specifications. The use of recycled or secondary aggregates should be considered as a replacement for primary aggregates.
Construction and Operation	Construction of sub-surface structures	The maximum depth of excavations will be in the region of 3 meters below ground level (mbGL) to facilitate the construction of foundations and installation of underground services. Due to the site topography and the presence of shallow bedrock in some areas of the site, it is envisaged that rock excavation will be required for foundations and below ground services in some isolated areas. The buildings have been designed to minimise rock excavation requirements. Groundwater ingress has been observed within this depth range in trial pits during site investigations; therefore, it is possible that these constructions in small portions of the site may lie within perched or bedrock groundwater and may impede shallow groundwater flow.

	Infilling	A degree of fill will be required during the works which will include the importation of concrete and stone. Construction materials which contain recycled/recovered content should be considered as part of the procurement stage.
Operation /Unplanned Events	Drainage Works	The existing groundwater/surface water regime may be altered by the construction of drainage and hard standing areas.
	Storage of hazardous Material	The proposed development will utilise heat pump technology with no fossil fuel usage on site except as may be required for back-up generators or other equipment or processes which have not been determined at this time.

As outlined in **Table 11.1**, the Construction Phase holds the highest number of activities that could potentially impact on the geological and hydrogeological environment. These activities primarily pertain to the excavation and infilling activities required to level the site for construction and to construct foundations and underground services. The operational phase of the project has very few or no activities which would constitute a risk to the soil, geological, and/or hydrogeological environment.

11.2 Assessment Methodology

The assessment has been carried out generally in accordance with the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Irish Environmental Protection Agency, May 2022.
- Guidelines for the preparation of Soils, Geology, and Hydrogeology chapters of Environmental Impact Statements (IGI, 2013);
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology, and Hydrogeology for National Road Schemes (NRA 2009);
- Control of Water Pollution from Construction Sites (CIRIA, 2001); and
- Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000).

The assessment followed a phased approach as outlined in EPA Guidelines for EIARs (EPA, 2022) and the Institute of Geologists of Ireland (IGI) Guidelines (IGI 2013). A Conceptual Site Model (CSM) was developed to identify any likely Source-Pathway-Receptor linkages relating to the Site and the proposed development. The phases of assessment are outlined below.

11.2.1 Assessment Approach

11.2.1.1 Phase 1: Initial Assessment

An initial assessment was carried out, which defined the project in terms of location, type, and scale; established the baseline conditions; established the type of soil/geological environment; established the activities associated with the project; and determined potential impacts.

These objectives were achieved by way of a geological desk study and baseline data collection. A full list of sources for the desk study, together with relevant legislation, are included in **Section 11.11** and are briefly listed below:

- Ordnance Survey of Ireland (OSI) maps⁴;
- Geological Survey of Ireland (GSI) Groundwater and Geotechnical map viewer⁵;
- Environmental Protection Agency (EPA) Envision Maps⁶; and

⁴ <https://maps.archaeology.ie/historicenvironment/>

⁵ <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>

⁶ <https://gis.epa.ie/EPAMaps/>

- National Parks and Wildlife Service (NPWS) maps⁷.

Additional information has been compiled through consultation and feedback from the project/EIAR Team.

The information obtained from the above-listed sources was utilised to establish the baseline conditions for the Site, and all available information was compiled into a preliminary CSM. The CSM is based on the accepted Source-Pathway-Receptor model for assessing environmental impacts. The CSM went through iterative reviews and was updated with site-specific data obtained through site investigations and studies.

11.2.1.2 Phase 2: Historic Site investigations Studies

One site investigation is known to have been undertaken on the Site and was conducted by IGSL from June to July 2020 on behalf of OCSC. This investigation is discussed further in Section 11.3.11.

The report also references the undertaking of a standard penetration and the installation of a standpipe in one cable percussion borehole.

11.2.1.3 Phase 2: Refinement of the Conceptual Site Model

Throughout the desk-based study, the CSM was continually updated, tested, and refined. The outcome is presented in this chapter, along with associated figures.

11.2.1.4 Phase 2: Detailed Assessment and Impact Determination

A Detailed Assessment and Impact Determination was carried out which incorporates the full range of site investigations and studies, the refined CSM, and a full assessment of any potential impacts.

The approach adopted is as per the IGI Guidelines (IGI, 2013), and each potential effect of the proposed development has been described in terms of Quality, Significance, Extent, Probability, and Duration. The classification of impacts/effects in this chapter follows the definitions provided in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Irish Environmental Protection Agency, May 2022.

Additional guidance and EIA definitions are contained in NRA Guidelines (NRA, 2009). These guidelines provide useful matrices outlining additional assessment criteria based on the importance of a feature to be protected and the magnitude of the potential impact. This approach has been adopted where appropriate.

Where the Initial Impact Determination concludes that the level of potential impact is capable of measurable and noticeable consequences, it is carried into the next assessment phase.

11.2.1.5 Phase 3: Mitigation, Residual and Final Impact Assessment

Phase 3 builds on the outcome of the initial assessment and detailed site assessments by identifying mitigation measures to address the identified impacts. Mitigation measures which are known to be effective have been built into the project design and have been considered in this process. The development, including all identified mitigation measures (assumed implemented), is then subject to impact assessment to identify any residual impacts.

The Final Impact Assessment presented in this chapter incorporates the outputs from the Detailed Assessment and Impact Determination, Mitigation Measures, and Residual Impact Assessment.

⁷ <https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba>

11.2.1.6 Phase 4: Completion of the EIAR Section

The final phase of work was the completion of this EIAR Section with associated Figures. The format follows the EPA Guidance Note and Design Team Template.

11.2.1.7 Assumptions and Limitations

The description of existing conditions and proposed works is based on the available desk study information supplied by the design team.

11.2.2 Definition of Study Area

The study area for the Land, Soils, and Geology assessment has been determined through examination of the extent of the proposed development and its location and setting together with available resources describing the current receiving environment and the area in which there is potential for negative impact on the surrounding geological or hydrogeological environment as a result of the proposed development. The study area is broadly the extent shown in **Figure 11.1**, with the site outlined in red. The zone of influence for the site works in terms of land and soil is 1km.

The site is currently greenfield used for agricultural purposes and can be accessed from Glascarn Lane to the east and Fairyhouse Road to the west of the site. Ground levels across the site fall generally from south-west to north-east towards Glascarn Lane. Levels along the public road forming the south-western boundary of the site are approximately 94.5 mAOD and fall to approximately 90.5 mAOD along the north-eastern boundaries of the site. There are two local high points of 92.8 mAOD in a small area in the centre of the site surrounded by a plateau area at 92.8 mAOD.

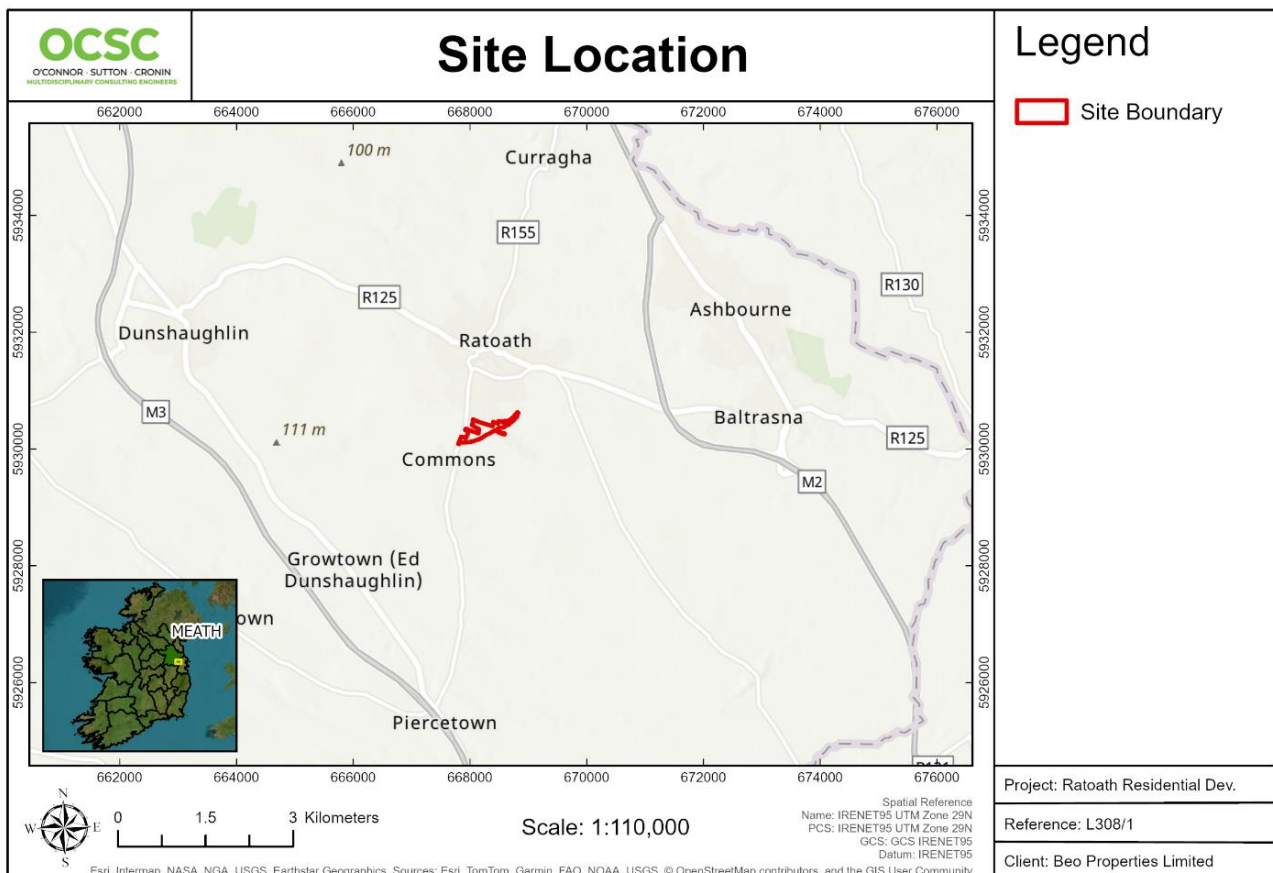


Figure 11.1: Study Area (subject site outlined in red)

Source: GIS, 2025

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This section defines the assessment criteria in terms of magnitude and impact for relevant Soil, Geology, and Hydrogeology receptors using the EPA Guideline, 2022⁸.

Table 11.2: Assessment Criteria

Significance of Impact	Topic Specific Criteria
Imperceptible	An effect capable of measurement but without significant consequences. For example, there will be a change in elevation of the bedrock surface on the Site following extraction to found structures within bedrock. However, no impact to the environment will result from these changes.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences. For example, due to the high and extreme groundwater vulnerability on the site, release of fuels or other contaminants during construction could impact groundwater quality beneath the site. However, mitigation measures will ensure that all hazardous material are handled in accordance with the Construction Environmental Management Plan (CEMP) to prevent the release of such materials.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. For example, cut and fill activities on the Site will alter the rate of rainfall recharge to groundwater in portions of the Site. However, drainage design for

⁸ EPA May 2022 Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

	the Site will ensure that recharge to the Site is maximised while protecting the underlying aquifer from potential impact by contaminants in runoff.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. For example, the increase in hardstanding on the Site following construction could significantly affect rainfall recharge to the underlying aquifer. However, appropriate drainage design will ensure that recharge to the Site is maximised while protecting the underlying aquifer from potential impact by contaminants in runoff.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment. For example, the removal of unconsolidated sediments in portions of the Site to facilitate site levelling and construction could increase groundwater vulnerability on the Site. However, this effect will be mitigated by appropriate drainage design and environmental control measures.
Very Significant Effects	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.

11.3 Baseline Environment

The receiving environment is discussed in terms of geomorphology, superficial and solid geology, contamination, and hydrogeology. This section and the accompanying Figures can be considered as the geo-environmental CSM for the project site.

11.3.1 Site Development

The Site is in County Meath to the south of Ratoath town centre, and has been studied with regard to geology, including the properties and characteristics of the soil, subsoil, and bedrock. Sources of information included databases held by the GSI, EPA, OSI, and NPWS.

A full list of references is included at the end of this chapter.

11.3.2 Topography & Setting

Ground levels across the site generally decrease from southwest to northeast towards Glascarn Lane. Levels along the public road forming the south-western boundary of the site are approximately 94.5 mAOD and fall to approximately 90.5 mAOD along the north-eastern boundaries of the site. There are two local high points of 92.8 mAOD in a small area in the centre of the site surrounded by a plateau area at 92.8 mAOD.

According to the Meath County Development Plan 2021-2027, the Site is zoned for The subject site is zoned 'A2 New Residential' with an objective,

"A2 New Residential - To provide for new residential communities with ancillary community facilities, neighbourhood facilities as considered appropriate."

Adjacent land uses to the Site include the R155 Fairyhouse Road, agricultural land, Glascarn Lane, Ratoath Outer Relief Road, Ratoath Town, and residences to the north and northwest; the Merch Limbo Limited, Roche Warehousing, Home Office Pods, Transton Logistics, Glascarn Lane, and agricultural land to the east; the Fairyhouse Racecourse, Tattersalls Ireland, agricultural land, and residential development to the south; and the M3 link road, the R155, residential development, and agricultural land to the west. Land uses bordering the site are shown on **Figure 11.3** and listed in **Table 11.3** below.

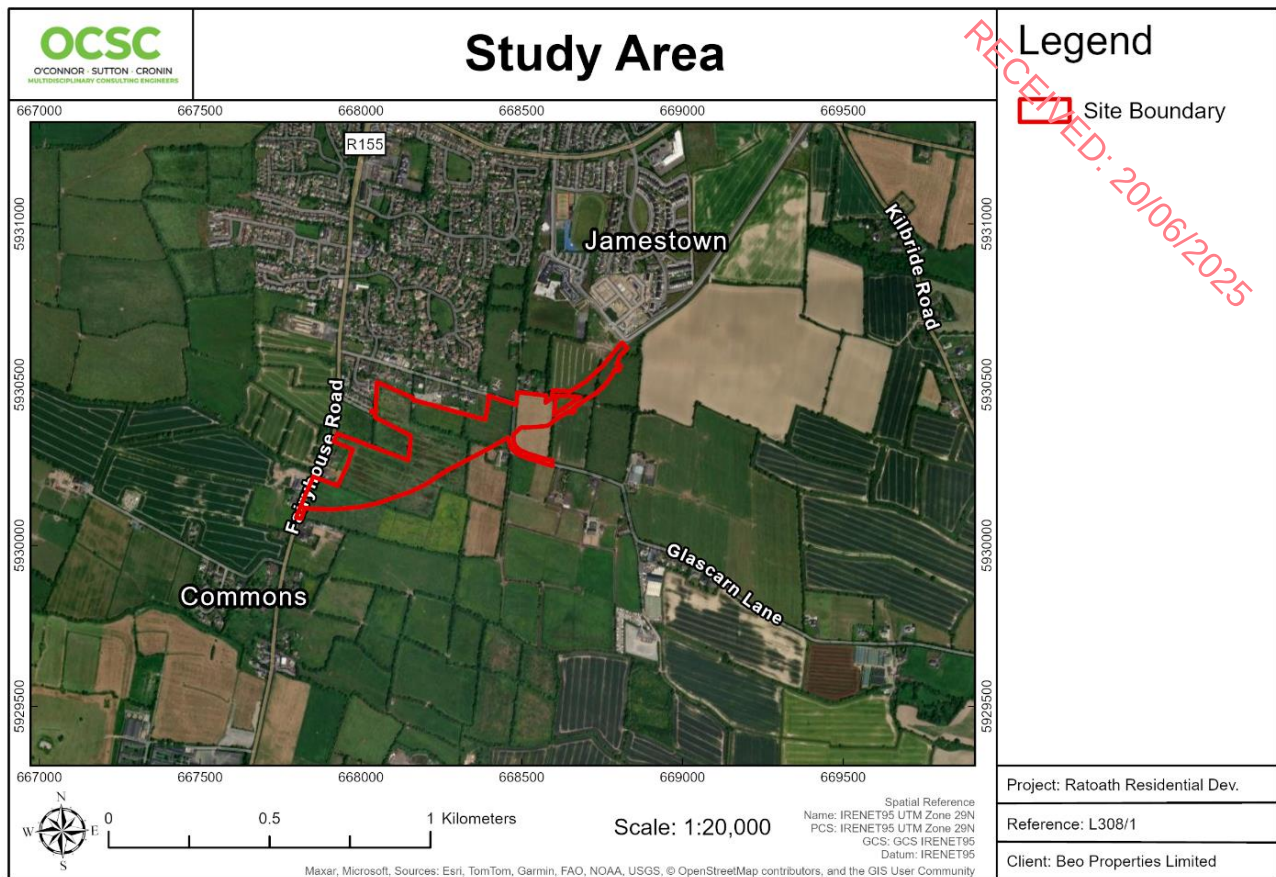


Figure 11.3 Surrounding Land Use.

Source: GIS, 2025

Table 11.3: Adjacent land Uses

Boundary	Land use
North	the R155, agricultural land, Glascarn Lane, Ratoath Outer Relief Road, Ratoath Town, and residences
South	Fairyhouse Racecourse, Tattersalls Ireland, agricultural land, and residential development
East	Merch Limbo Limited, Roche Warehousing, Home Office Pods, Transton Logistics, Glascarn Lane, and agricultural land
West	M3 link road, the R155, residential development, and agricultural land

11.3.3 Historic Land Use

The GSI online mapping service was consulted regarding areas of geological interest near the Site. The nearest area of geological heritage is 'Dunshaughlin', which is located approximately 4.45km northwest of the Site at its nearest point. Dunshaughlin is classified as a County Geological Site (site code MH026). This site is a basin shaped body of silica derived from decalcified limestone which is exposed at the land surface. See Figure 11.4.

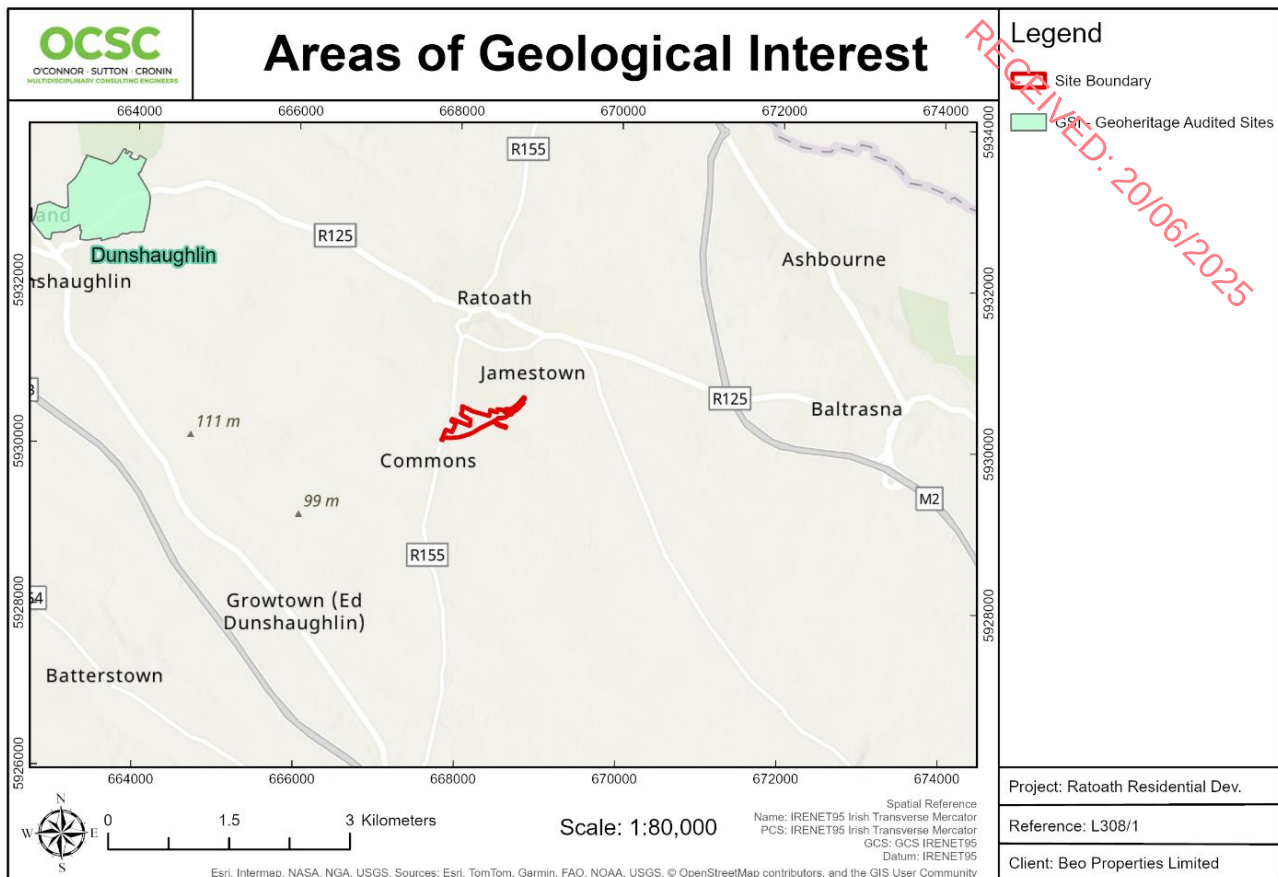


Figure 11.4: Areas of Geological Interest

Source: GSI, 2025

The assessment of impacts on the cultural heritage from the proposed development is detailed in **Chapter 9** (Archaeological, Architectural and Cultural Heritage) of this EIAR. Given the nature of the proposed works, the zone of influence for areas of geological interest is not considered to exceed 1km.

The OSI 6" historical map (1837-1842) indicates that the site was comprised of undeveloped land and a road transecting the northeastern portion of the site as shown in **Figure 11.5**. The surrounding land was largely undeveloped except to the northwest the town of Ratoath is located.

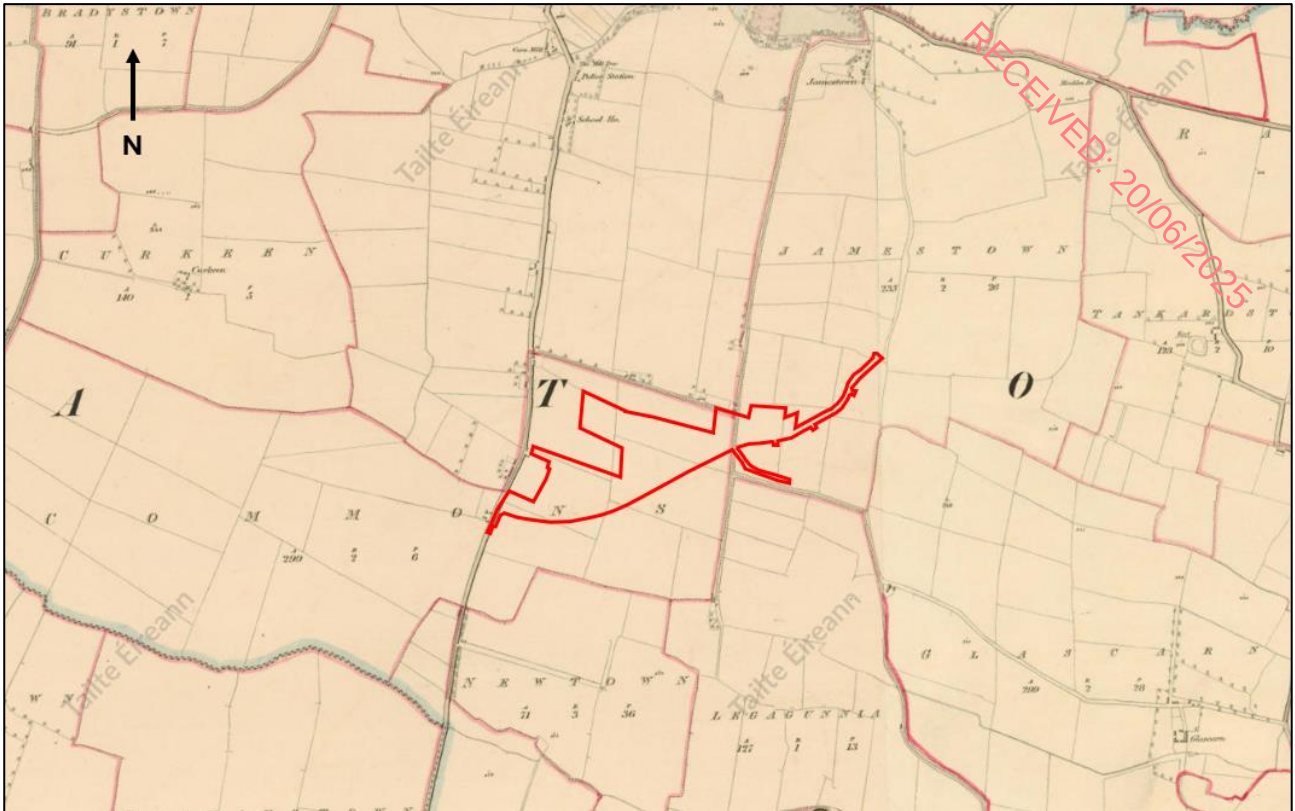


Figure 11.5: Location of the proposed development on Historic 6 Inch OSI Map (1837-1842) (subject site outlined in red)
Source: OSI 2025

The historic 25-Inch Map (1888-1913) shows no significant changes to the Site from that shown in Figure 11.6. No other significant changes were indicated within the surrounding area other than the development of some housing to the northwest. See **Figure 11.6**.

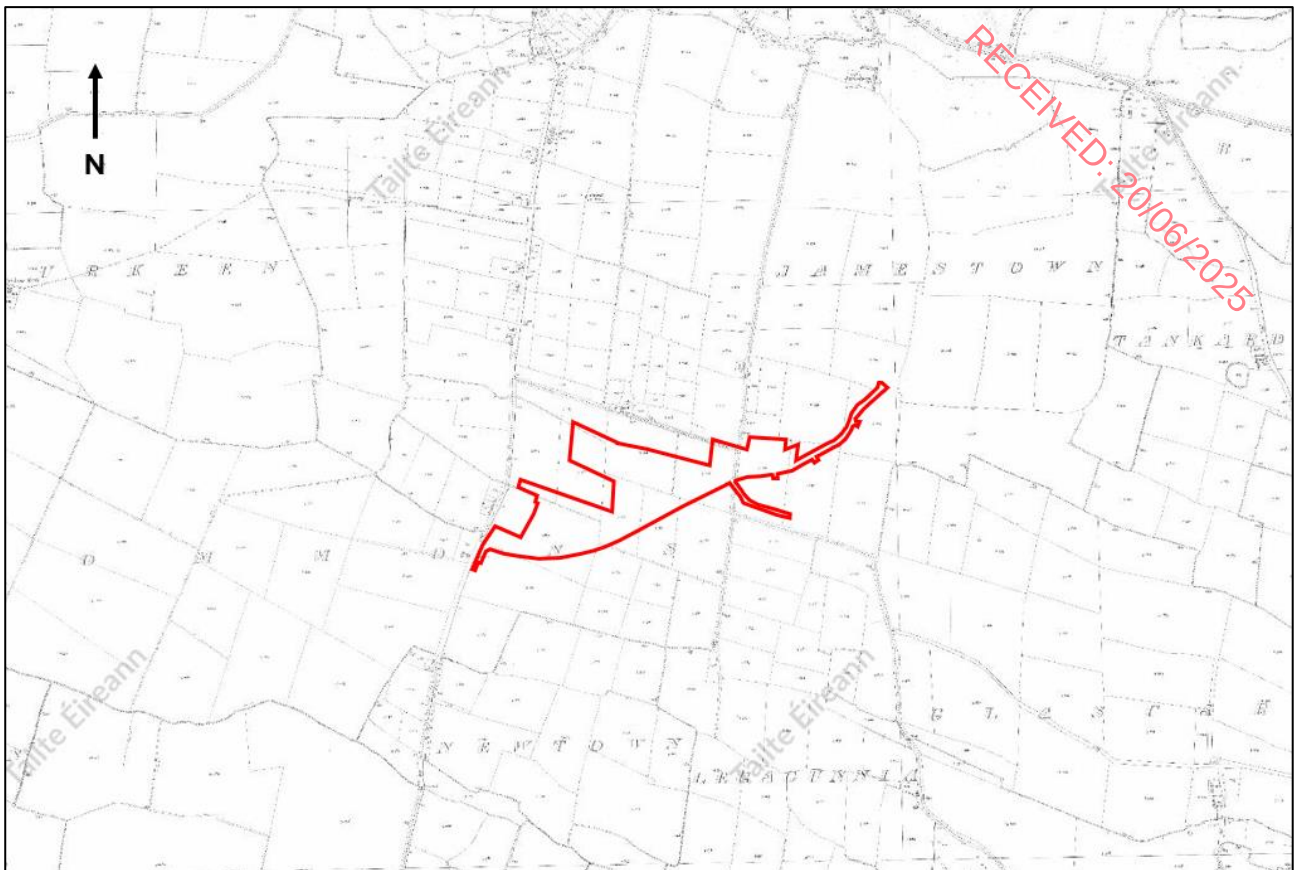


Figure 11.6: Location of the proposed development on 25 Inch OSI Map (1888-1913) (subject site outlined in red)

Source: OSI 2025

The 6-inch Cassini Map (1830s to 1930s) indicates no change to the Site or the immediate surrounding area. See **Figure 11.7**.

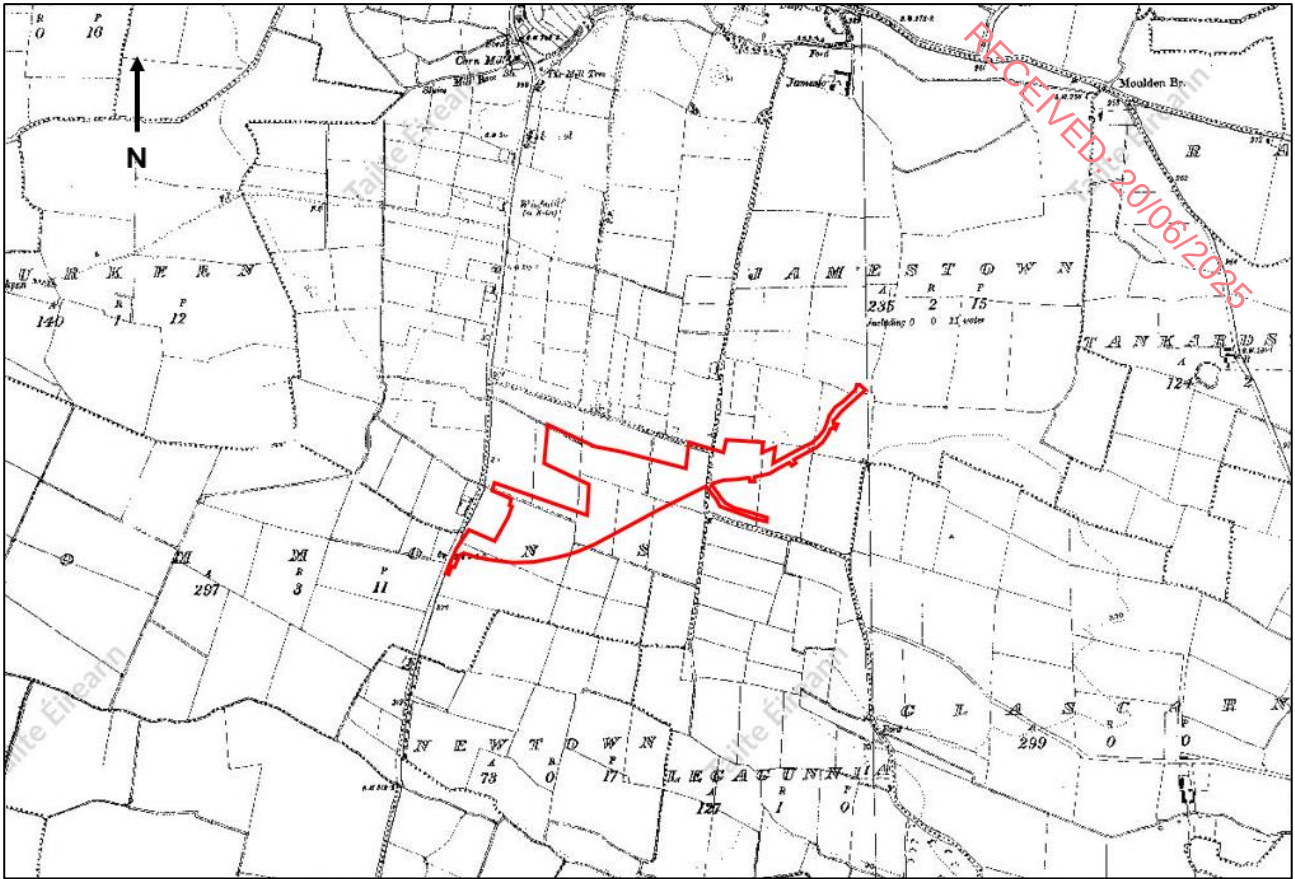


Figure 11.7: Location of the proposed development on Cassini OS Map (1830-1930) (subject site outlined in red)
Source: OSI 2025

Ordnance Survey aerial photography from 1995 (**Figure 11.8**) indicates no significant change to the Site or surrounding area since the Cassini mapping other than the construction of residential structures to the north, west, and east of the Site. Since the Cassini mapping, agricultural construction had also occurred to the north and commercial construction to the east along the R155. Further south of the site the Fairyhouse Racecourse has been constructed.



Figure 11.8: Location of the proposed development on OSI Aerial Image (1995) (subject site outlined in red)
Source: OSI, 2025

The 1999-2003 Ordnance Survey aerial photo (**Figure 11.9**) shows no significant change to the Site or surrounding area other than residential construction on the adjoining site to the north.

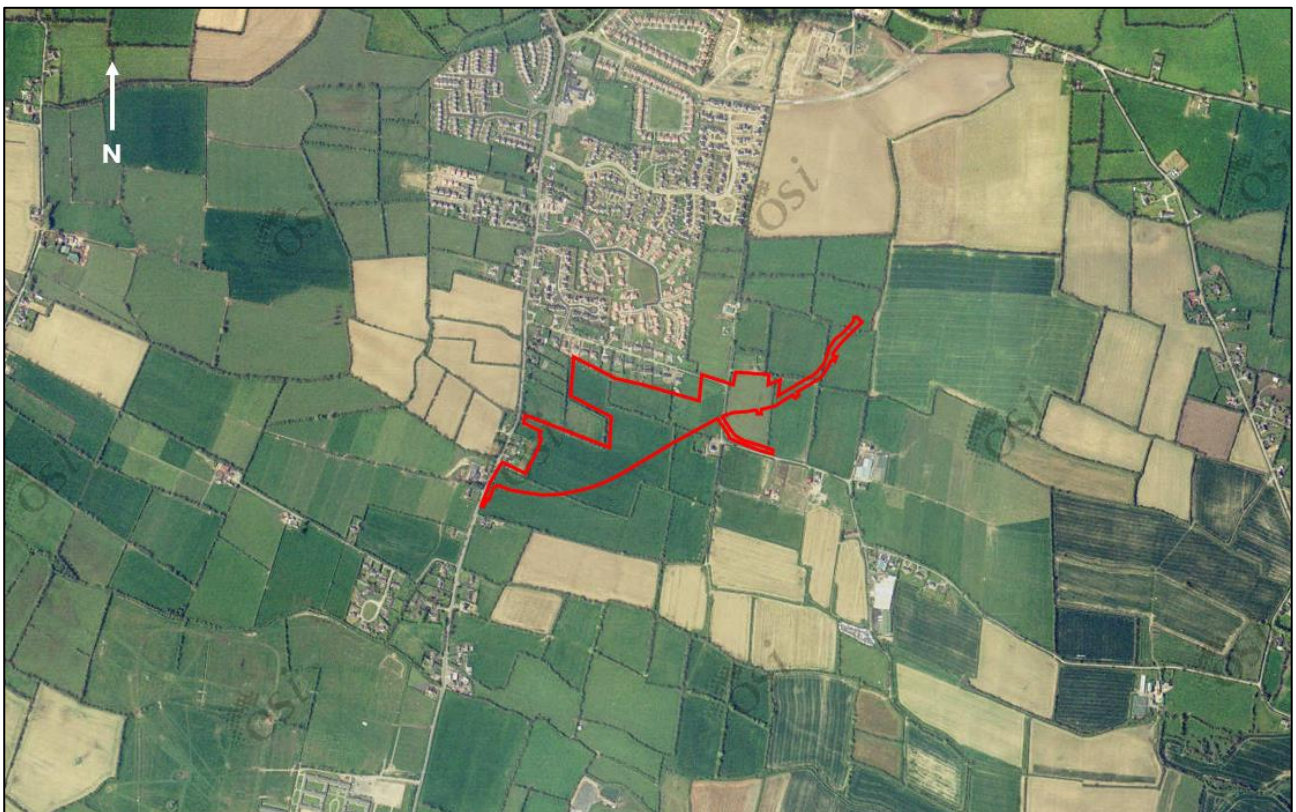


Figure 11.9: Location of the proposed development on OSI Aerial Image (1999-2003) (subject site outlined in red)
Source: OSI, 2025

The 2004-2006 Ordnance Survey aerial photo (**Figure 11.10**) shows no change to the Site. The aerial photo indicates that residential construction had occurred to the north, east, and northwest and that Tattersalls Ireland had been constructed to the south.



Figure 11.10: Location of the proposed development on OSI Aerial Image (2004-2006) (subject site outlined in red)
Source: OSI, 2025

The 2005-2012 Ordnance Survey aerial photo (**Figure 11.11**) indicated no significant changes to the Site. Residential properties and Ratoath College had been constructed to the north.



Figure 11.11: Location of the proposed development on OSI Aerial Image (2005-2012) (subject site outlined in red)
Source: OSI, 2025

The 2013-2018 Ordnance Survey aerial photo (**Figure 11.12**) indicated no significant changes to the Site and to the surrounding area.



Figure 11.12: Location of the proposed development on OSI Aerial Image (2013-2018) (subject site outlined in red)
Source: OSI, 2025

The 2021 Google Earth aerial image indicates that the Site layout remained largely unchanged while the Ratoath Outer Relief Road had been constructed to the northeast (**Figure 11.13**). The more recent aerial photographs show no other changes to the site and to the surrounding area.



Figure 11.13: Location of the proposed development on Google Earth Aerial Image (2021) (subject site outlined in red)
Source: Google Earth, 2025

11.3.4 Regional Soils

According to the Teagasc Soil Information System included on the GSI Groundwater and Geotechnical Mapviewer, BminPD, poorly drained, mainly basic mineral soils are present on the site and within a 1km zone of influence of the site. An area of made ground is also located to the northwest of the site, an area of BminDW, deep well drained mineral, mainly basic soil to the southeast of the site, and an area of AlluvMIN, alluvial, mineral to the south, northwest and northeast is of the site as shown in **Figure 11.14**.

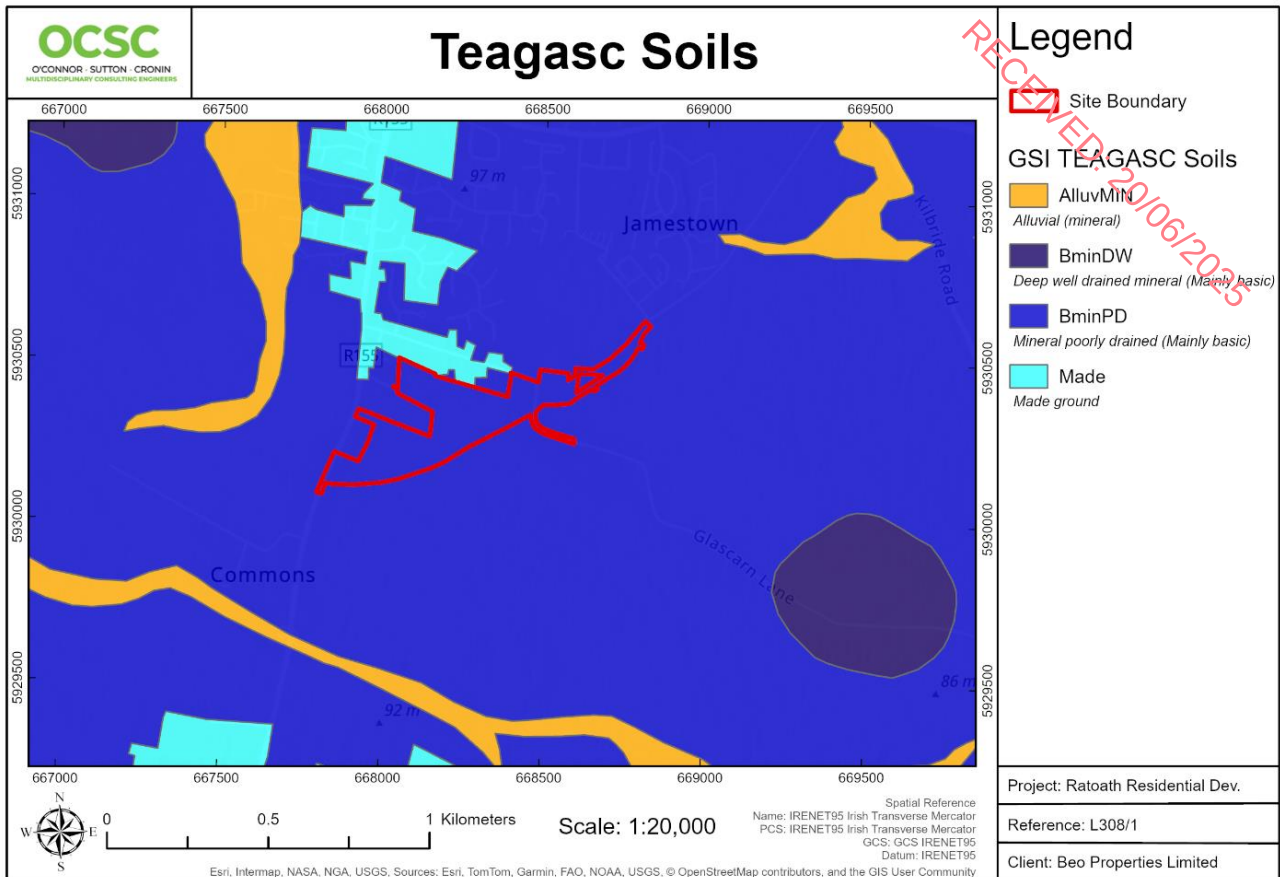


Figure 11.14: Teagasc Topsoils

Source: GSI, 2025

According to the GSI Groundwater and Geotechnical Map viewer, the quaternary sediments underlying the site have been classified as Carboniferous Till derived from limestones. This is the dominant subsoil type in the region, along with Alluvium as shown in **Figure 11.15**.

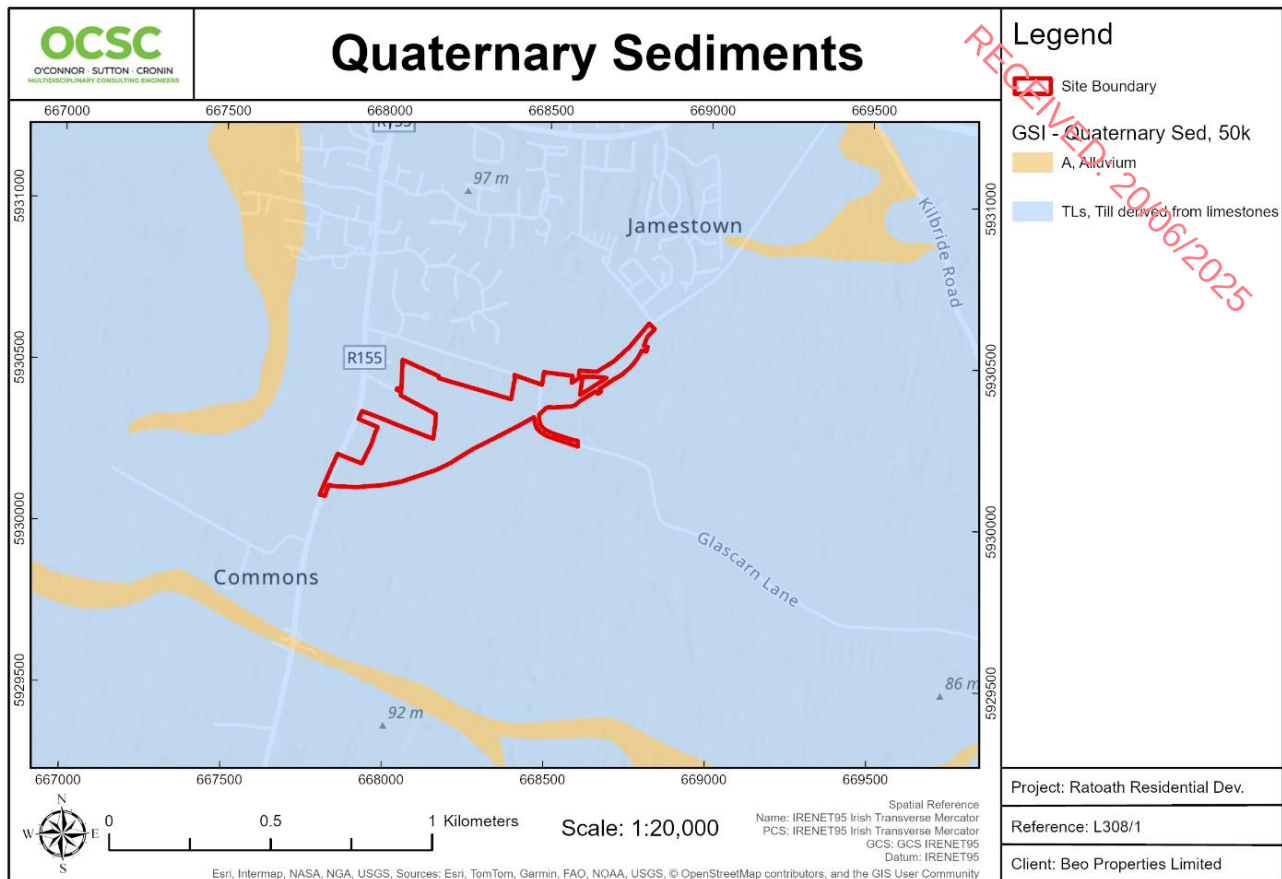


Figure 11.15: Quaternary Sediments

Source: GSI, 2025

The Till subsoil underlying the Site is a glacial deposit resulting from glaciations that covered the region during the Pleistocene and Quaternary periods. As ice moves over its substrate, pieces of rock are incorporated into its basal layers, making the ice very abrasive. The ice subsequently scours and erodes the bedrock over which it flows. The rock material eroded by and incorporated into the ice is eventually deposited, either directly by the ice as till (commonly known as boulder clay) or by meltwater which causes grading of the deposits into gravel, sand, silt, or clay. Local withdrawal and recedence of the ice sheet has led to the formation of fluvio-glacial sediments (gravel and sand lenses) and glaciomarine sediments (stiff/firm laminated clays, silts, and sands) which can exhibit significant lateral and vertical variations in grain size distribution over short distances. The presence of shales within local quaternary sediments may be due to shales within the “Calp” limestone formation which occurs extensively in Meath. The “Calp” is a Carboniferous limestone with extensive amounts of interbedded shales or a highly calcareous shale lithology.

These glacial deposits influence the local drainage pattern, resulting in poorly drained land in the interdrumlin zones relative to the steeper drumlin slopes (Clarke et al., 2007). The deposits are thin or absent in the upland areas, but on the lowlands till thicknesses of over 30m are common throughout County Meath.

Boulder clays generally exhibit exceptionally low permeability in the order of 1×10^{-7} to 1×10^{-9} m/s or lower. The glacial boulder clay will tend to function as an aquitard between the other more permeable formations, namely the overlying made ground and the sands and gravels.

11.3.5 Regional Geology

According to the GSI Groundwater and Geotechnical Map viewer, the bedrock underlying the Site is comprised of the Lucan Formation, which comprises dark grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser-grained calcarenitic limestones, sometimes graded, and interbedded dark grey calcar. The beds are predominantly fine-grained distal turbidites in the north Dublin Basin. The formation is intermittently exposed on the coast between Rush and Drumanagh Head. The local bedrock geology mapped by the GSI is illustrated in **Figure 11.16**.

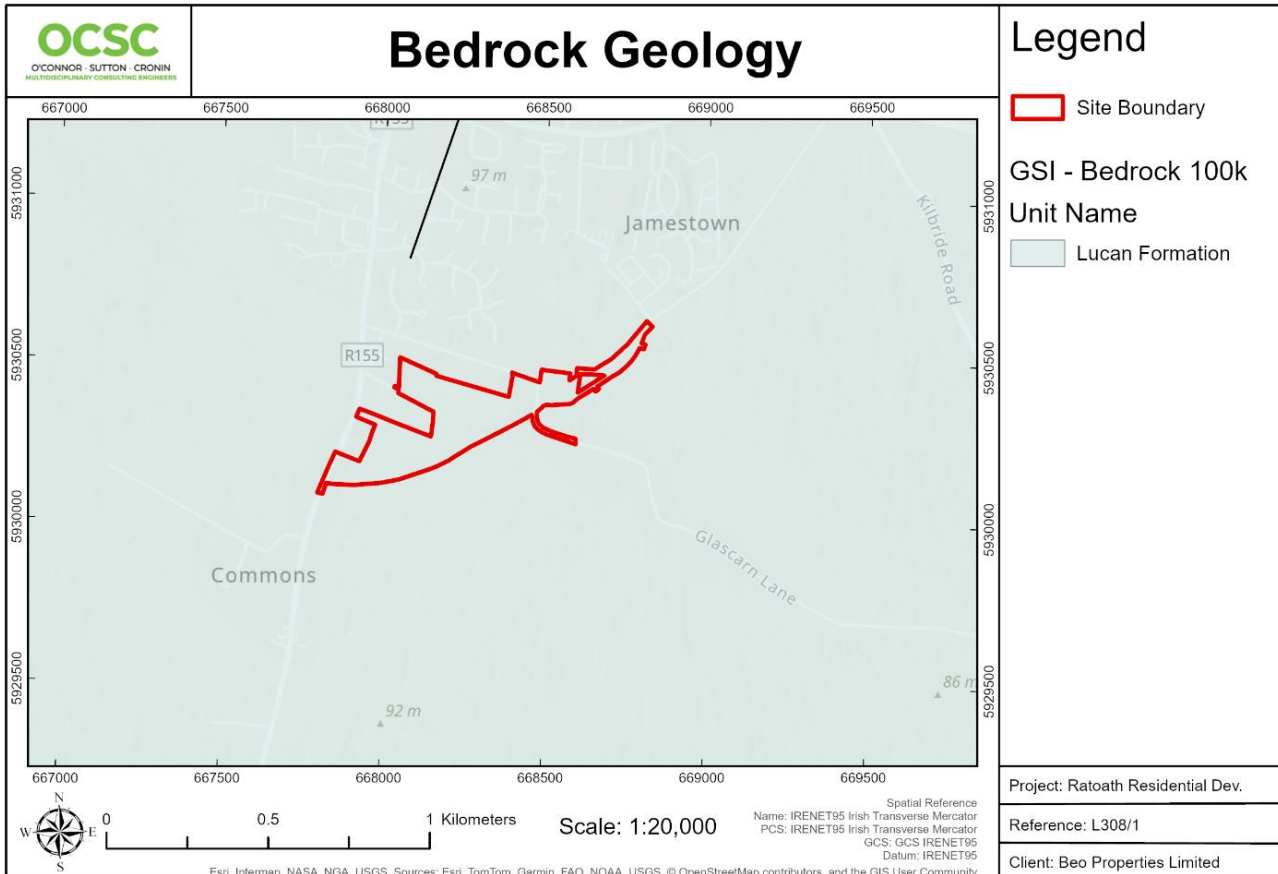


Figure 11.16: Local Bedrock Geology

Source: GSI, 2025

11.3.6 Regional Hydrogeology

The Site lies entirely within the Swords GWB, which is the primary GWB in the region and is comprised of moderate permeability, karstified limestone. The Swords GWB covers some 199km² and is located in North County Dublin. The Swords GWB comprises:

- Mostly LI: Locally important aquifer, moderately productive only in local zones;
- Some PI: Poor aquifer, generally unproductive except for local zones; and
- Small amounts (2% of total Area) of Lm: Locally important aquifer, which is generally moderately productive.

The Lucan Formation, located in the vicinity of the Ratoath, is classified by the GSI as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones. In the Dublin Basin, minor open NE/SW folds cause strike swings in otherwise predominantly E-W striking, moderate to shallow dipping strata. In general, permeability in this these rock units are likely to be moderate to low (1-10m²/d). Secondary

dolomitisation along faults in the Dublin area suggests that they have been and may still be open to allow fluid migration. Pumping test analysis at the public supply boreholes at Dunboyne, Co. Meath provided transmissivity values of between 10 and 150 m²/d.

There is a distinct reduction in the permeabilities of these rocks with depth. Packer tests show permeabilities reduce by an order of magnitude for each five meters of depth in the limestone. The majority of groundwater flow will take place within the upper weathered and broken rock zone (3m) with additional isolated flow along fractures and fissures at depths up to 50mbgl.

11.3.7 Groundwater Vulnerability

According to the GSI Groundwater and Geotechnical Mapviewer, the groundwater vulnerability beneath the proposed Site is low (see **Figure 11.17**). Vulnerability ratings are a function of permeability and overburden thickness which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution.

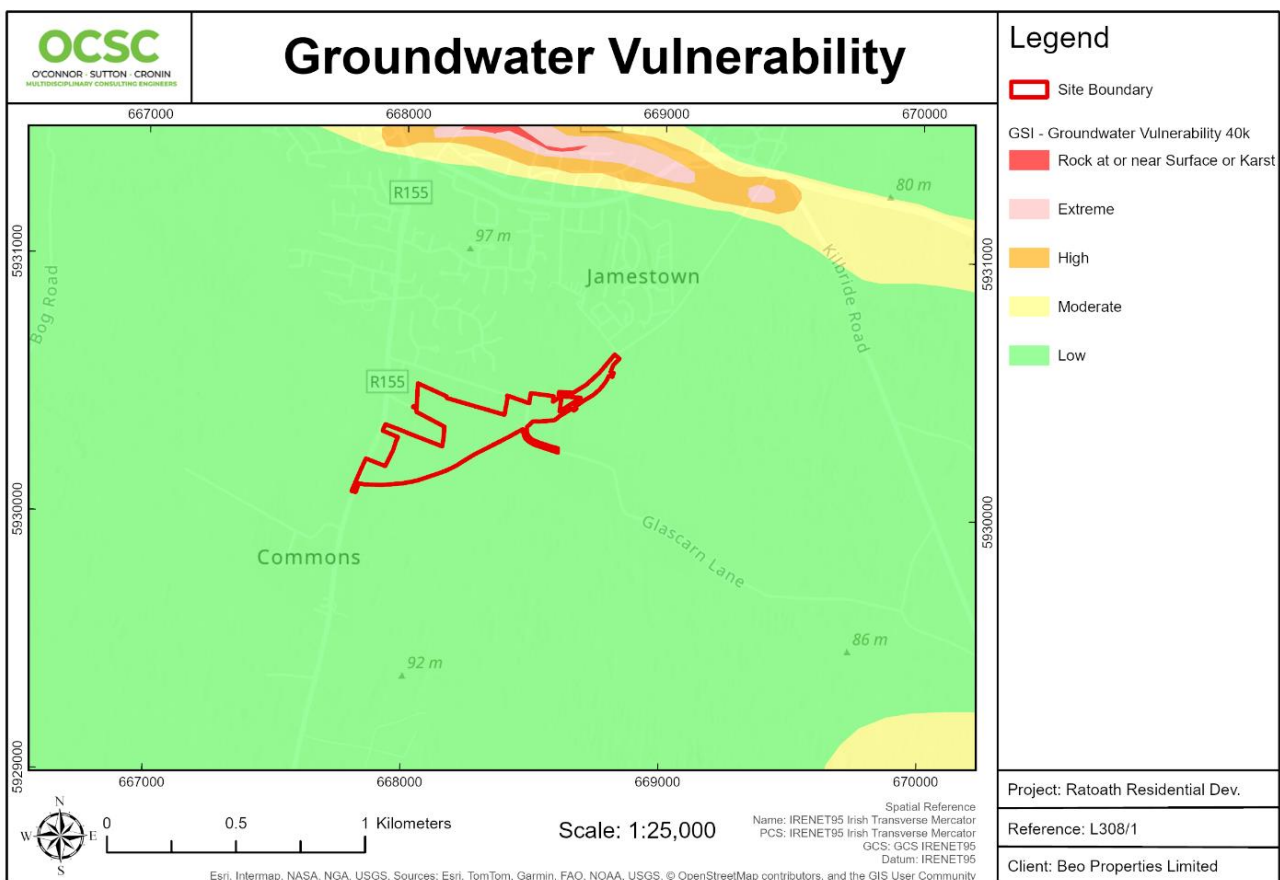


Figure 11.17: Aquifer Vulnerability

Source: GSI, 2025

11.3.8 Groundwater Status & Risk

An assessment carried out under the Water Framework Directive (WFD) and included on the EPA Envision Online Mapping tool has concluded that the groundwater within the Swords GWB is of “Good” status. See **Figure 11.18**. The WFD has determined that the Swords GWB is “not at risk” of failing to meet its WFD objectives by 2027. See **Figure 11.19**.

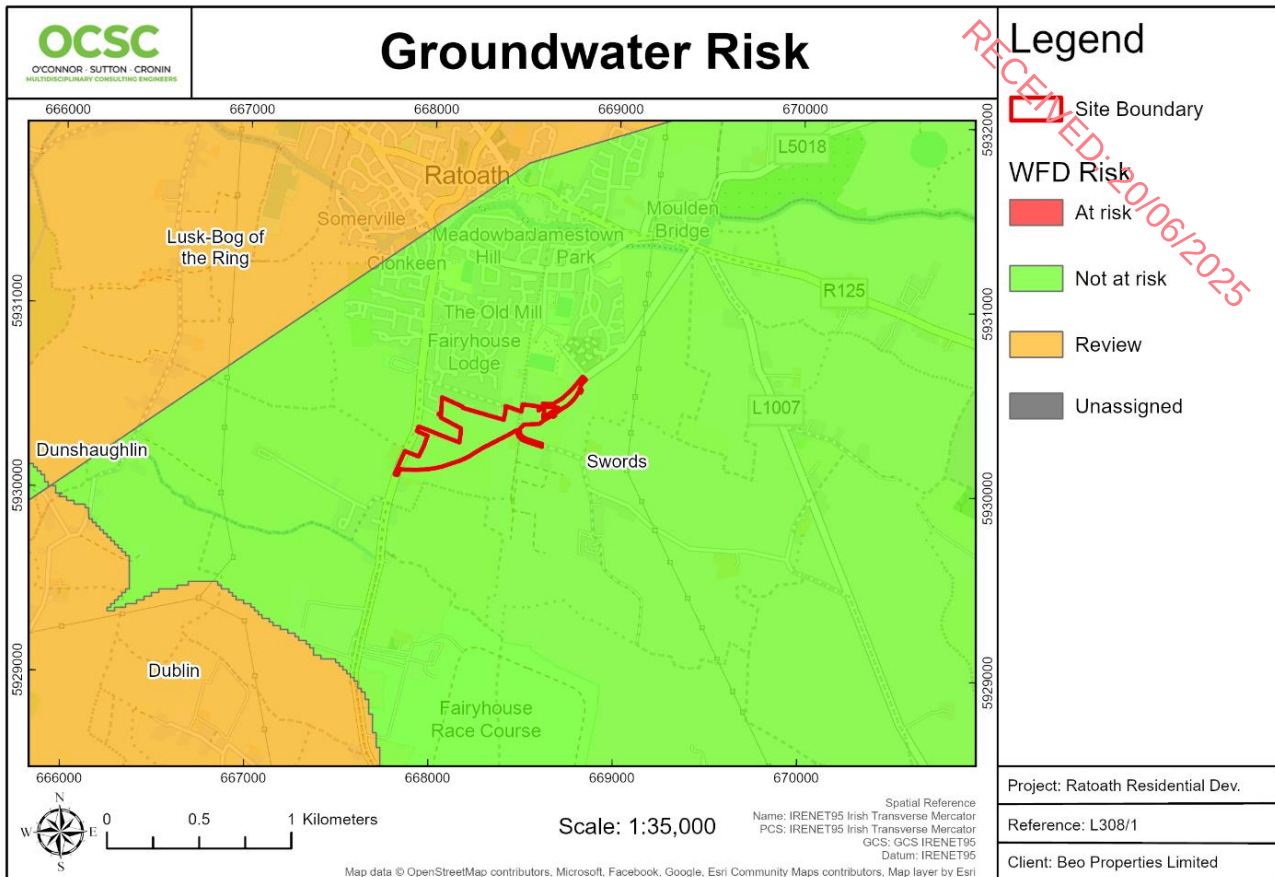


Figure 11.18: Groundwater Risk (subject site outlined in red)

Source: EPA, 2025

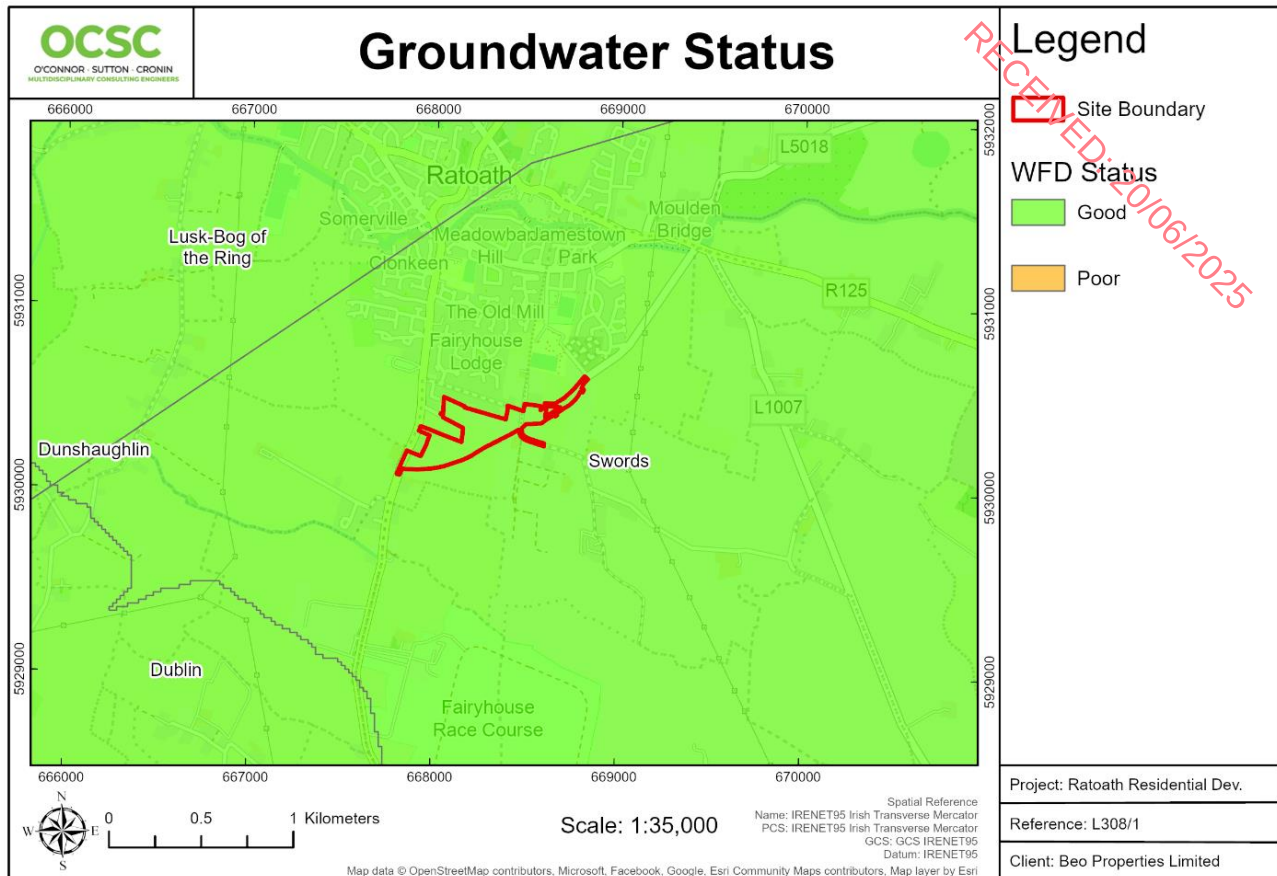


Figure 11.19: Groundwater Status (subject site outlined in red)

Source: EPA, 2025

11.3.9 Groundwater Recharge

Within the Site and its 1 km zone of influence, the Swords GWB are overlain primarily by till derived chiefly from limestone. Till layers allow diffuse recharge to occur while direct recharge is likely to occur in areas where rock is at or near the ground surface. The diffuse recharge will occur via rainfall percolating through the subsoil. The effective rainfall is the proportion of the total rainfall that recharges the aquifer and is largely determined by the thickness and permeability of the soil and subsoil and by the slope of the land surface. Due to the generally low permeability of the aquifers within the GWB, a high proportion of the recharge will discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing the available groundwater resource in the aquifer.⁹

Based on the GSI website¹⁰, the effective rainfall for the Site ranges from 377.6 to 405.8 mm/year. The recharge coefficient for the site is low variable, ranging from 8.0 to 20.0%. Recharge to the aquifer can only occur where rainfall can percolate through the subsoil to the aquifer. Recharge values are low to very low in the majority of the Site except along portions of the northeastern and northwestern Site boundaries where they range from very low to very high, depending on the permeability of the soil and subsoil and the presence of shallow bedrock. See **Figure 11.20**.

⁹ <https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/SwordsGWB.pdf>

¹⁰ <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228>

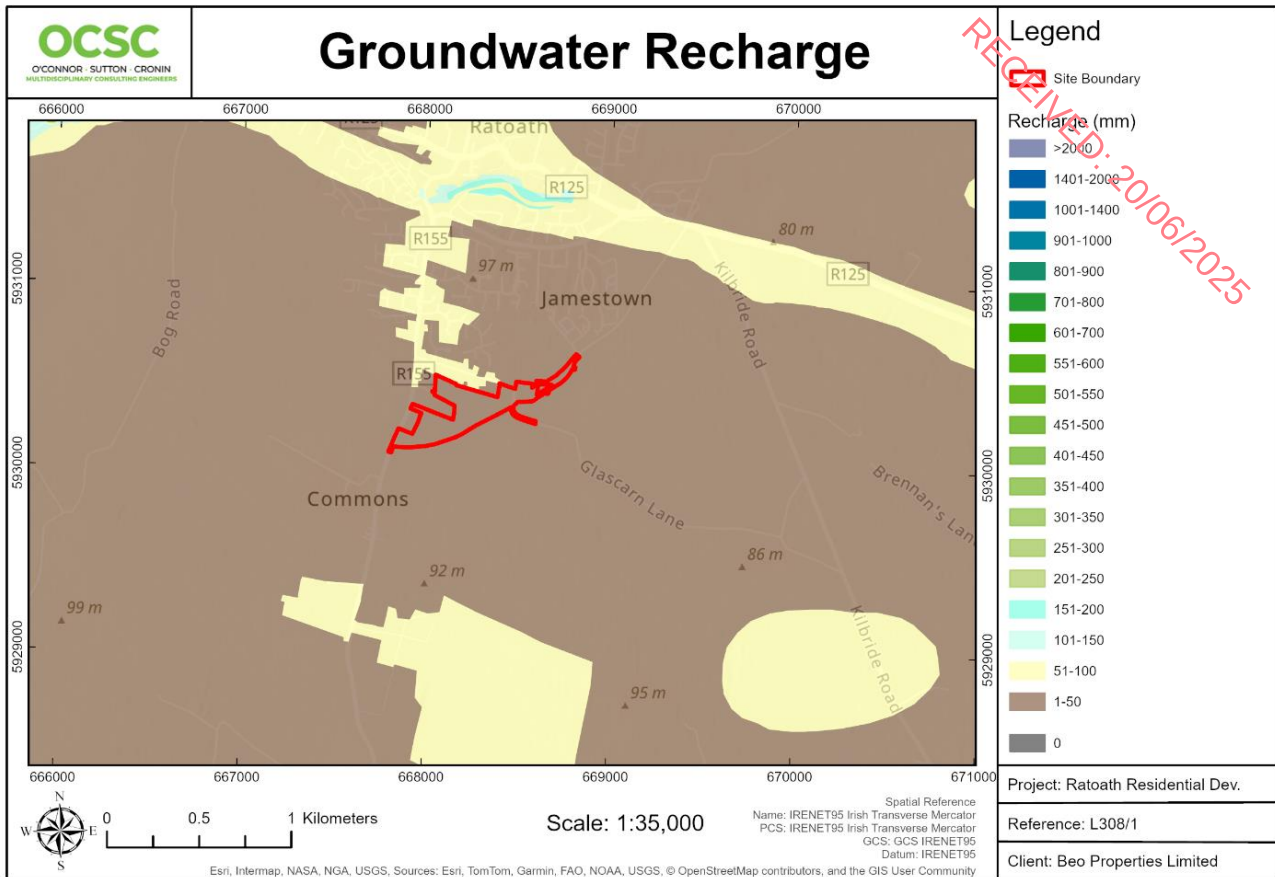


Figure 11.20: Groundwater Recharge (subject site outlined in red)

Source: GSI, 2025

11.3.10 Groundwater Abstractions

A search of the GSI groundwater well database was conducted to identify registered wells and springs in the surrounding area. There are two wells or springs identified as potentially within the site boundary. Well 2925SWW148 is potentially located within the northeastern portion of the site and was drilled in 1899 to a depth of 437.5m for a domestic use; the yield is reported as 28 m³/day. Well 2923NWW393 is potentially located within the southwestern portion of the site and was drilled in 1963 to a depth of 46.9m for an unknown use; the yield is reported as 21.8 m³/day.

There are eight additional wells within approximately 1km of the site. Three of these (ID 2923NWW336, 2923NWW337, and 2923NWW338) are located approximately 0.42 to 0.56 km southwest of the Site and were all drilled in December 1899 to depths ranging from 6.7 to 16.2m; no yield was reported for any of the wells. One well (ID 2923NWW339) is located approximately 0.87km south of the Site and was drilled in 1899 to 24.4m; the yield is not reported. Wells and springs in the general vicinity of the Site identified by the GSI are illustrated in **Figure 11.21**.

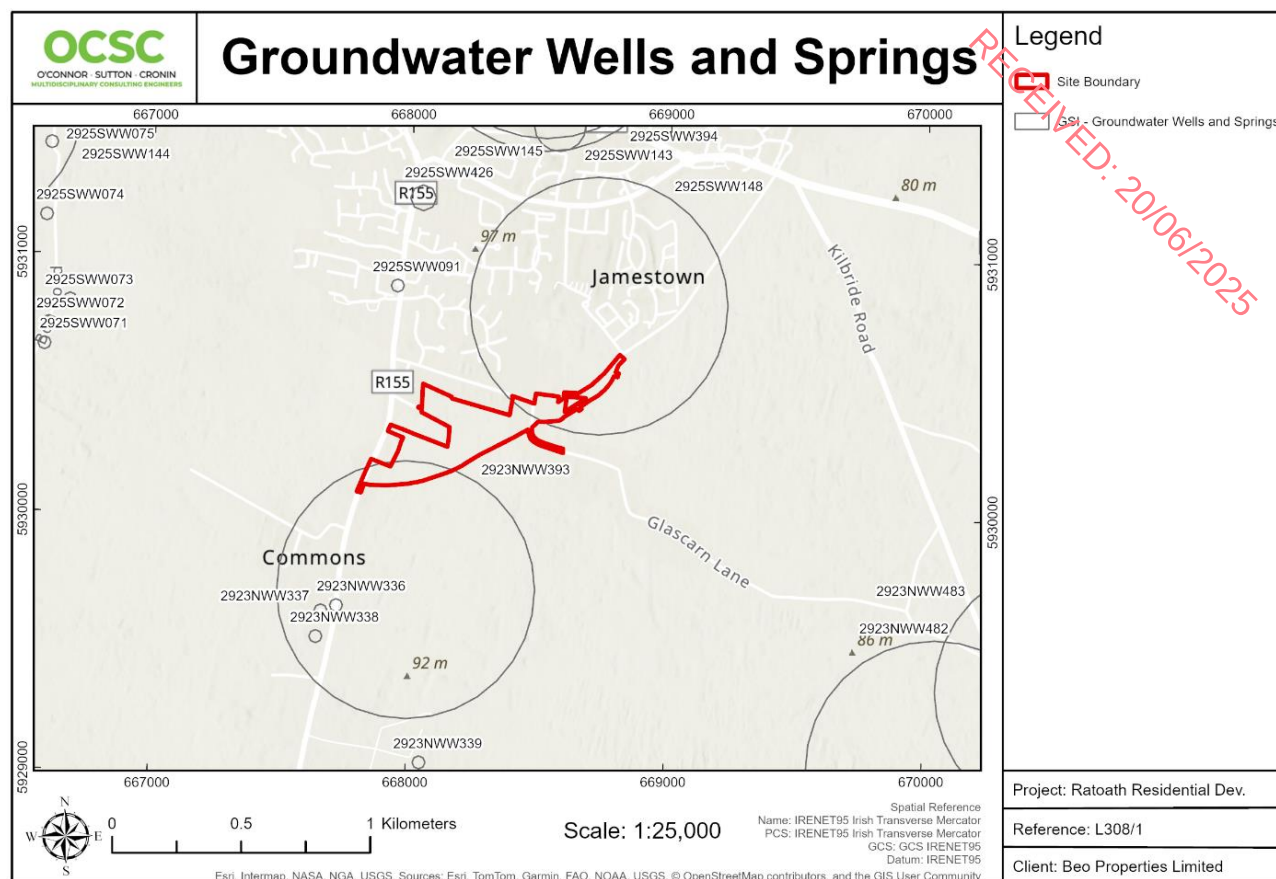


Figure 11.21: Wells and Springs (subject site outlined in red)

Source: GSI, 2025

The GSI database provides information on groundwater source protection zones (SPZs) (e.g., areas of contribution to water supply bores). SPZ delineation provides an assessment of the land area that contributes groundwater to a borehole or spring. The purpose of SPZs is to provide additional protection to safeguard drinking water quality through constraining the proximity of an activity that may impact upon a drinking water abstraction. The nearest SPZ is the Dunshaughlin Public Water Scheme, which is located 4.6km northwest of the site. As such, fuel and chemical storage and use on the site is unlikely to pose a risk to water of groundwater contamination within this SPZ. However, the risks to groundwater and surface water will be minimised via engineering design and construction in line with best practice. Contractors will prepare and implement a site-specific CEMP which will address the mitigation of risks to groundwater.

11.3.11 Nearby Site investigations

The GSI has compiled a database of site investigations previously carried out in Ireland¹¹. The database indicates that numerous site investigations have been undertaken in the areas to the north and south of the Site as shown in **Figure 11.22**. Three site investigations were identified within 1km of the Site. These were located on the adjoining site to the north (Report ID 3697), 1.3km south of the Site (Report ID 3694), and 0.95km southwest of the Site (Report ID 6226). The report associated with Report ID 6226 is for a trial pit investigation undertaken in Tattersalls, Fairyhouse in 2005.

The Transit Barn at Tattersalls development site investigation report indicates that the site had been infilled to a depth of 1.0 to 1.5m with material excavated in association with nearby development work. The boreholes revealed a soft, upper clay layer, presumably infill, although there were no indications of extraneous matter. Groundwater seepages were reported near the horizon of the underlying stiff, gravelly clay. Samples of the

¹¹ <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228>

sub-soils exhibited very low concentrations of soluble sulphates and near-neutral pH values (IGSL, 2005). The GSI website does not provide reports associated with Report IDs 3697 or 3694. Copies of these reports have been requested from the GSI but have not been supplied to date.

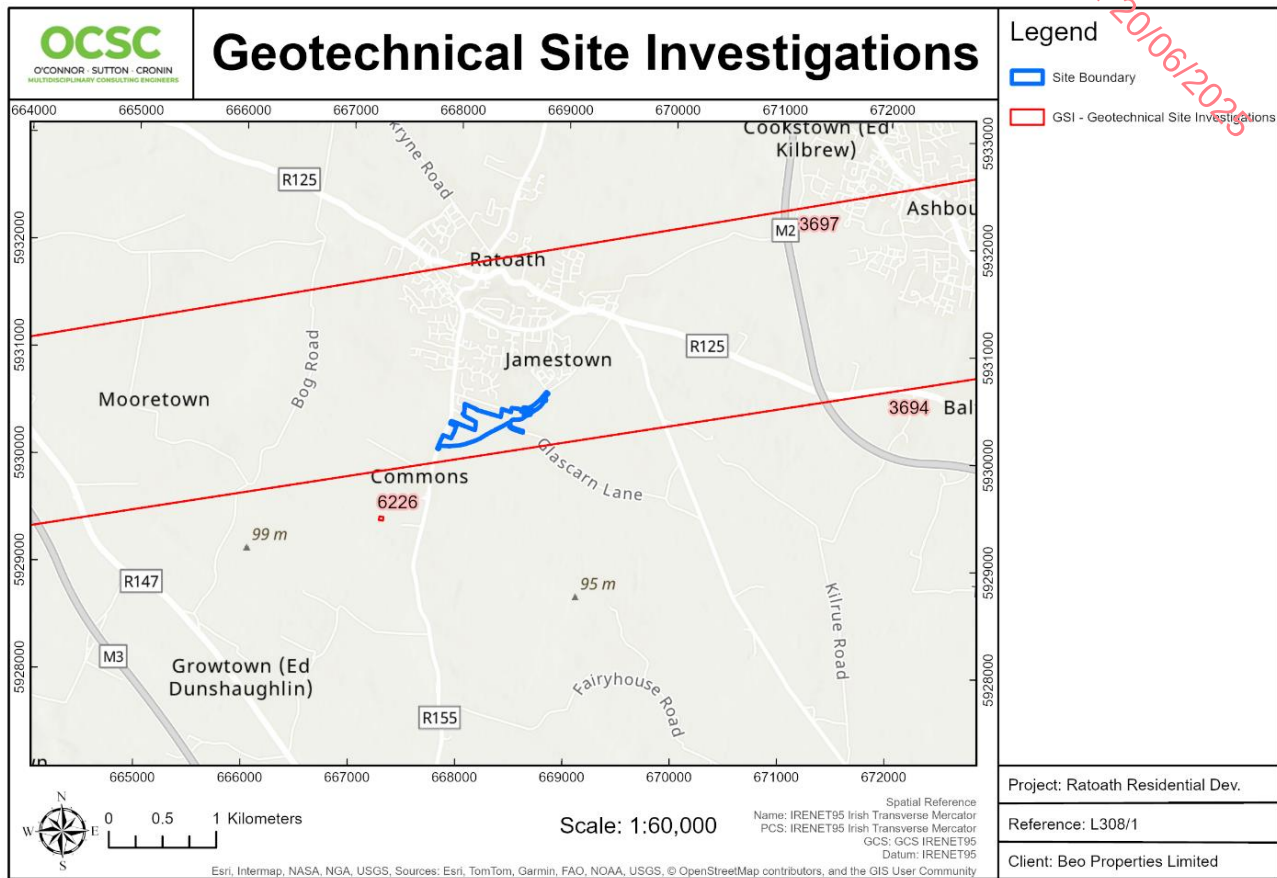


Figure 11.22: Nearby Site Investigations

Source: GSI, 2025

An investigation was undertaken on the Site by IGSL from June to July 2020. The investigation included the following:

- 4 no. Cable Percussion Boreholes;
- 1 no. Rotary Borehole
- 6 no. Trial Pits
- 15 no. CBR by Plate Tests
- 4 no. Infiltration tests to BRE Digest 365
- 2 no. HD Dynamic Probes
- Geotechnical Laboratory Testing
- Chemical Laboratory Testing

The report also references the undertaking of a standard penetration test and installation of a standpipe in one cable percussion borehole.

Logging undertaken during borehole and trial pit installation indicated that approximately 0.2 m of topsoil overlies firm to stiff, brown gravelly CLAY which extended to approximately 2 mbGL. Minor variations were noted in one of the pits, where boulder clay became sandier.

Stiff to very stiff, grey-black gravelly CLAY was present from approximately 2 mbGL to approximately 8.1 mbGL. Cobbles and the occasional boulders were encountered. Recovery below the gravelly clay layer was limited, but returns were identified as grey-black, sandy, cobbly gravel. From 10.00 to 16.50 mbGL alternating layers of gravel and sand were noted with some adverse 'blowing' noted in the fine sand layers.

No groundwater was encountered during the course of the borehole investigation, although a minor water seepage was noted at 2.20 meters in one trial pit. No fall water was recorded in the first test cycle of the infiltration testing.

In-Situ CBR by Plate Bearing Testing was carried out at 0.50 mbGL. The CBR at Load Cycle from the 15 locations ranged from 3.0 to 21.5%; the CBR at Re-Load ranged from 4.4 to 45.1%.

The Heavy-Duty Dynamic Probes were conducted at two locations to measure the soil resistance, the results of which are outlined below:

- The Firm to Stiff, Brown, Gravelly CLAY layer at 1 mbGL had Standard Penetration Test (SPT) N values ranging from 14 to 19.
- The Stiff, Brown, Gravelly CLAY layer at 2 mbGL had N values ranging from 22 to 28.
- The Stiff to Very Stiff, Brown, Gravelly CLAY layer at 3 mbGL had N values ranging from 24 to 34.
- The Very Stiff, Brown, Gravelly CLAY layer at 4 mbGL had N values ranging from 31 to 38.
- The Very Stiff to Hard, Brown, Gravelly CLAY layer between 5 and 8 mbGL had N values ranging from 33 to 50, with the deeper layer from 8 to 16 meters mbgl with N values which were >50.

11.3.12 Designated Areas of Conservation

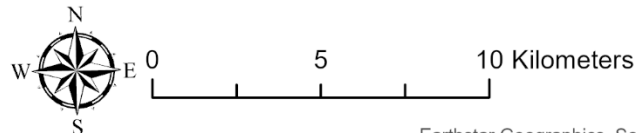
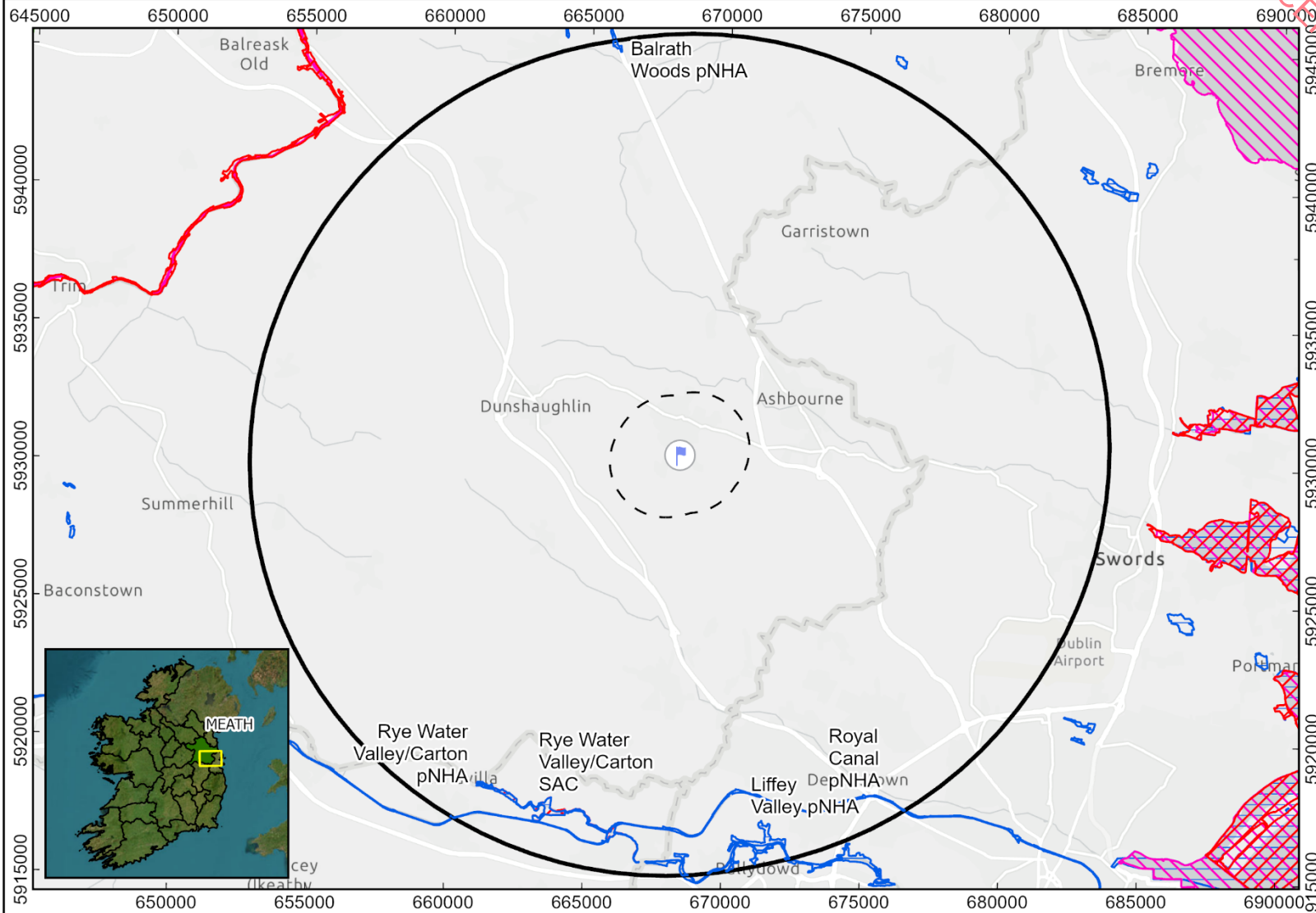
The nearest designated area of conversation is the Royal Canal proposed Natural Heritage Area (pNHA) (Site Code 002103) located approximately 12.18km south of the Site. Other designated areas of conservation located within 15km of the site include the Liffey Valley pNHA (Site Code 000128) located 13.51km to the south, Balrath Woods pNHA (Site Code 001579) located approximately 14.58km to the north and Rye Water Valley/ Carton pNHA (Site Code 001398) located approximately 12.91km to the southwest. The nearest Special Area of Conservation (SAC) is the Rye Water Valley/ Carton SAC (Site Code 001398) located approximately 12.91km southwest of the Site.

See **Figure 11.24** for nearby designated areas of conservation. Further information regarding European designated sites within the zone of influence of the site is included in the Enviroguide Appropriate Assessment Report for this site.

NPWS Designated Sites

Legend

-  Site Location
-  2km Buffer
-  15km Buffer
-  SAC
-  SPA
-  NHA
-  pNHA



Scale: 1:220,000

Spatial Reference
Name: IREN95 Irish Transverse Mercator
PCS: IREN95 Irish Transverse Mercator
GCS: GCS IREN95
Datum: IREN95

Earthstar Geographics, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Project: Ratoath Residential Dev.

Reference: L308/1

Client: Beo Properties Limited

RECEIVED: 20/06/2025

Figure 11.23: NPWS Designated Sites (Source: NPWS, 2025)

11.3.13 The Impact of subsurface structures on the local hydrogeology

No groundwater was noted during the course of the borehole investigation and only minor seepage was noted in an isolated sandy zone of one of the trial pits. Groundwater was recorded at 8.20 mbSL on 24/06/2020 in a standpipe installed in one of the boreholes during the site investigation detailed above. A reading taken three weeks later on 14/07/2020 indicated groundwater at 1.74 mbGL.

Although shallow groundwater may be present on the site, there will be no basement construction, so subsurface structures will be limited to shallow installations associated with foundations and services and, therefore, are not expected to impact on local hydrogeology.

11.3.14 Soil Contamination Assessment

The Site consists of greenfield land with no known history of development other than a road which transected the western portion of the Site as noted on the OSI 6" historical map (1837-1842). Based on this information, there is limited potential risk associated with past site use to future residential and commercial receptors following site development.

A detailed assessment of potential soil contamination and a waste classification has not been carried out for the Site. However, laboratory analysis of two soil samples from the site shows low levels of metals and inorganic and organic compounds. Based on the available site investigation information, there is a very low potential risk associated with past site use as agricultural land to future residential or commercial receptors following site development.

There are a number of mechanisms for addressing waste materials generated during construction in Ireland, including those outlined in **Table 11.4**, in addition to Article 27 Declaration (by-product) and recovery solutions.

Table 11.4: Waste Categories for Disposal/ Recovery

Waste Category	Classification Category
Category A Unlined Soil Recovery Facilities	Soil and Stone only which are free from anthropogenic materials such as concrete, brick, timber. Soil must be free ^a from "contamination" e.g., PAHs, Hydrocarbons ^b .
Category B1 Inert Landfill	Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL ^c application
Category B2 Inert Landfill	Reported concentrations greater than Category B1 criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HWOL application.
Category C Non-Hazardous Landfill	Reported concentrations greater than Category B2 criteria but within non-hazardous landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application.
Category C1 Non-Hazardous Landfill	As Category C but containing < 0.001% w/w asbestos fibres.
Category C2 Non-Hazardous Landfill	As Category C but containing >0.001% and <0.01% w/w asbestos fibres.
Category C3 Non-Hazardous Landfill	As Category C but containing >0.01% and <0.1% w/w asbestos fibres.
Category D Hazardous Treatment	Analytical results found to be hazardous using the HazWasteOnline application.

^a Free from equates to less than 2%.

^b Total BTEX 0.05mg/kg, Mineral Oil 50mg/kg, Total PAHs 1mg/kg, Total PCBs 0.05mg/kg and Asbestos No Asbestos Detected – EPA Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities, 2020.

^c HazWasteOnline Tool.

11.3.14.1 Groundwater Contamination Assessment

The Site is a greenfield site with a low risk of potential contamination from past agricultural chemical sources. An assessment of potential groundwater contamination has not been carried out for the Site. Therefore, any risk associated with past site use to future residential or commercial receptors following site development cannot be quantified at this time.

11.3.14.2 Chemical/Gas Assessment

Gas Monitoring was not undertaken on the Site during the site investigation. Therefore, any risk associated with past site use to future residential or commercial receptors following site development cannot be quantified at this time.

11.3.15 Potential Pollutant Linkages

A critical element of the risk assessment process is the establishment of a Conceptual Site Model (CSM) for the Site. A CSM describes the potential sources of contamination at a site, the migration pathways it may follow, and the receptors it could impact. If complete source-pathway-receptor scenarios exist, then there is a potential pollutant linkage that needs to be characterised and assessed (via formal risk assessment). All three elements need to be present for a viable risk to exist (e.g. if a source and receptor exist but no pathway is present, there is no pollutant linkage and hence no risk).

a. Sources

- i. The potential contamination from nearby properties relate to residential fuel usage and chemicals from agricultural land usage.
- ii. There is a potential for contamination associated with demolition debris or fill material from a former structure near the western site boundary and from agricultural land usage on Site.
- iii. There will be a source of potential contamination present on Site during the construction phase (e.g. machinery oils, fuel, cement, etc.).
- iv. The presence and concentrations of any soil contaminants will require assessment prior to the commencement of construction works.
- v. Run-off from construction sites can contain minor levels of pollutants (e.g. mineral oils) with high concentrations of suspended solids.
- vi. To keep excavations dry, dewatering may be required to lower the water table. Groundwater sampling will be required to determine the viability of discharging to the public sewer system during dewatering.
- vii. Lowering the water table could impact on nearby buildings, creating void space which would allow soil particles to compress and settlement to occur.
- viii. There will be no significant sources of potential contamination present on-site during the operational phase of the development.

b. Receptors

- i. The bedrock aquifer constitutes a potential receptor;
- ii. The surface water bodies in the area surrounding the site constitute receptors; and
- iii. The surrounding land (buildings), soils, and geology constitute potential receptors.

c. Pathways

- i. Migration of contaminants from surface spills to land, soils, geology, groundwater, or surface water constitutes a potential pathway and
- ii. Migration of contaminated run-off (e.g. during construction phase or operational phase) to groundwater, surface water, or surrounding geology constitutes a potential pathway.

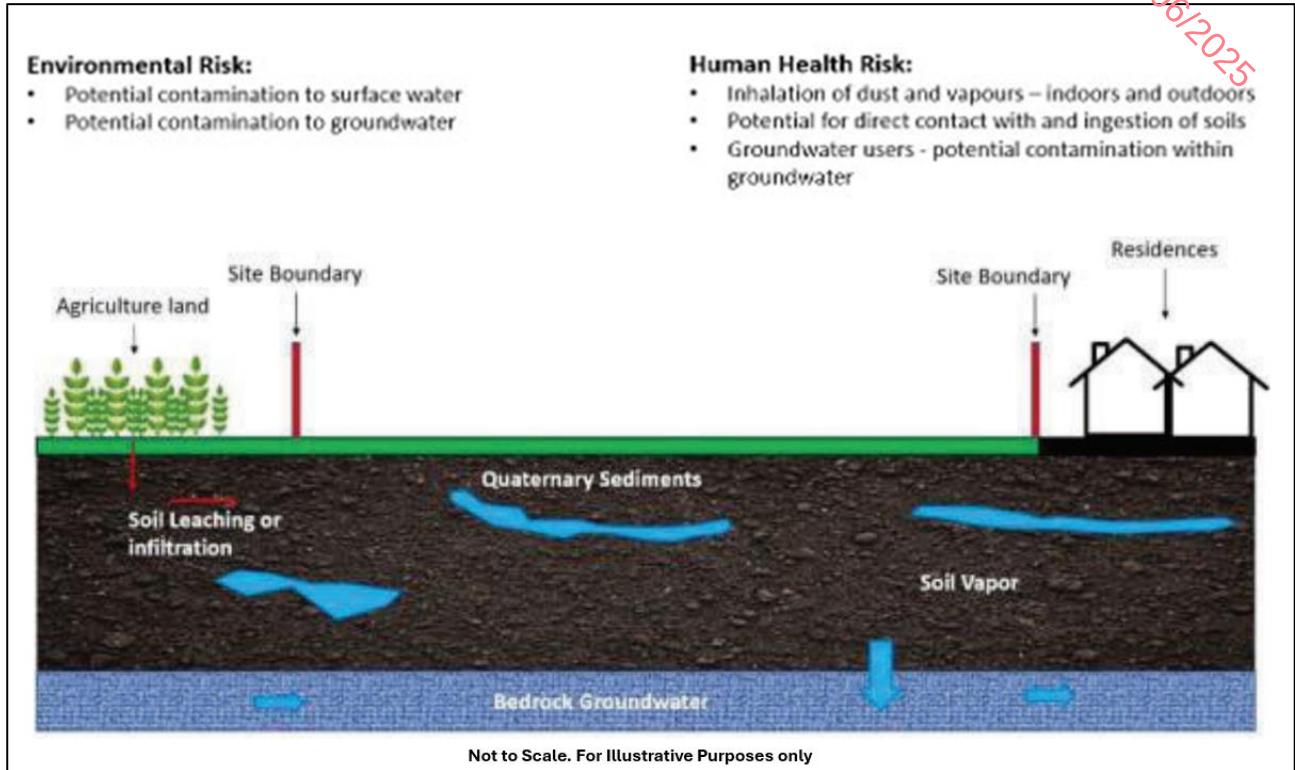


Figure 11.24: CSM based on existing site conditions

Note: CSM figure is not to scale and is for illustrative purposes only.

An environmental risk is only present when a pathway links a source with a receptor. The potential pollutant linkage CSM for the development is summarised in **Table 11.4**.

Table 11-5: CSM Pollutant Linkages Geology and Groundwater

Source	Pathway	Receptor	Potential Pollutant Linkage (Y/N)	Discussion
Deleterious materials stored on Site during construction	Migration of surface spills/ contaminated run-off	Surrounding land/soils, perched groundwater, or groundwater in the bedrock aquifer	N	All materials stored on the Site will be subject to strict control measures and local containment measures (e.g., bunded tanks and wood pallets)
Contaminated run-off from construction activities			N	Generation of contaminated runoff will be reduced through the Construction Management Plan and control measures implemented during the construction phase.
Deleterious materials stored on Site during construction	Migration of surface spills/ contaminated run-off	Nearby waterbodies: Ratoath Stream 0.3km to the west of the site Fairhouse Stream 0.3km to the west of the site	N	All materials stored on the Site will be subject to strict control measures and local containment measures (e.g. bunded tanks and pallets). There are roads and other infrastructure between the Site and the river water receptors. Appropriate setback and protection measures will be implemented to ensure no direct discharge to water bodies including the Ratoath Stream and the Fairhouse Stream except were regulated under a Discharge Licence from the Regulating Authority.
Contaminated run-off from construction activities			N	Generation of contaminated run-off will be reduced through the CEMP and control measures implemented during the construction phase. Appropriate set back and protection measures to be implemented to ensure no direct discharge to water courses except were regulated under a Discharge Licence from the Regulating Authority.
Potentially contaminated groundwater from the groundwater dewatering scheme	Discharge into the public sewer	Nearby public sewers	N	The appointed dewatering contractor will be supplied where needed to facilitate the design of a pre-treatment system, if necessary. Hence, only groundwater that meets the discharge license conditions will be discharged into the public sewer. Weekly sampling will be carried out and will be audited by the client's environmental consultant.
Lowering of the water table	Pumping of groundwater through dewatering wells and/or pits	Nearby buildings and/or water bodies	N	A detailed dewatering strategy will be developed for the Site to ensure to impacts beyond the site boundary.
Potential pesticide contamination of past use site as agricultural land or contamination related to demolition or fill materials associated with a historic structure on the site.	Migration of potential contamination from the fill and upper soils to the lower 'clean' soils and/ or bedrock	Surrounding land/soils, surface water, perched groundwater, or groundwater in the bedrock aquifer	Y	Human exposure to potential contamination related to past site usage may occur through multiple exposure routes (oral, dermal, and inhalation). However, the low permeability of soils underlying the site will greatly reduce the risk of migration of contamination to the bedrock aquifer. Soil and ground water sampling are required for assess the risk that potential contamination poses to human and the environment.

11.3.16 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland), the site has been classified as an area where about 1 in 20 homes are likely to have high radon levels. However, the EPA has also mapped areas where radon tests are required in workplaces based on the radon risk map of Ireland and an analysis of indoor radon measurements plus geological information, including bedrock type, quaternary geology, soil permeability, and aquifer type. Regulation 66 of S.I. 30 of 2019 requires that all workplaces at ground floor or basement level in High Radon Areas are tested for radon. This test must be done in accordance with guidance from the EPA. The Radon Map for Workplaces displays these High Radon Areas (in red), and will assist employers in complying with the regulation by quickly identifying if a workplace building is located in a High Radon Area.

Based on the EPA radon mapping for workplaces, radon testing is recommended within the Site as shown on **Figure 11.25**.¹²

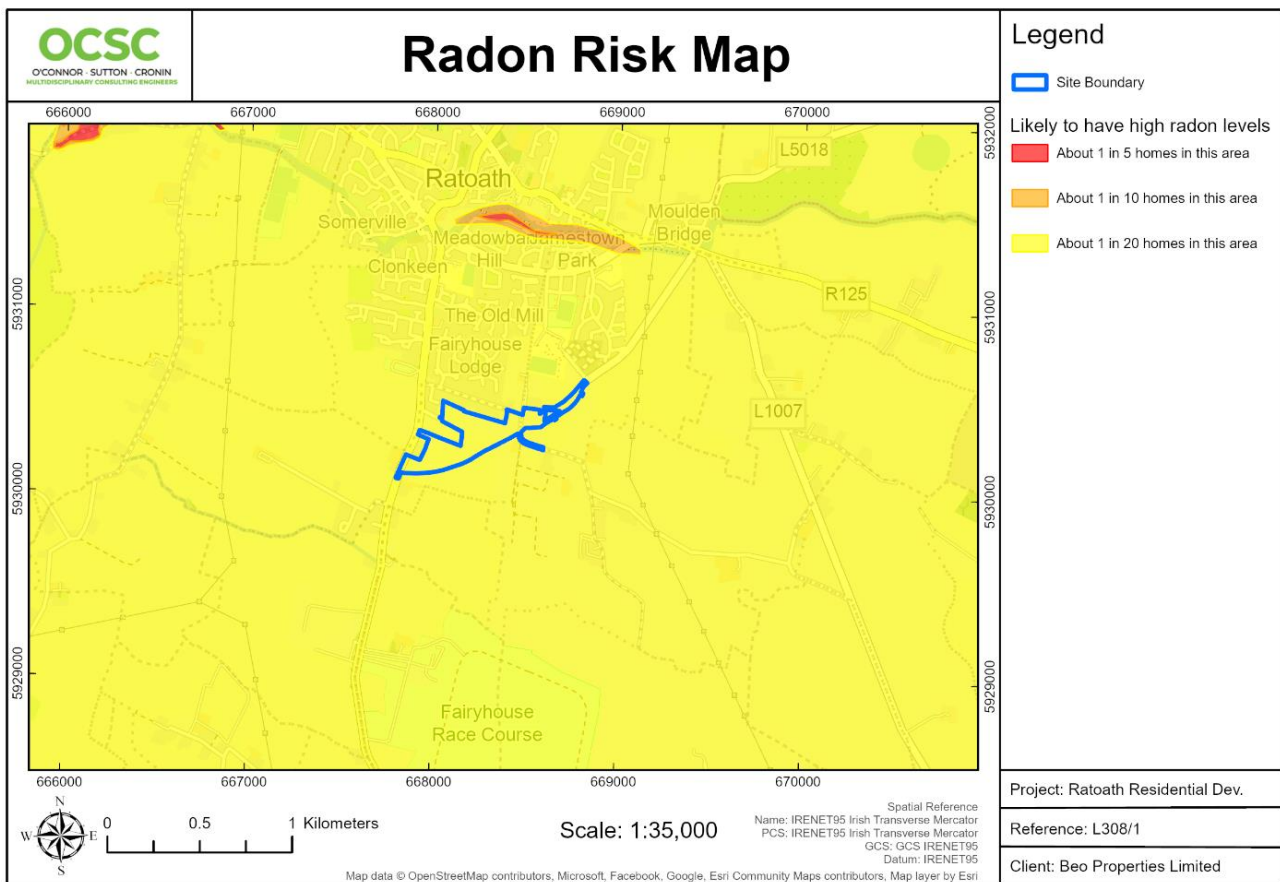


Figure 11.25: Radon Map

Source: EPA, 2025

11.3.17 Summary & Type of Geological/Hydrogeological Environment

Based on the regional and site-specific information available, the type of geological and/or hydrogeological environment as per the Institute of Geologists of Ireland (IGI) Guidelines is Type A – Passive geological and/or hydrogeological environment.

A summary of the geological/hydrogeological setting of the site based on limited site investigation conducted by others in 2020 and desk-based studies is outlined thus:

- The Ratoath development site is a greenfield and is currently used for agricultural purposes.
- The Site can be accessed from Glascarn Lane to the east and Fairyhouse Road to the west.

¹² <https://gis.epa.ie/EPAMaps/>

- There are no expected potential pollutant linkages associated with the construction or operation phase of the Site provided the mitigation measures in Table 11-6 are implemented.
- A high degree of consistency was found in the soils across the site.
- The topsoil was generally 200mm thick.
- The investigation indicated that topsoil overlies firm to stiff, brown gravelly CLAY which extended to approximately 2.0 mbGL. Slightly sandy clay was observed in one trial pit.
- Stiff to very stiff, grey-black gravelly CLAY was encountered at a depth of 2.0 mbGL to approximately 8.1 mbGL. Cobbles and the occasional boulders were encountered.
- Recovery below the gravelly clay layer was limited, but returns were identified as grey-black, sandy, cobbly gravel.
- From 10.0 to 16.5 mbGL alternating layers of gravel and sand were noted with some adverse 'blowing' noted in the fine sand layers.
- The trial pit excavations were generally dry and stable, although a minor water seepage was noted 2.20 meters in one trial pit. No other groundwater was encountered during the investigations.
- Groundwater level monitoring indicated water levels of 8.20 mbGL on 24/06/2020 and 1.74 mbgl on 14/07/2020 in one borehole on the site.
- In-Situ CBR by Plate Bearing Testing was carried out at 0.50 mbGL. The CBR at Load Cycle from the 15 locations ranged from 3.0 to 21.5%; the CBR at Re-Load ranged from 4.4 to 45.1%.

Further details on the site investigation can be found in the IGSL Site Investigation report in Appendix A.

11.4 Predicted Impacts

11.4.1 Characteristics of the Proposed Development

The proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 108 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas. The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development. A full description of the proposed development is also set out in Chapter 2 (Background to the Scheme) of this EIAR.

11.4.2 Potential Impacts of the Proposed Development

There are a number of likely and significant effects on the geological and hydrogeological environments that will occur due to the proposed development, namely:

- Land take – change of use from agricultural to residential use;
- Soil excavation – removal of soil for construction on the Site as well as limited excavation associated with lift sums, manholes, underground services, etc.

- Piling works, accidental spills, contaminated run-off, and/or contaminated groundwater discharged to sewer during the construction phase also have the potential to have an impact on the geology and hydrogeology of the Site and nearby land.

Accidental spills, contaminated run-off, and/or contaminated groundwater discharged to sewer during the construction phase also have the potential to have an impact on the geology and hydrogeology of the Site and nearby land.

11.4.3 Construction Stage

The predicted impacts of the construction phase in terms of quality, significance, extent, likelihood, and duration are described in **Table 11.5**. The relevant mitigation measures are detailed, and the residual impacts are determined, assuming the implementation of the mitigation measures.

Potential impacts expected to be encountered throughout the construction stage are as follows:

- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction phase. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content, which would impact water bodies if there were any water bodies nearby. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- There is a potential for dust from excavations or stockpiles to impact on air quality. This is discussed further in **Chapter 5** (Air Quality) and **Chapter 6** (Climatic Factors).
- Construction phase dewatering may be required for the development to maintain dry working conditions within the excavation (due to rainfall and groundwater ingress). Pumped water will require discharge offsite to the public sewer. A detailed dewatering strategy will also be required to ensure that reductions in the water table do not cause transboundary impact. However, it is considered that this impact at the site will be *temporary*, and *slight* given the depths of excavations proposed, the localised nature of the excavations, the overall lateral extent of the foundations, and the size of the site itself. Further site investigations will be undertaken, and the site design assessed and modified, if required, to ensure there are no transboundary effects associated with these predicted hydrogeological changes.
- Noise and vibration will be generated through the construction phase, particularly during excavation work and the removal of shallow bedrock to facilitate construction. Noise and vibration impacts are considered in detail in **Chapter 7** (Noise and Vibration).
- The import and export of materials to and from the Site as part of the excavation, infilling, and construction works will have implications for traffic in the surrounding road network. These impacts are considered further in **Chapter 14** (Material Assets: Traffic and Transport).
- As with all construction projects, there is potential for water (surface water and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a *significant, short-term* risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer. The main potential contaminants include:
 - Suspended solids (muddy water with increased turbidity) – arising from excavation and ground disturbance;
 - Cement/concrete (increased turbidity and pH) – arising from construction materials;
 - Hydrocarbons (ecotoxic) – arising from accidental spillages from construction plant or onsite storage and contaminated groundwater within the Site from previous site activities; and
 - Wastewater (nutrient and microbial rich) – arising from poor on-site toilet and washroom facilities.

Table 11.5: Impact Determination at Construction Phase

Constraint			Impact Assessment						
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks	Site Clearance Excavation, Construction	Excavation of natural soils for development, services, etc.	Negative	Moderate	Local	Certain	Permanent	The project has been designed to be constructed on the minimum amount of space. Material will be reused on site where possible to limit off-site disposal of soils.	<i>Moderate Negative</i>
Earthworks	Excavation	Soil erosion causing airborne dust and/or nuisance dust on public roads and neighbouring properties	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted throughout the excavation period. Vehicle wheel wash facilities will be installed at site exits, and a road sweeping programme will be implemented.	<i>Imperceptible Negative</i>
Earthworks	Construction	Imported fill and aggregates will be required during the works	Negative	Slight – Moderate	Local (maybe a number of quarry sites)	Certain	Permanent	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/compliance certificates will be required to ensure all aggregates meet the engineering specifications.	<i>Imperceptible Negative</i>
Altering Groundwater	Excavation Construction	Altering existing local groundwater regime	Negative	Slight	Local	Likely	Permanent	Due to the presence of perched water and shallow bedrock groundwater identified on portions of the Site during site	<i>Imperceptible negative</i>

Constraint				Impact Assessment					
								investigations, temporary lowering of the water table may be required during excavation for installation of foundations, underground services, etc. in limited areas of the Site where some structures may be founded below the water table, resulting in long-term, localised impact to water table levels and shallow groundwater flow patterns. However, it is not considered that this will represent a significant impact given the depths of excavations proposed, the localised nature of the excavations, the overall lateral extent of the foundations relative to the size of the site itself.	
Dewatering/ Lowering the water table	Excavation Construction	Discharge of potentially contaminated groundwater to sewer; possible settlement of buildings as a result of dewatering	Negative	Moderate	Local – maybe a number of nearby buildings	Likely	Short-term	If dewatering is required, a dewatering strategy will be developed for the Site to ensure no impacts beyond the site boundary.	<i>Imperceptible negative</i>
Storage of potentially polluting materials	Site Clearance Excavation General Construction	Potential leak or spillage from construction-related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping and proper handling, storage, and disposal of any potentially polluting substances can prevent soil and/or water contamination.	<i>Imperceptible Negative</i>

Constraint		Impact Assessment							
								Designated and bunded storage areas will be maintained.	
Discharge to Groundwater	Excavation General Construction	Potentially contaminated run-off percolating to ground and the underlying aquifer	Negative	Significant	Local	Unlikely	Short-term	There will be no direct discharge to groundwater during construction. Indirect discharges to the underlying bedrock aquifer may occur increasing the aquifer vulnerability as subsoil is removed from site. Protection of groundwater from potentially polluting substances will be dealt with through measures including correct handling and storage of potentially polluting substances.	<i>Imperceptible Negative</i>

11.4.4 Operational Stage

During the Operational Phase of the Ratoath development, there will be no predicted impact on the geological environment of the area. There is no requirement for any fuel oil stores as all heating will be fuelled by electrically powered heat pumps. The residual impact is assessed to be slight negative, imperceptible, and permanent.

11.4.5 Do Nothing Scenario

In the *'Do Nothing'* scenario, if the construction of the proposed development at the site does not take place, the existing baseline conditions will remain unchanged within the subject site, and there will be no resulting additional impacts on land and soils.

11.5 Mitigation Measures

This section describes a range of recommendations and mitigation measures designed to avoid, reduce, or offset any potential adverse geological impacts identified. Mitigation measures are summarised in **Table 11.5**.

11.5.1 Construction Stage

To reduce the impacts on the soils, geology, and the hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on Site. The measures will address the main activities of potential impact, which include:

- Control of soil excavation and reuse of material on site, where possible, to minimize soil export from the Site;
- Sources of fill and aggregates for the project;
- Fuel and chemical handling, transport, and storage; and
- Control of water and impacts related to dewatering during excavation and construction.

11.5.1.1 Control of Soil Excavation

Topsoil, subsoil, and bedrock will be excavated to facilitate the construction of above ground structures within the development and the construction of new sewer and water mains connections, roadways, and all other associated services. The project will incorporate the 'reduce, reuse, and recycle' approach in terms of soil excavations on Site. The construction will be carefully planned to ensure only the material required to be excavated will be excavated, with as much material left in situ as possible. All excavation arisings will be reused on Site where possible/if suitable.

Soil stripping, earthworks, and stockpiling of soil will be carried out during the construction phase. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of appropriate earthworks handling protocols. It is anticipated that any stockpiles will be formed within the boundary of the excavations, and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low-level stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off Site or will be reused in other areas of the Site as fill.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment is free of nuisance dust and dirt on roads.

11.5.1.2 *Export of Material from Site*

Where material cannot be reused off Site, it will be sent for recovery/disposal at an appropriately permitted/licenced site or under EPA Article 27 registration. This is discussed further in the CEMP which will be issued as a standalone document.

Site investigations undertaken to date indicate that significant levels of contamination were not detected in the samples sent for laboratory analysis. All material will be managed in accordance with the results of the Waste Soil Classification, the Waste Management Acts and subsequent regulations, and in a manner that ensures no negative impact on human beings or surface water, groundwater, or soil environments. Further details are included in the CEMP.

11.5.1.3 *Source of Fill and Aggregates*

All fill and aggregate for the project will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the project;
- Environmental management status; and
- Regulatory and legal compliance status.

The use of fill and aggregate containing recycled or recovered materials shall be considered.

11.5.1.4 *Fuel and Chemical Handling*

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of bunded refuelling areas on the Site (if required);
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, pump, tap, or valve will be fitted with a lock and will be secured when not in use;
 - All bowser units to carry a spill kit and operatives must have spill response training; and
 - Portable generators or similar static-operation, fuel-containing equipment will be placed on suitable drip trays.
- In the case of drummed fuel or other potentially polluting substances being used during construction, the following measures will be adopted:
 - Secure storage of all containers of potentially polluting substances in a dedicated, internally-bunded chemical storage unit or inside concrete bunded areas;
 - Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
 - All drums to be quality approved and manufactured to a recognised standard;
 - If drums are to be moved around the Site, they should be done so secured and on spill pallets; and
 - Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

The aforementioned list of measures is non-exhaustive and will be included in the contractor's CEMP.

11.5.1.5 *Control of Water During Construction*

Run-off from excavations/earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls, and profile to control run-off and prevent

ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site, which limits the potential for any offsite impacts. All runoff will be prevented from directly entering any water courses.

During excavation, ingress of groundwater is likely in small portions of the site. Pumping of this water may be required to keep the excavations dry. The discharge of water to the foul sewer during the construction phase will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) and issued under the Water Pollution Act. Attenuation, pre-treatment, and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence). Pre-treatment and silt reduction measures on Site will include a combination of silt fencing, settlement measures (silt traps, silt sacks, and settlement tanks), and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per the Conditions of any Discharge Licence. The client's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the discharge licence limits and testing frequency requirements and impacts due to changes in water levels.

11.5.1.6 Construction Management Plan

In advance of commencement of Site works, the works Contractor will provide a Construction Methodology document detailing their proposed construction methods and any additional requirements of the Design Team or Planning Regulator. The Contractor will also prepare a CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. The CEMP is a living document and will go through a number of iterations before works commence and during the construction phase itself. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures in the EIAR and any subsequent conditions relevant to the project.

11.5.2 Operational Stage

During the Operational Phase of the Ratoath development, there will be limited impact on the geological environment of the area. There is no requirement for any fuel oil stores as all heating will be fuelled by electrically powered heat.

11.6 Residual Impacts

11.6.1 Construction Stage

The predicted impacts of the construction phase in terms of quality, significance, extent, likelihood, and duration are described in **Table 11.5**. The relevant mitigation measures are detailed, and the residual impacts are determined, taking into account the mitigation measures.

The primary residual impacts from the construction phase are the land take/change of use and the removal of soil to facilitate the development. These impacts are unavoidable given the nature, requirement, and design of the proposed development. The construction stage residual impact is assessed to be *slight*, *negative*, and *permanent*.

11.6.2 Operational Stage

During the Operational Phase of the Ratoath development, there will be no predicted impact on the geological environment of the area. There is no requirement for any fuel oil stores as all heating will be

fuelled by electrically powered heat pumps. The residual impact is assessed to be a *slight negative, imperceptible, and permanent*.

11.7 Cumulative Effects

The cumulative impacts take into account the combined effects of the proposed development and other proposed projects in the surrounding area. Cumulative impacts occur as a result of actions taking place in the same area and within the same timeframe as the proposed development.

This cumulative assessment assumes that the following extant planning permissions will be completed:

- **(MCC reg. ref. 23704)** Works have commenced on site. Sirius Construction Co. Dublin has been appointed as the main contractor. For the decision to grant planning permission was issued by Meath County Council on 31/01/2024 to Raymond O'Malley that will consist of a two storey mixed use development (gross floor area 452 sq.m.) comprising 3 no. retail units (63.5sq.m., 52 sq.m. & 75 sq.m.) at ground floor level and 3 no. 1 bedroom duplex apartments (1 @ 69 sq.m. and 2 @ 76 sq.m.) with terraces at first floor and attic level; bin store (27 sq.m.) accessible wc (4.5 sq.m.) 13 no. car parking spaces; 18 no. bicycle spaces (including 8 no. residential bicycle spaces in a secure store (11 sq.m.)); freestanding high level variable message sign (1500 mm x 800mm) for parking spaces availability; and all associated site development works situated approximately 1.28km north of the Site.
- **(MCC reg. ref. 22204)** Works are expected to commence imminently on site on the construction of 2 no. dormer bungalows on sites 12-13 at Tiveragh, Curragha Road, Ratoath, Co. Meath. and situated approximately 1.85km north of the Site.
- **(MCC reg. ref. RA201957)** Works have now commenced on site on the construction of 18 no. single-storey sheltered housing units and associated site works at site to rear of Riverwalk Court, Ratoath, Co Meath. situated approximately 1.10km northwest of the Site.
- **(MCC reg. ref. 305196)** for the development comprising of 228 No. Residential Units, a childcare facility and all other ancillary site development works at Jamestown, Ratoath situated 0.6km northeast of the Site. Works are underway on the construction of Block 2 - 70 to 81 Wellfield Avenue (12 units) and Block 3 1 to 12 Wellfield Drive (12 Units).

Section 2.6 of Chapter 2 (Background to the Scheme) includes a list of other related projects and potential for ex-situ effects. The residual impact from these developments on land and soils was determined to be negative, imperceptible, and permanent.

11.7.1 Construction Phase

During the construction phase, the following aspects would interact with land and soils and, in the absence of mitigation, may give rise to likely significant effects:

- Site preparatory works (i.e. site clearance, re-profiling, etc.) during the construction stage can potentially impact the land, soils and geology due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.

11.7.2 Operational Phase

During the operational phase, the potential interactions are related to accidental leaking of sewage, fuel, etc.

The potential significant impacts on land, soils and geology arising from these interactions have been considered and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts are likely to occur.

11.8 Monitoring

11.8.1 Construction Phase

Monitoring shall be carried out as specified in any water Discharge Licence associated with the construction phase of the project. Monitoring of dust and noise shall also be carried out as specified in the planning permission should the development be allowed to proceed.

On-site pre-treatment of groundwater prior to discharge to sewer may be required depending on groundwater chemistry results. This will be confirmed by the appointed dewatering contractor. Any water discharged to the public sewer will be monitored frequently to ensure it meets the limits stipulated by the discharge licence.

Record keeping and monitoring of the import and export of soils shall be carried out in accordance with the Waste Management Act. All waste hauliers and receiving facilities shall have valid permits in accordance with the Waste Management Acts and Planning Conditions or be in compliance with requirements of Article 27 recovery of soils.

There is no requirement for monitoring during the operational phase.

11.9 Interactions

During the construction phase, the following aspects would interact with land and soils and, in the absence of mitigation, may give rise to likely significant effects:

- Site preparatory works (i.e. site clearance, re-profiling, etc.) during the construction stage can potentially impact the land and soils due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.
- During the operational phase, the potential interactions are related to accidental leaking of sewage, fuel, etc.

The potential significant impacts on land and soils arising from these interactions have been considered and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts are likely to occur.

11.10 Difficulties Encountered

No exceptional difficulties were experienced in compiling this EIAR.

11.11 References

- Clarke, A., Parkes, M., and Gatley, S. (2007) The Geological Heritage of Meath - An audit of County Geological Sites in Meath.
- Construction Industry Research and Information Association (CIRIA) (2000). Environmental Handbook for Building and Civil Engineering Projects.
- Construction Industry Research and Information Association (CIRIA) (2001). Control of Water Pollution from Construction Sites.
- Environmental Protection Agency (EPA) (2022). Groundwater Reports at <https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/SwordsGWB.pdf>

- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency (EPA) (2025). EPA Envision Online Mapping tool at <https://gis.epa.ie/EPAMaps/>
- Geological Survey of Ireland (GSI) (2025). Groundwater and Geotechnical Mapviewer at <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2f0de2aaac3c228>
- Geological Survey of Ireland Geotechnical Database (Reports No 6,226 and 2,398).
- IGSL Ltd (2005) 'Report on a site Investigation At Tattersalls, Fairyhouse On behalf of Declan Collier'
- IGSL Ltd (2020) 'Site Investigation Report Housing development Ratoath County Meath'
- Institute of Geologists of Ireland (IGI) (2013). Guidelines for the preparation of Soils, Geology, and Hydrogeology chapters of Environmental Impact Statements.
- Meath County Council (2017). Meath Development Plan 2021-2027.
- National Monuments Service (NMS) (2025). maps.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology, and Hydrogeology for National Road Schemes.
- OCSC (2022) 'Engineering Services Report Residential Development At Ratoath For Beo Properties Ltd.'
- Ordnance Survey of Ireland (OSI) (2025). Historic Environment Viewer at <https://maps.archaeology.ie/historicenvironment/>

12 Water

12.1 Introduction

This chapter was completed by O'Connor Sutton Cronin and Associates Limited (OCSC). It evaluated the potential impacts of the proposed development on water and hydrological aspects of the site and surrounding area during the construction and operational phases.

12.1.1 Author Information

The chapter was prepared following the EPA guidance documents, "Advice notes on current practice (in the preparation of Environmental Impact Statements)" and "Guidelines in the information to be contained in Environmental Impact Statements."

This chapter was prepared by Mark Killian (CEng MSc BSc), while reviewed and approved by Anthony Horan (CEng FCONSEI BSc).

12.1.2 Consultation

This chapter was prepared in coordination with the details outlined in Chapter 9 – Biodiversity; Chapter 12 – Land and Soils; and Chapter 16 Material Assets – Waste Management.

OCSC engaged with Uisce Éireann to prepare the application by receiving an EIAR Scoping Document, which is included Appendix E of the Engineering Services Report, which has been submitted under separate cover as part of this application.

Further consultation with Uisce Éireann was carried out through the Pre-Connection Enquiry process. As a result, Irish Water has provided a Confirmation of Feasibility for the proposed development and confirmed it as feasible subject to an extension of the existing 200mm watermain along the proposed section of the Ratoath Outer Relief Road (RORR) to the new junction with the R155 Fairhouse Road.

A wastewater network extension is also required along the RORR, to connect with existing infrastructure, along with possible upgrade works to be advised by Uisce Éireann during the Connection Application process i.e., no adverse impact overall has been advised.

12.2 Assessment Methodology

12.2.1 Scoping

An initial assessment was carried out, which defined the project in terms of location, type, and scale and established the baseline conditions, the hydrological environment, the activities associated with the project, and initial assessment and impact determination. These objectives were achieved by way of a desk study. Additional information has been compiled through consultation and feedback from stakeholders and the Design Team.

Under the Water Framework Directive (WFD) and corresponding Regulations, the water quality of Ireland's surface and groundwater is assessed biologically, physically, and chemically. Assessments are conducted by the EPA and Local Authorities and have been compiled and presented in a standardised manner for River Basin Districts. Baseline information on the local and regional surface water bodies, their status, and threats were obtained from a range of documents and online sources, including the EPA's Water Quality database, Ireland's Water Framework Directive "Water Matters" online resource, and the Eastern River Basin District (ERBD) website and reports.

12.2.2 Detailed Methodology

Water Infrastructure Services

Assessment of existing and proposed infrastructure for wastewater drainage, water supply, and surface water drainage was conducted in accordance with I.S. EN752: 2017 'Drain & Sewer Systems outside Buildings', 'The Greater Dublin Region Code of Practice for Drainage Works' (GDRCP), 'Uisce Éireann's Code of Practice for Wastewater Infrastructure', Uisce Éireann IW-CDS-5030-03 Revision 2, the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS), and the 'Institute of Hydrology Report 124 (IH 124) method'.

The OCSC Engineering Services Report (ESR) estimates the wastewater drainage effluent and the water demand calculated using Irish Water's Code of Practice for Wastewater Infrastructure and the Irish Water's Code of Practice for Water Infrastructure. In addition, the OCSC ESR contains existing public infrastructure record information for both the drainage network and water supply network for the area surrounding the subject lands obtained from Irish Water, and online GIS mapping from Geological Survey Ireland (GSI).

Allowable surface water runoff from the development site has been calculated on the OCSC ESR using the guidance within the 'Greater Dublin Strategic Drainage Study' (GDSDS) in accordance with Meath County Council Development Plan requirements to estimate existing greenfield runoff rates.

A Pre-Commencement Enquiry Form was submitted to Uisce Éireann to assess the potential impact of the proposed development on the existing public wastewater infrastructure and water supply based on estimated occupancy as per their guidance documents. As a result, Uisce Éireann has provided a Confirmation of Feasibility for the proposed development indicating that it is feasible subject to extension of the existing 200mm watermain along the proposed section of the Ratoath Outer Relief Road (RORR) to the new junction with the R155 Fairyhouse Road. A wastewater network extension is also required along the RORR, to connect with existing infrastructure, along with possible upgrade works to be advised by Uisce Éireann during the Connection Application process i.e., no adverse impact overall has been advised. A copy of both the Confirmation of Feasibility Letter, and the Statement of Design Acceptance is provided in Appendix E of the Engineering Services Report

Information on all services was obtained from the topographical site survey, site inspections, OCSC Engineering services report, and Irish Water and Ordnance Survey Ireland mapping. These are also discussed in Chapter 17 Material Assets – Waste Management, and the OCSC ESR, which accompanies this application.

12.3 Baseline Environment

The proposed development site consists of a c.12ha greenfield site located south of Ratoath, County Meath and northwest of Dublin City centre. The Site is bounded by detached houses and Glascarn Lane to the north; agricultural land to the south; agricultural lands and a house to the east; and Fairyhouse Road, detached houses, and agricultural land to the west.

According to Meath County Council's Development Plan 2021-2027, the Site is located in the Local Authority Zone of A2 - New Residential. The Local Authority Zone description for the Site is 'To Provide for new residential communities with ancillary community facilities, neighbourhood facilities, and employment uses as considered appropriate for the status of the centre in the Settlement Hierarchy'.

12.3.1 Site Development

12.3.2 Hydrology (Regional)

The site lies within the Eastern River Basin District (ERBD). The ERBD covers a large area (c. 6,300km²) extending from parts of Co. Cavan in the north to south Wicklow and from parts of Co. Westmeath to the Irish Sea. The main river catchments in the ERBD are the Boyne, the Nanny/Delvin, the Liffey, and the Avoca / Vartry.

The district is further divided into Hydrometric Areas (H.A.), and the site lies within Fingal East Meath district HA08, which is the catchment draining to the north-western Irish Sea. The HA08 is drained by the Rivers Nanny and Delvin and by all streams that enter tidal water between Mornington Point and Sea Mount, Co. Dublin and drains an area of 711km². The largest urban centre in the catchment is Swords. This catchment's other main urban centres are Donabate, Lusk, Skerries, Balbriggan, Stamullin, Laytown, Bettystown, Duleek, Ashbourne, Ratoath, and Dunshaughlin. The total population of the catchment is approximately 159,230, with a population density of 224 people per km² (EPA, 2021). The significant pressure affecting the greatest number of water bodies in this catchment is agriculture, followed by hydromorphology, urban wastewater, domestic wastewater, urban run-off, industry, and mines and quarries.

The location of the Site within the Fingal East Meath Hydrometric Area is shown in Figure 12-1, denoted by the yellow star.

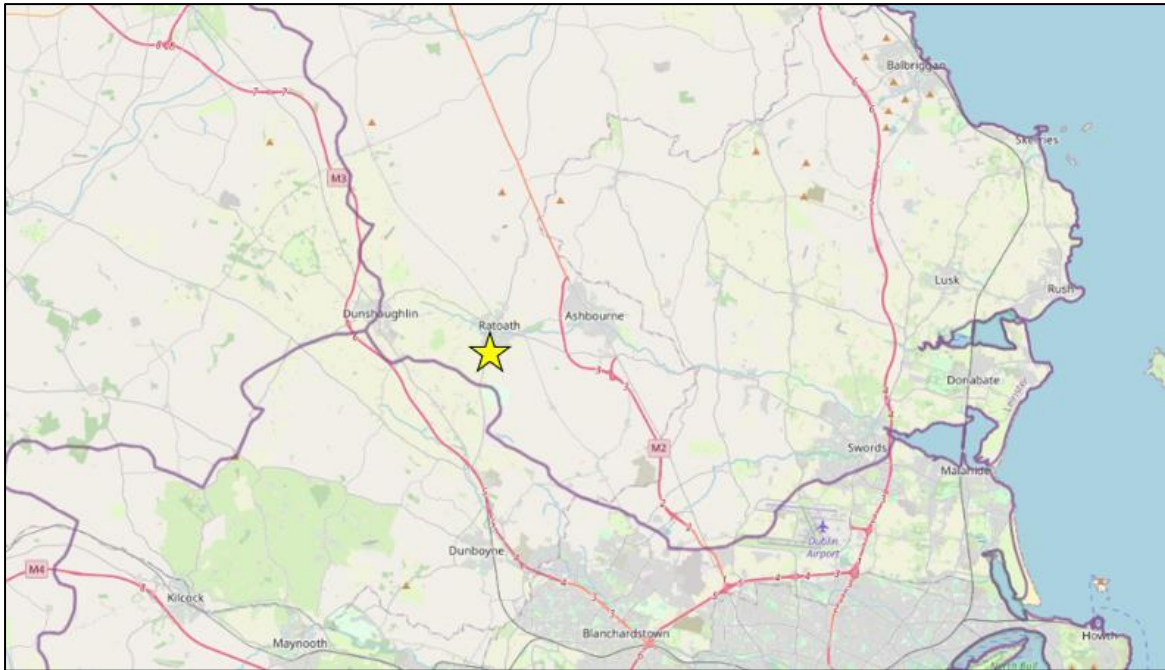


Figure 12-1: Hydrometric Areas (EPA)

The Site is located within three sub-basins of HA08: Ratoath Stream, Fairyhouse Stream, and the Broadmeadow River. The Broadmeadow River is part of the Broadmeadow sub-catchment (Broadmeadow_SC_010) that pertains to Swords Broadmeadow Estuary. It rises near Ratoath and flows in an easterly direction through Ashbourne and Rowlestown, eventually flowing into the Broadmeadow Water, north of Swords. The Dunshaughlin Stream enters the Broadmeadow River upstream of Ashbourne, while the Fairyhouse Stream enters the river downstream of the town. (Local Authority Water Programme, 2019). The Broadmeadow River flows for 25 km through Co. Meath and northern Co. Dublin before entering the Irish Sea at Broadmeadow Estuary. The Nanny-Delvin catchment is 711km². The Broadmeadow sub-catchment has a Poor 2013-2018 ecological status with elevated orthophosphate and ammonia. The Ratoath Stream and Fairyhouse Stream both have 'Poor' ecological status and impacted supporting nutrient conditions with elevated orthophosphate. Ammonia is also elevated in Ratoath Stream, and dissolved oxygen levels fail for the Fairyhouse Stream (WFD Application a, 2018).

The location of the Site within the Broadmeadow Sub-Catchment is shown in Figure 12-2, denoted by the yellow star.

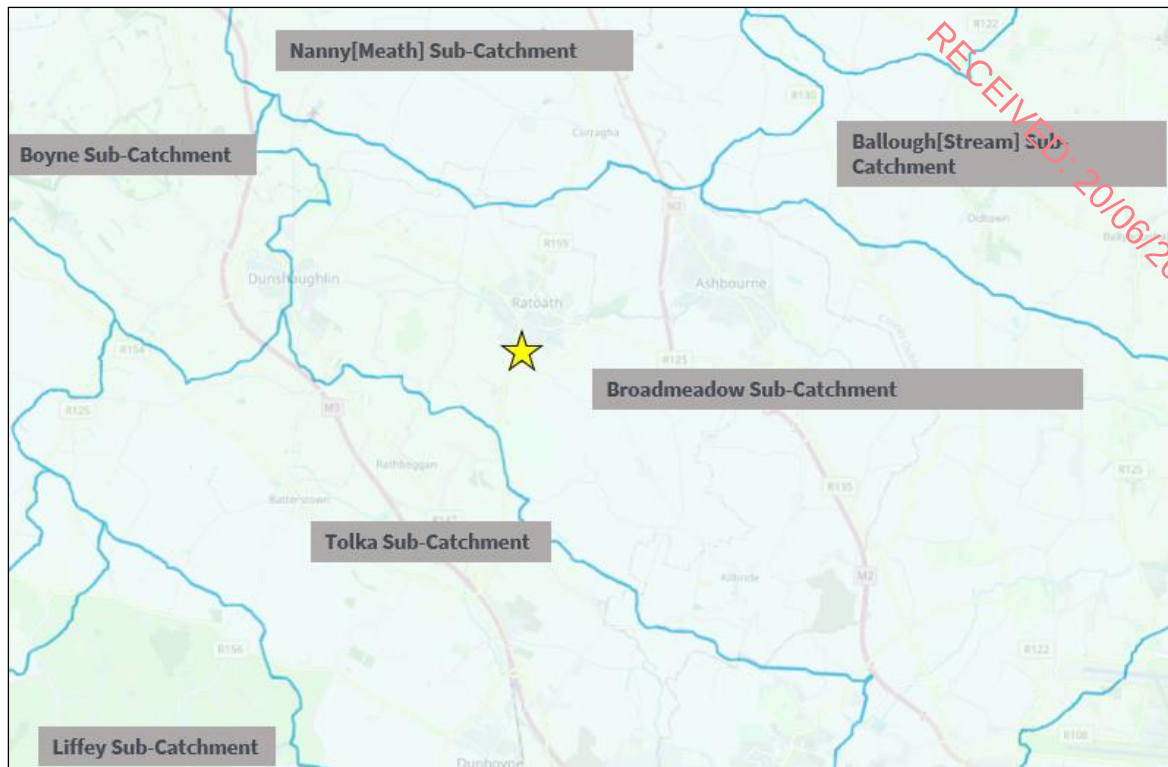


Figure 12-2: Broadmeadow Sub-Catchment (EPA)

Based on the GSI website, the aquifer beneath the Site is 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones'. The groundwater vulnerability beneath the proposed Site is Low. The effective rainfall in the vicinity of the Ratoath site is 377.600mm/year. The GSI has designated the recharge coefficient in the immediate area of the Site as 7.50%. Based on the GSI's

Recharge Model, the total recharge would be equivalent to approximately 28 mm/year.

The site and its vicinity are located in **Flood Zone C** and are not at apparent risk of fluvial flooding. There have been no records of flooding found for the site vicinity (Meath County Council, 2019).

There are no flooding issues within the site and its immediately surrounding area, but Bradystown Stream to the west of the site is located in a flood Zone B, while Ratoath Stream to the north is located in a flood zone A (OPW, 2016).

In Ratoath, Broadmeadow River is an area where a flood relief scheme can be found. See Figure 12-3 for details of the subject Site's proximity relative to Flood Zones, as noted in OCSC's SSFRA report, which has been submitted under separate cover as part of this application.

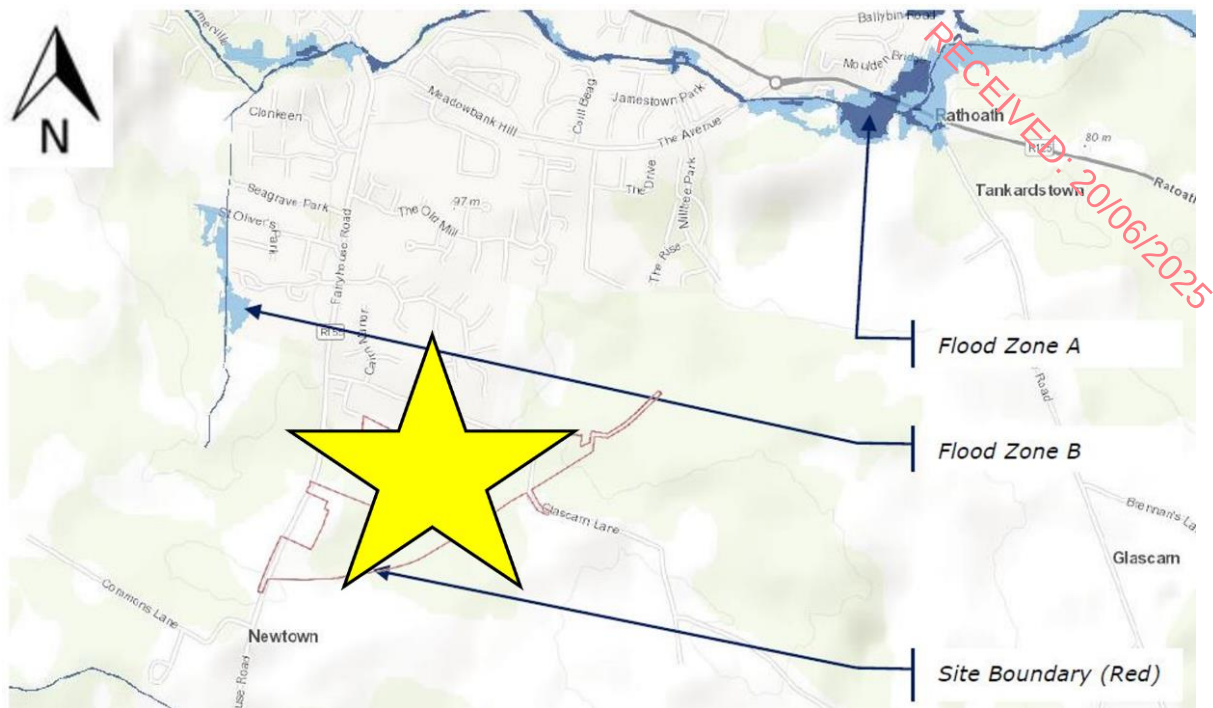


Figure 12-3: Flood Risk Mapping (OCSC SSFRA)

Malahide Estuary (also known as Broadmeadow or Swords Estuary) is situated in north Co. Dublin between the towns of Malahide and Swords. The estuary is bisected by a railway viaduct built in the 1800s, which creates an inner and outer site (NPWS, 2013). The inner estuary of the Broadmeadow Estuary covers an area of 3.3km² and is located approximately 15km north of Dublin City. The Broadmeadow River rises in Dunshaughlin and travels to Broadmeadow Estuary, which drains to the Malahide Estuary prior to discharging to the Irish Sea (Fingal County Council, 2019). For WFD assessment and classification, the estuary is considered of poor status for a transitional waterbody.

Agricultural Areas dominate the Broadmeadow Estuary land use to the north and south. These include Heterogeneous agricultural areas, Pastures, and Arable land. Land to the west and southwest of the estuary is dominated by Artificial Surfaces from Urban fabric to Industrial, commercial, and transport units. A bridge on the M1 Motorway crosses the estuary and covers some saltmarsh habitats. The estuary is bisected by a railway causeway which restricts the tidal flow between the inner and outer estuary, thus creating an artificial brackish "lagoon" west of the railway (NPWS, 2013).

The Broadmeadow Estuary is a transitional waterbody with a water level of 9.722 mOD, last taken in 2020 (OPW, 2020). The WFD report (2013-2018) for this transitional waterbody classifies the overall status as 'Poor' based on general physico-chemical elements, fish, phytoplankton, and macroalgal growths with an objective to achieve good status by 2027. The main threat to the waterbody is excess nutrients entering surface waters. Diffuse urban pressures caused by misconnections, leaking sewers, and runoff from paved and unpaved areas are also a threat. It has been noted that the estuary has high recorded salinity levels indicating that the sea exerts a greater influence on this water body than freshwater from the river (Inland Fisheries Ireland, 2010). The catchment is currently 'At risk' under the WFD due to discharge pressures from domestic wastewater (WFD Application b, 2018).

The Broadmeadow Estuary has been designated as a European Site under the Habitat's Directive where it is classified as part of the Malahide Estuary with the following designations:

- Malahide Estuary Special Area of Conservation (SAC) (000205)
- Malahide Estuary Special Protection Area (SPA) (004025)
- Malahide Estuary Proposed Natural Heritage Area (pNHA) (000205)

Other nearby European sites include the following:

- Rogerstown Estuary is located 3km north of Broadmeadow Estuary and is classified as a SAC, SPA, and pNHA.
- Baldoyle Bay is located 4km south of the site and is classified as a SAC, SPA, and pNHA.

12.3.3 Hydrology (Local)

The Fairyhouse Stream is located 0.6km south of the Site; the Bradystown Stream is 0.3km west of the Site; and Ratoath Stream is situated 1km north of the Site and Tankardstown stream located over 1km to the east as shown in Figure 12-4. There are no watercourses within or adjacent to the site boundary. There is an existing drainage ditch onsite, which receives local excess rainfall runoff from lands in immediate vicinity only; the Site is not located in an area which benefits from an Office of Public Works Arterial Scheme.

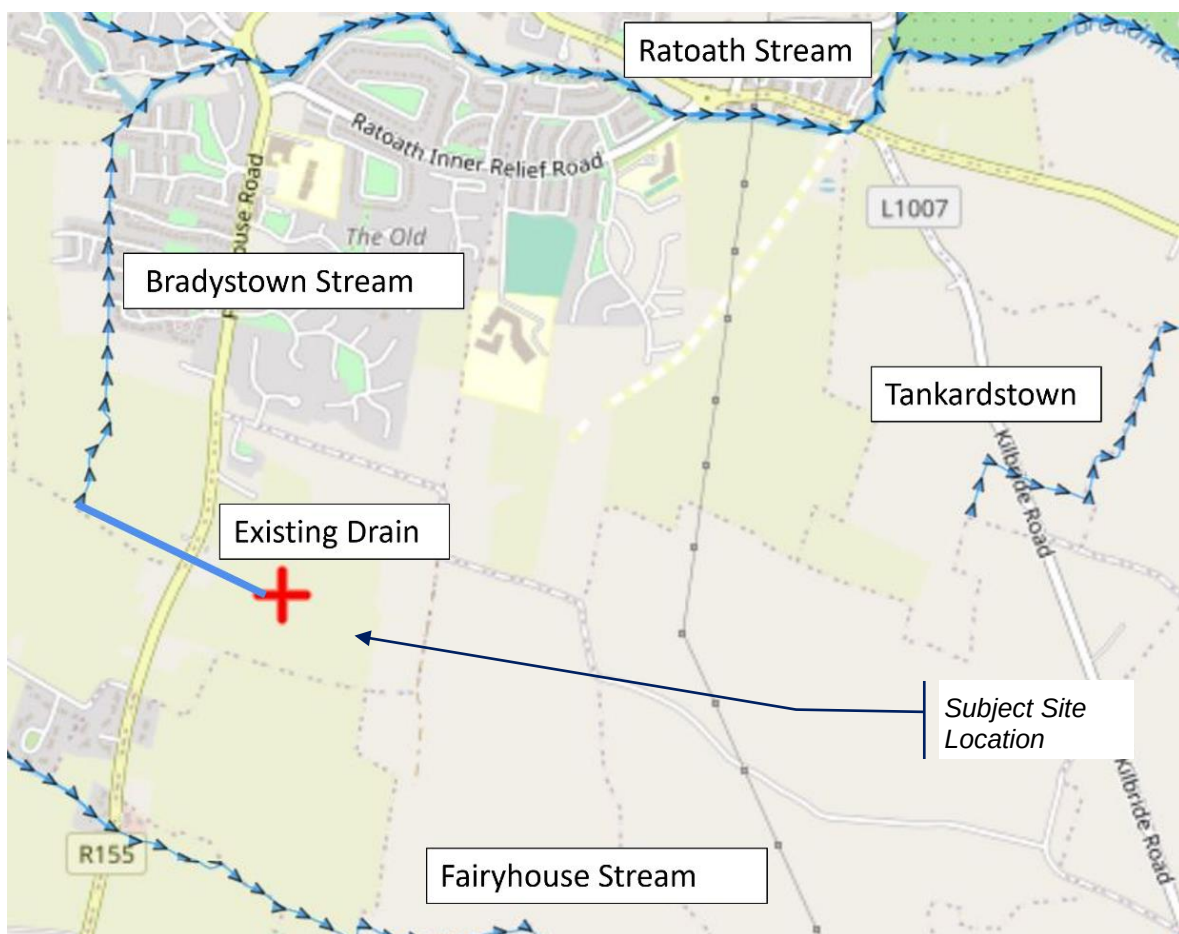


Figure 12-4 - Location of Nearby Streams / Rivers (EPA)

The gross catchment area for the proposed development's surface water network, including the extension to the RORR, is c.12 ha which includes the subject development and additional land to the west. The existing site comprises two surface water catchment areas with all surface water runoff on the Site currently draining to onsite drainage ditches.

The two catchment areas within the Site are separated by a surface water drain. The northern catchment drains in a north easterly direction, whereas the southern catchment drains to the existing local drain near the centre of the site, which forms the catchment boundary. From there it flows 300m

to the west from the Fairyhouse Road and then toward the Ratoath Stream via the OPW Bradystown Stream.

The locations of the proposed surface water outfalls from these two catchment areas within the Site are shown on Figure 12-5, which is discussed in greater detail within the OCSC ESR, which has been submitted under separate cover as part of this application.

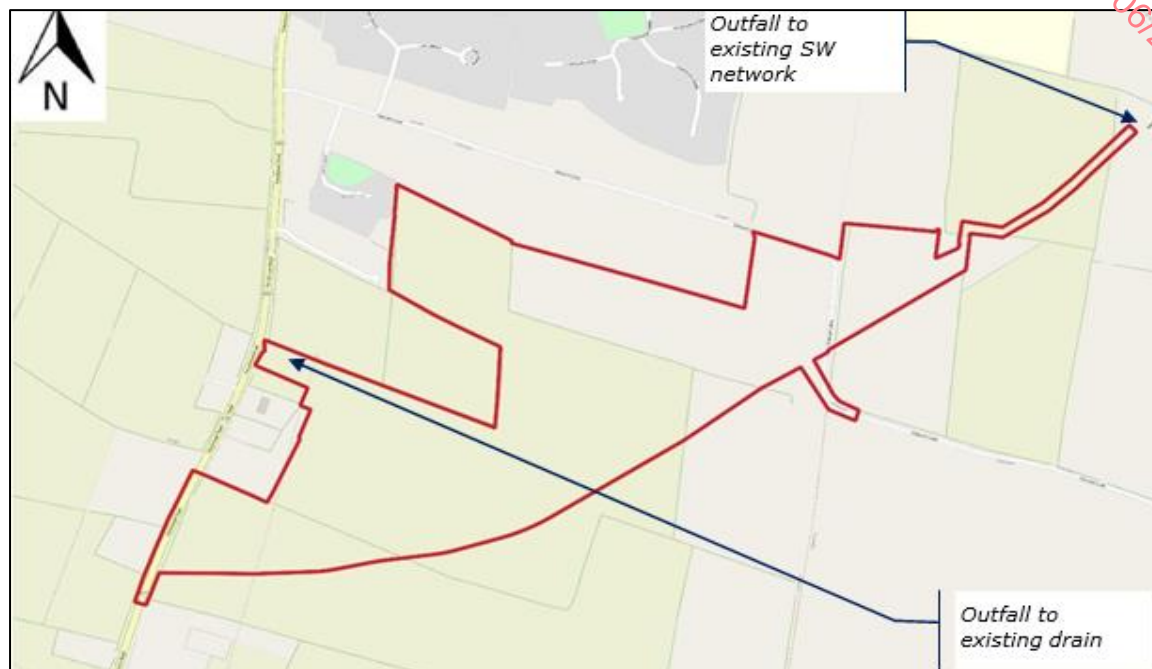


Figure 12-5 - Proposed Development Surface Water Outfall Locations

There is minimal surface water infrastructure in the vicinity of the proposed site. As discussed above, a drainage ditch running east to west within the site boundary currently drains a portion of the site. In addition, there is a surface water network constructed as part of the Ratoath Outer Relief Road to the northeast of the proposed development.

The outfall on the northeast corner of the site as shown on Figure 12-5 will discharge to this network which has been sized to accommodate greenfield runoff flows from upstream catchment areas. This network discharges treated and attenuated flows to adjacent streams via an attenuation pond, ultimately discharging to the Ratoath Stream.

The OCSC ESR states that infiltration tests were attempted at four locations across the Site and that there was no fall in water recorded during the tests. The Report states the existing ground has low permeability in the clay soils. According Met Éireann, the Standard Average Annual Rainfall (SAAR) value for the development site is 832mm.

The OCSC ESR estimated that the rainfall-runoff discharging from the portion of the greenfield site that is to be developed (i.e. c. 12.3ha of the overall) is $Q_{BAR} = 72.6 \text{ l/s}$ (5.9 l/s/ha) in its existing condition, based on the summary of the findings of the Site Investigation and the rainfall data received from Met Éireann Data, both of which is appended to the OCSC ESR.

The 2013 to 2018 WFD reports for Ratoath Stream, Fairyhouse Stream, and Broadmeadow River classify the overall status of these water bodies as 'poor' with an objective to obtain good status by 2027. In addition, these three water bodies are currently 'at risk' of not achieving a good status by 2027 due to significant pressure of nutrients and diffuse urban sources of pollution.

12.3.4 Flood Risk Assessment

OCSC Consulting Engineers has prepared a Site-Specific Flood Risk Assessment (SSFRA) submitted with this application under separate cover. This assessment considered flood risk to the proposed development from all potential sources and its possible impact on flood risk during the critical 1 in 10, 100, and 1,000-year storm events. Relevant sources / mechanisms of flooding include tidal / coastal, fluvial, pluvial, existing drainage and water infrastructure, proposed drainage and water infrastructure, and groundwater.

The flood risk assessment was conducted following the Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government and the Office of Public Works), C624 Development and Flood Risk (Construction Industry Research and Information Association, CIRIA).

This assessment was aligned with Meath County Development Plan 2021-2027. Record information on the existing infrastructure was also obtained from Meath County Council and Uisce Éireann, as well as online GIS mapping.

OCSC's SSFRA concludes that the subject site is located entirely within Flood Zone C, for fluvial, pluvial and tidal flooding, and therefore not at apparent risk of flooding. In addition, the subject development is to comprise a surface water drainage strategy to ensure no property is at risk of flooding for rainfall events up to and including the 1 in 100-year rainfall event.

12.3.5 Characteristics of the Proposed Development

The proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 114 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas.

The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development.

The proposed development is discussed in detail in Chapter 2 of this EIAR.

New water and drainage infrastructure is required to be installed in order to serve the proposed development, as detailed below.

Proposed Development Infrastructure

It is proposed to separate the wastewater and surface water drainage networks, which will serve the proposed development, and provide independent connections to the local public wastewater and surface water sewers, respectively.

In order to serve the proposed development, an extension from the existing public wastewater network, at the completed section of the RORR, is to be provided along part of the remaining section of the RORR, to be delivered as part of this development.

The wastewater from each unit will connect to the new gravity pipe network within the development, which has been designed in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure, which subsequently discharges to the noted extension of the wastewater network along the RORR.

The overall surface water drainage system serving the proposed development will consist of a gravity sewer network that will convey runoff from the roofs and paved areas to 2no. outfall manholes, which will discharge attenuated and treated rainfall runoff, at a controlled flow rate to the existing surface water network in the Ratoath Outer Relief Road, currently terminated to the northeast of development site, as well as discharging treated and attenuated flows to the local drain with the site boundary that discharges to the Bradystown Stream. The rate total of runoff discharging from site will be reduced by providing an integrated Sustainable Drainage System (SuDS) and flow controls, as part of the development's proposed surface water network.

A component of the SuDS protocol is to improve the surface water runoff's overall quality before it enters a natural watercourse or a public sewer, which ultimately discharges to a water body. This is to ensure the highest possible standard of surface water quality discharging from site.

Surface water within the Site will enter a gravity surface water network constructed throughout the proposed road layout and discharge to the existing network to the north of the site. The development's surface water runoff will be attenuated to restrict the outfall flow rate to a rate equivalent to that of greenfield runoff.

The development is designed to comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) requirements. It will have the physical capacity to retain surface water volumes and, if necessary, release these attenuated surface water volumes to an outfall at a controlled flow rate not greater than the greenfield runoff equivalent. The discharge from the development will be restricted by a flow control device in the final manhole within the development prior to discharging to the existing surface water networks, which limits discharge from the whole site to the greenfield runoff rate (Q_{bar}) of 72.6 l/s (5.9 l/s/ha), across both catchment areas.

Flow Control devices are to be provided immediately downstream of attenuation systems in order to restrict the surface water discharge from the site to a flow rate equivalent, or below, the natural greenfield equivalent runoff rate of 5.9 l/s/ha. It is proposed to provide the Hydro-brake optimum vortex flow control unit (or similar approved by MCC) at strategic design locations. This will occur downstream of the attenuation systems, prior to discharging to the existing surface water networks in the Ratoath Outer Relief Road and existing surface water drainage ditch, with the appropriate measures of attenuation provided.

The proposed surface water drainage system comprises a SUDS consisting of pervious paving, green roof, filter drains, trapped road gullies, underground pipe network, silt traps, oil separator, concrete storage systems, and flow control devices. The proposed SUDS devices provide a treatment train for rainfall runoff, delivering interception storage, water quality treatment, runoff volume reduction, and runoff rate reduction. Details of the proposed SuDS are summarised with the OCSC ESR that accompanies this submission.

Potable water is to be sourced from the local public watermain network, with an extension of the existing watermain to be routed along the remaining section of the RORR that is to be delivered as part of this development, connecting it to the existing public infrastructure at the proposed new junction with the R155 Fairyhouse Road. A metered connection, to serve the proposed development, will be taken from the noted watermain extension along the RORR.

12.4 Predicted Impacts

12.4.1 Construction Stage

Implementation of the measures outlined in Section 12.5 will ensure that the potential impacts of the development on water and hydrological environment are minimised during the construction phase and that any residual impacts will be short term and imperceptible.

Residual impacts from earthworks haulage and the risk of contamination of groundwater are deemed to be of minor risk. The residual impacts for a residential development, and open space are deemed to be imperceptible post construction (during the operational phase).

Discharge from the excavated areas could potentially lead to siltation, surcharge, and flooding within the sewerage system during the construction phase. This is seen as potentially significant if unmitigated.

Effluent from the onsite welfare facilities for construction personnel could potentially lead to pollution of watercourses and flooding within the sewerage system during the construction phase. This is seen as moderate and temporary.

12.4.2 Operational Stage

In the absence of mitigation measures, there are numerous potential impacts associated with the proposed development. For example, an increase in surface water run-off could impact on processes of erosion, sedimentation, and potentially salinity.

However, as it is required by the County Development Plan, that all surface water drainage design is carried out in accordance with the GSDS, and SuDS methodologies are being implemented as part of a treatment train approach, there are no predicted impacts on the water and hydrogeological environment arising from the operational phase i.e., the mitigation measures inherent in the design process already result in impacts being improbable..

12.5 Mitigation Measures

12.5.1 Construction Stage

To mitigate potential silt wash off or pollution discharging from site excavation areas, it is envisaged that the contractor will put in place temporary drainage facilities to manage water within excavations. Water entering excavation areas may be collected and discharged to the sewerage system following treatment (such as silt traps and interceptors) and at a flow rate subject to the conditions of a discharge licence from Irish Water. During the final stages of construction, the proposed surface water network will provide sufficient mitigation measures, through the provisions listed previously (principally the pervious paving, trapped road gullies, and silt traps). However, a fuel separator will be provided as an additional and final mitigation measure, upstream of the attenuation system.

Onsite welfare facilities will be managed such that wastewater effluent from these facilities will be discharged to the sewerage system at a location and a flow rate subject to the conditions of a discharge licence from Irish Water. To reduce the risk of defective or leaking sewers, all new sewers will be pressure tested and CCTV surveyed to ascertain any possible defects. Such defects, if they arise, would be repaired prior to the connection to the mains sewers.

Section 12.2 has a more detailed description of the mitigations measures for the Surface Water Drainage / Wastewater Drainage Systems.

All excavated materials shall be sorted and separated on site to suitable stockpiles of the smallest possible area and remote from the adjacent streams. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials. If

encountered, contaminated soils should be excavated and disposed off-site in accordance with the Waste Management Acts 1996-2001 & associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and the adjacent Ratoath Stream, Fairyhouse Stream, and Broadmeadow River from fuel, oil, and other hazardous materials (paints, cleaning agents, herbicides, fertilisers, etc.). Suitable bunded areas will be installed for all fuel storage tanks with a minimum 110% storage volume. Designated fuel filling points will be put in place at secure locations, remote from Ratoath Stream, Fairyhouse Stream, and Broadmeadow River, with appropriate oil separators to provide protection from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill. All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages. If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.

The appointed contractor will be required to prepare and implement a Waste Construction & Environmental Management Plan to ensure the mitigation of all potential impacts during the construction phase. This plan should be agreed with the Local Authority prior to the commencement of construction. The contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken.

Table 12 1: Construction Stage Mitigation Measures

Construction Mitigation Measures
All excavated materials shall be sorted and separated into stockpiles. The stockpiles will be kept remote from the adjacent Ratoath Stream, Fairyhouse Stream, and Broadmeadow River. Stockpile areas shall be designed with appropriate drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials.
If contaminated soils are found on site, they will be excavated and disposed of off-site in accordance with the Waste Management Acts 1996-2001 and associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.
Bunded areas for oil storage tanks and oil separators will be installed at fuel filling points to protect from accidental spills during the construction phase. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.
The site-specific Waste Construction & Environmental Management Plan will be approved by the Local Authority prior to the commencement of construction.
The Surface Water Management Plan will be implemented to ensure surface water storage in excavations will be directed to on-site settlement ponds, where silt removal will occur before discharge off site at a controlled rate. Periodic testing of the surface water discharge will be undertaken as required.
Any concrete mixing plant shall be sited in a designated area with an impervious surface.
All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages.

Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. New sewers will be pressure tested and CCTV surveyed to detect defective or leaking sewers. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.

12.5.2 Operational Stage

During the project's operational phase, sustainable drainage systems, trapped gullies and silt-trap manholes will reduce the volume of debris discharging into the surface water system and, ultimately, the public combined sewer network.

Pervious paving, green roofs, filter drains, Swales, trapped road gullies, underground pipe network, silt traps, oil separators, concrete storage systems, and flow control devices will assist in reducing runoff volumes and improving water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.

All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.

During the operational phase, the surface water network (drains, gullies, manholes, AJs, SuDS devices, and attenuation system) will need to be regularly maintained and cleaned, where required. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file / maintenance manual for the development.

Suggested mitigation measures to be implemented during the construction and operational phases of the proposed development are outlined in Table 18-2 and Table 12-1 respectively.

Table 12-1: Operational Phase Mitigation Measures

Operational Mitigation Measures
Water sewerage system treatment (such as silt traps and interceptors) will be implemented following conditions of a discharge licence from Irish Water.
Sustainable drainage systems, trapped gullies and silt-trap manholes will decrease the amount of debris discharging into the surface water system and, eventually, to the public combined sewer network.
Pervious paving, green roofs, filter drains, trapped road gullies, underground pipe network, silt traps, oil separator, concrete storage systems, and flow control devices will reduce runoff volume and improve water quality.
Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.
All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.

During the operational phase, the surface water network (drains, gullies, manholes, AJs, SuDS devices, and attenuation system) will need to be regularly maintained and cleaned, where required. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file/maintenance manual for the development.

12.6 Residual Impacts

12.6.1 Construction Stage

Provided the sustainable drainage systems and all mitigation measures outlined above are fully implemented as part of the proposed works, the predicted environmental impacts on the downstream receiving drainage infrastructure should be temporary and insignificant. This should include any mitigation measures proposed in respect of flora and fauna, which is dealt with separately in this EIAR.

The impact from the proposed development on the public drainage systems will be a temporary and insignificant increase in the quantity and rate of discharge of wastewater from the site to the existing public sewer system, with the contributing flows coming mainly from the site office and welfare facilities.

There will be a temporary and insignificant increase in water supply demand for site offices and facilities during the construction phase.

There will be temporary traffic disruption in the vicinity of the Site when excavation and installation works are being carried out.

12.6.2 Operational Stage

As surface water drainage design has been carried out in accordance with the GSDS, and SuDS methodologies are being implemented as part of a treatment train approach, there are no adverse or significant predicted impacts on the water and hydrogeological environment arising from the operational phase. Therefore, any such potential impact is unlikely. There has been no history of flooding in the area; therefore, no adverse impact in respect of flooding downstream is envisaged as a result of the proposed development, as it has been designed in accordance with all the applicable and relevant standards set out in Section 2 of the Engineering Services Report.

The surface water design has been prepared in accordance with best practice incorporating significant sustainable drainage systems, which include the installation of pervious paving, swales, green roofs, filter drains, trapped road gullies, underground pipe network, silt traps, oil separator, concrete and proprietary storage systems, and flow control devices. The integrated sustainable drainage system will reduce runoff volume and improve water quality prior to discharging to the nearby watercourse and public network. As mentioned above, the surface water network has been reduced to the greenfield runoff equivalent, so there is no likely impact in water volume discharging from site, with a positive permanent impact on the water quality.

The impact of the proposed development on the existing wastewater drainage network at Ratoath Outer Relief Road will result in an increase in the rate of discharge of wastewater from the development site. These increased flows can be accommodated, as confirmed by Uisce Éireann as part of the Pre-Connection Enquiry process, so there will be a permanent but insignificant impact from this development on wastewater.

The proposed development will result in an increase in water demand on the water distribution network. This increase in demand can be accommodated by the connection of the existing network to the watermains, as noted by Uisce Éireann in the Confirmation of Feasibility letter. Therefore there is a permanent but insignificant impact from the operational stage on water demand.

12.7 Cumulative Impacts

12.7.1 Construction Stage

Based on an assessment of the current overall environment in the vicinity of the proposed development; the current infrastructure and proposed and potential changes to this infrastructure in the vicinity of the Site based on the current application and nearby proposals; the design life and life cycle for the current application and nearby proposals; and the County Development Plan, the potential cumulative impacts may be considered to be Moderate and Long-term. Predicted cumulative impacts during the construction phase of site works are detailed in [Table 12-2](#).

Table 12-2 - Impact determination – construction phase

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks	Site Clearance Excavation Construction	Excavation of natural soils for development, services, etc.	Negative	Moderate	Local	Certain	Permanent	The project has been designed to construct on the minimum amount of space. Material will be reused on-site where possible.	Moderate Negative
Earthworks	Excavation	Soil erosion causing airborne dust and/or nuisance dust on river/streams	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted throughout the excavation period. Vehicle wheel wash facilities will be installed at site exits, and a road sweeping programme will be implemented.	Imperceptible negative
Earthworks Altering Groundwater r/ Surface water	Excavation Construction	Imported fill and aggregates will be required during the works	Negative	Slight - Moderate	Local (maybe a number of quarry sites)	Likely	Permanent	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/ compliance certificates will be required to ensure all aggregates meet the engineering specifications.	Imperceptible negative

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Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Dewatering/ Lowering the water table	Site Clearance, Excavation, and General Construction	Discharge of potentially contaminated groundwater to sewer; possible settlement of buildings as a result of dewatering	Negative	Slight	Local - maybe a number of nearby building s	Likely	Short-term	The appointed dewatering contractor will be supplied where needed. The contractor will design an on-site pre-treatment system based on the risk assessment results.	Imperceptible negative
Storage of potentially polluting materials	Excavation and General Construction	Potential leak or spillage from construction- related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping and proper handling, storage, and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained.	Imperceptible negative
Discharge to Groundwater		Potentially contaminated run-off percolating to ground and the underlying aquifer	Negative	Significant	Local	Unlikely	Short-term	There will be no direct discharge to groundwater during construction. Indirect discharges to the underlying bedrock aquifer may occur increasing the aquifer vulnerability as subsoil is removed from site. Protection of groundwater from potentially polluting substances will be dealt with through measures including correct handling and storage of potentially polluting substances.	Imperceptible negative

12.7.2 Operational Stage

Any impact which may occur would be consistent with existing and emerging trends, with the proposed development likely having a design life in the order of fifty years.

Any new developments in the surrounding area would be required to provide sustainable drainage systems designed to reduce flow rates to greenfield equivalent and reduce overall discharge volumes while improving the discharge quality. Wastewater and water supply impacts would be subject to a similar Pre-Connection Enquiry process and approval by Irish Water. Therefore, the cumulative impact of new developments in the vicinity of the subject development would likely have a moderate but sustainable impact on the receiving environment.

Any redevelopment in the area complying with current best-practice methods will likely lead to an improvement in surface water runoff conditions, as is expected with the proposed subject development.

12.8 Interactions

During the construction phase, the following aspects would interact with water and hydrology and, in the absence of mitigation, may potentially give rise to significant effects:

Material Assets Built Services: The construction of the proposed services (water supply, drainage, etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids runoff.

Land & Soils: Site preparatory works (i.e. site clearance, re-profiling, etc.) during the construction stage have the potential to impact the hydrology and hydrogeology due to accidental spills, suspended solids becoming entrained in surface water runoff, etc.

During the operational phase, the potential interactions are;

Material Assets Built Services: There will be an increased demand on potable water supply and on the municipal drainage system.

The potential significant impacts on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined, where required.

With mitigation measures in place, no significant, permanent, residual, negative impacts will occur.

12.9 Do Nothing Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and, therefore, no impact on water and hydrology arising from the subject site.

12.10 Risks to Human Health

The construction phase of the proposed development has the potential to give rise to short-term contamination however this is considered unlikely and a low risk. Ensuring water quality and compliance with the Water Pollution Acts would be seen as the primary method of ensuring no significant impact on watercourses and neighbouring sites.

The operational stage of the development is unlikely to cause any adverse impacts on the existing and future hydrological environment of the locality once all mitigation measures are fully in place.

12.11 Worst Case Scenario

12.11.1 Construction Phase

Significant spillage of oils or other contaminants during the construction phase could cause significant but temporary negative impact on the groundwater, or receiving watercourse if allowed enter the public infrastructure.

12.11.2 Operational Phase

Failure of attenuation and flow control systems, through lack of maintenance or otherwise, could allow greater volumes for surface water discharge, and debris and sediment loads, to be discharged from the development, causing a temporary but significant adverse impact downstream.

12.12 Monitoring

The requirement and recommendation for monitoring related to the hydrological environment is as follows:

Qualitative and quantitative monitoring of any water to be discharged to the combined sewerage during the construction and operation phases. This might include flow monitoring and a regular sampling and analysis programme as required by the Regulating Authority under any Discharge Licence.

Suggested monitoring proposals related to the construction and operational phases of work on the Site are outlined in Table 12-3.

Table 12-3: Monitoring Proposals

Monitoring Proposals
Watching Brief and Discovery Strategy for any potentially contaminated material to ensure adequate classification and disposal (refer to Land and Soils Chapter);
Monitoring of retaining wall structures, including inclinometers, tilt-meters, and water movements of either seepages or through control points during the construction programme. The specific monitoring requirements and frequency will be defined in the Contractor's CMP;
Regular inspection of on-site fuel storage facilities to ensure environmental 'best-practices' are being employed during construction;
Upon installation of new drains and pressure testing to assess the potential for leaks to occur in the newly constructed drains; and
Following completion of the proposed drainage systems, a short-term flow and rainfall survey (involving in-pipe flow monitors and rain gauges on site) will be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any leakages.
Regular inspection of maintenance of landscaping and sustainable drainage systems to ensure they are well maintained and remain functioning as per design.

12.13 Difficulties Encountered

No exceptional difficulties were experienced in compiling this EIAR.

12.14 Interactions

This chapter was prepared in coordination with the details outlined in Chapter 9 – Biodiversity; Chapter 12 – Land and Soils; and Chapter 16 - Material Assets: Waste Management.

12.15 References

- Code of Practice for Wastewater Infrastructure (2020) – Irish Water
- Code of Practice for Water Infrastructure (2020) – Irish Water
- Control of water pollution from linear construction projects – Technical guidance, Publication C648, CIRIA, 2006;
- Environmental Handbook for Building and Civil Engineering Projects (2000) – Construction Industry Research and Information Association
- Environmental Protection Agency 2021 3rd Cycle Draft Nanny Delvin Catchment Report (HA 08) - Catchment Science & Management Unit
- Environmental Protection Agency Envision Data Viewer: <http://gis.epa.ie/Envision>
- Fingal County Council 2019 Appendix C Estuary West Draft Masterplan Surface Water Management Plan (SWMP)
- Greater Dublin Strategic Drainage Study (2005) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009) – National Roads Authority
- Inland Fisheries Ireland 2010 Sampling Fish for the Water Framework Directive Transitional Waters 2010 Broadmeadow Water Estuary
- I.S. EN12056: 2000 Gravity Drainage Systems inside Buildings (2000) – National Standards Agency Ireland
- I.S. EN752: 2017 Drain & Sewer Systems outside Buildings (2017) – National Standards Agency Ireland
- Local Authority Waters Programme 2019 Ashbourne (Broadmeadow) Priority Area for Action: Desk Study Summary
- Meath County Council Strategic Flood Risk Assessment and Management Plan for the Meath CDP 2021-2027
- National Parks & Wildlife Service 2013 Malahide Estuary Special Protection Area (Site Code 4025) Version 1
- Office of Public Works 2020 <https://waterlevel.ie/hydro-data/search.html?free=Broadmeadow>
- Pollution Prevention Guideline PPG3 Use and design of oil separators in surface water drainage systems (2006) – U.K. Environment Agency

13 Population and Human Health

13.1 Introduction

This chapter has been prepared by Maria Rochford, MRUP MIPI, Associate Director (Planning) at KPMG Future Analytics. Maria has 15 years' experience in the preparation and project management of EIARs.

This chapter examines the potential population and human health effects and mitigation measures of the proposed residential development on lands to the immediate south of the established town of Ratoath, Co. Meath. The purpose of this assessment is to identify and assess the potential population, human health and well-being effects of the proposed project, and to deliver evidence-based recommendations that maximize health benefits and mitigate or remove potentially negative impacts associated with the proposed developments.

This chapter describes the demographic and socio-economic profile of the receiving environment and potential impact of the proposed development on population, i.e. human beings, and human health. Any likely negative impacts would be addressed through mitigating factors and actions to be applied to minimise these effects.

Population

The impact on population has been assessed / evaluated through consideration of socio-economic and social factors. Specifically, the assessment seeks to capture the social effects of the proposed scheme, vis-à-vis, impact of construction workforce on local service, impacts on quality of life and well-being issues reflected through a range of indicators including (but not limited to): existing health status of population in the area, access to facilities and services etc., community health, participation etc. Economic impacts include any resulting employment and expenditure opportunities resulting from the scheme (at the different construction and operational stages).

Human Health

In addressing impacts on Population, it is but inevitable to consider the subsequent impacts of the proposed scheme on Human Health. This has been considered both separately and together to ensure the relationship between the two factors is considered in the assessment of impacts arising from the proposed scheme within the defined baseline.

Although there is no definition of Human Health within the EIA Directive, a commonly used (and widely accepted) definition of health is by The World Health Organisation (WHO), which defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity".

In the assessment of impact on Human Health arising from the proposed development, this Chapter first establishes the current status of health within the local study area catchment through relevant baseline information available in the local context. Where applicable (and inadequate information available at the local level) comparable data on Health, for a wider scale at Meath Region level has also been set out. Subsequently the impact of the proposal during the different stages of construction and operation – on the welfare of the people, specifically the vulnerable groups (dependents) and quality of life, the impact on factors affecting human health, e.g., water supply, air, etc. and environment in general has been considered.

The baseline for both Population and Human Health has been set out in Section 13.4 of this Chapter.

Description of Development

Please refer to the statutory development description in Chapter 1.2 of this EIAR. In summary form, the proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 114 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas.

The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development.

13.2 Assessment Methodology

The following Guidance documents have been reviewed by KPMG Future Analytics in setting out the methodology for the assessment of the impacts of the proposed development on the Population and Human Health, for the local area serving the subject site. It is also note that the approach within these documents is consistent with the approach as set out in the European Commission's Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).

- (EUPHA) Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment
- Health Impact Assessment in Planning (IEMA 2020);
- Healthy Ireland - A Framework for Improved Health and Wellbeing 2013 – 2025 (the Healthy Ireland Framework) (Department of Health 2019);
- Environmental Noise Guidelines for the European Region (hereafter referred to as the WHO Noise Guidelines) (WHO 2018)
- Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017);

This section has been prepared in accordance with the EIA Directive, the European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017), the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (published in August 2018) and the Guidelines on the information to be contained in Environmental Impact Assessment Reports published by the EPA (2022).

Article 3 of the EIA Directive, on the assessment of effects of certain public and private projects on the environment, sets out the following:

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

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in points (a) to (d)..."

The 2014 Directive's title change to assess the impact on 'Population and Human Health' and the 2022 EIA Guidelines published by the EPA have been adhered to in this Chapter, including the requirement that the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR, e.g., under the environmental factors of 'air, water, soil, etc.'

With regard to 'Human Health', the European Commission's (EC) 2017 publication, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, states that:

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

EIA Directive Article 3(1) sets out the environmental factors that EIAs must consider. Human Health is specifically mentioned, as is its interaction with population, biodiversity, land, soil, water, air, climate, material assets, cultural heritage, the landscape, and the vulnerability of the project to risks of major accidents and / or disasters.

This Chapter will follow the EC guidelines and will examine the relevant health effects in the context of the proposed development as they relate to the defined study area. The effects of the proposal on the population and human health are analysed in compliance with the requirements of the EPA Guidelines.

The analysis comprises a study of the key assessment themes as well as consideration of the construction phase, with a conclusion reached in relation to the Proposed Development on the baseline characteristics as described above. The characteristics of this impact assessment are defined below, as per the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022):

Table 13-1 Information to be Contained in Environmental Impact Assessment Reports (EPA 2022)

Type	Description
Probability of Effects	<u>Likely Effects:</u> The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. <u>Unlikely Effects:</u> The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Quality of Effects	<u>Positive Effects:</u> 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).

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

13.2.1 Assessment of Significance

The EC guidelines sets out that the assessment of significance should be based on clear and unambiguous criteria, and that significance should be defined in a way that reflects what is valued in the environment by public and private stakeholders. A common approach to this would be the application of multi-criteria analysis. Common criteria used to evaluate significance include the magnitude of the predicted effect and the sensitivity of the receiving environment:

- 'Magnitude' considers the characteristics of the change (timing, scale, size, and duration of the impact) which would probably affect the target receptor as a result of the proposed Project;
- 'Sensitivity' is understood as the sensitivity of the environmental receptor to change, including its capacity to accommodate the changes the Projects may bring about.

The EC guidelines also notes that significance is always context-specific and hence, a tailored criteria should be developed for each Project and its settings.

13.2.2 Description of Baseline

According to the World Health Organisation, 'well-being is a positive state experienced by individuals and societies.' Both health and well-being are a resource for daily life and are determined by social, economic, and environmental conditions. Poor social and economic circumstances have a great impact on the health and well-being of people and societies and therefore, better health encompasses improving quality of life by encouraging education, supporting employment, improving living / housing standards, and ensuring a safe and secure environment. Health is not only the physical disability, but also the state of mental health, social wellbeing, and economic conditions.

As per the Healthy Ireland: A Framework for Improved Health and Wellbeing 2013-2025 (Healthy Ireland Framework), 'a healthy population is essential to allow people to live their lives to their full potential, to create the right environment to sustain jobs, to help restore the economy and to look after the most vulnerable people in society.'

The Healthy Ireland Framework was a landmark policy published by the Department of Health in 2013 with a focus on living healthier lifestyles and preventing chronic disease. A Healthy Ireland Outcomes Framework was published in 2018 to monitor and drive the achievement of Healthy Ireland's targets and performance indicators. The Outcomes Framework sets out four high-level outcomes that reflect the broad determinants of health and wellbeing across the life course:

- Responsibility is shared in addressing the social determinants of health and wellbeing;
- People of all ages and abilities participate in education, work, and leisure activities to their full potential;
- Children are active and healthy, with positive physical and mental wellbeing;
- We live longer healthier lives in safe, healthy environments in resilient communities.

These outcomes are supported by indicators grouped into three broad areas: Healthy Status, Health Outcomes, and Social Determinants to provide a holistic view of the impact of current policies. For each indicator an appropriate measure has been selected to allow progress and emerging trends to be tracked.

Table 13.2 below provides an overview of some relevant indicators extracted from the Healthy Ireland Outcomes Framework's 'Indicators Set' for the three broad areas described above. This will further help determine some of the baseline data in the context of the proposed development. The indicators will also be subject to comparison with national data, where applicable / relevant.

Table 13-2 Healthy Ireland Outcomes Framework Indicator Set 2018.

Indicator Group	Indicator Set
Health Status	Preventive Measures: Breast Cancer Screening Rate, Cervical Cancer Screening Rate, Measles Mumps and Rubella (MMR) Immunisation Rate, Meningitis C Immunisation Rate Lifestyle and Behaviour Risks: Overweight and Obesity, Physical Activity Levels, Current Smoking Rate, Harmful Use of Alcohol, Breastfeeding Rates, Condom use (young people), Screen time (young people)
Health Outcomes	Mortality and Morbidity: Healthy Life Years, Premature Non-Communicable Disease Mortality, Cancer Incidence

	Wellbeing Factors: Self-Perceived Health, Positive Mental Health, Probable Mental Health Problem, Moderate and Severe Depression (age 50+), Social and Cultural Participation (age 50+), Safety and Security (age 50+), Feeling Safe (young people)
Social Determinants	Environmental Factors: Air Quality Index, Water Quality, Radon Socio-economic Factors: Long-term unemployment, Jobless Households, Education: Retention, Education: Attainment, Literacy and Numeracy, Consistent Poverty Rate, Inequality of Income

With regard to the above, the baseline data has been carefully considered and range of Socio-Economic, Environmental and Wellbeing Factors for the defined local area are based on local population information sourced from the Central Statistics Office (CSO) Census data captured during the Census 2016 and 2022.

Datasets analysed include:

- Population and Household Data
- Economic, Education and Employment Data
- General Human Health Data

Population and Household data mainly seek to capture the change (growth / decline) in the overall size of the area surrounding the subject development, the demographic profile, specifically age and gender distribution and the household composition within the area. This will help identify specific / potentially vulnerable groups, establishing a baseline for assessing possible effects.

The Institute of Public Health's Guidance on Health Impact Assessment (2021) includes further details on who can be considered within the ambit of 'vulnerable / sensitive groups': young-age vulnerability (children and young people as potentially more vulnerable road users); old-age vulnerability (older people as potentially more vulnerable road users); low-income vulnerability (people living in deprivation, including those on low incomes for whom travel costs or alternatives may be limiting); poor health vulnerability (people with existing poor physical and mental health in relation to health trip journey times); and access and geographical vulnerability (people who experience existing access barriers or for whom close proximity to project change increases sensitivity).

The economic and employment context draws on principle economic status data of persons in the Study Areas aged 15 years and older. The economic conditions of an area can have immense implications on the health of the population, for e.g., unemployment, income deprivation and social status can often have an impact on both physical and mental well-being of individuals. Negative impacts associated with unemployment include depression, anxiety, and self-esteem – this can in turn affect participation of such groups / individuals within the community and hence, often neglected. In addition, people living in deprivation also have reduced / limited access to financial resources, further restricting their access to healthcare, housing, travel, and other basic necessities. On that basis, this chapter sets out the existing economic condition within the Study Area and further evaluates the impact of the proposal on employment, and other economic activities.

The baseline also captures the educational status within the Study Area, which is also a key contributing factor to improved employment, security, and therefore good health.

Census data has also been used to reflect on the (self-evaluated) general health status of residents in the Study Area. Where applicable and available, relevant health data has been presented for the local area and where local level data was limited, data representing the Meath Region has been detailed to provide an overview of the health status within the administrative area. Some environmental indicators

such as water quality data available for the Ratoath area have also been included in the baseline to provide a complete representation of health for the area.

Built Environment is also a key factor impacting the health of population within an area. This includes (but is not limited to) access to green and blue spaces – which is considered to provide support for mental health by providing opportunities for play, recreation, activity, and social connection. Therefore, an assessment of the current provision of community and social infrastructure was conducted through spatial analysis.

The Chapter also identifies relevant proposed / upcoming schemes within the Study Area, to assess the effects / impact these may have in combination with the proposed scheme. The current and prospective development and land use activity in the Study Area in relation to the proposed development has been set out in Section 13.6 'Cumulative Impacts'.

Finally, to provide further context to the social and demographic assessment, a similar data analysis exercise, but at broader scale, was performed on the Meath Region, and the State were deemed necessary.

13.3 The Study Area

The site is c. 12.58 ha in size and is irregular in shape. It is bounded to the north by Glascarn Lane, the rear of houses at Glascarn Lane, further existing residential dwellings and a permitted strategic housing development (planning reg. ref. SH305196) to the east and south by existing agricultural fields and by Glascarn Lane; and to the west by Fairyhouse Road (R155), the rear of houses at Fairyhouse Road, the Carraig Na Gabhna and Cairn Court developments, and existing agricultural fields.

The Study Area selected for this assessment comprises of a 2km buffer of subject site as depicted below. To analyse the effects of the proposed development on Population and Human Health within the catchment area surrounding the site, the Study Area comprising Ratoath Electoral Division in proximity to the site has been assessed in detail. This delineation of the Study Area provides a good representation of the socio-economic and demographic characteristics of the immediate populated area potentially impacted by the proposed development. The Study Area captures an area of the application site, Ratoath town centre and neighbourhoods to the west, south and east.

The rationale behind choosing this study area was that it best demonstrates the demographics of the area in the context of its surrounding land uses to the west, south and east, as well as Ratoath town centre to the north.



Figure 13-1: Study Area

The demographic and socio-economic analysis is based on Census 2016 and Census 2022 Electoral Divisions data in order to provide a consistent and accurate picture of the demographic profile of the study area. It is considered that this Study Area provides a good representation of the socio-economic and demographic characteristics of the immediate populated area potentially impacted by the proposed development.

13.4 Baseline Environment

This section presents the findings of the baseline analysis of datasets relevant to population and human health. This analysis informs the professional conclusions reached as to duration and significance of impacts.

13.4.1 Population and Household Characteristics

The closest neighbours to the subject site are the occupants of the residential units situated along Glascarn Lane, at the northern boundary of the site, which are located approximately 15m from the development site at their closest point, those at Carraig na Gabhna to the west and residents of housing situated on Fairyhouse Road.



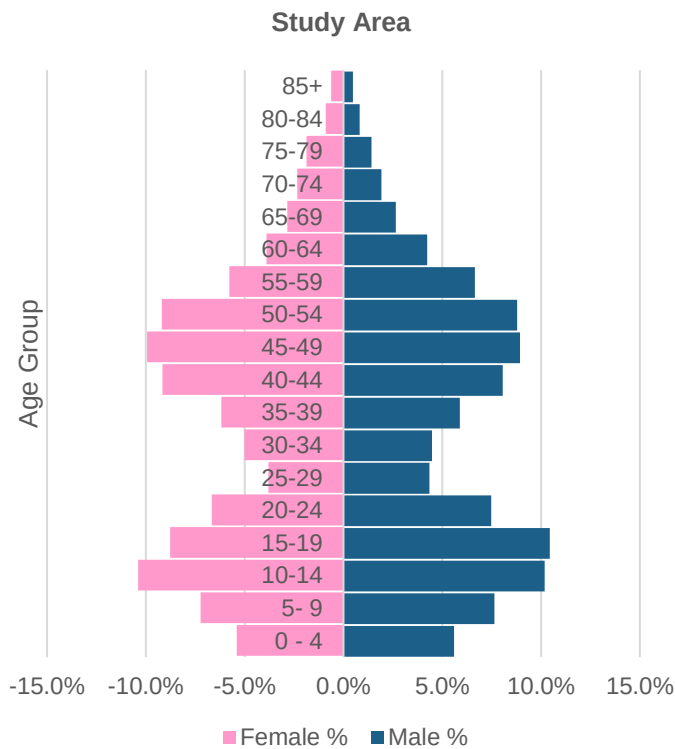
Figure 13-2: Closest residential receptors to the site

The CSO Census results (Census 2022) indicate that there were 11,894 residents in the Study Area, which increased by 7.3% from 11,082 as recorded in the 2016 Census.

Table 13-3 Population Change during the Census Period 2016 and 2022

Area	2016	2022	2016-2022 Change #	2016-2022 Change %
Study Area	11,082	11,894	812	7.3
Meath Region	195,044	220,826	25,782	13.2%

Data analysis on the Study Area shows an imbalance in the distribution of the population across various age cohorts, with a noticeably larger portion of its population in the 10-19 years and 40-54 years age cohorts, and a smaller portion between the ages of 0-9, 20-34, and 65+. This reflects a period of rapid population growth between 1996 and 2011, followed by subsequent aging of the population. There is a slight prevailing of female (51%). In comparison with Meath Region figures the Study Area shows similar trends differing in a varying of disbalances as shown in Figure 13.2 below.



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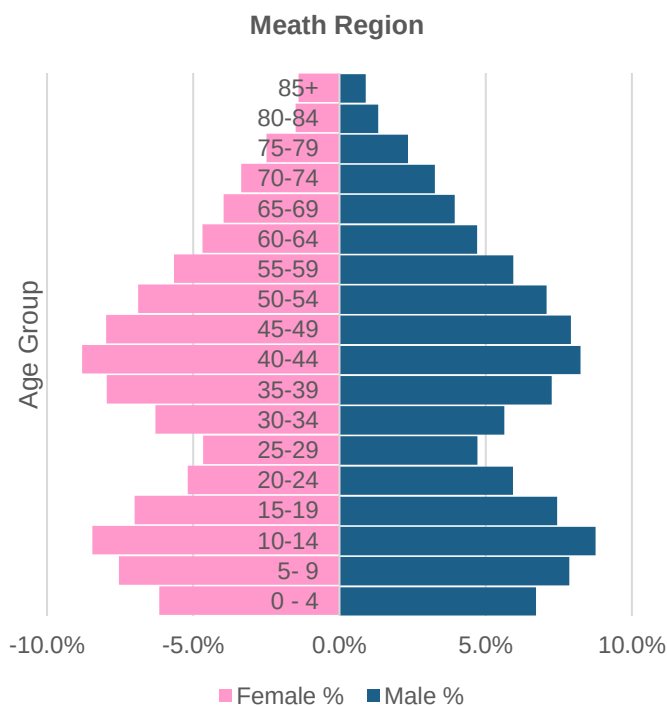


Figure 13-3 Study Area and Meath Region Population Pyramids

Inheriting a distorted distribution of population from the 2000s, the Study Area also experiences significant shifts between age groups. Following aging of two most populated cohorts there is a significant increase in 10-29 and 50+ age groups (20-53% between 2016 and 2022). Although the percentage growth in the 65+ age group appears very high at 28%, the numerical increase is only 207 people over the intercensal period, still constituting a relatively low 7.9% of the total population. However, faster growth is expected in the future following population distribution trends.

In contrast, there is a noticeable decrease in the 0-9 age group (-28.3%) and the 30-39 age group (-20.2%). The decline in the number of children aged 0-9 may be related to both the corresponding drop in the number of people aged 25-34 and the nationwide trend of declining fertility rates. This trend has been attributed to a combination of demographic and economic factors, including people starting families at a comparatively later stage and affordability constraints.

The average age of the population in the Study Area increased from 31.7 years to 34.5 years over the intercensal period.

Table 13-4 Study Area, Meath Region, and State Population by Age Group (Summary)

Age	Study Area				Meath Region	State
	2016 No.	2022 No.	% Change	% 2022	% 2022	% 2022
0 - 9	2146	1538	-28.3%	12.9%	14.1%	12.4%
10-19	2006	2365	17.9%	19.9%	15.8%	13.8%
20-29	949	1324	39.5%	11.1%	10.2%	11.7%
30-39	1607	1283	-20.2%	10.8%	13.6%	13.9%
40-49	2113	2149	1.7%	18.1%	16.5%	15.2%
50-59	1183	1807	52.7%	15.2%	12.8%	12.6%
60-69	596	809	35.7%	6.8%	8.6%	9.9%
70-79	351	450	28.2%	3.8%	5.7%	6.9%
80+	131	169	29.0%	1.4%	2.6%	3.5%
Total	11082	11894	7.3%			

While the study area and Meath Region have a majority of Irish nationals (89.3% and 86.4%, respectively), there is also a notable presence of other nationalities. At the study area level in 2022, 'Other EU' nationals made up 4.9% of the total population, and 'UK nationals' made up 1.2%, as seen in Figure 13.3. Nationalities from the 'Rest of the World' account for another 2.3%, making the total share of foreign nationals 8.4%. Up to 2.3% didn't mention their nationality.

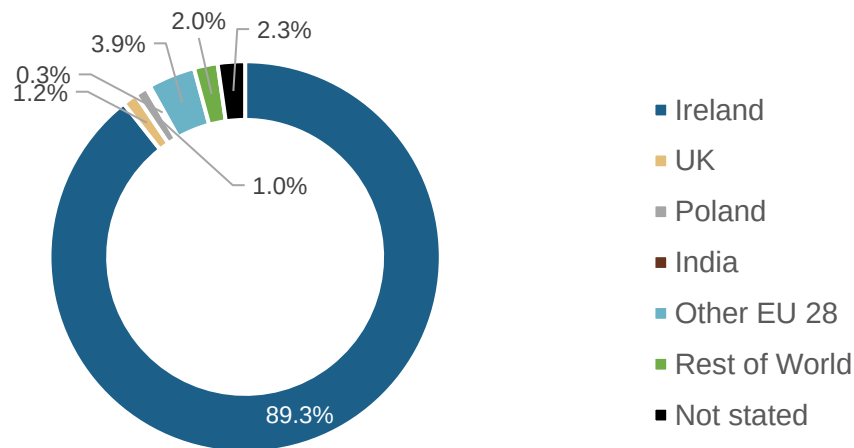


Figure 13-4 Study Area Nationalities

There is a slight shift in the distribution of nationals between 2016 and 2022. While the proportion of Irish nationals decreased from 92% to 89%, their numbers increased by 462. Conversely, the number of foreign nationals increased by 175 (21%), rising from 7.5% to 8.4%. Foreign nationals make up a smaller share compared to regional and national levels; in the Meath Region, they constitute 11.4% of the population, compared to 12.4% at the national level.

Trends in household data from the intercensal period for the Study Area are summarized in the Table 13.3.

Table 13-5 Study Area Household Composition

	Study Area				Meath	State
Composition of Households	2016	2022	Change	2022%	2022	2022
One person	388	417	29	11.5%	17.3%	23.1%
Married couple	384	434	50	11.9%	14.4%	14.9%
Cohabiting couple	105	119	14	3.3%	4.1%	4.3%
Married couple and children	1,678	1,710	32	47.0%	37.3%	29.4%
Cohabiting couple and children	179	197	18	5.4%	5.4%	4.3%
Father and children	33	46	13	1.3%	1.5%	1.5%
Mother and children	266	291	25	8.0%	8.1%	8.5%
Couple and others	22	37	15	1.0%	1.4%	1.5%
Couple children and others	95	119	24	3.3%	3.0%	2.2%
Father children and others	9	10	1	0.3%	0.3%	0.3%
Mother children and others	19	47	28	1.3%	1.2%	1.2%
Two or more family units	45	44	-1	1.2%	1.6%	1.2%
Non-family households and relations	35	61	26	1.7%	1.9%	2.2%
Two or more non-related persons	52	107	55	2.9%	2.6%	5.4%
Total	3,310	3,639	329	100%	100%	100%

There is a significant difference in household composition between the Study Area, Meath Region, and the State. While 'Single person' households made up 11.5% of all households in the study area in 2022, this is noticeably lower compared to the Meath Region average (17.3%) and the State average (23.1%). Other notable household compositions include 'Married Couple and Children,' which constitute 47% in the study area. This is higher than in the Meath Region, at 37.3%, and the State, at 29.4%. The 'Married Couple' composition in the study area is 11.9%, which is lower than in the Meath Region (14.4%) and the State (14.9%). Distribution is relatively evenly split across other compositions.

Notably, the compositions with the largest changes in the Study Area from the 2016-2022 intercensal period were 'Two or more non-related persons' (+55 households) and 'Married couple' (+55 households), while the total number of households increased by 329 (9.9%).

Family cycle statistics in the Study Area follow trends identified in population and household statistics. The increase in the average age of the population, along with a decrease in the number of children aged 0-9 and an increase in the number of individuals aged 50 and above, has led to a corresponding rise in the number of 'Retired' (+37.5% from 2016 to 2022) and 'Adult' (+52.4%) families. To a lesser extent, there has been an increase in the number of 'Empty nest' and 'Adolescent' families (+12.2% and +10.9%, respectively).

In contrast, there has been a significant drop in the number of 'Pre-school' and 'Early school' families (-23% and -38%, respectively). The Study Area is reflective of the overall decline in 'Pre-school' and 'Early School' families in the State, which is down by c. 14% between since 2016.

There has been an overall increase in the number of families between Census 2016 and Census 2022 by 163 families, resulting in a total of 3,046 families in the Study Area in the year 2022.

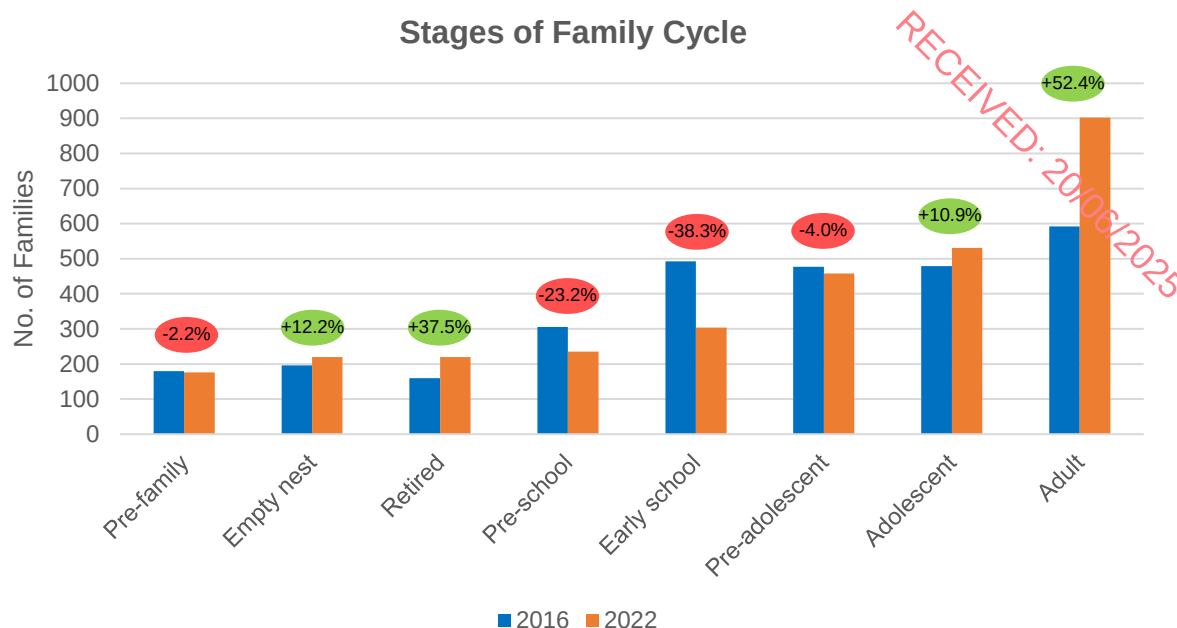


Figure 13-5 Study Area Family Cycle Stages

As identified in the population and households' statistics, the Study Area characteristics highlight a majority of older adult population with a tendency to live in 'married couple and children' households. An increase in the number of older adult population (65+ years) is also noted. General trend of increase in number of old aged families establishes growing the old age vulnerabilities within the area.

13.4.2 Education

Among residents of the Study Area aged 15 and over, 52% hold some form of third-level qualification (Level 6 or above), which is higher than the Meath region and the national average of c. 45%. As visible in Table 13.4 below, the general level of third-level (Level 6+) education in the Study Area increased by a significant 24.8%. Within this group, the number of individuals with postgraduate education or higher increased by 37% during the 2016–2022 intercensal period. These changes, overall, are driven by shifts in the age distribution of the population in the Study Area.

Another significant portion of residents within the Study Area completed secondary education (38.2%) as of 2022, which is close to the Meath region and state average. The number of persons holding secondary education did not change significantly between Census 2016 and 2022. Individuals with primary education or below constitute 5% of the population aged 15 and over, which is lower than the national average of 9.8%.

Table 13-6 Population aged 15 years and over with highest level of education completed (Census 2016, 2022)

	Study Area				Meath	State
	2016	2022	2022%	Change, %	2022%	2022%
No Formal Education	39	92	1.3%	136%	2.3%	2.4%
Primary Education	357	268	3.7%	-25%	6.6%	7.4%
Secondary Education	2,610	2,744	38.2%	5%	41.6%	38.8%
Third Level Education (without Postgraduate+)	2,276	2,752	38.3%	21%	34.5%	32.5%
Postgraduate Education or higher	716	983	13.7%	37%	10.7%	12.3%

Not Stated	290	339	4.7%	17%	4.3%	6.5%
Total	6,288	7,178	100.0%	14%	100.0%	100.0%

13.4.3 Economic Activity and Employment

The principal economic status, as captured by the CSO, provides a breakdown of the number of people aged 15 years and older who are employed, unemployed, or looking for their first job (these groups constitute the labour force), and the inactive population (not in the labour force). Individuals or groups over 15 years of age who are not participating in the labour force are typically students, homemakers, retirees, and persons unable to work due to illness or disability and are therefore considered not to be economically active.

The total number of people aged over 15 years increased by 16.7% from 2016 to 2022, reaching 9,132 individuals. Table 13.5 provides an overview of the population aged 15 years and over in the Study Area.

Table 13-7 Population Aged 15 years and Over by Principal Economic Status

	Study Area				Meath	State
	2016	2022	Change	2022%	2022%	2022%
At work	4894	5768	17.9%	63.2%	59.3%	56.1%
Looking for first regular job	26	68	161.5%	0.7%	0.8%	0.8%
Short & Long Term Unemployed	306	303	-1%	3.3%	3.9%	4.3%
Student	1128	1407	24.7%	15.4%	11.2%	11.1%
Looking after home/family	658	525	-20.2%	5.7%	7.2%	6.6%
Retired	640	818	27.8%	9.0%	13.2%	15.9%
Unable to work due to permanent sickness or disability	160	193	20.6%	2.1%	3.7%	4.6%
Other	11	50	354.6%	0.5%	0.6%	0.7%
Total	7823	9132	16.7%	100.0%	100.0%	100.0%

The number of people in the labour force increased by 913, or 17.5%, over the intercensal period, reaching 6,139 (67.2% of people aged over 15 years old in 2022). The number of people 'at work' in the Study Area grew faster (17.9%) during the same period, leading to an increase in the share of this group to 63.2% of people aged over 15 years old. Meanwhile, the number of short- and long-term unemployed remained almost the same, causing a decrease in the unemployment rate. The number of people 'looking for their first regular job' increased 2.5 times to 68 individuals in 2022.

Among the economically inactive population, the number of 'Students' increased by c. 25%, and the number of 'Retired' individuals increased by c. 28%. A possible explanation for this could be the increase in people of corresponding age cohorts in the Study Area during the 2016-2022 period. On the contrary, the number of people 'Looking after home/family' decreased by c. 20%, likely following a drop in the number of families with children and more active women's involvement in the labour force.

The economic profile of the Study Area slightly differs of the Meath Region and State due to demographic reasons. There is a higher proportion of labour force in the Study Area, with the Meath Region and State are below the Study Area at 61.7% and 58.6% of the people aged 15 and over, respectively. While proportion of unemployed in the Study Area slightly below those for the Meath Region and State share of persons 'At work' consequently higher. This, in turn, is explained, lower proportion of elderly people in the Study Area comparatively to the Meath Region and State (as observed in Section 5.2 above), with the share of 'retired' individuals of 9% in the Study Area, 13.2% in

the Meath Region and 15.9% in the State. Another noticeable distinction is higher proportion of 'Students' (15.4%), while in the Meath Region and in the State It is c. 11%.

The economic profile of the Study Area slightly differs from that of the Meath Region and the State due to demographic reasons. There is a higher proportion of the labour force in the Study Area, with the Meath Region and the State below the Study Area at 61.7% and 58.6% of people aged 15 and over, respectively. While the proportion of unemployed individuals in the Study Area is slightly lower than that of the Meath Region and the State, the share of people 'at work' is consequently higher. A higher proportion of the labour force can be explained by the lower proportion of elderly people in the Study Area compared to the Meath Region and the State (as observed in Section 5.2 above), with the share of 'Retired' individuals at 9% in the Study Area, 13.2% in the Meath Region, and 15.9% in the State. Another noticeable distinction is the higher proportion of 'Students' (15.4%), compared to approximately 11% in both the Meath Region and the State.

13.4.4 Human Health

The Healthy Ireland – Framework for Improved Health and Wellbeing 2013-2025 described 'Health' as being a personal, social, and economic good...'. Further stating that 'a healthy population is a major asset for society...', the framework continues to emphasise that a healthy population is essential to enable people to live their lives to their full potential, create the right environment, sustain jobs, help restore the economy, and to finally look after the most vulnerable people in the society. One of the key goals of this framework is to '...Increase the proportion of people who are healthy at all stages of life'.

Health and wellbeing are determined by various factors including, social, economic, and environmental conditions. While the sections above have provided details on current social and economic conditions of the local area, it is also important to note the existing health status and environmental conditions that are likely to affect the health of the existing and future population for the area. This section captures some information on the level of disability, persons that smoke, total number of carers, mortality and its causes and healthy life years at birth and at 65 years. While some data was available at Electoral Division Level, some of the data was only made available Local Electoral Areas, County Level or National Level. Therefore, the context has been analysed on the basis of granularity of the data. With regard to environmental factors – data in relation Water Quality for the Study Area have been noted.

Healthcare Services

The healthcare facilities are illustrated in Figure 13.6 below. These healthcare facilities include a dentistry practice, a health centre, an optician, pharmacies (4), and speciality facilities (5). As seen in figure 4.9 below, healthcare facilities are generally centred towards the northern portion of the Study Area within the town centre.



Figure 13-6 Healthcare Facilities in the Study Area

Table 13-8 Existing Healthcare Facility types identified within c. 2km radius of subject site

Type	Facilities
Hospitals and Health Centres	Ratoath Medical Centre
Pharmacies	Ratoath Pharmacy, Kavanagh's Pharmacy, Lilly's Pharmacy, Stack's Pharmacy
Speciality Clinics	Ratoath Eyecare, Ratoath Sports Injury Centre, Ratoath Physiotherapy, Ratoath Dental Centre, Vitality Holistic Therapy, Ratoath Orthodontics, Clinico Aesthetics
Nursing Homes	Ratoath Manor Nursing Home

Pobal Deprivation Index

The Pobal Deprivation Index for the small area population defining the Study Area boundary (in 2022) was also reviewed. The Pobal HB Deprivation Index is Ireland's most widely used social gradient metric, which scores each small area (c. 100 households) in terms of affluence or disadvantage. The Index uses information from Ireland's census, such as employment, age profile and educational attainment to calculate this score.

While majority of the population being 'At work', the Study Area as per the 2022 Pobal Deprivation Index recorded a predominantly 'Marginally Above Average' or 'Affluent' population, with a portion of areas falling under the 'Marginally Below Average' category (Figure 13.6). Compared to the 2016 Pobal Deprivation Index, there has been a shift toward less affluence, with an increased geographic

distribution of 'Marginally Below Average' or 'Marginally Above Average' territories, while the number of 'Affluent' areas has decreased.



Figure 13-7 Pobal Deprivation based on 2022 Small Area Data.

A study by Wang, J., & Geng, L. (2019), on the 'Effects of Socioeconomic Status on Physical and Phycological Health...', examined the impact of socioeconomic status on health and focused on the mediating role of lifestyle. The main findings of this study indicated that, socioeconomic status was significantly associated with physical health, but not psychological health. The study also concluded that lifestyle had a significant positive effect on both physical and phycological health and that lifestyle mediated the relationship between socioeconomic status and health.

The study also found that the impact from socioeconomic status on health is reflected in three aspects of an individual's life: occupation, income, and education. People with higher professional status enjoy more work autonomy, engage in less manual labour, have fewer occasions of being exposed to health risks. Likewise, higher incomes are usually associated with better nutritional status, housing conditions, medical services, etc. Additionally, people with higher levels of education tend to have better health awareness, access, and health-related knowledge.

The following section details the status of health within the Study Area, where available, to establish how the proposed development might impact (positive, negative, no impact etc.) the existing population, their socioeconomic status and health conditions.

Self-Evaluated Health Status

The Census records the self-evaluated general health status of respondents (as opposed to the health status confirmed by medical practitioners). In terms of general health and wellbeing, disparate changes were recorded throughout the spectrum as seen in Table 13.7 below.

Table 13-9 Study Area Population by General Health and Gender

General Health	Male			Female			Total			
	2016	2022	% Chang e	2016	2022	% Chang e	2016	2022	% Chang e	2022%
Very good	3,907	3,673	-6.0%	3,957	3,770	-4.7%	7,864	7,443	-5.4%	62.6%
Good	1,196	1,506	25.9%	1,234	1,611	30.6%	2,430	3,117	28.3%	26.2%
Fair	227	301	32.6%	267	333	24.7%	494	634	28.3%	5.3%
Bad	41	35	-14.6%	59	60	1.7%	100	95	-5.0%	0.8%
Very bad	6	9	50.0%	3	5	66.7%	9	14	55.6%	0.1%
Not stated	104	307	195.2 %	81	284	250.6 %	185	591	219.5 %	5.0%
Total	5,481	5,831	6.4%	5,601	6,063	8.2%	11,082	11,894	7.3%	100.0 %

From the table above, there was a noticeable decline in self-evaluated general health status in the Study Area during the 2016–2022 intercensal period. "Although the majority of the population reported 'Very good' health in 2022, this figure decreased by 5.4% overall from 2016, leading to a drop from 71% to 62.6% of the total population, with a decrease of 6.0% for males and 4.7% for females. In contrast, the number of people with 'Good' and 'Fair' health increased by 25.9% and 32.6% respectively, reaching 26.2% and 5.3% of the total population in the Study Area. However, despite this negative trend, the share of the population declaring 'Bad' and 'Very bad' health remains less than 1%, compared to the Meath region's 1.4% and the national average of 1.7%.

Population with Disabilities

Around 16.1% of the Study Area population have some form of disability, up from 9.4% in 2016. The proportion of people with disabilities appears to be slightly higher for males (16.3%) compared to females (15.9%). However, this is less than the average for the Meath region (19.6%) and the State (21.5%).

To further look at the prevalence of disabilities across age-groups, data for the Ratoath town has been considered – as age wise information at the Electoral Divisions level was unavailable at the time of drafting this Chapter.

An age-wise proportion of persons with any extent of disabilities for Ratoath is set out in Figure 13.8. As expected, there is a direct correlation between the proportion of the population with a disability and their age. A comparatively higher portion of people in the age profile 60 to 85 years and over have a disability of some extent, compared to those below 50 years.

Ratoath, similar to the Study Area, has an almost equal proportion of males and females with a disability. However, there are slight disproportions in some age cohorts. Notably, there is a higher proportion of males aged 0-15 and 70-79, and females aged 20-29 and 35-45 with disabilities. It is worth noting the high rate of females with a disability in the age group 25-29 (23%), which is significantly higher than in other groups before 55 years old.

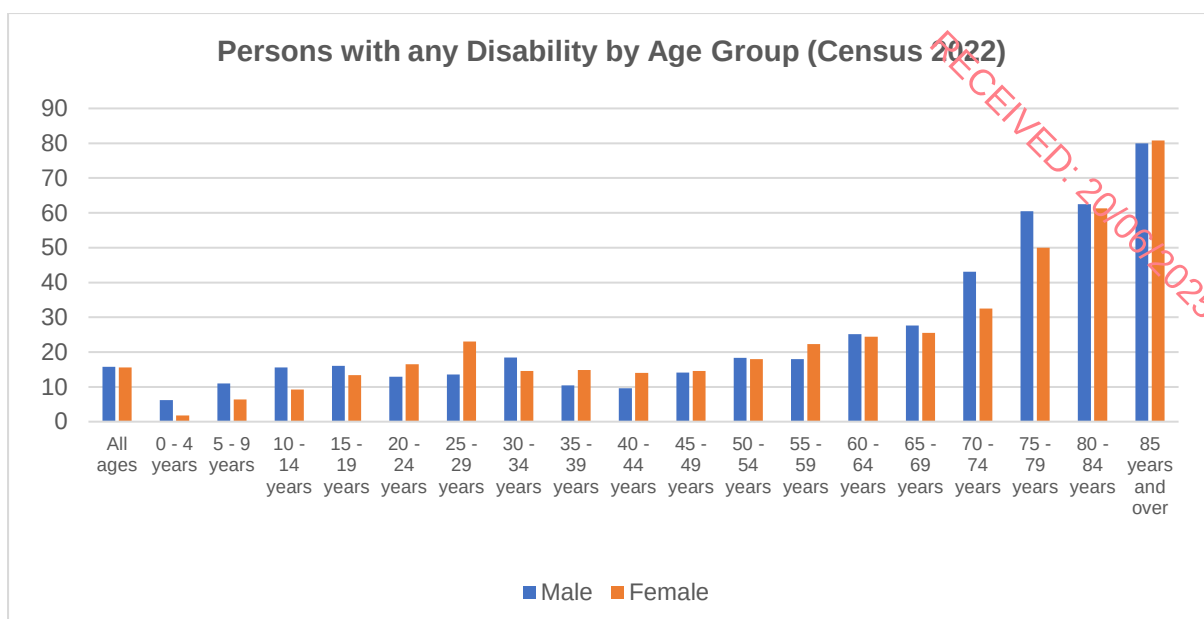


Figure 13-8 Persons with any Disability by Age-Group (Census 2022)

As per the WHO, persons with disabilities are generally more susceptible to poorer health, mortality, and experience increased limitations in everyday functioning than others. Poverty, exclusion from education and employment, and poor living conditions all add to the risk of poor health and unmet health care needs among persons with disabilities.

In that regard, as per Census 2022, the total number of carers for the Study Area was recorded at around 5% of the total population. This is an average of one carer for every 3 disabled persons within the Study Area.

Population that Smokes:

As per the Healthy Ireland Outcomes Framework, lifestyle factors such as smoking, drinking, inactivity and obesity have the potential to reverse many healthy gains. In that regard, the Framework notes that as per the 2021 Healthy Ireland Survey, smoking rates increased slightly between 2019 and 2021 despite there being a steady decline for a number of years prior to this.

The Study Area, as per Census 2022, has around 9.1% of the total population that smoke and about 85.3% that do not smoke (Table 13.10). The Study Area has a comparatively lower proportion of smokers than the Meath region and the State, where 12.3% and 13.1% of people smoke, respectively.

Table 13-10 Persons that smoke and do not smoke within the Study Area as of Census 2022

Category	Persons	% of Total
Persons who smoke	1,087	9.1%
Persons who don't smoke	10,149	85.3%
Non stated	658	5.5%
Total persons	11,894	100.0%

A number of smoking related health issues have been noted in the Healthy Ireland Outcomes Framework (2022), which states that while much progress has been made in tackling smoking in Ireland, there is a continuing toll of smoking-related disease, especially for groups with higher past or present smoking rates.

Healthy Life Years:

It is noted that the national Healthy Life Years (HLY) at birth observed an overall increase (in both sexes), between 2016 and 2019 from 68.5 to 69.6 years. However, there is a visible decline during 2020, to 66.2 years (Table 13.11). This is a drop of around 3.4 years between 2019 and 2020. There is a generally higher number of healthy life years noticeable for female in the State than male.

Table 13-11 National Healthy Life Years (HLY) at Birth (CSO)

Year	Both Sexes	Male	Female
2016	68.5	67.2	69.8
2017	68.6	67.9	69.3
2018	69.4	68.3	70.4
2019	69.6	68.6	70.5
2020	66.2	65.3	67.1
2021	67.2	66.4	68.0
2022	66.0	65.2	66.8

Healthy Life Year at birth is a measure used across EU and is defined as the average number of years that a new-born child can expect to live in a healthy condition and free from disability (Healthy Ireland Outcomes Framework 2022). A major implication of the reduced healthy life years / falling life expectancy in Ireland can be associated with the Covid19 Pandemic, which was also observed for most countries throughout 2020.

Water Quality:

The water supply zone for Ratoath, Co. Meath, Ireland is South Louth & East Meath. A water sample which contains higher levels of a parameter than the regulations allow, is called an exceedance. When this happens, Uisce Éireann carries out a risk assessment. If there is a risk to public health, the Health Service Executive (HSE) is consulted with, to agree on the next steps, which may include informing the public.

Table 13-12 Summary of the Water Quality for the South Louth & East Meath generated for 2024.
(Source: Water Quality & Drinking Safety Advice in Ireland | Uisce Éireann)

Parameter	Unit	Tests Undertaken	Exceedances	Pending Review	% of Tests within Exceedance Limit
Bacteria and Protozoa		12	0	0	100%
Metals		6	0	1	100%
Other		18	1	0	94.44%

Water quality of the water supply zone within which the subject site is located in, seems to be mostly in 100% compliance with limits with a minor level of exceedances noted for parameters described as 'other'.

13.4.5 Social Infrastructure and Amenities

Social Infrastructure (SI) is defined by the European Association of Long-Term Investors¹³ as a subcategory of infrastructure that are physical assets in the social sector that provide personal (individual/household) benefits and community benefits to increase social cohesion. The figures below provide an overview of the social infrastructure available within proximity to the subject site.

As visible in the series of maps below, a variety of different Social Infrastructure (SI) and Amenity facilities are within close proximity to the subject site. Table 13.13 below lists the number of SI facilities within two kilometres from the site. Separately, a detailed Social Infrastructure Audit (SIA) has been prepared as part of this application and is provided as a separate enclosure. The information set out in this part of the impact assessment aligns with the information set out in the SIA.

Table 13-13 Social Infrastructure and Amenities Within 2km from Proposed Development

Services / Facilities	Total Facilities within the 2km Study Area
Creche	8
Primary School	3
Secondary School	1
Arts and Cultural	6
Community	5
Healthcare	13
Open Space and Recreation	17
Religious Institutions	2
Retail Centres and Services	18

Social infrastructure near the subject site caters for different age groups and family cycles resident in this area. In total, there are 8 creches available to provide childcare for parents with small children, with an additional childcare facility also proposed as part of this application. Separately, there are 3 primary schools and 1 no. post primary school located within the Study Area also. A range of healthcare facilities are accessible in the Study Area, in addition to 17 no. open space and recreation facilities.

Childcare and Education Facilities

There are three primary schools and one post-primary school located within the Study Area. In addition, there are also eight childcare facilities within the Study Area. As visible from Figure 13.9 below, all education facilities are located to the north of the subject site. Table 13.14 lists the schools (primary and post primary) in the area, as well as the number of pupils over the last two academic years as recorded by the Department of Education and Skills.

¹³ Fransen, L., del Bufalo, G., Reviglio, E. (2018). Boosting Investment in Social Infrastructure in Europe, Report of the High-Level Task Force on Investing in Social Infrastructure in Europe 2018. [PDF File]. Retrieved from: https://economy-finance.ec.europa.eu/system/files/2018-01/dp074_en.pdf



Figure 13-9 Education Facilities in the Study Area

Table 13-14 Primary and Post Primary Education Facilities in the Study Area

Official Name	Type	DES Enrolment Figure by Academic Year		Change in Enrolment Figure
		2020/2021	2023/2024	
PRIMARY SCHOOLS IN STUDY AREA				
Ratoath Junior N S	Primary	334	254	-80
Ratoath Senior N S	Primary	480	405	-75
St Paul's N S	Primary	640	576	-64
TOTAL		1,454	1,235	-219
SECONDARY / POST-PRIMARY SCHOOLS IN STUDY AREA				
Ratoath College	Post-Primary	1,091	1157	66

As illustrated in 13.4 above, there has been a notable reduction in the number of children enrolled in primary schools in the area, with a net decrease of 219 pupils over the past four academic years; the most notable of which being Ratoath Junior National School (-80).

In contrast, an increase is noted in the enrolment figures of the secondary school in the Study Area, of which its enrolment increased throughout the four academic years. A likely explanation for this would be changing demographics in the area, as illustrated in Section 13.4.1 above.



Figure 13-10 Childcare Facilities in the Study Area

There are eight childcare facilities within the Study Area, of which 3 provide all-day and sessional childcare and other provide only sessional childcare.

Table 13-15 Childcare Facilities within the Study Area

Official name	Service type	Túsla Records ¹⁴	
		Capacity 2023	Age profile
Flintstones Pre-school	Sessional	no data	2-6 years
Forever Friends Pre-school	Sessional	30	2-6 years
Fox Lodge Manor Montessori & Playschool	Full day/Part time/Sessional	70	2-6 years
Happy Days (Ratoath)	Sessional/Part time	46	2-6 years
Little Robyn's Montessori	Sessional	11	2.5-6 years
Millview Childcare	Full day/Part time/Sessional	60	0-6 years
Ratoath Childcare Centre Limited Building B	Full day/Sessional	104	0-6 years
Seagrave Montessori	Sessional	15	2-6 years
All Childcare Facilities		336	

¹⁴ Source: Túsla Register of Early Years Services by County. Available at: <https://www.tusla.ie/services/preschool-services/early-years-providers/register-of-early-years-services-by-county/>

Retail Services

A variety of retail offerings of different size and diversity are available in the Study Area – Figure 13.11 and Table 13.16. There are multiple food/grocery retail offerings close to the subject site, with Centra, Tesco Express and Supervalu supermarkets all within close proximity. An overview of retail facilities in the surrounding area is also provided in the accompany SIA and Planning Report to this application

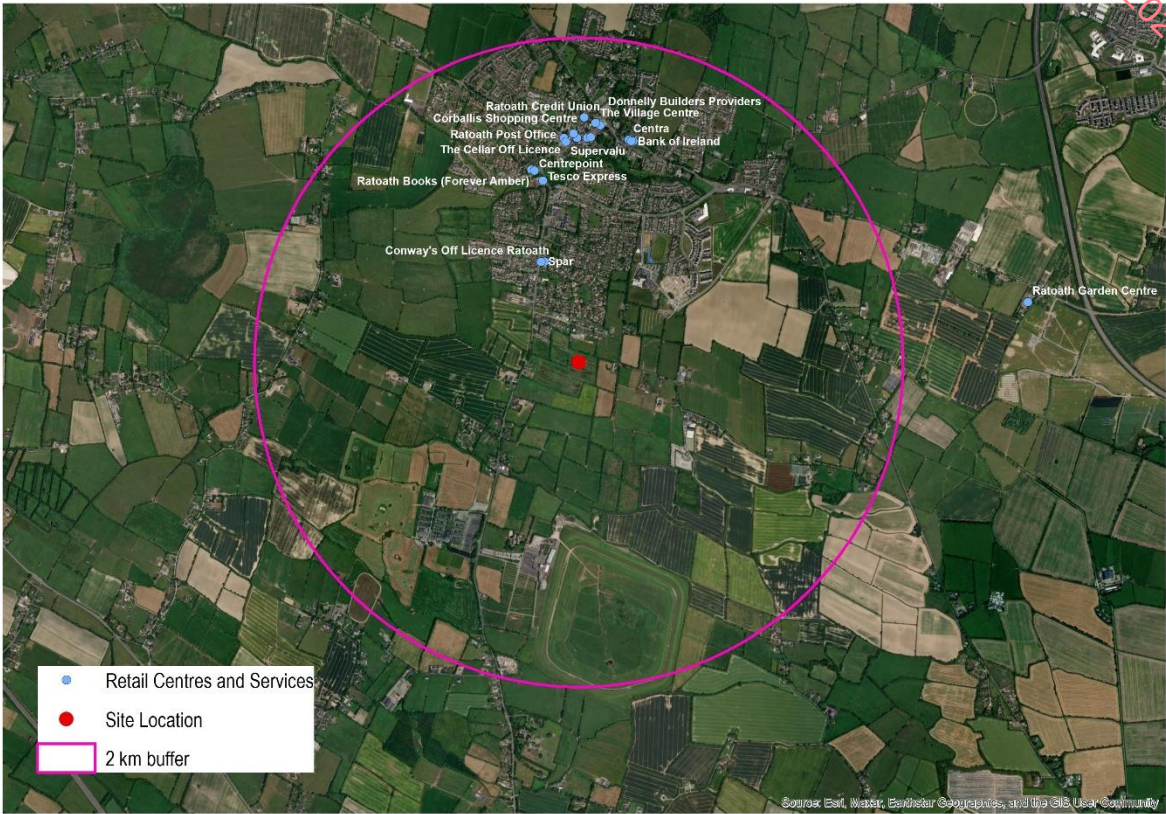


Figure 13-11 Retail Facilities within 2km of the Study Area.

Table 13.16 Existing Retail Facility types identified within c. 2km radius of subject site

Type	Facilities
Shopping Centres	Corballis Shopping Centre, The Village Centre, Centrepont (neighbourhood centre)
Supermarkets and Specialty Foods	Supervalu, Tesco Express, Dolan's Butchers, Tony's Butchers
Comparison Shops	Homeworld, Donnelly Builder's Providers, Ratoath Books (Forever Amber), Ratoath Garden Centre
Convenience and Off Licences	Centra, Spar, Conway's Off Licence Ratoath, The Cellar Off Licence
Other Retail Services	Ratoath Post Office, Ratoath Credit Union, Bank of Ireland

Access and Transport

The subject site is approximately 2km from the Ratoath town centre and is located within 5.5km distance from the M2 entrance and 10km distance from the M3 entrance which links to Dublin. The nearest train station is M3 Parkway approximately 10km to the south of the subject site with regular commuter service to Dublin Connolly Station.

In addition, Ratoath is well serviced by public transport, with numerous bus stops located within and adjacent to Ratoath town centre (most of which are within 2kilometres of the subject site). Specifically, Bus Eireann route 103 typically runs every 20-40minutes from Ratoath town centre to Dublin city centre with an average journey time of less than one hour. There is also a regular bus (105) serving Drogheda – Dublin and a service (109A) linking Ratoath to DCU, Dublin Airport and Navan.

The main transportation arteries in the study area are Fairyhouse Road, Meadowbank Hill, The Avenue, R155 and Main Street (R125) with the proposed Ratoath Outer Relief Road (RORR) acting as a key link for the area and facilitating access to the proposed development.

Existing mode of travel within the Study Area

According to the latest Census 2022 results, there is a notable difference in transportation behaviour within the Study Area between work commutes and journeys to school, college, or childcare. While 66% of individuals prefer to use a car for their work commute, compared to 10% who utilize 'Green Transport' (Bus, Bike, Walk, Luas, DART...), the trend is reversed for journeys to educational institutions and childcare, where 56.8% favor 'Green Transport' and 37% use a car. Overall, cars account for 55% of all travel modes, while 29% of travelers opt for 'Green Transport'. This pattern of transportation behaviour remains consistent with the Census 2016 results, where 61% preferred car travel, and approximately 30% used 'Green Transport'.

Table 13-16 Population Aged 5 years and over by means of travel (Census 2022)

Work	School, College, or Childcare	Total
Green Transport		
576	2,226	2,802
10.0%	56.8%	29.0%
Car (or passenger)		
66%	37%	55%

Community and Civic Services

The community services available in the Study Area are set out in Table xx. This comprises of a community centre, scout hall, farmer's market and men's shed. The Study Area is also served by a small number of Arts & Culture facilities, including the Venue Theatre, Ratoath School of Music, Clarke Art School, Fit Teens Dance Class and other attractions like the Grotto and Tattersalls Ireland Country House. Figure 13.12 and Figure 13.13 below identifies the location of these assets in the context of the subject site.



Figure 13-12 Community Services and Facilities within 2km of the Study Area



Figure 13-13 Art and cultural facilities within 2km of the Study Area

Table 13-17 Existing Community Facility, Arts and Cultural Facility types identified within c. 2km radius of subject site

Type	Facilities
Community and Social Services	Ratoath Community Centre, Ratoath Men's Shed, 9 th Meath Scout Den, Ratoath Allotments, Fairyhouse Market (weekly)
Libraries	None within 2km study area - Others within c. 10km: Ashbourne Library, Dunshaughlin Library
Arts and Cultural Facilities	The Venue Theatre (Ratoath Community Centre), Ratoath School of Music, Clark Art School, Fit Kids/Fit Teens Dance Class
Other Attractions	The Grotto, Tattersalls Ireland Country House

Sports and Recreation

A total of 17 Sports and Recreation facilities are available within the 2km radius of the subject site. This comprises of 14 sports facilities providing various sports activities, a park, playground and allotments. Figure 13.14 below identifies the location of these assets in the context of the subject site.



Figure 13-14 Sport and Recreation Facilities within 2km of the Study Area

Table 13-18 Existing Open Space and Recreation Facility types identified within c. 2km radius of subject site.

Type	Facilities
Sports Centres and Grounds	Ratoath Community Sports Complex (Jamestown Sports Campus), Ratoath Athletics Club, Ratoath GAA (Sean Eiffe Park), Ratoath Harps AFC and Main Astro Pitches, Ratoath College Astro Pitches, Ratoath Rugby Club, Ratoath Tennis Club, Ratoath Boxing, Ratoath BMX Club
Parks, Playgrounds, Nature Trails and Gardens	Steeplechase Green and Playground, Ratoath Broadmeadow Riverwalk, Ratoath Allotments
Golf Courses	Ratoath Pitch and Putt Club
Equestrian Centres	Fairyhouse Racecourse
Other Training Facilities	Ratoath Fitness Studio, Fitness Factory, The Yoga Room

13.5 Impact Assessment

This section provides a description of the specific, direct, and indirect impacts that the Proposed Development may have during both its construction and operational phases. Potential impacts are assessed under the following headings: Population and Household Characteristics; Economic Activity and Employment; Human Health and Social Infrastructure and Amenities. For a more detailed assessment of potential impacts associated with other environmental factors, please refer to the specific chapters of the EIAR.

The analysis comprises a study of the key assessment themes as well as consideration of the construction and operational phase, with a conclusion reached in relation to the proposed development on the environment. The baseline characteristics are as described above. The characteristics of this impact assessment are defined below, as per the EPA Guidelines on the Information to be Contained in Environment Impact Assessment Reports (EPA 2022).

Table 13.20 provides an overview of the significance of effects arising from the Construction and Operational Phases of the Proposed Development and has been determined on the basis of their environmental sensitivity and the magnitude of change.

Table 13-19 Summary Impact Assessment – Population and Human Health Population and Household Characteristics

Characteristics	Significance of Effects / Impact Assessment
Construction Phase	
Population and Household	Likely negative moderate short-term
Economic Activity and Employment	Likely positive moderate short-term
Human Health	Likely neutral slight temporary
Social Infrastructure:	
<i>Childcare/Creche Facilities</i>	Unlikely neutral slight temporary
<i>Schools</i>	Unlikely neutral slight temporary

<i>Retail</i>	Likely positive moderate short term
<i>Access and Transport</i>	Unlikely neutral imperceptible temporary
<i>Amenities and Open Space</i>	Unlikely neutral imperceptible temporary
<i>Local Attractions and Tourism Activities</i>	Unlikely neutral imperceptible temporary
Operational Phase	
Population and Household	Likely positive significant permanent
Economic Activity and Employment	Likely positive moderate permanent
Human Health	Likely positive moderate permanent
Social Infrastructure:	
<i>Childcare/Creche Facilities</i>	Likely positive significant permanent
<i>Schools</i>	Likely neutral moderate permanent
<i>Retail</i>	Likely positive significant permanent
<i>Access and Transport</i>	Likely positive significant permanent
<i>Amenities and Open Space</i>	Likely positive significant permanent
<i>Local Attractions and Tourism Activities</i>	Unlikely neutral imperceptible temporary

13.5.1 Population and Household Characteristics

Construction Phase

The construction phase of the Proposed Development may give rise to short term impacts on the local population associated with traffic and transport generated by heavy goods vehicles (HGVs) travelling to and from the development site. 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 stage. It should be noted that construction trips will occur outside of the traditional peak hours, and it is not considered that this level of construction traffic would result in significant impacts.

Residents of homes situated at locations close to the site are most likely to experience effects arising from the development. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. In this regard, please refer to Chapter 5 Air, Chapter 6 Climate, Chapter 7 Noise and Vibration, Chapter 10 Landscape and Visual and Chapter 14 Material Assets – Traffic and Transport. These impacts will not be of a scale to either encourage people to move from the area or discourage people from moving to the area.

Probability	Quality	Significance	Duration
Likely	Negative	Moderate	Short-Term

Operational Phase

The operational phase of the proposed development will result in the provision of 364 no. residential units. This will provide accommodation for approximately 1,092 persons, based upon an indicative occupancy rate of 3 persons per unit (as per the Meath average household size – Census 2022).

The uplift in local population generated by the proposed development will contribute to meeting the new national housing target of 50,000 additional homes per annum to 2040, as set out in the revised NPF. Further, these homes will be delivered in accordance with compact growth policies targeting a greater proportion (40%) of future housing development to be within the existing footprint of built-up areas. As stated in the revised NPF, the Eastern and Midland Region is expected to grow in population by approximately 470,000 additional people between 2022 and 2040 (c. 690,000 additional people over 2016-2040) i.e. a population of almost 3 million. The scheme will respond, at a localised scale, to the housing need generated by this significant level of growth, at a level that is proportionate and appropriate to Ratoath, in alignment with the MCDP Core Strategy household allocations.

The proposed scheme also delivers a creche facility, retail unit and cafe and new parks / public open spaces. These facilities will ensure the future occupants of the scheme will have an appropriate level of essential services and amenities available to them without placing significant additional pressure on existing resources and facilities in Ratoath.

The completion of the RORR, as proposed alongside the LRD scheme, will bring benefits to the wider community enhancing connectivity and easing congestion through the town.

On consideration of the above, the proposed development will have a significant permanent positive impact on population and households.

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

13.5.2 Economic Activity and Employment

Construction Phase

The construction of the Proposed Development is likely to have a positive effect on economic activity and employment. The development in the short term will provide for increased construction related employment. During the construction phase, businesses directly involved in the sector and those indirectly involved in the supply chain would generate economic benefits that would provide for a positive net impact on the economy. The construction phase will also provide for indirect positive impacts through spending in local businesses around the site, such as retail services, together with wider benefits in the construction sector, building materials supply services and professional and technical professions. These beneficial impacts on economic activity will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the phased construction period.

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Short Term

Operational Phase

The operational phase of the Proposed Developments will result in the provision of a total of 364no. residential units. In total, the development will provide accommodation for approximately 1,099 persons. Considering the number of people in employment in the area based off 2022 census data (67.2%) it can be expected that circa 738 of the population generated will be working. This increase in occupancy in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local employment generating opportunities.

Therefore, in the long term, the proposed development is likely to provide additional spend in the local shops and restaurants, providing a positive impact. The increased number of residents in the area will also create additional demand for ancillary services such as barbers/salons, dry cleaners etc., which would strengthen the retail mix. Separately, the proposed development also includes the provision for a retail unit, cafe and a creche facility – all of which will generate local employment opportunities. It is considered that these elements of the development will bring a positive impact on economic activity and employment in the area, as they will provide both part-time and full-time employment and also contribute to the existing retail / commercial provision on offer in the locality.

The RORR will divert passing traffic from Ratoath town centre reducing congestion and enhancing safety for pedestrians and cyclists within the town centre.

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Permanent

13.5.3 Human Health

Construction Phase

The construction phase of the Proposed Development may give rise to short term impacts to the locality such as, construction traffic and surface contaminants, dust, exhaust emissions, noise, and littering, and potential impacts on water quality. These impacts are considered in the relevant topic assessments in the applicable chapters of this EIAR, including Chapter 5 Air, Chapter 6 Climate, Chapter 7 Noise & Vibration and chapter 12 Water, from which the subsequent impact on human health has been considered. In terms of implications for human health, the following is noted:

Air

During the construction stage the greatest potential for air quality impacts is from fugitive emissions impacting nearby sensitive receptors – this includes but is not limited to the residential dwellings adjacent to the development site. As described in Chapter 5, the local area is considered of low sensitivity to human health impacts from dust emissions. The scale and nature of the construction works were reviewed, and it was determined that a high level of dust control was required for the construction phase of the proposed development.

Climate

As stated in the assessment of impact on climate in Chapter 6, there is no impact on climate due to air quality

Traffic and Transport

Construction phase traffic can also impact air quality, particularly due to the number of HGVs accessing the site. Construction phase traffic levels were reviewed, as detailed in Chapter 14 Traffic and Transport, and it was found that the change in traffic was not of the magnitude to require a detailed assessment or likely to be impact on human health.

Land, Soils and Geology

Chapter 11 on Land Soil and Geology notes the potential for chemical contaminants in site soils and/or groundwater which may, if unmitigated for, pose a risk to human health. The chapter has also provided appropriate mitigation measures to minimise this risk.

Noise and Vibration

Chapter 7 describes the noise, and vibration impacts which may create some temporary nuisance and disturbance to residential amenity. While moderate construction noise impacts are expected to occur

when work is ongoing at boundary locations adjacent to noise sensitive locations this is not of a scale / level or duration that will impact on human health.

Water

The likely effects of the construction phase on human health will be slight and short term. Therefore, the proposed development does not have any negative significant effects on human health. The appointed contractor will adhere to the relevant HSE guidelines and any Government protocols that may be in place, if any, during the construction phase. If all health, hygiene, and safety measures are followed, then it is considered that there will be no health risks arising from the Proposed Development.

On balance, the assessment of impacts on human health arising from the construction phase of the proposed development is as set out in the table below.

Probability	Quality	Significance	Duration
Likely	Neutral	Slight	Temporary

Operational Phase

The operational stage of the development is unlikely to cause any adverse impacts on the existing and future residents of the locality in terms of human health. The design of the development has been formulated to provide for a safe environment for the future residents, providing quality outdoor spaces to support recreation and an active, healthy lifestyle. The paths, roadways and public realm have been designed in accordance with the best practice and applicable guidelines. All open areas have been designed to be inviting, safe and conveniently located. The central open space proposed will in time, in alignment with MP37 principles, connect onto open space on adjoining lands to the west, to create a large central park for the wider community.

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Permanent

13.5.4 Social Infrastructure

Construction Phase

Childcare / Creche Facilities

During the construction phase, the childcare and creche facilities within close vicinity of the subject site might be temporarily impacted by construction noise, traffic, and emissions.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Slight	Temporary

Primary and Post Primary Schools

During the construction phase, the impact on primary and post primary school facilities is expected to be minimal. Although there are 3 primary schools and 1 secondary school located within 2km of the subject site, all schools are located closer to Ratoath town centre, north of the subject site.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Not significant	Temporary

Retail

The construction phase will bring indirect positive impacts through spending in local retailers around the site. This is likely to be felt most by convenience goods retailers in the area.

Probability	Quality	Significance	Duration
Likely	Positive	Moderate	Temporary

Access and Transport

The construction phase of the RORR will give rise to additional construction related trips on the local road network. No diversions or road closures are anticipated that would give rise to impacts on accessibility and the existing transport network. Chapter 14 Traffic and Transport details that there will be increased vehicle and HGV movements, however, these will be routed to use the most appropriate routes to limit the associated impact and minimise potential interaction with vulnerable road users where possible. Further, the urban nature of the local road infrastructure lends itself to lower speeds and the limited increase in vehicle numbers means there is expected to be no real increase in risk to other vulnerable road users.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Imperceptible	Temporary

Amenities and Open Space

Construction of the Proposed Development will take place on a greenfield site located to the south of Ratoath town centre. As such, the Proposed Development will not negatively impact amenities of open space on the development site, as the site is not currently in use. Chapter 14 'Landscape and Visual' assesses the impact on landscape character, which is expected to be temporary during the construction phases of development. These impacts will be short term until such a time as construction is finished and the proposed high-quality landscaping matures. In any event the impacts are not considered to be significant from a population and human health perspective.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Imperceptible	Temporary

Local Attractions and Tourism Activities

It is not expected that the construction of the proposed development would have a negative impact on the local/tourist attractions in the area. The closest attraction to the subject site is Emerald Park which is located c. 10 minutes' drive from the site.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Imperceptible	Temporary

Operational Phase

Childcare / Creche Facilities

Section 4.7 of the 'Sustainable Urban Housing: Design Standards for New Apartments' (2018) guidelines state that in relation to childcare facilities:

"... the threshold for provision of any such facilities in apartment schemes should be established having regard to the scale and unit mix of the Proposed Development and the existing geographical distribution of childcare facilities and the emerging demographic profile of the area. One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms."

Accordingly, discounting the one-bedroom units and 30% of two-bedroom units in accordance with the Apartment Guidelines, childcare space is required for 300 dwellings. Applying the Childcare Facilities Guideline standard of 20 places per 75 no. dwellings, the total requirement arising from the scheme is

80 places. However, not all children in the 0-6 age cohort will require private childcare. The CSO's Census 2022 provides a study specifically on childcare. This release is especially relevant for the purposes of this assessment as it indicates the extent to which childcare facilities are utilised by the general population. Table 6.18 shows the range of methods parents use for childcare for their pre-school children (0-4 years) in Meath County compared to the larger State.

Table 13.21: Type of Childcare Utilised by Parents of Pre-School Children (0-4 years).

Type of Childcare	Meath	State
Not in childcare	50.1%	49.5%
Unpaid relative or family member	10.2%	9.7%
Paid relative or family member	2.9%	2.2%
Childminder (in childminder's home)	9.5%	7.7%
Au pair/nanny/childminder (in child's home)	2.1%	2.1%
Creche/Montessori/playgroup/after school	24.7%	28.3%
Other (including special needs facility, breakfast club)	<1%	<1%
Type of childcare not stated	<1%	<1%

Half of pre-school children in Meath are cared for by their parents (50.1%), with only c. 25% of pre-school children attending a childcare facility compared to 28.3% nationally.

Applying the figure above of people who utilise the services of a childcare facility in the Meath County (25%), it is anticipated that the proposed development would create an actual demand of 18 children (according to the Childcare Guidelines calculation set out above of 300 units).

It is however acknowledged that the 25% CSO's Census estimate for the Meath Region is an average and one would expect the percentage to be greater in areas where there are higher instances of both parents working, and therefore requiring private childcare. Therefore, in order to stress test this estimate, it is assumed that 40% of children aged 0-6 years in the development may require private childcare. On this basis, circa 29 pre-school childcare places would be required.

In any event, the proposed childcare facility included as part of this development will have ample capacity to accommodate any childcare needs arising from the development – with a floor area of 692.85sqm it has a capacity to cater for up to 115 children. Given the estimated number of spaces generated by the proposed development, the crèche will also be able to cater for additional need arising for childcare spaces in the wider area.

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

Primary and Post Primary Schools

A schools capacity assessment was undertaken as part of the Social Infrastructure Audit prepared and submitted as part of this application (as referred to in Section 13.4.5 above. This assessment determined the likely number of schools spaces required by the future occupants of the proposed development, as set out here in Table 13.22.

Table 13.22

	Study Area Population in 2022	Estimated school going population for the Proposed Development
	% Share	
Primary School	12.9%	128

(5-12)		
Post Primary School (13-18)	9.3%	92

Based on an average household size for Co. Meath of 3.02, the estimated population of the development will be 1,099 people. In order to estimate the primary and post primary school child yield generated from the development, the population generated by studio and 1-bedroom apartment units have been discounted given their improbability of generating a child yield and in accordance with the Apartment Guidelines previously noted. Therefore, 329 no. units at an average of 3.02 persons per household will yield an estimated population of 994 persons.

Based on the 2022 Census figures for the co. Meath, the population estimate for the 5-12 age cohort (primary school) (12.92%) is estimated to be 128 children. the population estimate for the 13-18 age cohort (Post primary school) (9.3%) is estimated to be 92 (please refer to SIA report accompanying this application). However, the Proposed Development will not generate this level of demand instantly given that the development will be constructed in a phased manner. It is expected that the primary and post primary school facilities in proximity of the Proposed Development will sufficiently absorb the school going population generated by the development, as per the assessment of schools capacity summarised in Section 13.4.5 above and detailed in the Social Infrastructure Audit (SIA) report accompanying this application.

Probability	Quality	Significance	Duration
Likely	Neutral	Moderate	Permanent

Amenity and Open Space

The Proposed Developments will contribute to the existing network of pedestrianised public open space and landscaped areas in the area. The development proposal delivers on the requirement set out in the Meath County Development Plan 2021-2027 to provide a public landscaped part with appropriate recreational facilities, as part of Master Plan (MP 37). A 0.4ha central open space is proposed to be delivered on the application lands. This central open space proposed will in time, in alignment with MP37 principles, connect onto open space on adjoining lands to the west, to create a public park of 0.7ha that can be enjoyed by the future residents of MP37 lands and the wider community.

The amenity and open space impacts likely to arise from the Proposed Developments will be positive over the long term as it will add to the character and aesthetics of the existing site. Moreover, the layout of the Proposed Development and generous quantum of public open space serve to mitigate any impacts through sensitive urban and landscape design. The design of the Proposed Development's residential and public space offerings serves to improve and add to the visual character and identity of the surrounding areas and, as such, the impact is considered to be positive for the site. The planned landscaping will mature over the long term and create public spaces that are conducive to enjoyable public interaction. Please refer to Chapter 14 'Landscape and Visual' of this EIAR for a more detailed assessment.

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

Retail

Once operational, the development will bring a new community of circa 1,000 people to support the viability of local retailers. A small, appropriately scaled retail unit is proposed for the neighbourhood centre as part of the scheme. This is of a scale that is commensurate with serving the convenience shopping needs of the residents of the scheme and will not detract from the core retail services in Ratoath town centre. Overall, there will be a positive, significant and permanent impact on retail in the area as a result of the completed, occupied scheme.

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Permanent

Local Attractions and Tourism Activities

The local/tourist attraction impacts likely to arise from the Proposed Development will be positive and permanent over the long term. The attractions will enjoy increased exposure through the higher volume of resident and visitor numbers to the area. The increased spending power will likely spill over into the local tourism and related supplementary services (transport, food and beverage services, tour operators, etc.), with the potential to create a range of additional employment opportunities.

Probability	Quality	Significance	Duration
Unlikely	Neutral	Imperceptible	Permanent

Access and Transport

The completed RORR will be an essential part of the local roads infrastructure providing access to the proposed LRD and opening up zoned lands for development. The road will provide a safe, well-designed route for motorists, pedestrians and cyclists and will bring significant benefits for the local community and anyone passing through or visiting the area.

Probability	Quality	Significance	Duration
Likely	Positive	Significant	Long-term

13.5.5 Risk of Major Accidents or Disasters

Construction Phase

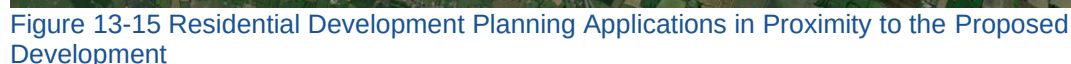
It is considered that the proposed development will not give rise to any impacts related to a major accident or disasters during the construction phase. Throughout the construction phase standard and regulated construction practices will be employed. The accompanying Construction and Environment Management Plan (CEMP) prepared by OCSC outlines measures that will ensure construction practices will limit the risk of accidents during the construction phase. It will also detail the storage measures for hazardous materials used during construction ensuring they do not give rise to a risk of pollution.

The works proposed in proximity to public roadways and footpaths will be governed by best practice and appropriate safety procedures, thus reducing any risk of a major accidents in public areas.

Operational Phase

The proposed development is not considered to be vulnerable to major accidents or disasters, and therefore the anticipated impacts are considered to be negligible. The site access, surrounding local roads and the pedestrian network of the proposed development has been designed to ensure risk of a major accident is avoided.

A record of planning applications within 2km of the subject site¹⁵ from **January 2020** to the end of May 2025 indicate that 5 residential planning applications (schemes of over 10 units) were granted permission, of which 3 have commenced, totalling to 466 units. This shows a continuous residential development over the last number of years mainly in the north and east part of Ratoath town, indicating demand for residential development in the area and the suitability of the area for higher density developments. The location of the fully commenced, commenced, and granted applications are indicated in Figure 13.12 below.



Construction

¹⁵ Sourced from An Bord Pleanála

Operational

It is noted a SHD development (Ref. SH305196) was granted on the adjacent lands permitting the construction of 114 no. apartments and 114 no. houses and a crèche facility. This scheme, which is currently under construction will, on completion, generate an uplift in the local population. It is noted that the scheme provides for a crèche facility which will cater primarily for its occupant population – in this regard, it is not likely, in combination with the development proposal, to place undue pressure on the local childcare network. It will, however, generate a requirement for school spaces. Given that this scheme is partially completed and is likely to be occupied when the proposed scheme, if granted, is under construction – it is not anticipated that there will be competing need for school spaces. It is also noted that the local school's system – at both primary and secondary level, appears to have relatively good capacity for future populations. This neighbouring scheme, forms part of the Masterplan 37 (MP37) lands, on which the proposed development is also located. The additional population generated by the proposed development in combination with the neighbouring schemes, has been anticipated, as noted by the MP37 designation and associated zoning. The new populations will require access to a sufficient level of social infrastructure available locally. This will have a positive impact on local businesses and service providers increasing the viability of for example, local retailers, and contributing to the vibrancy and prosperity of Ratoath. As with any area experiencing strong population growth, it is also reasonable to assume that market forces will respond to demand for a broadening of the existing service base available locally.

The impact of the proposed development, in combination with other approved schemes in the area will have a likely significant and permanent impact on population and human health. That impact is largely positive, significant and permanent in terms of providing homes for the considerable population growth forecasted.

13.7 'Do Nothing' Impact

This section considers the potential impacts should the Proposed Development not take place. In a 'Do Nothing' scenario, the subject site would remain as is and would potentially be left vacant thereafter. The environmental receptors discussed throughout this EIAR would in all likelihood remain unchanged while the potential for any likely significant adverse environmental impacts arising from the proposed development would not arise.

Consequently, in a 'Do Nothing' scenario, the potential for any significant positive impacts from the construction and operation of the Proposed Development would also not arise.

Moreover, a 'Do Nothing' scenario would involve the subject site remaining in its current underdeveloped, underutilised state. Subsequently, the site would not fulfil its local, regional and national planning policy objectives. The contribution the proposed scheme to delivering homes for the forecasted growth in population will not be realised.

13.8 Mitigation Measures

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. Through the provision of these remedial and mitigation measures, any negative impacts on population and human health during the construction phase shall be appropriately mitigated.

The Development have been designed to avoid negative impacts on population and human health through the design and provision of physical and social infrastructure. Mitigation measures are proposed throughout the various chapters of this EIAR to avoid any adverse impacts from the proposed

scheme and accordingly no further mitigation measures are considered necessary. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the Chapters of this EIAR which address other environmental matters such as Water, Air Quality, Climate Factors, Landscape and Visual Impact and Noise sufficiently address monitoring requirements. Readers are directed to Chapter 18 of this EIAR for a summary of mitigation measures proposed from this EIAR.

13.9 Residual Impacts of the Proposed Development

Any adverse likely and significant environmental impacts will be avoided by the implementation of the remedial and mitigation measures proposed throughout this EIAR. Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development. The overall predicted likely and significant impact of the construction phase will be short-term, temporary and neutral.

Overall, the long-term impacts of the completed (operational) development on population and human health are envisaged to be positive. The new population will deliver much needed homes for a rapidly growing population and a choice of housing option to suit various needs. The scheme will contribute to the economic viability of the area, increasing local spending power, and the development of a new creche, commercial unit and public open spaces will add to the viability and vibrancy of the area. Local businesses, transport, schools, etc. will benefit from the increase in resident population, and this will deliver a further economic injection into the area.

The mix of residential tenure will provide a more sequential, balanced approach to Ratoath. Furthermore, the development will provide much needed residential dwellings in a location that provides easy access to multiple retail, social infrastructure and amenity offerings to residents and visitors alike.

In addition, the scheme includes the provision of space for retail units and coffee shop, which will provide both part-time and full-time employment to the area, as well as adding to the vitality of retailing offering in the area. Importantly, the scheme also includes the development of a Creche facility. It is envisaged that this facility would provide employment to the area, as well as also offering additional childcare spaces to the wider area.

Finally, the proposals will also include the construction of the second phase of the Ratoath Outer Relief Road (RORR) which will run along the southern boundary of the subject site. The construction of this road will bring forward a critical piece of infrastructure for the area, reduce congestion in the town centre, contribute to safer streets and will therefore have a positive impact for all living and visiting the area.

13.10 Interactions

There are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to population and human health. The main high-level interactions between Population, Land, and Human Health and other environmental factors include Water (Chapter 12), Air and Climate (Chapter 5 and Chapter 6), Noise and Vibration (Chapter 7), Traffic and Transport (Chapter 14) and Landscape and Visual (Chapter 14). Please refer to the specific chapters of this EIAR where detailed assessments relating to these environmental topics are provided.

13.11 Monitoring

In relation to the impact of the development on population and human health, it is considered that the monitoring measures outlined in the chapters of this EIAR which address other environmental matters such as water, air quality and climatic factors, landscape and visual impact and noise sufficiently address monitoring requirements.

13.12 Difficulties Encountered

No notable difficulties were encountered in the preparation of this chapter.

13.13 References

All references are as listed in Section 13.1 and 13.2 above.

RECEIVED: 20/06/2025

14 Material Assets – Traffic and Transport

This chapter assesses the potential impact of the proposed development in terms of traffic and transportation. This chapter aims to provide a detailed and conservative assessment of the potential impact of the proposed development on the operation of the links and junctions which form the local road network.

The assessment of the traffic section of this report has been prepared by Wian Marais (Senior Traffic Engineer) from O'Connor Sutton Cronin Consulting Engineers (OCSC) who is a chartered engineer with over 13 years of experience in traffic and transport engineering.

This section should be read in conjunction with the site layout plans for the site and project description provided in Chapter 2 (Background of the Scheme) of this EIAR.

14.1.1 Author Information

The author, Wian Marais, has a Bachelor's degree in Civil Engineering, an Honour's degree in Transportation Engineering, and over 13 years of experience in traffic and transportation engineering in Ireland and South Africa.

Example projects include:

- *Moygaddy Masterplan, Co. Meath*: the masterplan includes a large number of different land uses, as well as the planning and construction of the Maynooth Outer Orbital Road (MOOR), which intends to improve overall traffic flows and reduce congestion within this area.
- *St. Vincent's Hospital Fairview Redevelopment, Co. Dublin*: provision of 9 no. residential buildings which includes a total of 811 no. residential units and the redevelopment of the hospital.
- *Residential Development, Porterstown, Dublin*: The development principally consisted of the demolition of a vacant dwelling and outbuildings (207 sq m) and the construction of 90 residential units.

The author has completed numerous Traffic and Transport chapters for similar residential and commercial schemes and is therefore suitably qualified and experienced to undertake this assessment.

14.1.2 Scoping

Scoping of the proposal identified the following issues for consideration in the EIA Report:

- Trips generated by the proposed development;
- Potential traffic impact on the local road network;
- Potential traffic impact on the local junctions.

Further to this, the principal issues identified through stakeholder feedback for consideration under this chapter related to:

- Pre-planning with local authority to determine extent of study, based on scale and nature of development, and junctions to be assessed; and
- Extent of traffic surveys to be conducted.

14.2 Methodology

This chapter is based on the findings of the *Traffic & Transportation Assessment (TTA)* prepared by O'Connor Sutton Cronin Consulting Engineers in support of this application. This assessment has been carried out in accordance with relevant guidelines, including:

- Traffic & Transport Assessment Guidelines (2014) as published by the former National Roads Authority (NRA) now Transport Infrastructure Ireland (TII);
- Guidelines for Traffic Impact Assessment (1997) as published by the Chartered Institute of Highways & Transportation;
- Meath County Development Plan 2021 - 2029; and
- Ratoath Local Area Plan.

14.2.1 Assessment Approach

In order to inform this assessment, the junction turning count surveys (JTC), automatic traffic count surveys (ATC) and origin-destination surveys (OD) were carried out by IDASO at the following locations:

Table 14-1: Junction Survey Details

Type	No	Location	Source	Survey Date	Survey Times
JTC	1	Dunshaughlin Rd R125/R155	IDASO	27/09/2023	07:00 to 19:00
JTC	2	R155/Somerville	IDASO		
JTC	3	R155/Meadowbank Hill	IDASO		
JTC	4	Main St/Moulden Bridge	IDASO		
JTC	5	Main St/Kilbride Rd	IDASO		
JTC	6	Jamestown Park/The Avenue	IDASO		
ATC	1	Curragha Road	IDASO	27/09/2023 – 03/10/2023	24 Hours
ATC	2	Fairyhouse Rd	IDASO		
ATC	3	Glascarn Lane West	IDASO	05/10/2023 – 11/10/2023	
ATC	4	Glascarn Lane East	IDASO		
OD	1	Main Street (West of Junction 4)	IDASO	27/09/2023	07:00 to 19:00
OD	2	Fairyhouse Road (South of Glascarn Lane)	IDASO		

The exact locations of these surveys can be seen in Figure 14-1:

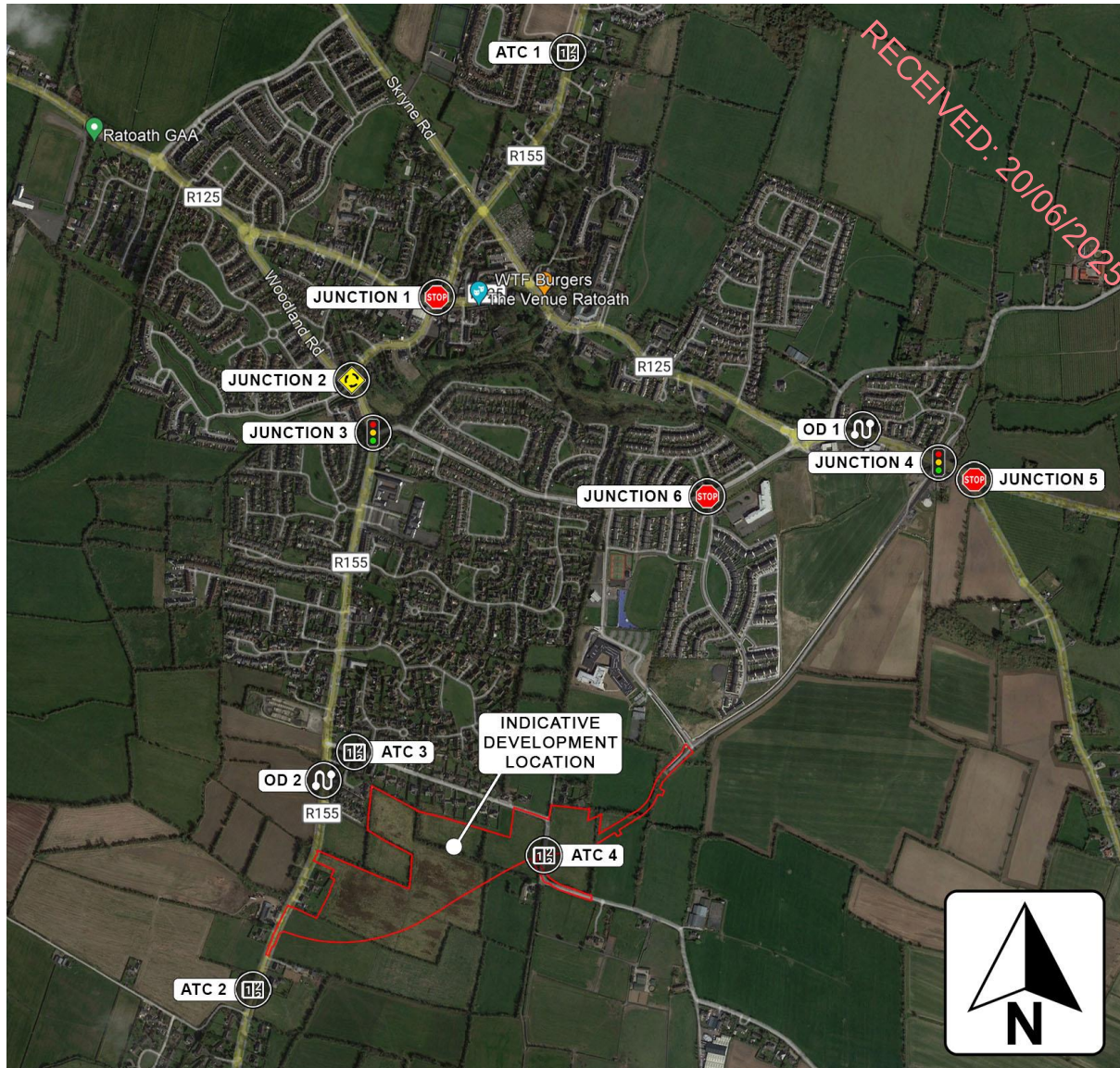


Figure 14-1: Survey Locations

The surveys were carried out on during September and October of 2023 when the schools were in session.

The following classification system was used as follows:

- Motorcycle;
- Car;
- Light Goods Vehicle;
- Heavy Goods Vehicle (Class OGV 1 & 2);
- Bus (PSV).

The junction surveys also included the queue length surveys, which recorded the maximum queue length observed on a per lane basis at each approach of each junction over 5 minutes intervals.

The base year flows were then adjusted to the predicted Year of Opening for the development (2029) and the Design Year (2044) using medium range NRA growth factors, defined in the table following.

Table 14-2: Background Traffic Growth Rates (TII medium-range)

Year	Growth Rates	
	Light Vehicles	Heavy Vehicles
2024 - 2029	110.84%	124.00%
2024 - 2044	123.78%	167.73%

The traffic generation potential of the proposed development was then assessed using the Trics planning database. This database contains information on thousands of sites in Ireland and the U.K. and can be used to predict the traffic that will be generated by numerous types of development. Consideration has also been given to the following committed developments which are expected to lead to a cumulative impact:

- **Planning Ref. 2460487 – Residential Development at Ballybin Road:** the proposed development, located to the east of Ratoath, comprises 141 no. residential units, car parking, green space and associated site access work. Part of this scheme involves a proposed realignment of the Main Street/Jamestown Road junction.
- **ABP318557 – Jamestown LRD:** the Jamestown LRD is located on the already-constructed portion of the Ratoath Outer Relief Road (RORR) and will be adjacent to this LRD site, towards the northeast. The development comprises 228 residential units (114 no. houses and 114 no. apartments) with childcare facilities and associated site works.
- **Planning Ref. 2460676 – Proposed Residential Development at Ratoath:** the site is located on lands at Jamestown, Ratoath. The development fronts on the already-constructed portion of the Ratoath Outer Relief Road (RORR) and is located just northeast of the Jamestown LRD. The proposed development entails 90 no. residential units together with associated roads, drainage, services and landscaping.

The location of these committed developments is shown in Figure 14-2:



Figure 14-2: Indicative Locations of Committed Developments in the Study Area

While there are additional, comparatively small developments in the area, these have not specifically been assessed as their traffic impact is expected to be negligible and forms part of the background traffic growth defined in Table 14-2.

By combining the base flows with the traffic generation estimates for the proposed development, the following peaks were identified:

- A.M. Peak Hour: 08:00 – 09:00; and
- P.M. Peak Hour: 17:00 – 18:00.

The estimated additional traffic was assigned to the local road network, and its impact on the operation of the local links and junctions was assessed using guidance from the NRA, CIHT, the Design Manual for Roads and Bridges (DMRB) and task specific traffic software, Junctions 9 & Transyt 15. Traffic flows diagrams indicating the associated volumes for each scenario assessed can be found appended to the TTA.

14.2.2 Definition of Study Area

The study area for the traffic and transport assessment has been defined with reference to the area in which there is potential for traffic impact as a result of the proposed development. This has been informed by the Traffic & Transport Assessment Guidelines (2014) published by TII. The extent of the study area with the junctions earmarked for assessment is shown in Figure 14-1.

14.2.3 Assessment Criteria

The traffic assessment considers two different scenarios. These are:

Do Nothing – no proposed development taking place in the local area and only allowance for natural background traffic growth and the committed developments for the opening and design years;

Do Something – natural background traffic growth, committed developments and the additional traffic estimated to be generated by the proposed development.

These two scenarios are assessed against three different analysis years, which comprise of:

- 2023 – Base year for the traffic surveys;
- 2029 – Predicted Opening Year for the development;
- 2044 – Design Year for the development, based on the predicted Opening Year.

Two different sets of criteria are used for the assessment of traffic operationality. The specific criteria used relates to the methodology used for the modelling.

The two criterion are the Ratio of Flow to Capacity (RFC) and Degree of Saturation (DoS). These both measure the demand relative to the total capacity of each road link of vehicular turning movement. RFC is used for road links and uncontrolled junctions while DoS is used for controlled junctions.

Table 14-3: Assessment Criteria

Significance of Impact	RFC/D&S
Imperceptible	< 10%
Not Significant	11% - 30%
Slight Effects	31% - 50%
Moderate Effects	51% - 70%
Significant Effects	71% - 90%
Very Significant Effects	91% - 99%
Profound Effects	> 100%

14.2.4 RORR Redistribution

The proposed road portion to be constructed as part of this development, which will include the two accesses into and out of the development will complete the RORR. At present, a portion of the RORR is already constructed from the Main Street/Moulden Bridge junction, south-westwards where it ends at the access to new residential developments and Ratoath College.

The completion of the RORR will lead to a redistribution of traffic, specifically northbound traffic along Fairyhouse Road travelling towards the east of Ratoath and westbound traffic along the R125 travelling towards the south of Ratoath. The RORR will provide a quicker and easier route for the journey of these vehicles.

To ascertain the volume of redistribution, the OD surveys (noted in Chapter 2) were consulted. One OD point is located to the east of the Main Street/The Avenue roundabout (OD Point no. 1), while the other is located to the south of Ratoath, along Fairyhouse Road (OD Point no. 2). The table following shows the recorded OD relationship between these two points for the peak hours.

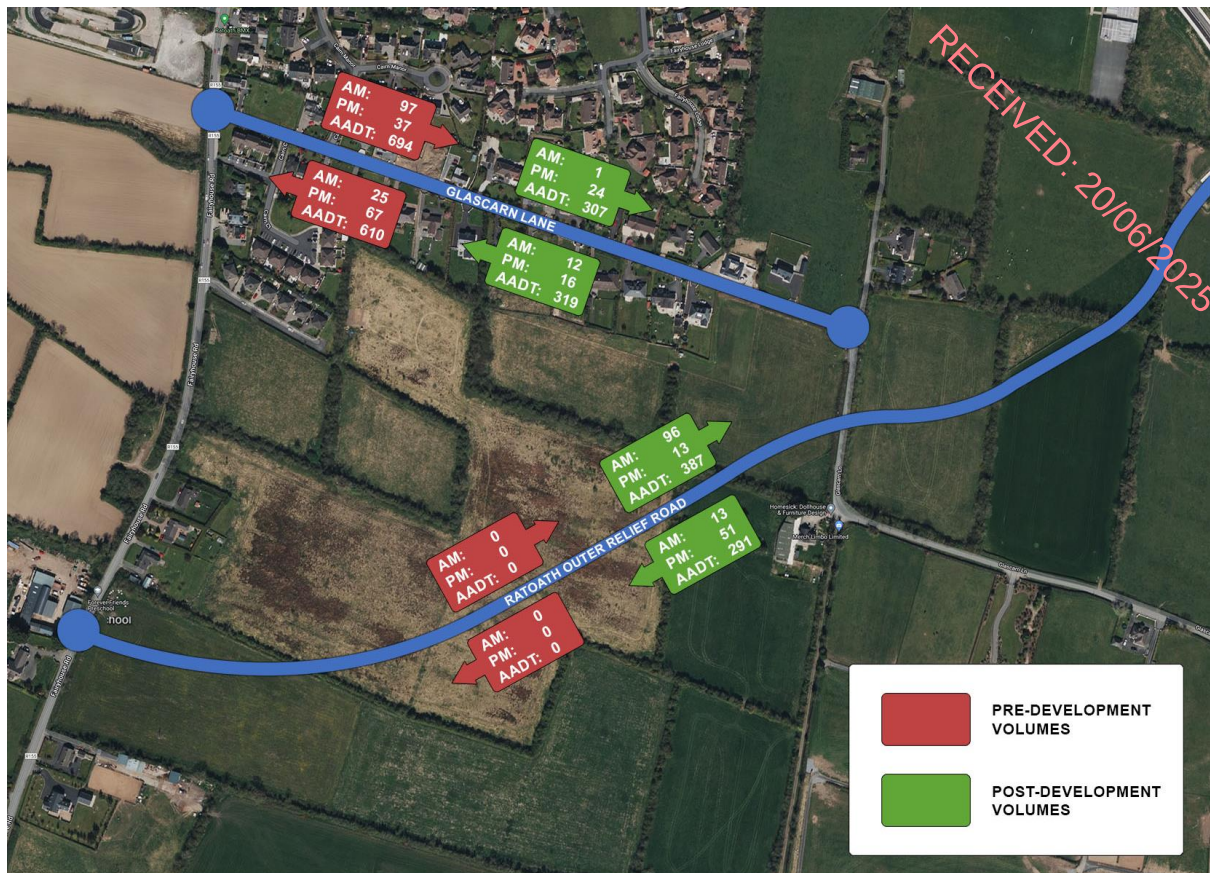
Table 14-4: RORR Redistribution

	AM Peak			PM Peak		
Origin	Destination					
	08:00	OD1	OD2	17:00	OD1	OD2
	OD1	-	41	OD1	-	27
	OD2	39	-	OD2	48	-

Based on this table, 80 vehicles during the morning peak hour and 75 vehicles during the afternoon peak hour will be redistributed to the RORR and removed from the roads within the town.

In addition to the above, traffic will also be redistributed from Glascarn Lane. This road currently acts as an east-west link between the R155 and Kilbride Road. Glascarn Lane will be split by the RORR once it is completed. This means that the northern portion of Glascarn Lane will be changed into a cul-de-sac with access to existing housing developments while the southern portion will tie in with the RORR as a new junction. This means that all traffic currently using Glascarn Lane as a through route will be redistributed to the RORR. Two ATC surveys were used to determine the potential redistribution of vehicles onto the RORR from Glascarn Lane.

This redistribution is shown in Figure 14-3.



Traffic Along Glascarn Lane - Wednesday 11 October 2023									
Period	Direction	Current - Surveys		Predicted - Post-Dev		Redistributed to RORR		Percentage Reduction	
		LV	HV	LV	HV	LV	HV	LV	HV
AM Peak (08:00 - 09:00)	Eastbound	93	4	1	0	92	4	99%	100%
	Westbound	24	1	12	0	12	1	50%	100%
	Combined	117	5	13	0	104	5	89%	100%
PM Peak (17:00 - 18:00)	Eastbound	36	1	23	1	13	0	36%	0%
	Westbound	65	2	15	1	50	1	77%	50%
	Combined	101	3	38	2	63	1	62%	33%
AADT	Eastbound	640	54	296	11	344	43	54%	80%
	Westbound	549	62	303	16	245	46	45%	74%
	Combined	1189	116	599	27	589	89	50%	77%

Figure 14-3: Glascarn Lane Redistribution

14.2.5 Trip Generation

The traffic generation potential of the proposed development has been estimated using the Trics software modelling database. This database contains records of surveys carried out at a range of development types across the UK and Ireland. It records a variety of details including the number and type of vehicles entering and exiting the site as well as several other site-specific factors.

When developing traffic generation estimates for any development, several surveys are selected from the database based on a range of factors including development type, size, location, public transport etc. The results are then used to establish trip rates for the development in question which is ultimately used to derive estimates for traffic generation.

The trip generation estimates for the proposed residential development are shown in the table below.

It should be noted that the trip generation only considers the residential portion of the development since the commercial portion (creche & retail unit/coffee shop) is considered ancillary and will service the residents of the development. As such it is expected that these components will be accessed

through pass-by trips, in other words residents stopping here on their way to or from other activities such as commuting. It is not expected that these components will generate any external or direct trips and as such have not been included in the trip generation.

Table 14-5: Estimated Trips Generated

Time Range	Mixed Private Houses & Apartments	
	364	Units
	Arrivals	Departures
07:00-08:00	17	83
08:00-09:00	36	117
09:00-10:00	48	70
10:00-11:00	51	46
11:00-12:00	44	49
12:00-13:00	54	45
13:00-14:00	64	67
14:00-15:00	56	61
15:00-16:00	86	63
16:00-17:00	81	58
17:00-18:00	125	59
18:00-19:00	124	54
Daily Trips:	786	771

Based on this table, the proposed development is expected to generate approximately 1,556 additional trips per day. Of these, approximately 36 arrivals and 117 departures are expected during the A.M. peak (08:00 – 09:00) while approximately 125 arrivals and 59 departures are expected in the P.M. peak hour (17:00 – 18:00). These trips have been split 50:50 between the two accesses on the RORR.

14.3 Receiving Environment

14.3.1 Site Location and Zoning

The subject site is located approximately 1.0 km south of Ratoath town centre as shown in Figure 14-4. The proposed development site is immediately bound by:

- Glascarn Lane and the rear of houses at Glascarn Lane to the north;
- existing agricultural fields and by Glascarn Lane to the east and south; and
- By Fairyhouse Road (R155), the rear of houses at Fairyhouse Road, the Carraig Na Gabhna and Cairn Court Developments, and existing agricultural fields to the east and south.



14.3.2 Local Road Network

Outside of the study area development-generated traffic will dissipate and so is expected to have a negligible impact on the operation of the wider network. While there is expected to be substantial variation in the type of traffic travelling on the links locally, during the peak travel hours they would be expected to mainly carry commuter traffic based on the nature of the local area.

TA 79/99 “Traffic Capacity of Urban Roads” from the DMRB provides information on the capacity of urban roads based on classification and width. The table following shows the capacities of various road types based on this manual and using a 60:40 split in flow.

Table 14-6: Urban Road Capacities

Carriageway Width (m)		Two-Way Single Carriageway – Busiest Direction Flow (Assumes a 60/40 directional split)									Dual Carriageway			
		Total number of Lanes									Number of Lanes in each direction			
		2				2-3	3	3-4	4	4+	2		3	4
		6.10	6.75	7.30	9.0	10.0	12.3	13.5	14.6	18.0	6.75	7.3	11.0	14.6
Road Type	UM	Not Applicable										4000	5600	7200
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300	3350	3600	5200	-
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700	2950	3200	4800	-
	UAP3	900	1110	1300	1530	1620	-	-	-	-	2300	2600	3300	-
	UAP4	750	900	1140	1320	1410	-	-	-	-	-	-	-	-

The local links have been classified based on the associated definitions in the DMRB. Using the previous table, link capacities have been calculated and current Ratio of Flow to Capacity (RFC) values have been assessed for the key links bordering the site.

It should be noted that given the variation in width across the links in question, an average figure for each has been used which is rounded down to the nearest value shown in the above table, thus ensuring a conservative assessment of link capacity.

The Base Year RFC value for the links within the study area is shown in the table below.

Table 14-7: Base Year Link RFC Values in Local Network

Link	Width (m)	Link Capacity	A.M. Peak	RFC	P.M. Peak	RFC
		(veh/hr)	(veh/hr)	(%)	(veh/hr)	(%)
Fairyhouse Road	6.75	1,260	598	47%	613	49%
Meadowbank Hill / The Avenue	6.75	1260	483	38%	398	32%
R155	7.3	1,470	107	7%	128	9%
Main Street	7.3	1,470	838	57%	753	51%

The existing link capacities during are sufficient to accommodate the traffic with the highest ratio of flow to capacity occurring in the morning peak period on Main Street, with a value of 57%.

14.3.4 Existing Bus Service

The closest bus stops are located along Fairyhouse Road to the northwest of the development and on the R125 to the northeast of the development.

The Fairyhouse Road stops are approximately 1.3km from the planned new access on the RORR, while the stops on the R125 are approximately 2.0km from this same position. With improved permeability through the proposed development as well as adjacent existing and planned developments, this distance could be substantially reduced. Nevertheless, the development's trip generation reflects the limited access to high-quality and frequent public transport.

These stops provide access to the following bus routes:

- Route 105 – Blanchardstown to Drogheda via Ashbourne
- Route 105X – Fairyhouse Road to Dublin via Ratoath
- Route 109A – Dublin Airport to Kells

- Route 103 – Dublin to Ratoath via Ashbourne and Emerald Park
- Route 194 – Ratoath to Dublin City

More details of bus service can be found at www.buseireann.ie. The location of these stop relative to the development are shown in Figure 14-5.



Figure 14-5: Bus Stops in Vicinity of the Development

14.3.5 Existing Cycle Facilities

The cyclists are allowed to cycle on the road together with other road users in local areas. Relative to the development site, the nearest cycle infrastructure is an existing dedicated cycle lane running along Meadowbank Hill and The Avenue, as outlined with the green line in Figure 14-6.

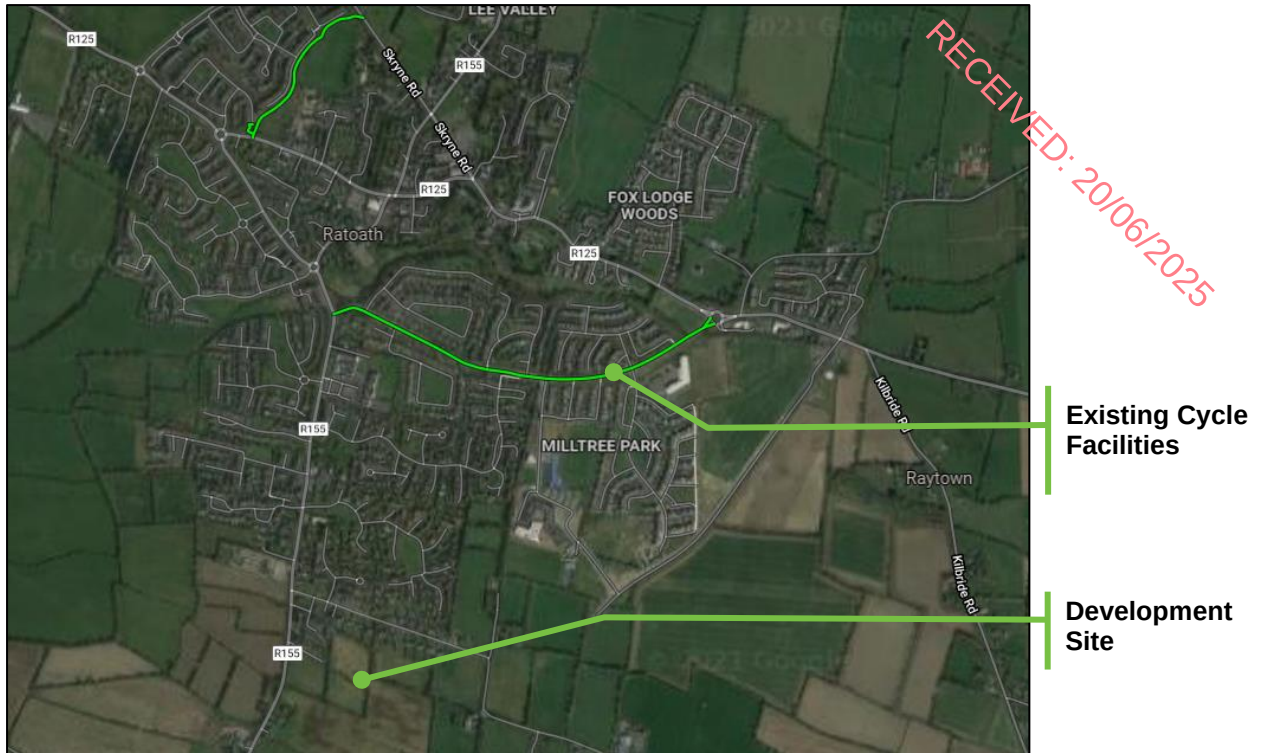


Figure 14-6: Existing Cycle Facilities in the Local Area

The abovementioned cycle facilities along Meadowbank Hill are shown below.



Figure 14-7: Meadowbank Hill Cycle Facilities

14.3.6 Existing Pedestrian Facilities

Given that the proposed development is located within 1,200m (15 minutes) walking distance of Ratoath Town Centre, where a large number of retail and employment opportunities are available, it is expected that the future residents will be able to travel on foot from/to the proposed development.

In terms of pedestrian access, the existing footpaths that surround the proposed development are considered to be of good quality, which will improve accessibility for future residents to nearby bus stops and the town centre.

The existing pedestrian facilities located along the R155 can be seen in Figure 14-8.



Figure 14-8: R155 Walking Facilities

14.4 Planned Future Receiving Environment

There are a number of proposals which will further enhance the sustainable transport infrastructure serving the site, be it directly or indirectly. These are discussed in further detail below.

14.4.1 Ratoath Pedestrian and Cycle Scheme

Meath County Council (MCC) in partnership with the National Transport Authority (NTA) are proposing to deliver a high-quality Pedestrian and Cycle Scheme within Ratoath.

An overview of the scheme, as extracted from the Part 8 Report (dated March 2022), is shown in Figure 14-9.

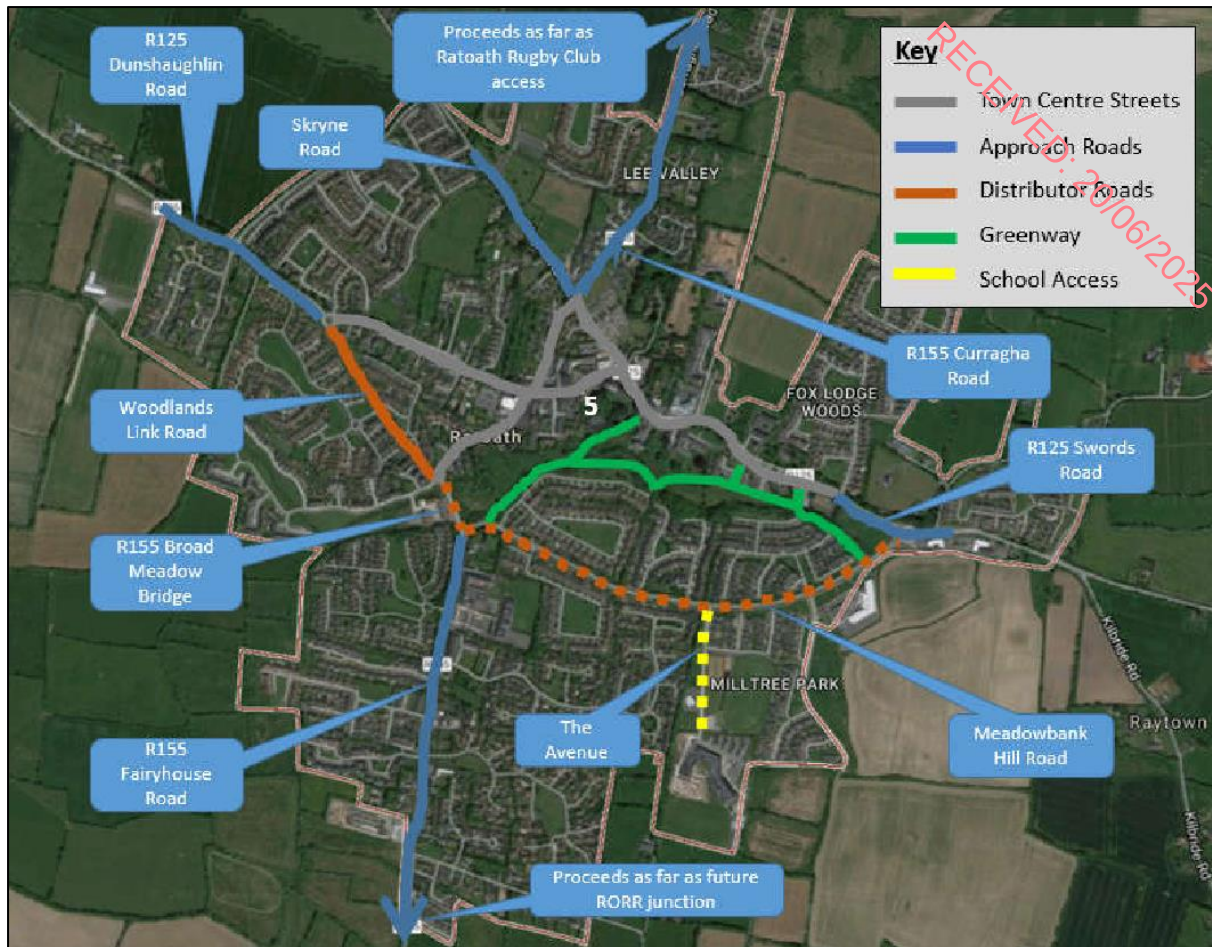


Figure 14-9: Ratoath Pedestrian and Cycle Scheme (Source: Part 8 Report)

The Part 8 Report also noted that the proposed scheme consists of improvements and upgrades to the following key routes:

- Town Centre Streets
- Approach Roads
- Distributor Roads
- Greenway
- School Access Roads

Furthermore, it is also noted that the proposed scheme incorporates the Ratoath Cycle Network as developed by the NTA within the Cycle Network Plan (CNP) for the Greater Dublin Area (GDA).

Figure 14-10 illustrates the relevant extract from the CNP.

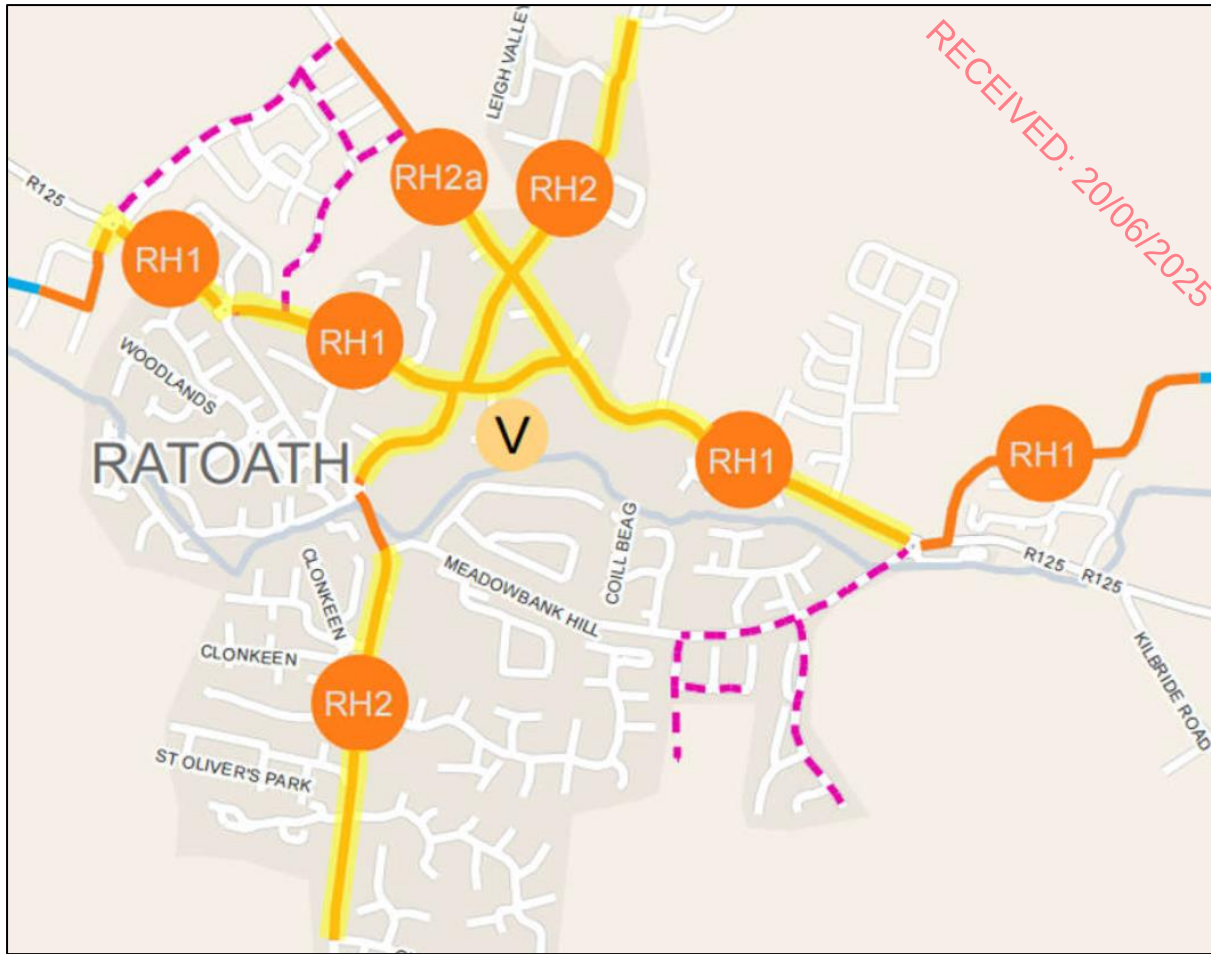


Figure 14-10: Ratoath Cycle Network (Source: CNP)

The implementation of the above scheme will be highly beneficial for the development as it will improve walking and cycling infrastructure in the town, leading to more accessible and safe opportunities for residents to make use of these sustainable modes.

14.4.2 Greater Dublin Area Cycle Network Plan

Published by the National Transport Authority (NTA) in 2022 and adopted into the GDA Transport Strategy 2022 – 2042 in January 2023, this cycle network plan sets out a number of additional cycle route proposals which focus on improvement and extension of the cycle network across Dublin. The proposals for the local area are shown in Figure 14-11.

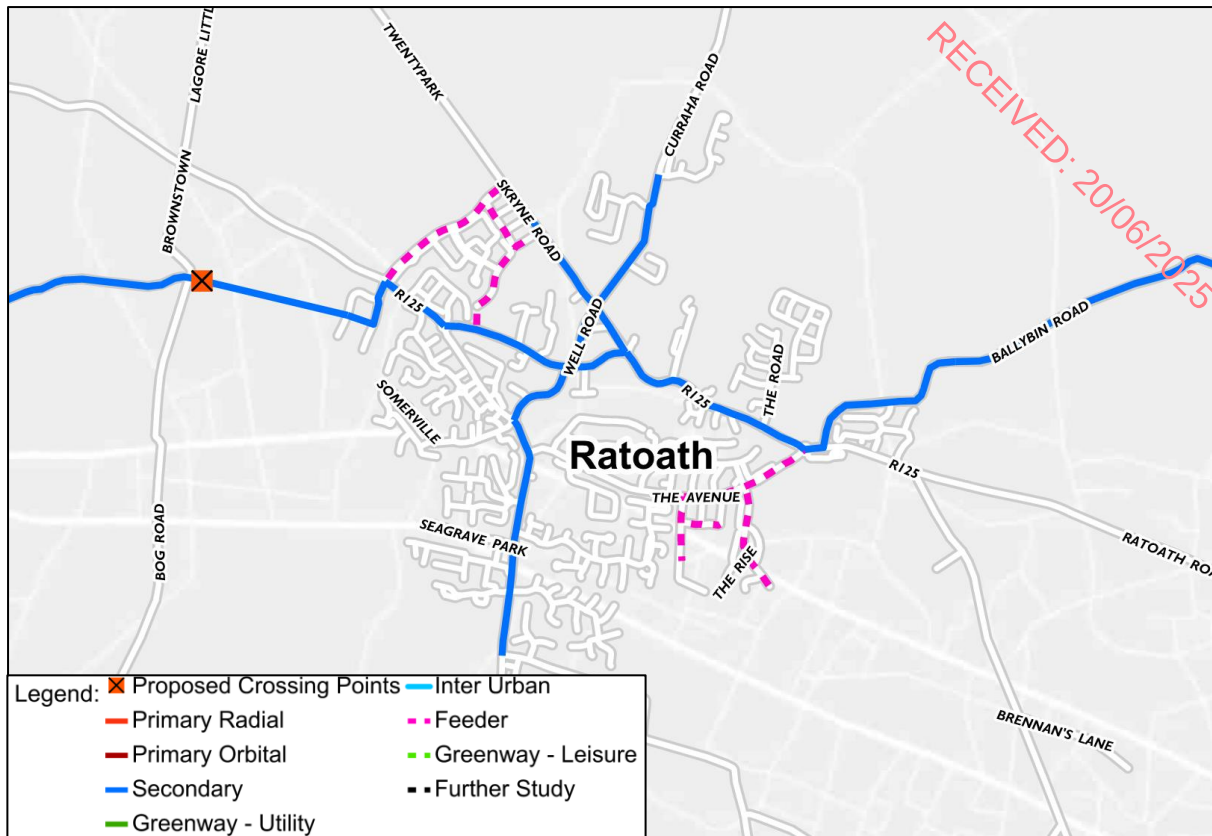


Figure 14-11: CNA Ratoath (Source: GDA Cycle Network Plan 2022)

As part of GDA cycle networks, the provision of the additional cycle facilities in Ratoath, particularly the secondary route located along Fairyhouse Road to the west of the development, will offer convenient and safe access to the town centre. This will encourage future residents to by means of more sustainable modes compared to private car usage.

14.4.3 Meath Development Plan 2021 – 2027

The Meath Development Plan 2021 -2027 sets out the policies, objectives, and future strategic developments for Meath County over the plan period 2021-2027. The following key policies have been developed in order to facilitate and encourage a shift to more sustainable transport modes, and reduce dependency on private car usage within the county:

- **MOV POL 1:** To support and facilitate the integration of land use with transportation infrastructure, through the development of sustainable compact settlements which are well-served by public transport; and
- **MOV POL 3:** To promote sustainable land use planning measures which facilitate transportation efficiency, economic returns on transport investment, minimisation of environmental impacts and a general shift towards the greater use of public transportation throughout the County.

As part of the development plan strategies, Meath County Council will support the preparation of a feasibility study exploring the potential of a future rail spur off the Navan-Dublin Rail line from Dunshaughlin to serve Ashbourne and Ratoath.

Based on the statement above, it is expected that there will be further improvements to existing public transport facilities. This addition of new service routes across the county will encourage a more positive mode share.

14.5 Characteristics of Proposed Development

14.5.1 General

The proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 114 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas.

The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development.

14.5.2 Vehicular Access Points

The development proposals include the construction of the remaining southwestern portion of the Ratoath Outer Relief Road (RORR). This section of the RORR is proposed to connect Fairyhouse Road to the existing portion of the RORR already constructed, in order to complete the link. This will allow a new northeast-west movement commencing at the R155 immediately east of the Fairyhouse Road – R155, continuing to the development boundary near Glascarn Lane.

This new road section is estimated at 850m in length and will also require a new signalised junction where it intersects with Fairyhouse Road. Two accesses to the development are proposed along this new section of the RORR, the western entrance and the eastern entrance.

As mentioned, a new 3-legged signalised junction will be required at Fairyhouse Road with dedicated turning lanes to cater to the proposed additional traffic which is expected to be generated and redistributed.

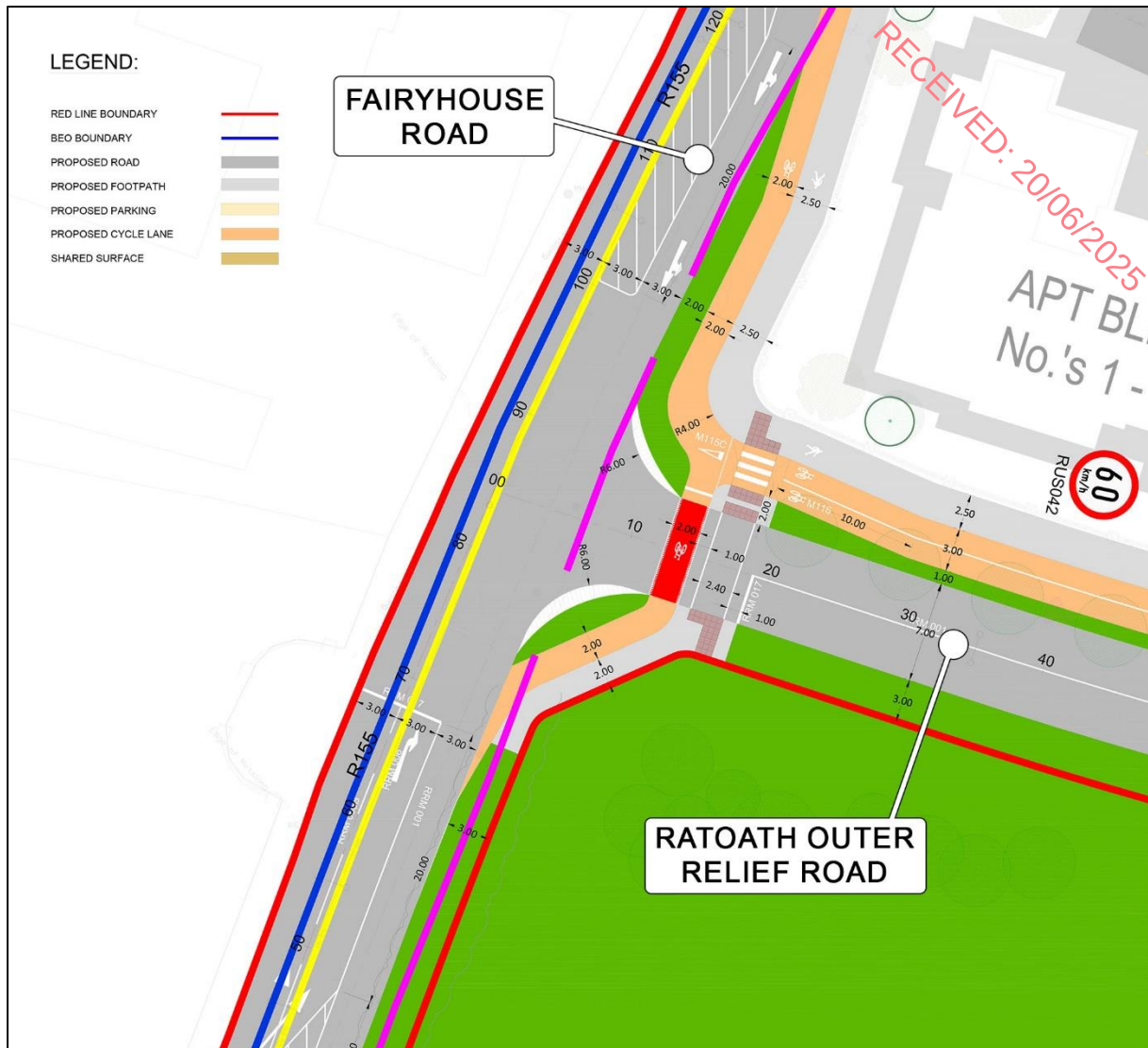


Figure 14-12: Proposed Signalised Junction Layout on R155

14.5.3 Pedestrian and Cyclist Infrastructure

In terms of active travel accessibility, the following is proposed in order to facilitate and encourage the use of these more sustainable modes throughout the development:

- A 2.50m wide walkway and 3.0m wide two-way cycle facility on the northern side of the RORR in line with the requirements of DMURS and the Cycle Design Manual, along the development frontage;
- The above facilities will tie in with existing infrastructure on the eastern side, at the extent of the redline;
- Protected facilities at the new Fairyhouse Road/RORR junction in line with the Cycle Design Manual; and
- A controlled toucan crossing towards the eastern side of the development, east of the eastern access, to allow safe and effective crossing for active travel users between the northern side of the RORR and the 2.0m wide walkway on the southern side which provides access to Glascarn Lane and the proposed bus stop on the southern side of the RORR.

14.6 Predicted Impacts

14.6.1 Construction Stage

Relative to the operation stage, the construction period will be temporary in nature. Construction traffic is expected to consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full-time site supervisory staff and occasional professional supervisory staff, i.e. design team members and supervisory staff from utility companies;
- Materials delivery and removal vehicles.

It is difficult to assess the exact quantum of traffic that will be generated during the construction period as it will vary throughout the construction process as different activities have different associated transportation needs. However, the following points are noted with regard to construction traffic:

- In general, the construction day will begin and end outside of peak travel hours. As a result, the majority of workers travelling to and from the site will arrive before the a.m. peak hour and depart after the p.m. peak hour;
- Limited on-site parking will be provided to encourage staff to use alternate options such as car-sharing or public transport. However, this will also take into consideration the required demand to prevent any overspill of parking into adjacent areas;
- Adequate on-site compounding will be provided to prevent any potential overflow onto the local transport network;
- The potential for construction staff to be brought to the site in vans/minibuses will be investigated;
- Excavation and materials delivery vehicles travelling to and from the site will be spread across the course of the working day meaning the number of HGV's travelling during the peak hours will be relatively low.

Overall it is expected that the level of traffic generated by the construction works will be less than that generated by the operational phase of the development during the peak traffic hours. As a result, a detailed analysis of this stage has not been deemed necessary, and the impact is considered to be *likely* and *adverse* but *moderate* and *short-term*.

14.6.2 Operational Stage

In order to assess the actual impact of the operational development on the local road network, a number of different scenarios have been analysed as follows:

- Base Year (2023) – The current performance of the local road network was initially assessed along with the impact of the proposed development to establish which junctions require more detailed analysis;
- Year of Opening (2029) – The performance of the local road network was then assessed for Year of Opening. In order to show the true impact of the proposed development, the Do Nothing and Do Something scenarios were analysed;
- Design Year (2044) – The local road network was analysed for Design Year considering the Do Nothing and Do Something.

The junction analysis was carried out using the *Junctions 9* and *Transyt 15* software packages and the link capacities for the Year of Opening and the Design Year were assessed based on the same methodology outlined previously.

The Opening Year Do Something scenario RFC value for the links within the study area is shown in the table following.

Table 14-8: Opening Year Do Something Link RFC Values for Local Network

Link	Width (m)	Link Capacity	A.M. Peak	RFC	P.M. Peak	RFC
		(veh/hr)	(veh/hr)	(%)	(veh/hr)	(%)
Fairyhouse Road	6.75	1260	688	55%	695	55%
Meadowbank Hill / The Avenue	6.75	1260	435	35%	321	25%
R155	7.3	1470	124	8%	157	11%
Main Street	7.3	1470	1180	80%	954	65%
RORR	6.1	1020	335	33%	213	21%

The link capacities during the opening year are sufficient to accommodate the traffic with the highest ratio of flow to capacity occurring in the morning peak period on Main Street, with a value of 80%.

The Design Year Do Something scenario RFC value for the links within the study area is shown in the table following.

Table 14-9: Design Year Do Something Link RFC Values for Local Network

Link	Width (m)	Link Capacity	A.M. Peak	RFC	P.M. Peak	RFC
		(veh/hr)	(veh/hr)	(%)	(veh/hr)	(%)
Fairyhouse Road	6.75	1260	768	61%	769	61%
Meadowbank Hill / The Avenue	6.75	1260	487	39%	358	28%
R155	7.3	1470	139	9%	175	12%
Main Street	7.3	1470	1306	89%	1053	72%
RORR	6.1	1020	368	36%	222	22%

The link capacities during the design year are sufficient to accommodate the traffic with the highest ratio of flow to capacity occurring in the morning peak period on Hillcrest Road, with a value of 89%.

Section 11.2.1 of the Meath County Development Plan 2021 - 2027 speaks to the requirements for Traffic and Transport Assessments. This section states that *“Traffic and Transport Assessments (TTA) are required to accompany planning applications for major developments with significant potential to generate traffic and or which could create a significant hazard or safety performance impact on a major road, particularly national roads.”*

It further states that the requirement for a TTA is at the discretion of the Council but the following thresholds can be used for guidance purposes only:

- Traffic to and from the proposed development exceeds 10% of the traffic flow on the adjoining road;
- Traffic to and from the proposed development exceeds 5% of the traffic flow on the adjoining road where congestion exists;
- Residential development in excess of 100 dwellings;
- Retail and leisure development in excess of 1,000 sq.m;
- Industrial development in excess of 5,000 sq.m; and
- Distribution and warehousing in excess of 10,000 sq.m.

A TTA was deemed necessary at the pre-planning stage. Following this requirement, of particular interest from the above thresholds are Thresholds 1 and 2. These specify at which point junctions

need to be analysed. To ascertain which junctions experience congestion, the queue length surveys were consulted. The table following shows the average queue length at each junction for the two peak hours.

Table 14-10: Average Queue Lengths per Junction

Junction	Peak Hour	
	AM	PM
Junction 1	9	14
Junction 2	14	7
Junction 3	47	29
Junction 4	7	4
Junction 5	6	19
Junction 6	18	4

From the above table, it is evident that for most of the junctions, the average queues are relatively short, especially considering the above lengths account for the full junction, rather than specific approaches. Junction 3 does however show relatively long average queues. Based on this, it is assumed that congestion exists at Junction 3, but not at any other junctions.

To determine the impact of the development trips on each junction, the generated and distributed trips are compared to the base volumes at each junction obtained from the surveys. This comparison is shown in the table following.

Table 14-11: Junction Impact

	AM			PM			Crit	Requires Analysis
	2023 DN	Dev Trips	% Impact	2023 DN	Dev Trips	% Impact		
Junction 1	861	8	0.96%	1216	12	0.97%	>10%	No
Junction 2	941	47	4.97%	1017	72	7.10%	>10%	No
Junction 3	1265	47	3.70%	1292	72	5.59%	>5%	Yes
Junction 4	1228	61	4.99%	1128	59	5.22%	>10%	No
Junction 5	1200	61	5.11%	1093	59	5.38%	>10%	No
Junction 6	1107	0	0.00%	735	0	0.00%	>10%	No

The above table indicates that the development will have less than 10% impact on all the surveyed junctions and will slightly exceed the 5% criteria at Junction 3 during the afternoon peak hour. Based on the above, only Junction 3 requires detailed analysis as the impact of the development trips on all other junctions can be considered *negligible*.

14.6.2.1 Junction 3: Fairyhouse/Meadowbank Hill

This junction is currently operating as a three-legged signalised junction between Fairyhouse Road and Meadowbank Hill. This development will add approximately 3.7% and 5.6% additional traffic during the morning and afternoon peak hours respectively. It should however be noted that this comparison is to the Do Nothing scenario.

The development is linked to the completion of the RORR which will result in a redistribution of traffic. This redistribution will lead to a reduction in traffic volumes on the right-turning movement of the

southern approach of this junction. This means that even though the development adds trips to the movements at this junction, this will likely be offset by the reduction in trips due to the redistribution. Nevertheless, to ensure a comprehensive and robust analysis, the redistribution was not considered for the impact of development trips. The redistribution is however considered for the junction analysis.

The junction was analysed using Transyt 15, with the worst-performing movement at each approach, for each scenario shown in the table below. The performance of the approaches is measured in Degree of Saturation (DoS) which indicates the demand required vs. the capacity provided. The queue lengths are measured in Passenger-Car-Units (PCU).

Table 14-12: Junction 3 Analysis Results

Peak	Scenario		Year	Fairyhouse Road (N)		Meadowbank Hill (E)		Fairyhouse Road (S)	
				Queue	DOS	Queue	DOS	Queue	DOS
AM	1	DN	2023	7.44	48%	5.10	56%	1.46	19%
	2	DN	2029	10.36	59%	6.25	61%	1.48	23%
	3	DS	2029	8.81	54%	5.08	59%	1.47	24%
	4	DN	2044	12.66	66%	6.53	68%	1.56	37%
	5	DS	2044	11.11	62%	5.79	64%	1.48	27%
Peak	Scenario		Year	Fairyhouse Road (N)		Meadowbank Hill (E)		Fairyhouse Road (S)	
				Queue	DOS	Queue	DOS	Queue	DOS
PM	6	DN	2023	4.27	31%	3.81	40%	3.19	37%
	7	DN	2029	5.83	39%	4.61	49%	5.21	46%
	8	DS	2029	5.52	39%	3.25	47%	4.62	44%
	9	DN	2044	6.67	44%	5.17	58%	7.92	54%
	10	DS	2044	6.44	43%	4.41	50%	6.26	50%

The above table shows that this junction has sufficient capacity to accommodate all future and current traffic demands. This includes future projected traffic, committed developments and the trips generated by the development. The table also shows a slightly improved performance for the Do Something scenario compared to the Do Nothing scenario. This is due to the aforementioned redistribution which results in a lower total demand at the junction.

The impact at this junction is considered to be *negligible*.

14.6.2.2 Junction 7: Fairyhouse Road/RORR

The construction of the western section of the RORR, which is linked to this development, and which provides access to the development will result in a new junction being formed with Fairyhouse Road. This new junction will facilitate access to and from the RORR from the southern approach into Ratoath. In order to ensure sufficient capacity for projected redistributed traffic, trips generated by the development, as well as future redistribution and developments, it is proposed to operate this new T-junction by means of traffic signals. In addition, it is also proposed to provide a short (20m) right-turning lane on the southern approach to remove right-turning vehicles onto the RORR from the main traffic stream along Fairyhouse Road. Furthermore, the junction will operate as a fully protected junction in line with the requirements of the Cycle Design Manual.

The junction was analysed using Transyt 15, with the worst-performing movement at each approach, for each scenario shown in the table below. The performance of the approaches is measured in

Degree of Saturation (DoS) which indicates the demand required vs. the capacity provided. The queue lengths are measured in Passenger-Car-Units (PCU).

Table 14-13: Junction 7 Analysis Results

Peak	Scenario		Year	Fairyrhouse Road (N)		RORR (E)		Fairyrhouse Road (S)	
				Queue	DOS	Queue	DOS	Queue	DOS
AM	3	DS	2029	7.97	50%	4.76	54%	20.98	33%
	5	DS	2044	9.71	55%	5.20	59%	3.01	37%
Peak	Scenario		Year	Fairyrhouse Road (N)		RORR (E)		Fairyrhouse Road (S)	
				Queue	DOS	Queue	DOS	Queue	DOS
PM	8	DS	2029	4.88	39%	4.78	57%	3.16	51%
	10	DS	2044	5.95	42%	5.20	61%	3.27	57%

As can be seen from the table above, the proposed layout and control for this junction will provide sufficient capacity for all approaches up to the Design Year. It should be noted that the scenarios above include TII growth rates, committed developments, redistributed traffic and traffic generated by the development.

14.6.2.3 Junction 8: Western Access Junction

The layout for the proposed western access junction along the RORR is a simple priority T-junction, with the RORR acting as the main road in an east-west direction, and the development access joining as the northern approach and acting as the minor road.

The junction was analysed using Junctions 9, with the worst-performing movement at each approach, for each scenario shown in the table below. The performance of the approaches is measured in Ratio-of-Flow-to-Capacity (RFC) which indicates the demand required vs. the capacity provided. The queue lengths are measured in Passenger-Car-Units (PCU).

Table 14-14: Access Junction Analysis Results

Peak	Scenario		Year	Development Access (N)		RORR (E)		RORR (W)	
				Queue	RFC	Queue	RFC	Queue	RFC
AM	3	DS	2029	0.1	11%	0	1%	N/A	N/A
	5	DS	2044	0.1	12%	0	1%	N/A	N/A
Peak	Scenario		Year	Development Access (N)		RORR (E)		RORR (W)	
				Queue	RFC	Queue	RFC	Queue	RFC
PM	8	DS	2029	0.1	6%	0.1	5%	N/A	N/A
	10	DS	2044	0.1	6%	0.1	6%	N/A	N/A

The results from the western access junction analysis indicate that the RFC values are very low with very short queues on all approaches. The right turn into the development along the RORR will not cause any undue delays for through traffic. This means that the proposed access junction layout is sufficient to cater to the demand and no additional turning lanes are required.

14.6.2.4 Junction 9: Eastern Access Junction

Similar to the western access junction, the layout for the proposed eastern access junction along the RORR is a simple priority T-junction, with the RORR acting as the main road in an east-west direction, and the development access joining as the northern approach and acting as the minor road.

The junction was analysed using Junctions 9, with the worst-performing movement at each approach, for each scenario shown in the table below. The performance of the approaches is measured in Ratio-of-Flow-to-Capacity (RFC) which indicates the demand required vs. the capacity provided. The queue lengths are measured in Passenger-Car-Units (PCU).

Table 14-15: Access Junction Analysis Results

Peak	Scenario		Year	Development Access (N)		RORR (E)		RORR (W)	
				Queue	RFC	Queue	RFC	Queue	RFC
AM	3	DS	2029	0.1	11%	0	1%	N/A	N/A
	5	DS	2044	0.1	12%	0	1%	N/A	N/A
Peak	Scenario		Year	Development Access (N)		RORR (E)		RORR (W)	
				Queue	RFC	Queue	RFC	Queue	RFC
PM	8	DS	2029	0.1	6%	0.1	5%	N/A	N/A
	10	DS	2044	0.1	6%	0.1	5%	N/A	N/A

Again, similar to the western access junction results, the results from the eastern access junction analysis indicate that the RFC values are very low with very short queues on all approaches. The right turn into the development along the RORR will not cause any undue delays for through traffic. This means that the proposed access junction layout is sufficient to cater to the demand and no additional turning lanes are required.

The table below summarises the identified likely significant effects of the proposed development in the absence of mitigation during the operational phase.

Table 14-16: Summary of Operational Phase Likely Significant Effects Without Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Excessive car usage	Adverse	Moderate	Wider road network	Likely	Long term	Worst case
Increased traffic congestion	Adverse	Moderate	Wider road network	Likely	Long term	Worst case
Poor site permeability negatively impacting pedestrian and cycle movements	Adverse	Moderate	Travel routes in the immediate area	Likely	Long term	Worst case
Increased risk of accident due to increased vehicle movements	Adverse	Slight	Wider road network	Likely	Long term	Worst case
Failure to realise local and national sustainable transport objectives	Adverse	Moderate	Wider road network	Likely	Long term	Worst case

14.7 Do Nothing Scenario

The do nothing scenario would involve leaving the subject site in its current state. This would entail that the proposed development will not take place in the local area and only allowance for natural background traffic growth and the committed developments would be accounted for.

14.8 Potential Cumulative Impacts

The assessment set out above has considered the build-out of the proposed development as well as the three noted permitted developments. In addition, background traffic growth has been allowed for which will account for a degree of additional development in the area as well as population growth and changes in car ownership levels.

14.8.1 Construction Stage

The construction assessment is considered to be both conservative and a representation of the worst-case scenario where multiple construction programmes may overlap. Based on this, it is considered that the impact of the cumulative construction activities on Traffic and Transport will be *likely, adverse, moderate, and temporary*.

14.8.2 Operational Stage

The assessment is considered to be both conservative and a representation of the worst-case scenario. Based on this, it is considered that the impact of the cumulative developments on the operational stage for Traffic and Transport will be *likely, positive, moderate, and permanent*.

14.9 Mitigation Measures

14.9.1 Construction Stage

This stage of the development will be dealt with by the appointed contractor through the development and implementation of a *Construction Traffic Management Plan*, as set out in Section 7.1 of the Traffic and Transportation Assessment Report, submitted under separate cover with this application. This plan will be agreed upon with the Local Authority prior to the commencement of construction and will ultimately include details on the following:

- Daily and weekly working hours;
- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites, if necessary;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place as required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads and dedicated parking provided for construction personnel.

14.9.2 Operational Stage

The operational stage impact of the proposed development will be mainly *negligible* in terms of traffic as can be seen in the traffic modelling results. The proposed accesses will be via two new priority-controlled junctions along the proposed new section of the RORR, which will be accessed via a new signal-controlled junction between the R155 and the RORR. This is a conservative assessment as it includes the following elements:

- Medium-range TII growth rates from 2023 to 2044;

- Third-party developments in the study area;

It could be argued that the applied growth rates represent traffic growth due to the development in the study area. This means that accounting for additional developments on top of these growth rates could lead to an element of double counting. As such, this assessment can be viewed as conservative.

14.9.2.1 Car Parking

The car parking strategy has considered the following guidelines:

- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities
 - Peripheral Location: *In intermediate and peripheral locations, defined in Chapter 3 (Table 3.8), the maximum rate of car parking provision for residential development, where such provision is justified to the satisfaction of the planning authority, shall be 2 no. spaces per dwelling.*
- Sustainable Urban Housing: Design Standards for New Apartments
 - Less Accessible Urban Location: *There is a requirement of one car parking space per unit together with an element of visitor parking of one space per 4 apartments.*
- Meath County Development Plan 2021 – 2027
 - Dwellings – 2 per conventional dwelling; and
 - Flats/Apartments – 2 per unit, 1 visitor space per 4 apartments.

The following car parking is proposed as the site:

Table 14-17: Car Parking Provision

Component	Relevant Standard	Standard	Development	Provision
Houses	MCC Development Plan	2 spaces per unit	250 units	500
Apartments/ Duplexes	Apartment Guidelines	1 space per unit	114 units	114
Visitors	Apartment Guidelines	1 space per 4 units	114 units	38
Commercial	MCC Development Plan	1 per employee & dedicated set down area and 1 per 4 children plus dedicated set down area	Varies	24
Total Provision				676 Spaces

A key aspect of the parking strategy will be the ongoing management of parking at the site. The parking strategy will come into effect from initial contact with prospective tenants. It will be made very clear at the initial stage of communication as to what the parking availability is at the site and the lack of long term alternatives in the surrounding area.

Measures to prevent unauthorised car parking will be investigated should the need arise and may include:

- A clamping system whereby any cars parked in an unapproved location will be clamped and the owner required to pay a fine for release;
- Ongoing monitoring of visitor and tenant parking to ensure appropriate use.

All tenants will be advised of any such measures as part of the initial/ongoing consultation with appropriate signage also provided.

14.9.2.2 Bicycle Parking

Similar to car parking, the bicycle parking also considered the following guidelines:

- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities

- Section 5.2.5 of the Compact Settlement Guidelines also states that, in the case of residential units that do not have ground-level open space or have smaller terraces, a general minimum standard of 1 cycle storage space per bedroom should be applied. Visitor cycle parking should also be provided.
- Sustainable Urban Housing: Design Standards for New Apartments
 - 1 no. bicycle space per bedroom; and
 - 1 no. visitor space per 2 residential units.
- Meath County Development Plan 2021 – 2027
 - Apartments – 1 private secure bicycle space per bed space, minimum 2 spaces and 1 visitor bicycle space per two housing units.

Bicycle parking is only required for the apartment component of the development since the houses have sufficient ground level open space to accommodate private bicycle parking. Based on this, it is proposed to provide the following:

Table 14-18: Bicycle Parking Provision

Requirement	Relevant Standard	Standard	Development	Long-Stay	Short-Stay
1 Bed Units	MCC Development Plan	1 space per bedroom	32	32	N/A
2 Bed Units	MCC Development Plan	1 space per bedroom	69	138	N/A
3 Bed Units	MCC Development Plan	1 space per bedroom	13	39	N/A
Visitor	MCC Development Plan	1 space per 2 units	108	N/A	57
Provisions				209	57

14.9.2.3 Mobility Management Plan

A development specific *Mobility Management Plan* will be implemented at the site which sets out a series of measures to facilitate and encourage a positive modal shift towards more sustainable modes of transport. These measures will be refined based on travel surveys conducted at the occupied development but typically include:

- Appointment of a site Mobility Manager to oversee the implementation of the plan;
- Ongoing liaison with relative bodies including public transport providers such as Dublin Bus and Irish Rail;
- Providing ongoing information with respect to existing, amended and proposed public transport, cycle and pedestrian infrastructure and services;
- Providing information with respect to technological advances which improve the use of public transport such as apps and integrated ticketing systems;
- Developing new or advising of existing databases to facilitate and promote car sharing, walking groups, cycle groups etc.;
- Organising learning opportunities which promote travel by sustainable means such as bike maintenance and repair tutorials;
- Advising of and providing information with respect to available initiatives such as tax saver tickets and the Cycle to Work scheme which may be of benefit to residents.

Drawing from the above, it is considered that the impact of the operational phase on Traffic and Transport will be *likely, positive, moderate, and permanent*.

The table below summarises the identified likely significant effects of the proposed development with mitigation in place.

Table 14-19: Summary of Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Car usage	Neutral	Slight	Local road network	Likely	Long term	Residual
Traffic congestion	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Site permeability for pedestrian and cycle movements	Positive	Moderate	Travel routes in the immediate area	Likely	Long term	Residual
Risk of accident due to vehicle movements	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Realising local and national sustainable transport objectives	Positive	Moderate	Wider transport network	Likely	Long term	Residual

14.10 Residual Impacts

14.10.1 Construction Stage

The impact of the proposed development construction phase on the existing road network will be *negligible* with *slight negative impacts* experienced during the construction phase with construction traffic on the local road network, though this is *temporary* to *short-term* in duration.

The impact of the construction stage is assessed as follows:

- Increased vehicle numbers are expected to be limited during peak hours meaning congestion impacts are expected to be a negligible increase on background levels. As a result, associated health impacts from emissions and increased safety risk with respect to potential accidents involving vehicles will also be expected to be a negligible increase on background levels;
- There will be increased vehicle and HGV movements, however, these will be routed to use the most appropriate routes to limit the associated impact and minimise potential interaction with vulnerable road users where possible;
- The urban nature of the local road infrastructure lends itself to lower speeds and the limited increase in vehicle numbers means there is expected to be no real increase in risk to other vulnerable road users.

The impact of the proposed development construction stage will be managed by the measures set out in the *Construction & Environmental Management Plan* (enclosed as part of the full application pack) which include:

- Minimising waste and facilitating re-use/recycling of material where possible to reduce the need to transport off site;
- Use of the shortest possible haul routes available;
- Limited on-site parking for construction personnel to encourage travel by more sustainable means;
- Wheel washing and dust suppression facilities;
- A managed delivery system.

Drawing from the above, it is considered that the impact of the construction phase on Traffic and Transport will be *likely* and *adverse* but *moderate* and *short-term*.

14.10.2 Operational Stage

The assessment which forms the basis of this chapter has been wholly conservative to ensure a worst-case scenario is considered. This includes allowing for conservative background traffic growth based on TII guidance and also the buildout of the committed developments in the area. On that basis, the assessment and the associated results are considered to represent the worst-case scenario.

The increased traffic as a result of the proposed development has been shown to be minimal and will have a negligible impact in terms of traffic. The associated impact on human beings will be limited.

The increased permeability of the site and the provision of high-quality pedestrian and cycle facilities will result in increased numbers of cyclists which in turn will promote healthier living and a more active population.

The potential for increased accidents is also considered low as a result of the relatively minor traffic increases associated with the proposed development.

Thus, taking the above into consideration, the potential impact of the development operational stage is summarised as follows:

- The link capacities for the study area road network will continue to operate within acceptable limits at the year of opening;
- The impact on the junctions in the study area is considered to be negligible with relatively low increases in RFC values at each as a result of the proposed development;
- The development will increase pedestrian and cycle permeability through the local area and increase connectivity; and
- The increased traffic levels associated with the development are relatively low, particularly when compared to existing traffic flows locally meaning the associated impact in terms of road safety will be negligible. The completion of the RORR will also provide a bypass around Ratoath which will lead to a reduction of vehicular trips going through the town.

Drawing from the above, it is considered that the impact of the operational phase on Traffic and Transport will be *likely, neutral, slight, and permanent*.

Full details of traffic modelling assumptions and results are included in the Traffic & Transport Assessment completed by O'Connor Sutton Cronin Consulting Engineers for the proposed development. Although it should be noted that the impact is expected to be *negligible* relative to the existing scenario.

14.11 Monitoring

It has been demonstrated that the proposed development has negligible impact on the operation of the local road network meaning monitoring is not required to facilitate it.

14.12 Difficulties Encountered

No difficulties were encountered during the course of this assessment.

14.13 Interactions

During the construction phase, the following aspects would interact with traffic and transport and in the absence of mitigation may give rise to likely significant effects;

- **Noise and Vibration:** Construction traffic, excavation works and the build out of the blocks may result in short-term localised noise and vibration effects. Monitoring stations will be set up around the site to monitor vibration and noise levels and ensure they are within acceptable

levels. Outside of the site, the noise and vibration will be in line with standard traffic, which means this impact can be disregarded;

- **Air Quality and Climate:** Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. The effect of this interaction would be *local, neutral, not significant* and at worst *short-term* in duration.

During the operational phase the potential interactions are;

- **Air Quality and Climate:** Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

14.14 References

The following documents were consulted in preparation for this chapter:

- Traffic & Transport Assessment Guidelines (2014) as published by the former National Roads Authority (NRA) now Transport Infrastructure Ireland (TII).
- Guidelines for Traffic Impact Assessment (1997) as published by the Chartered Institute of Highways & Transportation.
- Meath County Development Plan 2021 – 2027.
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) as published by Environmental Protection Agency (EPA).
- Geometric Design of Junction (2017) as published by Traffic Infrastructure Ireland (TII).
- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (2019) as published by Transport Infrastructure Ireland (TII).
- The TRICS database (<http://www.trics.org/>) operated by TRICS Consortium Limited.

15 Material Assets – Waste Management

15.1 Introduction

This Chapter was completed by O'Connor Sutton Cronin and Associates Limited and assesses the likely and significant environmental impacts associated with the proposed development and Resource and Waste Management.

The following topics will be assessed in this chapter of the EIAR:

- Construction and Demolition Waste Management
- Operational Waste Management

This chapter provides a description of the project (in connection with resource and waste management); the baseline for waste for the Proposed Development and a statement of significant impacts associated with both the construction and operational phases of the Proposed Development. A 'do-nothing' scenario has also been considered. Mitigation measures are proposed in the form of avoidance, prevention, reduction, offsetting, and reinstatement or remedial measures and recommendations for monitoring are included where appropriate. Predicted residual effects are also described. This section on Waste has been prepared by O'Connor Sutton Cronin (OCSC) with supporting information provided by AWN Consulting Limited.

Assessments for the Site are detailed in this Chapter with relevant technical information included in the following standalone reports:

- OCSC (2025) Construction and Demolition Waste Management Report
- AWN (2025) Operational Waste Management Report

15.1.1 Author Information

This chapter was prepared by Anthony Horan (Chartered Engineer) and reviewed by Mark Killian (Chartered Engineer) and approved by Anthony Horan Chartered Engineer (MIEI) and FCONSEI.

15.1.2 Proposed Development

The proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 114 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas.

The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development.



Figure 15-1 Site Boundary in Red. Source: Fewer Harrington Architects for Beo Properties Limited.

15.1.3 Aspects Relevant to this Chapter

The activities associated with the project which have the potential for impact are detailed in Table 15.1

Table 15-1 Aspects

Phase	Activity	Description
Construction	Demolition of existing boundary structures	Run-off percolating to the ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Limited excavation will take place at the Site for the provision of building foundations and the installation of services.
	Storage of Hazardous Material	Fuel for re-fuelling on-site machines and chemical storage (such as for concrete curing) during the construction phase.
	Import/Export of Materials	All suitable surplus subsoil, if any exists, will be exported for reuse off-Site to a reuse site subject to the requirements under the Waste Management Act (e.g., Article 27 or 28). Where material cannot be reused, it will be recovered or disposed of by the Waste Hierarchy and Waste Management Act. Limited excavation will take place at the Site for the provision of building foundations, installation of services, and construction of roads. Aggregates will be required for sub-base under roads and buildings. All sub-base materials must meet the relevant engineering specifications. The use of recycled or secondary aggregates should be considered as a replacement for primary aggregates.
Construction and Operation	Construction of sub-surface structures	Excavations will be undertaken to facilitate the implementation of services. It is not considered that the construction at the required depths will impede groundwater flow.
	Infilling	A degree of fill will occur during the works which will require the importation of concrete, 6F2 stone, topsoil, and class 2 material. Construction materials that contain recycled/recovered content should be considered as part of the procurement stage.
Operation /Unplanned Events	Operational Waste Storage and Collection	All waste stored and presented for collection will do so in a manner consistent with the 2018 MCC Waste Management Byelaws.
	Storage of hazardous materials	No fuel oil storage is required for the operational phase. All heating will be provided by air to water heat exchangers or similarly efficient systems.

15.2 Assessment Methodology

Table 15-2 Definition of Quality Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts, see Table 15.3 below.

Table 15-3 Definition of Significance of Effects

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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects, see Table 15.4 below.

Table 15-4 Definition of Duration of Effects

Quality	Definition
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

15.2.1.1 Assumptions and Limitations

The description of existing conditions is based on the available desktop study (May 2024) and on current available public service records information as well as site walks in January 2025 and April 2025. Given the site history and site activities, it is not envisaged that any significant contaminated ground (including contaminated waste) exists within the site of the Proposed Development.

15.2.2 Legislation and Guidance

The assessment of waste is a desktop study, to identify properties, and the generation of waste materials that may arise from the Proposed Development. It also involved consultation with Local Authorities and the relevant utility providers. The assessment followed a phased approach as outlined in Chapter 4.4 of the Environmental Protection Authority's *(EPA) Guidelines on Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

An initial assessment was carried out which defined the Proposed Development in terms of location, type and scale; established the baseline conditions; established the type of wastes on-site and generated during the Operational Phase; established the activities associated with the Proposed Development and initial assessment and impact determination. This assessment identified any likely Source-Pathway-Receptor (**SPR**) linkages relating to the site of the Proposed Development.

The information sources that were utilised to establish the baseline conditions for the Site and all available information was compiled in accordance with:

- *Guidelines on Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022);
- Advice Notes for preparing Environmental Impact Statements DRAFT (EPA, September 2015);
- Guidelines on information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);

- The classification of impacts / effects in this Chapter follows the definitions provided in the Guidelines (EPA, 2022);
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of the Environment, Community and Local Government, 2013);
- *Additional* guidance and EIA definitions are contained in NRA Guidelines (NRA, 2009).
- The *Construction and Demolition Waste Management Plan* for the Proposed Development (OCSC);
- *Protection of the Environment Act 2003* as amended;
- The *Construction Environmental Management Plan (CEMP)* for the Proposed Development incorporating the *Operational Phase Waste Management Plan (OWMP)* for the Proposed Development;
- *The Eastern Midlands (EMR) Waste Management Plan (WMP) 2015-2021*; (EMRWMP 2015-2021)
- *EPA National Waste (Database) Reports*;
- *The Meath County Development Plan (DCDP) 2021-2027*;
- *Waste Management Act 1996* (No. 10 of 1996) as amended 2001 (No. 36 of 2001), 2003 (No. 27 of 2003) and 2011 (No. 20 of 2011) Sub-ordinate and associated legislation;
- *Environmental Protection Act 1992* (S.I. No. 7 of 1992) as amended;
- *Litter Pollution Act 1997* (Act No. 12 of 1997) as amended and *Planning, and Development Act 2000* (S.I. No. 30 of 2000) as amended;
- *EPA 'Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'*;
- *BS5906:2005 Waste Management in Buildings – Code of Practice*; and
- *DEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018)*.
- *Circular Economy and Miscellaneous Provisions Act 2022*.
- *Meath County Council Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Byelaws (2018)*

Additional information was obtained from the following sources:

- *Department of the Environment, Community & Local Government, (DECLG)*;
- *EPA*; and
- *Irish Waste Management Association (IWMA)*.

15.2.3 Terminology

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying quality effects, see Table 15.5 below.

Table 15-5 Definition of Quality Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
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
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In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts, see Table 15.6 below.

Table 15-6 Definition of Significance of Effects

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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects, see Table 15.7 below.

Table 15-7 Definition of Duration of Effects

Quality	Definition
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

15.3 Baseline Environment

15.3.1 Sourcing Baseline Information

The site of the Proposed Development is in the Local Authority area of Meath County Council (MCC). The receiving environment in the MCC area is governed by the requirements set out in the National Waste Management Plan for a Circular Economy 2024 to 2030.

Details of waste collection permits (granted, pending and withdrawn) for the region are available from the National Waste Collection Permit Office (NWCPO).

15.3.2 Topography and Setting

The site is currently greenfield and used for agricultural purposes and can be accessed from Glascarn Lane to the east and Fairyhouse Road to the west of the site.

Ground levels across the site fall generally from south-west to north-east towards Glascarn Lane. Levels along the public road forming the south-western boundary of the site are approximately 93.5 mAOD and these fall to approximately 90.5 mAOD along the north-eastern boundaries of the site. There are two local high points of 92.8 mAOD in a small area in the centre of the site surrounded by a plateau area at 92.8 mAOD. A detailed topographical survey has been carried out of the site and this has informed the EIAR and design. The general site topography can be seen on Figure 12.3.

15.3.3 Existing Waste Infrastructure

There are three no. municipal solid waste landfills currently in operation in Leinster and all are operated by the private sector - Knockharley Landfill (W0146-02), Drenth (W0201-03) and Ballynagran Landfill (W0165-02). There are two no. existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

There is several other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities, soil waste and integrated waste management facilities.

The MCC Bring Centre is in the Mullaghboy Industrial Estate, Navan located c. 22.km northwest of the site. Thorntons Civic Amenity Centre is located in Dunboyne Business Park 10 km south of the site. There is also a bring bank located c. 2.5km northeast of the proposed development at Raystown Industrial Estate, Ratoath, where glass and aluminium cans can be deposited.

15.4 Characteristics of the proposed development

15.4.1 Demolition Phase

There are no known existing structures on the site and as such there is no separate demolition phase of this project.

15.4.2 Construction Phase

The development programme will be market driven to a large extent; however, it is expected, given the nature and scale of the development, that it will be rolled out over a period of 24 – 48 months post receipt of planning permission.

15.4.2.1 Phasing

Given the size and scale of the proposed development it is expected that it will be developed in four individual but sequential development phases. The proposed development phasing plan is shown in the figure following.

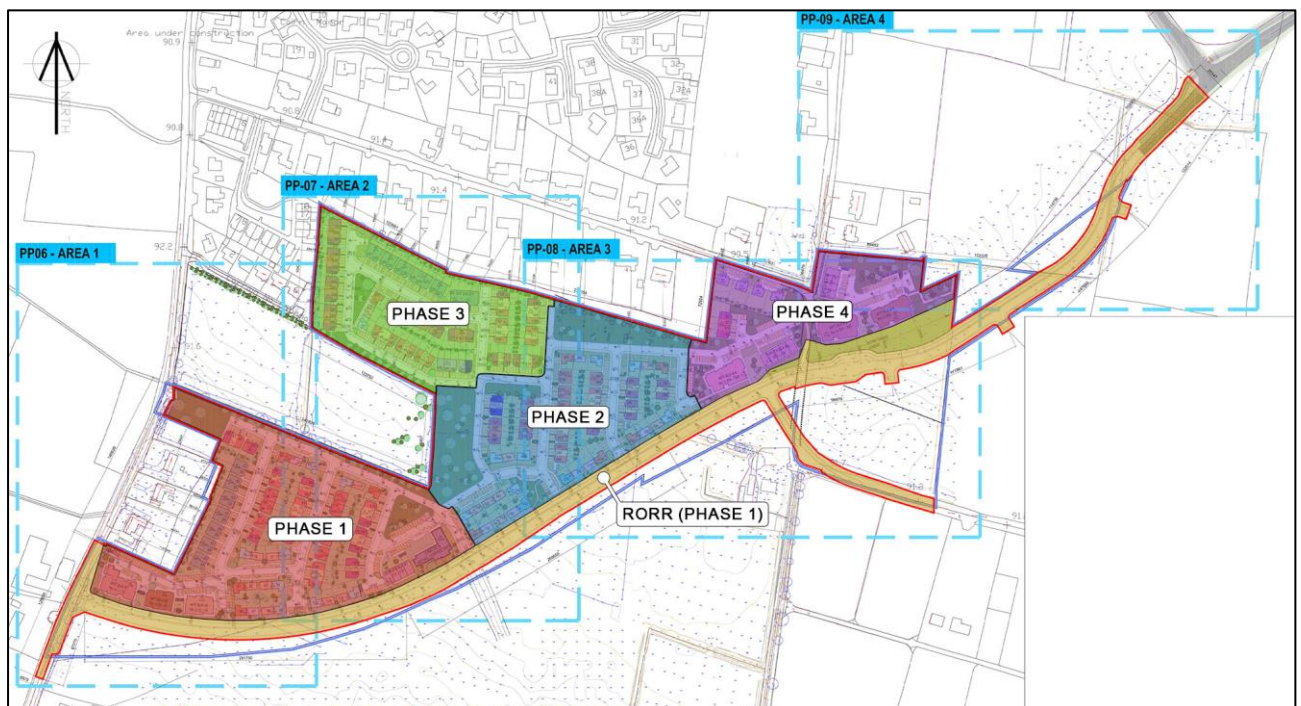


Figure 15-2 Development Phasing Plan

15.4.2.2 Construction Traffic Routing

This aerial map illustrates the proposed construction route and locations in the Ratoath area. The map features several key elements:

- CONSTRUCTION ACCESS:** Indicated by a white dot on the M3 motorway.
- INDICATIVE DEVELOPMENT LOCATION:** Indicated by a white dot on the R155 road.
- CONSTRUCTION ROUTE:** A green line showing the path from the M3 interchange, through the R155 road, and towards the Ratoath area.
- M3 INTERCHANGE:** Located at the bottom of the map, where the M3 motorway meets the R154 road.

The map also shows various roads (R147, R125, R155, R154, M3, M2), landmarks (Ratoath GAA, Donaghmore Ashbourne GAA Club, Ratoath Garden Centre, Fairyhouse Racecourse, Meath Eco Park, Nuttstown Storage), and a north arrow in the bottom right corner.

Waste materials generated will be segregated on-site. This will allow for the maximum possible degree of recycling. Where on-site segregation of certain waste types is not practical, off-site segregation will be carried out. Skips and receptacles will be provided to facilitate segregation at the source.

The appointed waste contractor will collect and transfer the waste as receptacles are filled. Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

15.4.3 Operational Phase

The Proposed site will be well planned from an operational waste management perspective with bin stores set out and managed in accordance with the AWN Operational Waste Management Plan, enclosed with this application and in accordance with the Bye Laws of Meath Co. Co. Each house will have an Organic, Mixed Dry Recyclable and Waste bin. All shared bin stores for apartments, duplexes, the crèche and the retail unit will all have Organic, Mixed Dry Recyclable, Waste and Glass bins. Each individual residence will be provided with a three-bin storage system, as per section 5.1 of the AWN OWMP. The management company for the development will be required to appoint a pest control operator to manage pests at all communal waste storage areas.

15.5 Predicted Impacts

15.5.1 Construction Phase

By using the EPA category split figures and the industry standard overall waste generation figures, the C&D waste arisings for the subject site can be estimated. The estimated arisings under the various EPA categories are set out in Table 15-8.

Table 15-9: C Waste: Reuse, Recycle & Disposal Amounts

Construction Waste: Reuse, Recovery, Recycle & Disposal							
Waste Type	tonnes	Reuse/Recover		Recycle		Disposal	
		%	tonnes	%	tonnes	%	tonnes
Soil & stone	41,450*	100	41,450	0	0	0	0
Concrete, brick, tiles	20	0	0	80	15	20	5
Asphalt, tars	288*	0	0	20	58	80	230
Metals	5	5	0.25	90	4.5	5	0.25
Miscellaneous	25	10	2.5	40	10	50	12.5
Total:	41,788	-	41,453	-	88	-	248

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction. 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 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, possible odours and visual pollution. In the absence of compliance with relevant waste legislation and mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with local, regional and national legislation, bye-laws and guidance, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of compliance with relevant waste legislation and mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

Wastes arising must be taken to suitably authorised waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous authorised waste

facilities in the vicinity 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. The majority of construction materials are either recyclable or recoverable. However, in the absence of compliance with relevant waste legislation and mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

15.5.2 Operational Phase

A waste generation model (WGM) developed by AWN has been used to predict waste types, weights and volumes expected to arise from the proposed development. The WGM incorporates building area and use and combines these with other data, as well as Irish and US EPA waste generation rates.

The estimated quantum / volume of waste that will be generated from the residential units and amenity areas has been determined based on the predicted occupancy of the units. While the estimated quantum / volume of waste that will be generated from the commercial units (creche and retail unit) is based upon floor area m² and its usage.

The estimated additional waste generation for the Proposed Development for the main waste types is presented in the table below.

Waste Type	Waste Volume (m3 / week)
Organic Waste	1.99
DMR	15.94
MNR	2.07
Glass	7.87
Total	27.83

Table 15-10 Estimated additional waste generation for the proposed development

In addition to the typical waste materials that will be generated at the Proposed Development daily, there will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green / garden waste may be generated from internal plants or external landscaping;
- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (**WEEE**) (both hazardous and non-hazardous);
- Printer cartridges / toners;
- Chemicals (paints, adhesives, resins, detergents, etc.); and
- Light bulbs (Fluorescent Tubes, Long Life, LED and Filament bulbs).

Further details in relation to the waste management can be found in the Operational Waste Management Plan (**OWMP**). This has been prepared by AWN Consulting Ltd. specifically for the Proposed Development.

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 pollution and/or small volumes of waste being sent unnecessarily to landfill. In the absence of

compliance with relevant waste legislation and mitigation, the effect on the local and regional environment is likely to be **Long-term, significant** and **negative**.

The nature of the development means the generation of household 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. Municipal Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The knock-on effect of litter issues is the presence of pollution and vermin in affected areas. However, in the absence of mitigation and compliance with relevant waste legislation and, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

Waste contractors will service the proposed Development on a regular basis to remove waste. Legislation requires the proper management of waste and its removal to appropriate facilities. 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. All waste materials will be dealt with in accordance with regional and national legislation, as outlined previously, and time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of compliance with relevant waste legislation and mitigation, the effect on the local and regional environment is likely to be **Long-term, significant** and **negative**.

15.6 Mitigation Measures

15.6.1 Construction Phase

As outlined in the Resource Waste Management Plan (RWMP) and the Outline Construction Environmental Management Plan (OCEMP) for the Site, it is proposed to ensure the highest possible levels of waste reduction, waste reuse and waste recycling are achieved for the Proposed Development. Specifically, the OCEMP aims to achieve waste prevention, maximum recycling and recovery of waste. The plan has as a central tenet, the diversion of waste from landfill wherever possible.

The OCEMP describes the applicable legal and policy framework for C&D waste management in Ireland (both nationally and regionally), it also estimates the category and quantity of waste generated by the Proposed Development and makes recommendations for the bespoke management of the various waste streams. The RWMP also provides guidance on collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g., contamination of soil or water resources).

Any soil removed off-site will be carried out by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

It will be the role of an appointed Waste Manager to try to find alternative options for demolition waste before sending it to landfill. It is preferable, where possible, to retain the soil on site for reuse rather than soil leaving the Site. Some wastes may be transported to another site for reuse on that site. All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility.

The Waste Manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc. All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off site will be covered to prevent dust or particle emissions from the load.

15.6.2 Operational Phase

The typical wastes that will be generated during the Operational Phase of the Proposed Development will include the following:

- Dry Mixed Recyclables (**DMR**) - These materials could potentially catch fire, and this would be a significant local effect with a short-term impact. This is mitigated by the risk being considered by the Fire consultant in the production of their strategy for the scheme.
- Organic waste – These materials could attract vermin if it is not appropriately stored, and the stores maintained. As mitigation there will be appropriately designed and managed WCAs for all common waste areas in the development.
- Glass – No significant environmental concerns have been identified for the storage of domestic glass waste at the Proposed Development.
- Mixed Non-Recyclable (**MNR**) / General Waste – These materials could attract vermin if it is not appropriately stored, and the stores maintained. As mitigation there will be appropriately designed and managed WCAs for all common waste areas in the development.

More detail is provided in the Operational Waste Management Plan prepared by AWN Consulting Limited and included with the submission.

Alternative Designs Considered

There have been no other alternative designs considered for waste as all proposed designs are constrained by existing infrastructure and to be implemented as directed by local service providers and the local authority, in accordance with best practice and local byelaws.

15.7 Residual Impacts

15.7.1 Construction Phase

It is considered that once the mitigation measures discussed above are employed, there will be a slight negative imperceptible, permanent impact since the development will require some material to be taken on-site to an appropriate waste facility. However, it is noted that the lands are zoned for residential and as such an alternative development would be provided for on the subject site in the future.

15.7.2 Operational Phase

It is considered that once the mitigation measures discussed above are employed, there will not be residual impacts on the environment in relation to waste as a result of the Proposed Development. The residual impact is assessed to be a slight negative, imperceptible, permanent impact.

15.8 Cumulative Impacts

The cumulative impacts consider the combined effects of the proposed development and other proposed projects in the surrounding area. Cumulative impacts occur as a result of actions taking place in the same area and within the same timeframe as the proposed development. This cumulative assessment assumes that the following extant planning permissions will be completed:

- **Planning Ref. 2460487 – Residential Development at Ballybin Road:** the proposed development, located to the east of Ratoath, comprises 141 no. residential units, car parking, green space and associated site access work. Part of this scheme involves a proposed realignment of the Main Street/Jamestown Road junction.
- **ABP318557 – Jamestown LRD:** the Jamestown LRD is located on the already-constructed portion of the Ratoath Outer Relief Road (RORR) and will be adjacent to this LRD site, towards the northeast. The development comprises 228 residential units (114 no. houses and 114 no. apartments) with childcare facilities and associated site works.
- **Planning Ref. 2460676 – Proposed Residential Development at Ratoath:** the site is located on lands at Jamestown, Ratoath. The development fronts on the already-constructed portion of the Ratoath Outer Relief Road (RORR) and is located just northeast of the Jamestown LRD. The proposed development entails 90 no. residential units together with associated roads, drainage, services and landscaping.

The location of these committed developments is shown in the figure following:



Figure 15-4: Indicative Locations of Committed Developments in the Study Area

While there are additional, comparatively small developments in the area, these have not specifically been assessed as their impact is expected to be negligible. The cumulative impact from these developments on was determined to be negative, imperceptible, and permanent.

15.8.1 Construction Phase

It is considered that the additional developments in the area once combined with this scheme will have a negative, not significant permanent residual impact.

15.8.2 Operational Phase

It is considered that the additional developments in the area once combined with this scheme will have a negative, imperceptible permanent residual impact.

15.9 Monitoring

A OCEMP has been prepared in advance of any works starting on site. The appointed Contractor will author a Construction Environmental Management Plan (CEMP) document considering their approach and any additional requirements of the Design Team or Planning Regulator and the measures set out in the OCEMP. The Contractor will also update the CEMP prior to that start and through the construction process.

The CEMP sets out the overarching strategy for ensuring that construction of the Proposed Development will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. The CEMP is a living document, and it will go through several iterations before works commence and during the works. It will set out requirements and standards which must be met during the Construction Phase and will include the relevant mitigation measures outlined in this EIAR and any subsequent conditions relevant to the Proposed Development. The CEMP and the RWMP are included in the planning application submission. Monitoring shall be carried out for compliance with these plans.

15.10 Interactions

These impacts also relate to and interact with other Chapters within the EIAR such as:

- Chapter 4, Population & Human Health
 - The proper management of wastes during construction stage and operation phase is required to ensure that waste does not pose a hazard to human health. This has been considered in the mitigation measures outlined above.
- Chapter 5, Biodiversity: Flora and Fauna
 - The proper management of wastes during construction stage and operation phase is required to ensure that waste does not pose a hazard to flora and fauna. This has been considered in the mitigation measures outlined above.
- Chapter 6, Lands, Soils & Geology
 - The excavation and removal of soil is also discussed in the Land, Soils and Geology chapter.
- Chapter 7, Hydrology, Water and Hydrogeology
 - The management of runoff during the construction phase is also discussed in this chapter.
- Chapter 8, Air Quality & Climate
 - The management of dust during the construction phase in accordance with the OCEMP will be an interaction with this chapter.
- Chapter 9, Noise and Vibration

- The Management of construction stage noise is dealt with in the OCEMP.
- Chapter 11, Materials Assets (Transportation)
 - The management of the removal of waste from the site has been considered in the Materials Assets Transportation chapter.
- Chapter 13, Cultural, Archaeological and Architectural Heritage
 - The discovery of archaeological finds can take place during earthworks.

15.11 Difficulties Encountered

No exceptional difficulties were experienced in compiling this EIAR.

15.12 References

Waste Management Act 1996 (S.I. No. 10 of 1996) as amended 2001 (S.I. No. 36 of 2001), 2003 (S.I. No. 27 of 2003) and 2011 (S.I. No. 20 of 2011). Sub-ordinate and associated legislation;

Environmental Protection Act 1992 (Act No. 7 of 1992) as amended;

Litter Pollution Act 1997 (Act No. 12 of 1997) as amended;

Eastern-Midlands Waste Region, Eastern-Midlands Region (EMR) *Waste Management Plan 2015 – 2021* (2015);

Meath County Council (DCC) Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Byelaws (2018);

Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998);

Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002);

DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action* (World Summit on Sustainable Development) (2002);

DoEHLG, *Taking Stock and Moving Forward* (2004);

DoECLG, *A Resource Opportunity - Waste Management Policy in Ireland* (2012);

Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012;

MCC, Meath County *Development Plan 2021 – 2027* (2016) Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended 2010 (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015);

European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC);

Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC);

EPA, European Waste Catalogue and Hazardous Waste List (2002);

EPA, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015);

BS 5906:2005 Waste Management in Buildings – Code of Practice;

DoEHLG, *Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities* (2018).

16 Material Assets – Utilities

16.1 Introduction

The purpose of this chapter is to describe the methodology used to assess the potential impacts from the proposed Development and its associated electrical underground cables, communication underground cables (hereafter referred to as the “proposed development”) on the material assets in the study area. This chapter has been prepared by Barry O’Neill Tech Eng. Dip. Eng. BEng. CEng. MCIBSE MIEI. Director of Barry O’Neill Ltd. trading as BBSC, a Chartered Engineer of over 30 years experience in preparing planning submissions for houses, apartment, multiuse development schemes, schools, hospitals, offices, creches, retail developments in the industry.

The proposed development comprises a Large-scale Residential Development (LRD) on a site of 12.58ha within the townlands of Jamestown and Commons in Ratoath Co. Meath. The proposed development will principally consist of the construction of 364 no. residential units including 250 no. houses and 114 no. apartment / duplex units along with a creche, retail unit and café unit all with associated car and cycle parking and bin stores. Proposed building heights range from 2 no. to 4 no. storeys. Public open space is proposed across the site consisting of a central public park area and pocket parks featuring formal and informal play and amenity areas.

The proposed development also includes the construction of a section of the Ratoath Outer Relief Road (RORR) which will be continued from its current termination point in the northeast of the subject site to the existing Fairyhouse Road (R155) in the southwest. Access to the development is proposed via 2 no. vehicle access points from the new RORR. A series of pedestrian and cycle connections are proposed to site from the Fairyhouse Road (R155), Glascarn Lane and the new RORR.

Please refer to the planning application form and statutory notices (newspaper and site notices) for a full and formal description of the proposed development.

The chapter will describe the baseline environment of the material assets in the study area, assess the likely impacts and set out mitigation measures to be put in place to reduce these impacts on the material assets.

The chapter considers the impacts on the material assets and not the people using the assets.

The issues and impacts on people are discussed in Chapter 13 (Population and Human Health).

The issues and impacts on water are discussed in Chapter 12 (Water).

Material Assets are resources that are valued and that are intrinsic to specific places.

These may be economic assets of human or natural origin.

With regard to Material Assets, the Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) published by the Environmental Protection Agency (EPA) state:

“In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure.”

Material Assets of a human origin include, within the scope of this section:

- Pedestrian Ways; and
- Aviation.

Material assets of a natural origin include:

- Land Resources;
- Geological Resource;
- Natural Amenities; and
- Raw Materials.

16.2 Assessment Methodology

The Material Assets Assessment was prepared in accordance with relevant European Union and Irish legislation and guidance, namely,

- Requirements of Annex IV of Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment (EIA) Directive)
- In accordance with Schedule 6 of the Planning and Development Regulations 2001 as amended (S.I. No. 600 of 2001) and conforms to the relevant requirements as specified therein.

In addition other guidelines referred to in this appraisal, but not limited to,

- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA) 2022)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003) (and revised advice notes (EPA 2015b))
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of the Environment, Community and Local Government 2013); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017).

The Material Assets chapter should be read in conjunction with the following chapters:

- Chapter 3– Background to the Scheme
- Chapter 14 – Material Assets: Traffic and Transport
- Chapter 13– Population and Human Health; and;
- Chapter 7 – Noise and Vibration.

The Material Assets chapter should be read in conjunction with the following reports, prepared by BBSC, as enclosed with the wider application pack.

- Energy and Climate Action Statement Encompassing TBG Part F, Part L – BBSC, 05-June-2025
- Utility Impact Assessment, BBSC, 05-JUNE-2025
- Telecommunications Impact Assessment, BBSC, 05-JUNE-2025

Assessment of the potential impacts of the proposed development on existing built services in the vicinity of the site included:

- Review of ESB Network Utility Plans
- Review of Gas Networks Ireland Service Plans
- Review of EIR E-Maps
- Review of Siro E-Maps
- Review of Virgin Media E-Maps
- Review of Ordnance Survey mapping
- Review of Meath County Development Plan 2021-2027

16.2.1 Data Collection Methods

Data collection was limited to known data sources as published by the various Utility Providers such as ESB, Bord Gais, Eir, Virgin, Siro where available.

The site is a green field site with no existing infrastructure other than that expected of a green field, namely overhead ESB cables feeding Ratoath and its environment.

Therefore, material assets were identified through consultation and a review of available datasets and Utility mapping.

16.2.2 Consultation

Consultation and information requests was undertaken with the following organisations, was overlaid with the project mapping and assessed. Figures, maps and other details are included at the end of this chapter.

- ESB (Electrical Networks in the Area and development Areas)
- Bord Gais Ireland.
- Irish Water
- Siro
- Virgin
- Eir

16.3 Baseline Environment

16.3.1 List of Principle Utilities

Water Utility

Irish Water (Uisce Eireann), a statutory body for the supply of Potable Water refer Water Services Act 2017 and amended acts, orders and regulations thereafter.

Foul Water Utility

Irish Water (Uisce Eireann), a statutory body for the Treatment of Waste or Foul Water refer Water Services Act 2017 and amended acts, orders and regulations thereafter.

Electrical Utility

Electricity Supply Board (ESB; Bord Soláthair an Leictreachais), a statutory body for the Supply of Electricity refer to Electricity (Supply) Act 1927 and amended acts, orders and regulations thereafter.

Natural Gas Utility

Bord Gais, a statutory body for the supply of Natural Gas refer to the Gas Act 1976 and amended acts, orders and regulations thereafter.

Communications Utility

ESB, Statutory Body, ESB (Electronic Communications Networks) Act 2014 (SIRO)

Eir, Private Entity.

Virgin Media, Private Entity.

16.3.2 Existing Properties

The development is a green field site, with no Human Built structures for habitation.

The site has over head wiring for ESB supplies to the Ratoath Area.

The development will be interlinking with adjoining Housing Estates for Utilities as is expected for a development of this type, as power, communications will be fed or will feed these existing developments.

The proposed development will divert and extend the existing infrastructure into the proposed development via underground ducting within the proposed development and connect to overhead wiring where existing is being diverted.

Existing power lines will be routed from the boundary of the development into underground ducts to enhance the visual impact of these services. Please refer to ESB drawing, ESB, Existing Network

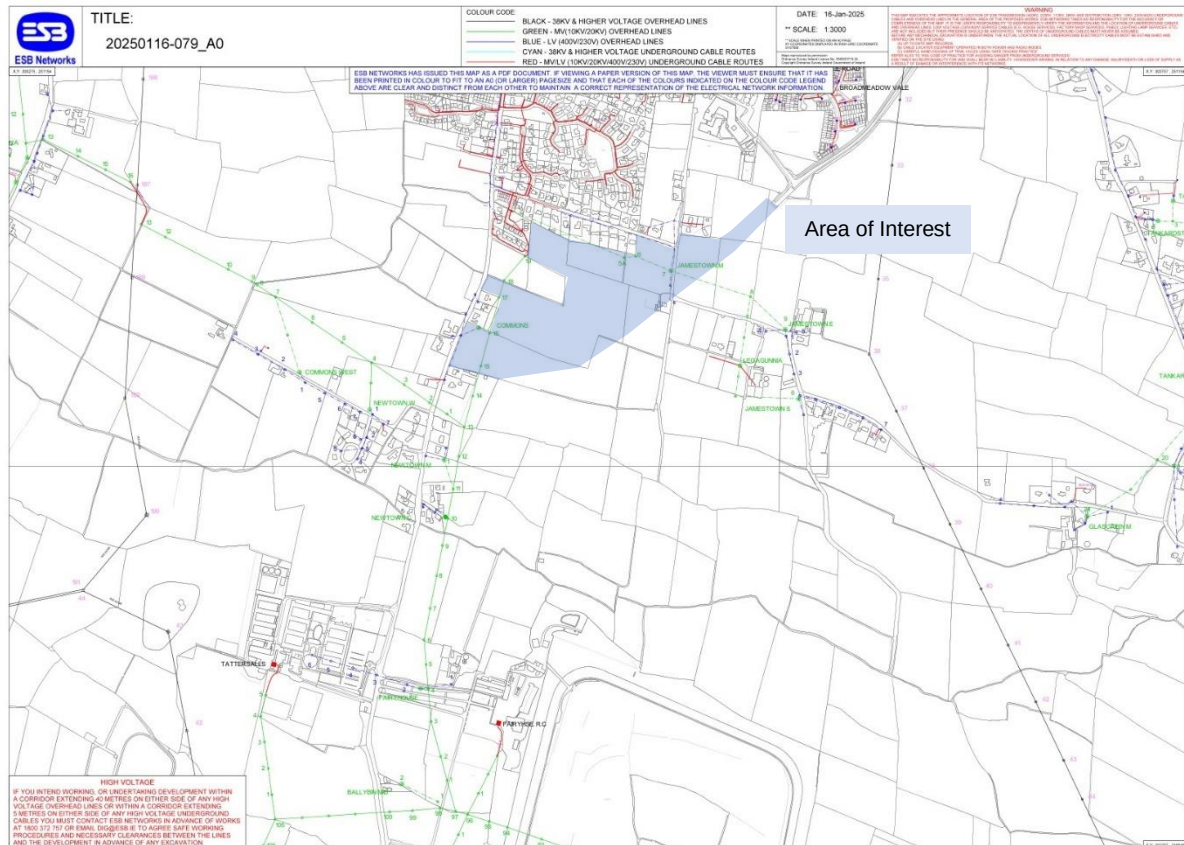


Figure 16-1 ESB, Existing Network

16.3.3 Electricity

There is no existing Ducted ESB cabling in ground within the scope of the proposed development.

There are 10/20KV lines running from the South of the site to the North of the site, passing through a proposed development (by others) where upon it drops down to feed an existing sub station in the Cairn Court Estate. Refer to Figure 16.1 for details of ESB routes.

There are a number of branch off lines running to pole mounted transformers for the provision of 400V and 230V lines to premises, dwellings and other Commercially related entities.

16.3.4 Gas

Natural Gas is available from Bord Gais networks to the north of the development.

Meath County Council is currently targeting a 40% reduction in emissions of Carbon in residential sector by 40%, Commercial by 45% (<https://www.meath.ie/council/council-services/environment/climate-action/climate-action-national-policies>).

16.3.5 Telecommunications

No other line runs over or under the proposed development.

16.4.1 General

During the construction of the development, communications, electrical, water, foul water services shall be installed in ground. Electrical services will be typically installed in ducts, with draw wires to facilitate the installation of services (wires). The installations will typically be under pathways, road ways to service the community needs. This will mainly involve excavation of trenches to lay ducting, construction/installation of access chambers and backfilling of trenching. The trenching and backfilling

works will be carried out in conjunction with the construction of the roads and footpaths throughout the scheme.

All Electrical Services, Telecommunication Services, Gas Services are regulated by the Commission for Regulation of Utilities (CRU). All works to the services must comply with CRU regulations, Irish National Standards and European Standards.

16.4.2 Electricity

16.4.2.1 Construction Phase

The installation of the utilities for the development will be conducted in parallel with the others services being provided to the proposed development, refer section 16.4.

The relocation or diversions of the existing overhead ESB lines may lead to loss of connectivity to and/or interruption of the supply from the electrical grid to the surrounding areas. Any loss of supply will be managed by ESB Networks to minimise the impact on neighbouring properties.

The construction of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving the electricity networks.

ESB system will be extended and made more robust as overhead wiring will go to in ground ducting. This will reduce the impact of falling wires. As the ESB Sub Station Transformers are now remote switched, the impact of a local sub station transformer failure impacting a large area will be greatly reduced to a single loop of dwellings or similar.

The existing overhead lines are to be relocated to below ground ducting.

It is intended that electrical power will be delivered by ESBN from their existing supply network and will require the construction of separate ESB sub-stations on the proposed development – these are identified on the submitted architects' overall site plan, drawing PP05, in total 6 number stations are proposed as outlined on Figure 3 Propose ESB Sub Station and Zoning below.

Power supply, and the requirement for any alterations to the existing power supply network for the development of the subject site, will be agreed with ESB Networks in advance of construction. Dedicated ducting shall be routed as per ESB National Rules and Standards for ducting 10/20KV and 400/230V lines.

The installation of these lines will follow the Phasing of works and will be in consultation with and in approval with ESB Networks and ESB requirements for a development of this type and context.

It is expected that the proposed development will require, based on ESB standard, 12KVA per House (<https://www.esbnetworks.ie/new-connections/understanding-connection-capacity>, ESB Networks - The Distribution System Security and Planning Standards (Demand customers only) Date: September 2003) and an estimated 3.5KVA per Apartment, 49.5KVA for Creche, 49.5KVA for Retail, 20KVA for Public Lighting in Estate, 20KVA for Public Lighting on proposed ring road, EV Charges in Estate, therefore. These are discussed in more detail in the report, Utility Impact Assessment, BBSC, 05-JUN-2025.

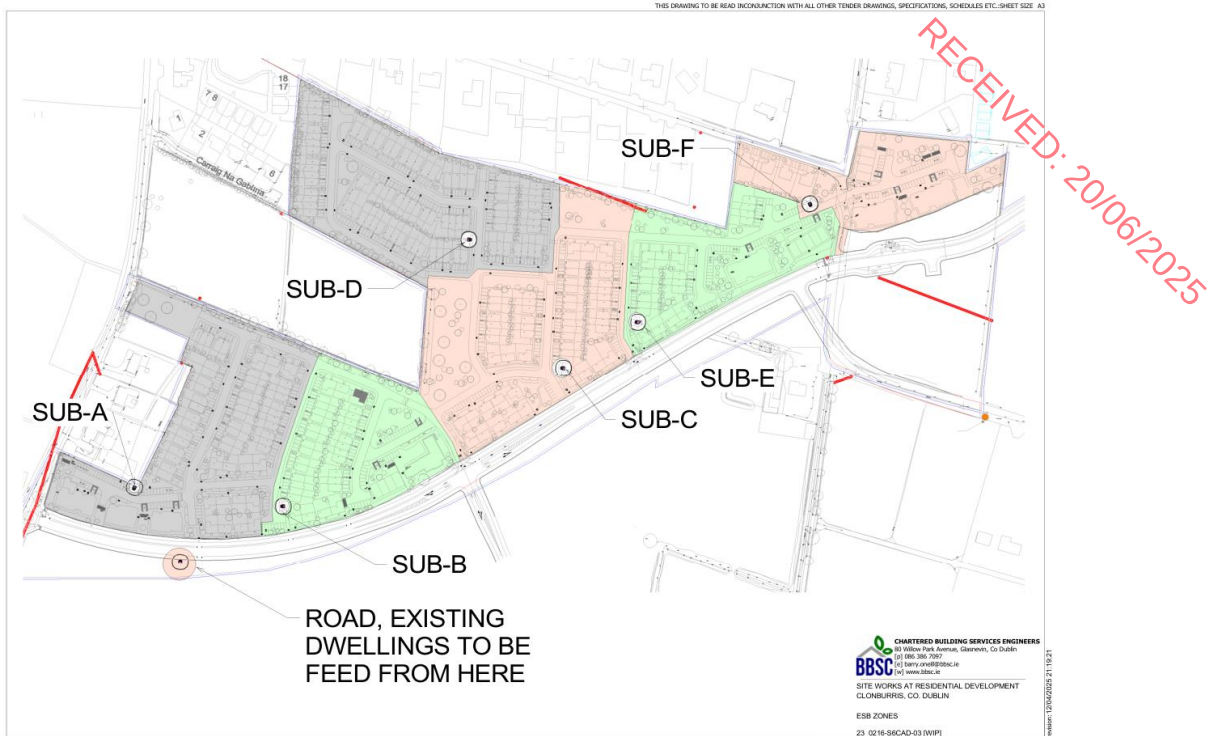


Figure 16-3 Propose ESB Sub Station and Zoning

On this basis it is proposed that 6nr Substations will be installed to allow for the reduction of power from 10/20KV to 400/230V.

Diversity on Houses and Apartments once applied the estimated loadings is as follows:

Substation	PEAK	DIVERSITY	Units
A	1,085.00	407.10	KVA
B	1,295.50	765.20	KVA
C	1,000.00	480.00	KVA
D	861.00	351.80	KVA
E	686.00	323.40	KVA
F	785.50	299.50	KVA
Total	5,713.00	2,627.00	KVA

This excludes any Solar Photovoltaic loads installed on occupation of the scheme and subject to SEAI BER rating via the DEAP assessment, which when energised would reduce the overall demand.

Cables and Transformers will be required to be sized the Peak demand above.

The expected Solar Photovoltaic loads is discussed in more detail in the report, Utility Impact Assessment and also in the report Energy and Climate Action Statement Encompassing TBG Part F, Part L.

It is estimated that the development, in meeting it's obligations under Part L of the Building Regulations will generate 1,192,200 kwhr/year, requiring over 3,300 panels each at 450watts or greater. As the technology advances the output per unit has, based on historical trends, increased every 12 months. The final selection and loadings will be available at dwelling or unit handover and assessed as per SEAI DEAP/ BER software.

Power from the substation will be by means of run outs, be looped and be routed to mini pillars to service, housing, apartments, creche, retail unit and electric vehicle charging stations via underground ducting.

Full Drawings of the proposed ESB is included at the end of this chapter.



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Figure 16-4 Sample of ESB mini-pillar and in ground ducting including run outs to Dwellings

Impact of these critical site preparation works is likely, positive, significant and permanent, it will allow for greater redundancy in the ESB network, provide power to dwellings, apartments, creches, retail, Electric vehicle charging stations, public lighting, power to heat pumps to facilitate the lowering of Carbon emissions when combined with Solar Photovoltaic Cells amongst some of the benefits to the community as a whole.

16.4.2.2 Operational Phase

The impact of the operational phase of the proposed development on the power supply network would be the requirement for an Electrical Diversified Load of 2.63 MW which will be split over up to 6 number ESB sub-stations located throughout the scheme.

The construction of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving the electricity networks.

16.4.3 Gas

The existing network is available on the R155 Fairyhouse Road, and in Carin Court estate.

It is proposed to extend the main gas pipeline along the proposed extension to the proposed RORR to facilitate industry needs.

16.4.3.1 Construction Phase

The installation of the utilities for the development will be conducted in parallel with the others services being provided to the proposed development, refer section 16.4.

Gas will be extended along the RORR to facilitate future development.

16.4.3.2 Operational Phase

The impact of the operational phase of the proposed development on the Gas supply network will have no impact as gas is not expected to be used.

16.4.4 Telecommunications

Telecommunications, are to be linked to the existing networks available in Ratoath and surrounding the area of the proposed development.

All telecommunications related works will be carried out in accordance with;

- The Gigabit Infrastructure Act (GIA) 2024
- Guide to the Installation of Telecoms Infrastructure in Residential and Mixed Use Developments, April 2024 Version 13, Dublin City Council – Telecoms Unit

- Meath Council Section 254 Appliance Licences - Telecommunications Infrastructure
- PAS 2016:2010, Next generation access for new build homes – Guide to telecommunications.
- EIR National standards “Duct Access Technical & Operational Manual”
- Siro National Standards.
- Virgin National Standards “New Build Handbook”

16.4.4.1 Construction Phase

The installation of the utilities for the development will be conducted in parallel with the others services being provided to the proposed development, refer section 16.4.

The impact of the operational phase of the proposed development on the existing networks will have no impact. The use fibre spitter panels typically has extension ports to allow for speedy extension of the network to allow for future development.

In order to allow for the connection of fibre broadband local street mounted cabinets will be required, as is typical for such installations, as these allow for wiring terminations and other equipment to allow for connection to the internet. These are typically 850x350x1250mm high and are site agreed once application to connect has been lodged with the users.

Impact of these critical site preparation works is likely, positive, significant and permanent, will allow for users of the development to be provided with fibre based broadband, increase commerce and facilitate interconnectivity across communities.

The existing housing estates to the east and north of the developments, existing infrastructure shall be extended into the proposed development as is normal practice for developments of this type.

For network integrity and security the development will install, in ground, vendor neutral ducting to allow for any user to be provided by any vendor. It is proposed to provide up to 4nr 125mm Green Ducts on the proposed ring road which shall act as a major spine. Branch offs from this spine shall be brought into the proposed development via 110mm Green Ducts. Access to the ducts will be by means of manhole cover junction relay boxes, mounted in ground.

Telecommunications supply, and the requirement for any alterations to the existing telecommunications network for the proposed development, will be agreed in advance of construction with the relevant telecommunications providers.

Eir, Siro and Virgin have been contacted and have indicated that each entity has no issues with supplying the development with Fibre based telecommunications for broadband. There cables shall be routed in dedicated ducting on the proposed ring road, acting as a spine see Figure 16.5. Once the vendors enter the development, these ducts shall be common to all providers, please see Figure 16.6. Full Drawings of the proposed Communications network is included at the end of this chapter.

Telecoms shall be to Gigabit Infrastructure Act 2024 with the arrangements for Fibre broadband to dwellings and Apartments requiring common ducting, chambers etc.

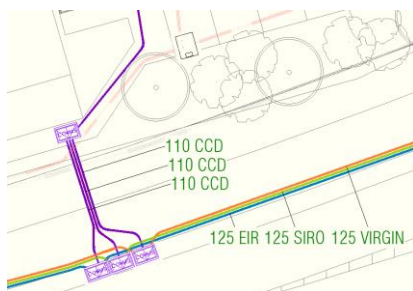
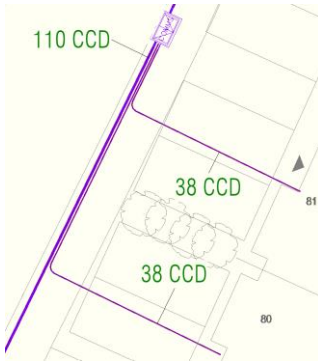


Figure 16-5 Example of Comms incomer to the development (CCD denotes Common Comms Duct)



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Figure 16-6 CCD run out from in ground chamber (JB4 or similar) to dwelling. It shall terminate in an ETU interface module prior to entering the dwelling. Units 80, 81 used for reference. 110 denotes 110mm diameter in ground duct.

16.4.4.2 Operational Phase

During the operational phase, works to the networks will be to allow for the relevant home owner, tenant, business owner to enter into commercial agreements with a preferred vendor of choice to connect their premises to the network. This may require access to in ground manholes to allow for the connection of the fibre drop (line to premises) to the network equipment located in the access chamber.

These systems are typically designed to allow for these works to be carried out without interruption of supply to others.

16.4.5 Rules for road openings and site works

For Clarity it is noted that all works where so required, will follow standard rules of work as per HSA "Code of Practice For Avoiding Danger From Underground Services" which details all requirements to ensure a safe and continued supply of Utility being amended and extended from an existing source.

Works to be carried out to Guidelines for Managing Openings in Public Roads, 2017, as published by Department of Transport, Tourism and Sport, please see Figure 16.7 for typical ducting standards.

Figure 6.2.1 NSAI Summary of Colour Code for Buried Plastic Piping



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Figure 16-7 Extract from “Guidelines for Managing Openings in Public Roads”

16.5 Mitigation Measures

16.5.1 Electricity

16.5.1.1 Construction Phase

Construction related activities will require temporary connection to the local electrical supply network, for the servicing of the temporary site compound.

The development site will be connected to the local electricity network system, but given the scale and transient nature of construction works, the power demand on the local electricity systems is not considered significant and is not anticipated to impact upon local power supply.

The diversion of the overhead power lines to sub-terrain ducting will be carried out by ESB under planned outages conditions, as a result these works are normally characterised as a temporary, regionally short term, with minimal impact to existing users or to the local electrical grid. These works will occur once the in ground services are provided, tested and proven safe prior to making live.

16.5.1.2 Operational Phase

The operation phase of the proposed development will be within the remit of ESB Networks to manage, maintain and upgrade as is required.

The impact of the operational phase of the proposed development on the electrical supply network is likely to increase the demand on the existing supply.

The potential impact from the operational phase on the electricity supply network is long term in nature and will require additional power from the national grid. The additional load falls within the expected simulation of future energy needs as per of CRU's "Tomorrow's Energy Scenarios (TES) publications" requirements up to the year 2040, however with the used of Solar Photovoltaic systems the overall demand will be offset by generation and storage of power using batteries as generated from the Suns energy.

16.5.2 Gas

Construction Phase

The supply of gas to the proposed development site will not be operational during the construction phase.

Where the proposed works will involve a live tap into the existing infrastructure carried out in accordance with standard rules relating to these works as outlined under Bord Gais requirements for same.

It is expected that no potential loss of supply from the Gas Networks Ireland infrastructure while carrying out works to provide service connections.

These works are normally characterised as a temporary, regionally short term, with minimal impact to existing users.

Operational Phase

The development is not being connected to the Gas Networks Ireland national gas supply network. However, should gas pipe in the proposed ring main be requested by Gas Network Ireland, then impact of the operational phase of the proposed development on the gas supply network is not likely to increase the demand on the existing supply as no load is required as heating is by means of Electrically driven heat pumps.

The potential impact from the operational phase on the gas supply network is minimal due to policy changes expected and being enacted to reduce societies demand on fossil fuels.

16.5.3 Telecommunications

Construction Phase

Telecommunications requirements during the construction phase will be primarily provided by means of mobile phones and or fixed line broadband.

The site compound will require a power and telecommunications connection, which comprise of connecting to the existing network. These connections shall be temporary and negligible in nature.

Fixed telecoms will not be operational during the construction phase.

The construction phase is unlikely to give rise to the requirement to divert fixed telecom lines but extend the existing infrastructure to suit site temporary construction requirements.

The local telecom ducted service may require to be extended into the site to facilitate telecoms on very focused and limited manner.

Operational Phase

The operational phase on telecommunications systems will be minimal.

16.6 Residual Impacts

16.6.1 Electricity

Construction Phase

Implementation of the measures outlined in Section 16.5 will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

Electrical works are normally characterised as a temporary, regionally short term, with minimal impact to existing users or to the local electrical grid and certified to IS10101 National Rules for Electrical Installations, current edition at time of installation.

Overhead wiring in the community will be reduced as the cabling will be below ground.

Operational Phase

The impact of the operational phase of the proposed development on the power supply network would be the requirement for an Electrical Diversified Load of 2.63 MW which will be split over up to 6 number ESB sub-stations located throughout the scheme.

The construction of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving the electricity networks

16.6.2 Gas

Construction Phase

Implementation of the measures outlined in Section 16.5 will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term

Operational Phase

The impact of the operational phase of the proposed development on the gas supply will be nil as no user of gas is expected.

The construction of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving gas networks

16.6.3 Telecommunications

Construction Phase

Implementation of the measures outlined in Section 16.5 will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term

Operational Phase

The impact of the operational phase of the proposed development on the telecommunications network would be to increase the demand on the existing network.

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The construction of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving the telecommunication networks

16.7 Cumulative Impacts

There will be an increase in demand for the electrical power, gas and telecoms supply into the development. It is expected that the scheme will be completed by c.2032.

16.7.1 Electricity

In the event of future development adjacent to the proposed development, it is not anticipated that there will be a significant impact on the material assets – built services provided that the other developments implement the appropriate mitigation measures.

The use of the proposed ring road will allow any future development to the south or West of the proposed ring road to be fully serviced from the utility services spines to be installed in the proposed ring road.

As the time frames for planned outages is required to be planned, the Utility providers ESB will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible.

Historically ESB will not engage with design process until such time as planning has been approved and an application for power has been made with the scheme name and numbering has been approved by the local County Council. The primary reason for this is to ensure an utility account is matched to an address.

16.7.2 Gas

In the event of future development adjacent to the proposed development, it is not anticipated that there will be a significant impact on the material assets – built services provided that the other developments implement the appropriate mitigation measures.

The use of the proposed ring road will allow any future development to the south or West of the proposed ring road to be fully serviced from the utility services spines to be installed in the proposed ring road.

As the time frames for planned outages is required to be planned, the Utility providers Bord Gais will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible.

16.7.3 Telecommunications

In the event of future development adjacent to the proposed development, it is not anticipated that there will be a significant impact on the material assets – built services provided that the other developments implement the appropriate mitigation measures.

The use of the proposed ring road will allow any future development to the south or West of the proposed ring road to be fully serviced from the utility services spines to be installed in the proposed ring road.

As the time frames for planned outages is required to be planned, the Utility providers Siro, Eir, Virgin will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible.

Historically Siro, Eir, Virgin will not engage with design process until such time as planning has been approved and an application for power has been made with the scheme name and numbering has

been approved by the local County Council. The primary reason for this is to ensure an utility account is matched to an address.

16.7.4 “Do Nothing” Scenario

The “Do Nothing” scenario would involve no change of use of the greenfield lands, and therefore no further impact to the material assets – built services would exist.

16.7.5 Worst Case Scenario

In predicting a worst-case scenario, various considerations were undertaken involving accident, fire, flood and natural disasters.

In considering the worst case for the built services - Utilities, it was determined that failure of an ESB Substation is the most likely impact. These typically do not fail if maintenance by ESB is regular and promptly carried out.

Should an underground duct become flooded, it should have no impact on provision of that service, as the cables, junctions etc. are waterproof.

However responsible and competent implementation of the mitigation measures will result in making these worst-case scenarios an unlikely event

16.8 Monitoring

The electricity network will be monitored by ESB networks.

Telecommunications will be monitored by EIR, SIRO, Virgin.

Gas Networks Ireland will monitor the existing gas network.

Reinstatement of any disturbance to the open space areas will be required.

16.9 Difficulties Encountered

No recorded difficulties were encountered during the preparation of this chapter.

16.10 Interactions

Population and Human Health interactions are noted.

16.11 References

- Gigabit Infrastructure Act 2024
- Guide to the Installation of Telecoms Infrastructure in Residential and Mixed Use Developments, April 2024 Version 13, Dublin City Council – Telecoms Unit
- PAS 2016:2010, Next generation access for new build homes – Guide to telecommunications.
- EIR National standards “Duct Access Technical & Operational Manual”
- Siro National Standards.
- Virgin National Standards “New Build Handbook”
- Guidelines for Managing Openings in Public Roads, 2017, as published by Department of Transport, Tourism and Sport
- ESB Networks - The Distribution System Security and Planning Standards (Demand customers only) Date: September 2003)
- Climate Action and Low Carbon Development Act 2015
- Meath County Development Plan 2021-2027
- Energy and Climate Action Statement Encompassing TBG Part F, Part L – BBSC, 05-JUN-2025

- Utility Impact Assessment, BBSC, 05-JUN-2025
- Telecommunications Impact Assessment, BBSC, 05-JUN-2025
- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA) 2022)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003) (and revised advice notes (EPA 2015b)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of the Environment, Community and Local Government 2013); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017).
- Annex IV of Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment (EIA) Directive)
- Planning and Development Regulations 2001
- S.I. No. 600 of 2001

17 Interactions

17.1 Introduction

This chapter has been prepared by KPMG Future Analytics in accordance with the requirements set out within the Planning and Development Regulations 2001 to 2025 and the EPA EIAR Guidelines (2022) to summarise the interactions and interrelationships between key factors identified and assessed.

17.2 Definitions

Article 3(1) of the amended EIA Directive requires environmental impact assessments to include interactions of key effects assessed. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

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

Within the interactions assessment it is required to assess direct and indirect combination of effects that can be magnified through interaction or accumulation of effects. The following definitions were used within the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022).

Indirect Impacts: *'Impacts on the environment, which are not a direct result of the project, often produced away from (the site) or as a result of a complex pathway.'*

Cumulative Impacts: *'The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.'*

It is general practice, to evaluate interaction of effects as a matrix between effects and key factors assessed, accompanied by brief text describing the interactions identified.

17.3 Interactions

This section collates, in summary form, the more detailed list of interactions set out within each of the chapters 5-16 above.

17.4 Interactions of Effects

Some interaction  No interaction x	Air Quality		Climate		Noise & Vibration		Biodiversity		Archaeology & Cultural Heritage		Landscape & Visual		Land & Soils		Water		Population & Human Health		Traffic & Transport		Waste Mngt		Utilities	
	Con.	Ope.	Con.	Ope.	Ope.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.	Con.	Ope.
Air Quality			✓	✓	x	x	x	x	x	x	x	x	✓	x	x	x	✓	x	✓	✓	x	x	x	x
Climate	✓	✓			x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	✓	x	x	x
Noise & Vibration	x	x	x	x			x	x	x	x	x	x	✓	x	x	x	✓	✓	✓	✓	x	x	x	x
Biodiversity	✓	x	x	x	x	x			x	x	x	x	✓	✓	✓	✓	x	x	x	x	✓	✓	x	x
Archaeology & Cultural	x	x	x	x	x	x	x	x			✓	✓	x	x	x	x	x	x	x	x	x	x	x	x
Landscape & Visual	x	x	x	x	x	x	x	x	x	x			✓	✓	x	x	✓	✓	✓	✓	✓	✓	✓	✓
Land & Soils	✓	x	x	x	x	x	✓	✓	x	x	x	x			✓	x	x	x	✓	✓	x	x	x	x
Water	x	x	x	x	x	x	✓	✓	x	x	x	x	✓	x			x	x	x	x	x	x	✓	✓
Population & Human Health	✓	✓	x	x	✓	x	x	x	x	x	✓	✓	✓	✓	x	x			✓	✓	✓	✓	x	x
Traffic & Transport	✓	✓	✓	x	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	x	x
Waste Management	x	x	✓	x	x	x	✓	✓	x	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓			x	x
Utilities	x	x	x	x	x	x	x	x	x	x	✓	✓	x	x	✓	✓	✓	✓	✓	✓	✓	✓		

Table 17-1 Table showing interaction between key factors assessed

17.4.1 Air Quality

Air quality does not have a significant interactions with other topics. However, air quality is related most significant to Population and Human Health and. Other interactions are notable with climate, land and soils, biodiversity and traffic and transport.

17.4.2 Climate

Climate change has the potential to increase flood risk over time. However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years, as part of the design of the proposed development.

- **Air Quality**

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the climate chapter. There is no impact on climate due to air quality, however, the sources of impacts on air quality and climate are strongly linked.

- **Traffic & Transport**

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site during construction will result in emissions of CO₂, a greenhouse gas. The effects of the proposed development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site.

- **Waste Management**

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. A Construction and Demolition Waste Management Plan (CDWMP) will be put in place in order to ensure the impacts of waste on climate are minimised.

17.4.3 Noise and Vibration

This chapter has used information from the Traffic and Transportation chapter and the architectural drawings to inform the assessment of noise and vibration impacts. With increased traffic movements, the noise levels in the surrounding area have the potential to 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.

17.4.4 Biodiversity

This chapter was prepared in coordination with the details outlined in Chapter 13 – Water; Chapter 12 – Land and Soils; and Chapter 16 - Material Assets: Waste Management.

17.4.5 Archaeological, Architectural and Cultural Heritage

No interactions in relation to the Cultural Heritage Resource are anticipated with other environmental factors assessed within this EIAR.

17.4.6 Landscape and Visual

As with any development that alters the visual environment, the landscape and visual impacts of the proposed scheme interact with several other environmental and social factors. The key interactions are outlined below:

- **Population and Human Health:**

Changes to the visual environment may influence the perception, amenity, and well-being of nearby residents. The proposed development has been designed to sit comfortably within its context, presenting as a well-scaled and contemporary residential scheme, supported by high-quality landscaping. These embedded design and mitigation measures will minimise adverse visual effects, particularly during the operational phase, and ensure that any potential impacts on residential amenity are minor and localised.

- **Material Assets:**

The visual presence of the development intersects with nearby material assets, including the Ratoath Outer Relief Road (RORR) and supporting urban infrastructure such as footpaths, lighting, and utilities. However, as the development is located within a serviced, zoned area with an emerging urban character, the interaction with material assets is considered minimal.

- **Cultural Heritage:**

The site is not located within, or adjacent to, any designated archaeological or architectural heritage features. Due to the absence of sensitive heritage receptors and the limited extent of long-range visibility, any interaction between the development's visual effects and cultural heritage is assessed as negligible.

17.4.7 Land and Soil

During the construction phase, possible interactions of land, soils, and hydrogeology may interact with other following aspects:

- **Biodiversity**

The cut and fill and other predicted excavation activities with the Site will result in the loss of some permanent habitat and the disturbance to some species during construction.

- **Water/Hydrology**

Site preparatory works (i.e., site clearance, re-profiling, etc.) can potentially lead to elevated silt/sediment or other contaminant loading due to construction site runoff. Dewatering of excavations during the construction phase can result in water with elevated silt and possible chemical contaminants requiring discharge to the local drainage system. Construction stage works can potentially impact water and hydrology due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.

- **Air Quality and Climatic Factors**

Dust generated during site clearance, reprofiling, excavation, and soil reinstatement works can lead to temporarily diminished air quality.

- **Noise and Vibration**

Excavation of soils and extraction of bedrock can lead to temporary noise and vibration within the Site.

- **Landscape & Visual**

The proposed cut and fill activities on the Site will alter the topography of the Site, and the subsequent construction within the Site will significantly alter the local landscape.

- **Material Assets (Traffic and Transport)**

Removal of waste soil and stone from the Site and the importation of aggregate fill material will temporarily impact on local traffic volume.

- **Material Assets (Built Services)**

The construction of built services will require the excavation of soils within the Site.

- **Material Assets (Waste Management)**

Removal from Site of a net excess of soil and stone to that required for cut and fill purposes will be required during the construction phase.

- **Population and Human Health**

Potential chemical contaminants in Site soils and/or groundwater may pose a risk to human health. This will be assessed through a GQRA prior to commencement of construction.

The impact of activities related to land, soils, and hydrogeology on the aforementioned aspects of the Site during the construction phase are anticipated to generally be short-term to permanent, neutral to negative in terms of quality, and not significant based upon the implementation of appropriate mitigation measures.

The impact of activities related to land, soils, and hydrogeology on the aforementioned aspects of the Site during the operational phase is anticipated to be long-term, neutral in terms of quality, and not significant given the implementation of appropriate mitigation measures

17.4.8 Water

This chapter was prepared in coordination with the details outlined in Chapter 9 – Biodiversity; Chapter 12 – Land and Soils; and Chapter 16 - Material Assets: Waste Management.

- **Material Assets**

The construction of the proposed services (water supply, drainage, etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids runoff.

There will be an increased demand on potable water supply and on the municipal drainage system.

The potential significant impacts on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined, where required.

With mitigation measures in place, no significant, permanent, residual, negative impacts will occur.

- **Land & Soils**

Site preparatory works (i.e. site clearance, re-profiling, etc.) during the construction stage have the potential to impact the hydrology and hydrogeology due to accidental spills, suspended solids becoming entrained in surface water runoff, etc.

- **Biodiversity**

Impacts on hydrology and water courses can impact on aquatic ecology and biodiversity.

17.4.9 Population and Human Health

There are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to population and human health. The main high-level interactions between Population, Land, and Human Health and other environmental factors include Water, Air and Climate, Noise and Vibration, Traffic and Landscape.

17.4.10 Material Assets – Traffic and Transportation

During the construction phase, the following aspects would interact with traffic and transport and in the absence of mitigation may give rise to likely significant effects.

- **Noise and Vibration**

Construction traffic, excavation works and the build out of the blocks may result in short-term localised noise and vibration effects. Monitoring stations will be set up around the site to monitor vibration and noise levels and ensure they are within acceptable levels. Outside of the site, the noise and vibration will be in line with standard traffic, which means this impact can be disregarded.

- **Air Quality and Climate**

Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. The effect of this interaction would be *local, neutral, not significant* and at worst *short-term* in duration.

Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

17.4.11 Material Assets – Waste Management

As with any development that alters the visual environment, the landscape and visual impacts of the proposed scheme interact with several other environmental and social factors. The key interactions are outlined below:

- **Population and Human Health**

The proper management of wastes during construction stage and operation phase is required to ensure that waste does not pose a hazard to human health. This has been considered in the mitigation measures outlined above.

- **Biodiversity: Flora and Fauna**

The proper management of wastes during construction stage and operation phase is required to ensure that waste does not pose a hazard to flora and fauna. This has been considered in the mitigation measures outlined above.

- **Lands, Soils & Geology**

The excavation and removal of soil is also discussed in the Land, Soils and Geology chapter.

- **Hydrology, Water and Hydrogeology**

The management of runoff during the construction phase is also discussed in this chapter.

- **Air Quality & Climate**

The management of dust during the construction phase in accordance with the OCEMP will be an interaction with this chapter.

- **Noise and Vibration**

The Management of construction stage noise is dealt with in the OCEMP.

- **Materials Assets (Transportation)**

The management of the removal of waste from the site has been considered in the Materials Assets Transportation chapter.

- **Cultural, Archaeological and Architectural Heritage**

The discovery of archaeological finds can take place during earthworks.

17.4.12 Material Assets – Utilities

Utilities have interactions for Population and Human Health, landscape and visual, lands, soils and geology.

18 Summary of Mitigation Measures

18.1 Introduction

This chapter provides a complete summary of mitigation measures proposed in Chapters 5-16. The appointed contractor is required to adhere to the mitigation measures provided here to avoid or reduce significant effects and ensure sustainable development.

18.2 Mitigation Measures

18.2.1 Air Quality

The proposed development has been assessed as having at most a high risk of dust soiling impacts and a low risk of dust related human health impacts and a medium risk of dust-related ecological impacts during the construction phase as a result of demolition, earthworks, construction and trackout activities (see Section 5.5.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a high risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- 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.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsters and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Operational Phase

The impact of the operational traffic associated with proposed development on air quality is predicted to be imperceptible and neutral with respect to the operational phase in the long term. Therefore, no site-specific mitigation measures are required other than those set out in Section 8.4.2 in relation to operational phase energy usage.

18.2.2 Climate Factors

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Mitigation of embodied carbon of materials include:

- Creating a construction program which allows for sufficient time to determine reuse and recycling opportunities for wastes;
- During detailed design, the embodied carbon will be a key consideration and principals from IEMA (IEMA, 2020b) and LETI (LETI, 2020) will be put in place to ensure that the project's GHG impacts are mitigated through 'good practice' measures;
- The project design will be reviewed to ensure it complies with existing and emerging policy requirements with respect to GHG emissions; and
- Where possible, adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction.

A number of mitigation measures have been incorporated into the design of the development to reduce the impact on climate wherever possible. An Energy and Climate Action Statement was prepared by BBSC as part of the proposed development.

The proposed development has the potential to be a Zero Energy Building (ZEB), which goes above the requirement for a Nearly Zero Energy Building (NZEB) in accordance with the 2022 Part L requirements and the relevant sustainability policies within the Meath County Development Plan 2022-2029 and Climate Action Plan 2025. The ZEB standard is reached by ensuring a low energy demand for heating by a tight building envelope and use of a heat pumps, with the energy supplied through solar panels. The residential and commercial units will aim to achieve a minimum Building Energy Ratio (BER) of A2. The dwellings shall include several energy conservation measures to achieve a high energy rating for each dwelling:

- Heat pumps;
- Use of solar panels;
- High-performance thermal envelope with low U-values for the fabric;
- Low thermal bridging construction details;
- Airtight construction;
- Energy efficient ventilation system;
- Energy efficient heating and hot water generation system; and
- Energy efficient lighting to be used throughout.

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Construction and detailed design of the proposed development will align with the most recent national and local Climate Action Plans;
- During detailed design the most recent Technical Guidance and Standards with respect to material recommendations for pavements and roads will be considered, with a particular emphasis on low carbon choices.
- 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. A construction waste management plan will be implemented to minimise construction waste sent to landfills. Subsoils will be reused within the development rather than becoming a waste product, this includes as base layers under footpaths. Recycling of materials will be promoted to and reduce the environmental footprint of the site. All topsoil will be reused within the proposed development.
- Where feasible precast concrete will be utilised rather than on-site pours. This reduces potential for wastage rates significantly.
- Recycled aggregates, preferably sourced on-site, will be used where feasible. Use of recycled crushed concrete, pulverised fuel ash, or blast furnace slags will replace other non-recycled aggregates where feasible.
- Reclaimed rather than recycled steel will be used where feasible.
- Sourcing materials locally will be prioritised. This will help to reduce transport related CO₂ emissions and helps support local suppliers, further promoting economic sustainability.
- Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example, a 70% GGBS clinker replacement in cement is proposed to be utilised for building elements where feasible, this goes above and beyond the 30% requirements for public bodies. For roads and pavements, a low carbon concrete with a minimum of 30% clinker replacement will be utilised, consistent with IS EN 206. Exceptions apply where a technical justification is made by a suitably qualified professional.
- Hot mix bituminous material will be replaced with warm or cold mix across the Proposed Development.
- Onsite lighting for roads will be LED.
- High-carbon CEM I cement products will not be used.
- Detailed design will review design with respect to the TII mitigation hierarchy (see figure 3.1 of PE-ENV-01105 (TII 2022b)). Where feasible, the aim will be to design out and eliminate potential carbon impacts completely. Where this is not practicable, mitigation measures were considered to reduce effects (i.e. choice of materials).

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, lightning and hail through site risk assessments and method statements.

In addition, active travel has been facilitated by providing cycle parking to provide facilities for residents and visitors to the development. This alongside the facilitation of 10% electric car charging across the proposed development will reduce the requirement for fossil fuel use. The active travel within the proposed development is designed to join with the active travel facilities being put forward by Meath

County Council linking the Fairyhouse Road with the centre of Ratoath. Aligning these facilities ensures a larger active travel network and increased potential for modal shift. Bus stops to facilitate public transport journeys will be provided as part of the RORR. The promotion of public and active travel journeys aligns with CAP25 transport principles.

During the operational phase the proposed developments operational management plan will ensure that potential effects of future climate change are monitored and where action is required (i.e. maintenance of trees, drains or structures).

18.2.3 Noise and Vibration

Construction Phase

The contract documents will clearly specify the construction noise criteria included in this chapter which the construction works must operate within. The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001. These measures will ensure that:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use
- Any plant, such as generators or pumps that is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen

During the course of the construction programme, the contractor will be required to manage the works to comply with the limits detailed in Table 1 using methods outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise BS 5228 -1: 2009+A1 2014 Part 2 which include guidance on several aspects of construction site practices, which include, but are not limited to the measures discussed below.

Selection of Quiet Plant

The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not said item can be replaced with a quieter alternative.

For static plant such as compressors and generators used at work areas such as construction compounds etc., the units will be supplied with manufacturers' proprietary acoustic enclosures where possible.

The contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where possible, where alternative lower noise

generating equipment that would economically achieve, in the given ground conditions, equivalent structural/ excavation/ breaking results, these will be selected to minimise potential disturbance.

General Comments on Noise Control at Source

The following outline guidance relates to practical noise control at source techniques which relate to specific site considerations:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant will be switched off when not in use and not left idling;
- For percussive tools such as pneumatic concrete breakers or tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erection of localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries are other suitable forms of noise reduction;
- 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, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights;
- Where compressors, generators and pumps are located in areas in close proximity to noise sensitive properties/ areas and have potential to exceed noise criterion, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation;
- Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact;
- Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary, and;
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening

Typically screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the source.

BS 5228 -1:2009+A1 2014 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice screens constructed of materials with a mass per unit of surface area greater than 10 kg/m² will give adequate sound insulation performance. As an example, the use of a standard

2.4m high construction site hoarding will provide a sufficient level of noise screening once it is installed at a suitable position between the source and receiver.

Working Hours

Normal working times will be 07:00 to 19:00hrs Monday to Saturday. Works other than the pumping out of excavations, security and emergency works will not be undertaken outside these working hours without the written permission of the Contracting Authority. This permission, if granted, can be withdrawn at any time should the working regulations be breached.

Operational Phase

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) 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. It is also noted that the ventilation strategy will be for Mechanical Ventilation Heat Recovery units which are expected to provide strong sound insulation to external noise, hence ingress of noise through the ventilation systems is considered to be negligible for this assessment.

The performance values set out in Table 7-16 below are to provide the range of the overall R_w values required for the glazing system.

Figure 18-1 Identified Façades that Require Upgraded Sound Insulation



Table 18-1 – Sound insulation performance requirements for glazing for each category.

Reference	Octave Band						Specification (dB R_w)
	125	250	500	1k	2k	4k	
RED	26	27	34	40	38	46	38
GREEN	23	23	32	38	42	44	35

The acoustic specification for Glazing Type Red and Green can be achieved using a double glazed configuration with slightly thicker glass panes than standard double glazing. For all other unmarked windows standard double glazing will be sufficient to meet the criteria.

With the inclusion of the glazing specifications noted above, the recommended internal noise criteria can be achieved. The calculated glazing specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage, consequently, these may be subject to change as the project progresses. It is noted that there are other glazing systems on the market that may also provide sufficient sound insulation to meet the criteria, the overriding factor is that suitable glazing systems are selected at design stage so that the internal noise levels presented in Table 7-4 are achieved.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

18.2.4 Biodiversity

18.2.4.1 Construction Phase

A Construction & Environmental Management Plan has been prepared by OCSC for the proposed development. It outlines the following measures which will be implemented to protect biodiversity in the area.

"Inland Fisheries Ireland (IFI)"

Inland Fisheries Ireland (IFI) made a submission during a prior iteration of this development, on 27 June 2022. Based on this submission, the following is relevant to this development:

- *It is noted that the development is in the catchment of the Ratoath stream/Broadmeadow River, which is an important salmonid system with Brown Trout throughout. Conservation of this system will be enforced throughout the construction and operational phases of the development.*
- *Adequate pollution prevention measures will be employed during construction to ensure fauna and flora within the freshwater system is not impacted. These measures are described in the following section.*
- *Various mitigation measures are noted in this document to ensure good construction practices.*
- *As requested by IFI, comprehensive surface water treatment measures will be implemented during the construction and operational stages. Drainage from the topsoil storage area will be considered. Wheel wash facilities will be provided and will be receive regular inspection and maintenance.*
- *Bio-retention areas or swales will be used for attenuation as requested by IFI.*
- *The capacity of the receiving foul and storm water infrastructure has been carefully calculated to accept predicted volumes.*
- *All discharges will be in compliance with the European Communities (Surface Water) Regulations 2009 and the European Communities (Groundwater) Regulations 2010.*

Pollution prevention

Pollution prevention measures will be undertaken in accordance with best practice guidelines from Inland Fisheries Ireland (2016). There are no sensitive fisheries habitats on the site however extensive earthworks are planned. A programme for the control of sediment will therefore be required. This will be put in place by the appointed contractor.

All works will be carried out in compliance of the Water Pollution Act 1977 and the Wildlife Act 1976 and all relevant amendments.

Only sediment-free run-off is to leave the site. A suitably sized detention basin or settlement area will be installed at the lowest point before discharge where excess run-off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc. The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.

Preliminary locations of temporary surface water lagoons used at construction stage can be seen in the figure following. The location of the four lagoons correspond to the envisaged four phases of construction. The exact locations of these including the detailed design will be undertaken prior to construction stage by the appointed contractor."

In addition to mitigation measures outlined elsewhere in the EIAR, the following measures will be implemented to protect biodiversity:

- A pre-construction survey for bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place.
- An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted.
- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). If removal is required during this season the removal of woody material will be carried out under the supervision of an ecologist. If nesting birds are present NPWS will be contacted, and removal will be subject to conditions outlined by NPWS.
- It would be expected that the beneficial effects of these trees would not be seen until the medium to long term.
- Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal as part of the development plans, it will first be surveyed for roosting potential and bat presence if required. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Any tree felling will be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period

(November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, will be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight.

- 20 bird boxes and 3 bat boxes will be placed on site as an enhancement measure. Of these ten bird boxes and 12 will be placed on the board walk. The position of these boxes will be carried out in consultation with an ecologist.
- An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted.
- Preconstruction surveys for mammals will be carried out given the high habitat suitability adjacent to the proposed works for a variety of mammal species and the time between the original surveys and possible commencement of works.
- Pre-Construction inspection for bats in trees of bat roosting potential.
- During construction, lighting at all stages will be done sensitively with no direct lighting of hedgerows and treelines.
- Lighting during construction should only be used during working hours with no floodlighting of the site.
- All lighting during construction and operation will be carried out to the satisfaction of the project ecologist.

18.2.4.2 Operational Phase

The biodiversity value of the site would be expected to improve as the landscaping matures. The proposed development has a sustainable drainage strategy and detailed landscape strategy and mitigation during operation will be carried out as outlined elsewhere in the EIAR. Post construction an inspection of drainage connections and lighting will be carried out by the project ecologist.

18.2.5 Archaeological, Architectural and Cultural Heritage

The site was subject to a number of archaeological assessments carried out in relation to the site, both invasive and non-invasive. These include Geophysical Survey (20R0026; Russell and Breen, 2020), test trenching (21E0511; Cosgrove, 2021) and Archaeological Impact Assessment (Collins, Lyne, 2025).

The following mitigation measures will be carried out subject to the approval of the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH), and further mitigation may be sought by the NMS.

- Three areas of archaeological activity (Areas 1-3) identified during test trenching (21E0511) will be preserved by record (excavated). At the locations of the features identified, in Field 1 an area measuring 37m by 27m and in Field 5 two areas measuring 25m by 25m and 20m by 20m will be stripped of topsoil (Figure 9.5-9.7), features identified including any features associated that might be exposed, will be preserved by record. This will be carried out under licence from the National Monuments Service of the DHLGH by a suitably qualified archaeologist. The appointed archaeologist shall consult with the Licensing Section of the NMS regarding the methodology to be employed in the resolution of all sites. This will be carried out prior to construction works commencing.

- Prior to the development of the site, an area measuring 20m by 25m around the location of Cultural Heritage Area CHA1 shall be stripped of topsoil to establish if any remains of the structure are present (Figure 9.5). Further archaeological investigation may be required depending on the results, including a full archaeological excavation of any features and deposits identified by a licensed archaeologist in accordance with a methodology to be agreed with the National Monuments Service.
- Archaeological test trenching of Area 5/Field 4 and Field 7 (Figure 9.5) within the northeast portion of the site will be carried out prior to construction. Should archaeological features be identified, further mitigation, including preservation in situ (if feasible) or by record (excavation), will be required. This will be carried out under licence from the National Monuments Service of the DHLGH by a suitably qualified archaeologist. The appointed archaeologist shall consult with the Licensing Section of the NMS regarding the methodology to be employed in the resolution of all sites. This will be carried out prior to construction works commencing.
- Prior to the development of the site, a photographic and measured survey (including written description, photographic record) will be carried out of Cultural Heritage Area CHA2 – townland boundary between Commons and Jamestown, as well as CHA3 and CHA4 townland boundaries between Commons and Ratoath (Figure 9.5).
- Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site, which will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place.
- A full report including all post-excavation analysis will be submitted to the relevant authorities within 12 months of the completion of the archaeological excavations.

18.2.6 Landscape and Visual

18.2.6.1 Construction Phase

While no landscape and visual mitigation measures are specifically required beyond standard good practice during the construction phase, a number of measures have been integrated into the Construction and Environmental Management Plan (CEMP) prepared by O'Connor Sutton Cronin & Associates. These measures will help reduce temporary landscape and visual disruption:

- The site compound and contractor parking will be located in the northeastern portion of the site, away from existing residential boundaries and outside the root protection areas of trees to be retained. The compound will be removed at the earliest practicable stage following completion of main construction activities.
- The location of any on-site batching plants or temporary disposal areas will be determined by the contractor, but will be positioned away from sensitive receptors, including existing dwellings.
- Trees, hedgerows, and mature vegetation will be retained wherever possible. A detailed Tree Protection Plan will be implemented to safeguard vegetation identified for retention, in accordance with best arboricultural practice.
- Site hoarding and temporary fencing will be installed to provide both security and visual screening of construction activities. These will be maintained to a high standard throughout the construction period and relocated as necessary to suit phasing and progress.
- Construction traffic will primarily access the site from the south via Fairyhouse Road (R155) and the M3 motorway, reducing potential disruption to residents along Glascarn Lane and the existing built-up area of Ratoath.

These measures are intended to manage and reduce the short-term impacts of construction on landscape character and nearby visual receptors, especially those in close proximity to active works areas.

18.2.6.2 Operation Phase

No additional LVIA-specific mitigation is required during the operational phase of the development.

However, it is important to note that the proposed development has been inherently designed to minimise visual impact and integrate successfully into its setting. The design approach adopted by the project team incorporates the following embedded mitigation principles:

- The use of locally appropriate building materials, colours, and forms that reflect the existing suburban character of Ratoath and promote visual cohesion with adjacent residential areas.
- The implementation of a comprehensive landscape strategy, prepared by Studio Glasú Landscape Architects, which includes a green spine, public open spaces, street tree planting, and native hedgerows. These elements contribute to the creation of a visually attractive and contextually appropriate landscape structure, helping to soften the built form and reinforce the emerging character of this part of the town.

Together, these embedded design and landscape measures ensure that the development sits comfortably within its landscape context, while contributing positively to the visual amenity of the area over the long term.

18.2.7 Lands and Soil

18.2.7.1 Construction Phase

To reduce the impacts on the soils, geology, and the hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on Site. The measures will address the main activities of potential impact, which include:

Control of soil excavation and reuse of material on site, where possible, to minimize soil export from the Site;

- Sources of fill and aggregates for the project;
- Fuel and chemical handling, transport, and storage; and
- Control of water and impacts related to dewatering during excavation and construction.

• **Control of Soil Excavation**

Topsoil, subsoil, and bedrock will be excavated to facilitate the construction of above ground structures within the development and the construction of new sewer and water mains connections, roadways, and all other associated services. The project will incorporate the 'reduce, reuse, and recycle' approach in terms of soil excavations on Site. The construction will be carefully planned to ensure only the material required to be excavated will be excavated, with as much material left in situ as possible. All excavation arisings will be reused on Site where possible/if suitable.

Soil stripping, earthworks, and stockpiling of soil will be carried out during the construction phase. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of appropriate earthworks handling protocols. It is anticipated that any stockpiles will be formed within the boundary of the excavations, and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low-level stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off Site or will be reused in other areas of the Site as fill.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment is free of nuisance dust and dirt on roads.

• **Export of Material from Site**

Where material cannot be reused off Site, it will be sent for recovery/disposal at an appropriately permitted/licenced site or under EPA Article 27 registration. This is discussed further in the CEMP which will be issued as a standalone document.

Site investigations undertaken to date indicate that significant levels of contamination were not detected in the samples sent for laboratory analysis. All material will be managed in accordance with the results of the Waste Soil Classification, the Waste Management Acts and subsequent regulations, and in a manner that ensures no negative impact on human beings or surface water, groundwater, or soil environments. Further details are included in the CEMP.

- **Source of Fill and Aggregates**

All fill and aggregate for the project will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

Aggregate compliance certificates/declarations of conformity for the classes of material specified for the project;

- Environmental management status; and
- Regulatory and legal compliance status.

The use of fill and aggregate containing recycled or recovered materials shall be considered.

- **Fuel and Chemical Handling**

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of bunded refuelling areas on the Site (if required);
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, pump, tap, or valve will be fitted with a lock and will be secured when not in use;
 - All bowser units to carry a spill kit and operatives must have spill response training; and
 - Portable generators or similar static-operation, fuel-containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances being used during construction, the following measures will be adopted:

- Secure storage of all containers of potentially polluting substances in a dedicated, internally-bunded chemical storage unit or inside concrete bunded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they should be done so secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

The aforementioned list of measures is non-exhaustive and will be included in the contractor's CEMP.

- **Control of Water During Construction**

Run-off from excavations/earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls, and profile to control run-off and prevent ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site, which limits the potential for any offsite impacts. All runoff will be prevented from directly entering any water courses.

During excavation, ingress of groundwater is likely in small portions of the site. Pumping of this water may be required to keep the excavations dry. The discharge of water to the foul sewer during the construction phase will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) and issued under the Water Pollution Act. Attenuation, pre-treatment, and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence). Pre-treatment and silt reduction measures on Site will include a combination of silt fencing, settlement measures (silt traps, silt sacks, and settlement tanks), and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per the Conditions of any Discharge Licence. The client's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the discharge licence limits and testing frequency requirements and impacts due to changes in water levels.

- **Construction Management Plan**

In advance of commencement of Site works, the works Contractor will provide a Construction Methodology document detailing their proposed construction methods and any additional requirements of the Design Team or Planning Regulator. The Contractor will also prepare a CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. The CEMP is a living document and will go through a number of iterations before works commence and during the construction phase itself. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures in the EIAR and any subsequent conditions relevant to the project.

18.2.7.2 Operational Stage

During the Operational Phase of the Ratoath development, there will be limited impact on the geological environment of the area. There is no requirement for any fuel oil stores as all heating will be fuelled by electrically powered heat.

18.2.8 Water

18.2.8.1 Construction Stage

To mitigate potential silt wash off or pollution discharging from site excavation areas, it is envisaged that the contractor will put in place temporary drainage facilities to manage water within excavations. Water entering excavation areas may be collected and discharged to the sewerage system following treatment (such as silt traps and interceptors) and at a flow rate subject to the conditions of a discharge licence from Irish Water. During the final stages of construction, the proposed surface water network will provide sufficient mitigation measures, through the provisions listed previously (principally the pervious paving, trapped road gullies, and silt traps). However, a fuel separator will be provided as an additional and final mitigation measure, upstream of the attenuation system.

Onsite welfare facilities will be managed such that wastewater effluent from these facilities will be discharged to the sewerage system at a location and a flow rate subject to the conditions of a discharge

licence from Irish Water. To reduce the risk of defective or leaking sewers, all new sewers will be pressure tested and CCTV surveyed to ascertain any possible defects. Such defects, if they arise, would be repaired prior to the connection to the mains sewers.

Section 12.2 has a more detailed description of the mitigations measures for the Surface Water Drainage / Wastewater Drainage Systems.

All excavated materials shall be sorted and separated on site to suitable stockpiles of the smallest possible area and remote from the adjacent streams. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials. If encountered, contaminated soils should be excavated and disposed off-site in accordance with the Waste Management Acts 1996-2001 & associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and the adjacent Ratoath Stream, Fairyhouse Stream, and Broadmeadow River from fuel, oil, and other hazardous materials (paints, cleaning agents, herbicides, fertilisers, etc.). Suitable bunded areas will be installed for all fuel storage tanks with a minimum 110% storage volume. Designated fuel filling points will be put in place at secure locations, remote from Ratoath Stream, Fairyhouse Stream, and Broadmeadow River, with appropriate oil separators to provide protection from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill. All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages. If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.

The appointed contractor will be required to prepare and implement a Waste Construction & Environmental Management Plan to ensure the mitigation of all potential impacts during the construction phase. This plan should be agreed with the Local Authority prior to the commencement of construction. The contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken.

Construction Mitigation Measures
All excavated materials shall be sorted and separated into stockpiles. The stockpiles will be kept remote from the adjacent Ratoath Stream, Fairyhouse Stream, and Broadmeadow River. Stockpile areas shall be designed with appropriate drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials.
If contaminated soils are found on site, they will be excavated and disposed of off-site in accordance with the Waste Management Acts 1996-2001 and associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.
Bunded areas for oil storage tanks and oil separators will be installed at fuel filling points to protect from accidental spills during the construction phase. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.
The site-specific Waste Construction & Environmental Management Plan will be approved by the Local Authority prior to the commencement of construction.
The Surface Water Management Plan will be implemented to ensure surface water storage in excavations will be directed to on-site settlement ponds, where silt removal will occur before

discharge off site at a controlled rate. Periodic testing of the surface water discharge will be undertaken as required.
Any concrete mixing plant shall be sited in a designated area with an impervious surface.
All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages.
Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. New sewers will be pressure tested and CCTV surveyed to detect defective or leaking sewers. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.

18.2.8.2 Operational Stage

During the project's operational phase, sustainable drainage systems, trapped gullies and silt-trap manholes will reduce the volume of debris discharging into the surface water system and, ultimately, the public combined sewer network.

Pervious paving, green roofs, filter drains, Swales, trapped road gullies, underground pipe network, silt traps, oil separators, concrete storage systems, and flow control devices will assist in reducing runoff volumes and improving water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.

All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.

During the operational phase, the surface water network (drains, gullies, manholes, AJs, SuDS devices, and attenuation system) will need to be regularly maintained and cleaned, where required. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file / maintenance manual for the development.

Suggested mitigation measures to be implemented during the construction and operational phases of the proposed development are outlined in Table 18-2 and Table 12-1 of the chapter, respectively.

Table 18-2: Construction Stage Mitigation Measures

Operational Mitigation Measures
Water sewerage system treatment (such as silt traps and interceptors) will be implemented following conditions of a discharge licence from Irish Water.
Sustainable drainage systems, trapped gullies and silt-trap manholes will decrease the amount of debris discharging into the surface water system and, eventually, to the public combined sewer network.
Pervious paving, green roofs, filter drains, trapped road gullies, underground pipe network, silt traps, oil separator, concrete storage systems, and flow control devices will reduce runoff volume and improve water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.
All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.
During the operational phase, the surface water network (drains, gullies, manholes, AJs, SuDS devices, and attenuation system) will need to be regularly maintained and cleaned, where required. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file/maintenance manual for the development.

Table 18-3: Operational Phase Mitigation Measures

18.2.9 Population and Human Health

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. Through the provision of these remedial and mitigation measures, any negative impacts on population and human health during the construction phase shall be appropriately mitigated.

The Development have been designed to avoid negative impacts on population and human health through the design and provision of physical and social infrastructure. Mitigation measures are proposed throughout the various chapters of this EIAR to avoid any adverse impacts from the proposed scheme and accordingly no further mitigation measures are considered necessary. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the Chapters of this EIAR which address other environmental matters such as Water, Air Quality, Climate Factors, Landscape and Visual Impact and Noise sufficiently address monitoring requirements.

18.2.10 Material Assets – Traffic and Transportation

18.2.10.1 Construction Stage

This stage of the development will be dealt with by the appointed contractor through the development and implementation of a *Construction Traffic Management Plan*, as set out in Section 7.1 of the Traffic and Transportation Assessment Report, submitted under separate cover with this application. This plan will be agreed upon with the Local Authority prior to the commencement of construction and will ultimately include details on the following:

- Daily and weekly working hours;
- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites, if necessary;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;

- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place as required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads and dedicated parking provided for construction personnel.

18.2.10.2 Operational Stage

The operational stage impact of the proposed development will be mainly *negligible* in terms of traffic as can be seen in the traffic modelling results. The proposed accesses will be via two new priority-controlled junctions along the proposed new section of the RORR, which will be accessed via a new signal-controlled junction between the R155 and the RORR. This is a conservative assessment as it includes the following elements:

- Medium-range TII growth rates from 2023 to 2044;
- Third-party developments in the study area;

It could be argued that the applied growth rates represent traffic growth due to the development in the study area. This means that accounting for additional developments on top of these growth rates could lead to an element of double counting. As such, this assessment can be viewed as conservative.

18.2.10.2.1 Car Parking

The car parking strategy has considered the following guidelines:

- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities
 - Peripheral Location: *In intermediate and peripheral locations, defined in Chapter 3 (Table 3.8), the maximum rate of car parking provision for residential development, where such provision is justified to the satisfaction of the planning authority, shall be 2 no. spaces per dwelling.*
- Sustainable Urban Housing: Design Standards for New Apartments
 - Less Accessible Urban Location: *There is a requirement of one car parking space per unit together with an element of visitor parking of one space per 4 apartments.*
- Meath County Development Plan 2021 – 2027
 - Dwellings – 2 per conventional dwelling; and
 - Flats/Apartments – 2 per unit, 1 visitor space per 4 apartments.

The following car parking is proposed as the site:

Table 18-4: Car Parking Provision

Component	Relevant Standard	Standard	Development	Provision
Houses	MCC Development Plan	2 spaces per unit	250 units	500
Apartments/Duplexes	Apartment Guidelines	1 space per unit	114 units	114
Visitors	Apartment Guidelines	1 space per 4 units	114 units	29

Commercial	MCC Development Plan	Varies	805.78 sqm	22
Total Provision				665 Spaces

A key aspect of the parking strategy will be the ongoing management of parking at the site. The parking strategy will come into effect from initial contact with prospective tenants. It will be made very clear at the initial stage of communication as to what the parking availability is at the site and the lack of long term alternatives in the surrounding area.

Measures to prevent unauthorised car parking will be investigated should the need arise and may include:

- A clamping system whereby any cars parked in an unapproved location will be clamped and the owner required to pay a fine for release;
- Ongoing monitoring of visitor and tenant parking to ensure appropriate use.

All tenants will be advised of any such measures as part of the initial/ongoing consultation with appropriate signage also provided.

Bicycle Parking

Similar to car parking, the bicycle parking also considered the following guidelines:

- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities
 - Section 5.2.5 of the Compact Settlement Guidelines also states that, in the case of residential units that do not have ground-level open space or have smaller terraces, a general minimum standard of 1 cycle storage space per bedroom should be applied. Visitor cycle parking should also be provided.
- Sustainable Urban Housing: Design Standards for New Apartments
 - 1 no. bicycle space per bedroom; and
 - 1 no. visitor space per 2 residential units.
- Meath County Development Plan 2021 – 2027
 - Apartments – 1 private secure bicycle space per bed space, minimum 2 spaces and 1 visitor bicycle space per two housing units.

Bicycle parking is only required for the apartment component of the development since the houses have sufficient ground level open space to accommodate private bicycle parking. Based on this, it is proposed to provide the following:

Table 18-5: Bicycle Parking Provision

Requirement	Relevant Standard	Standard	Development	Long-Stay	Short-Stay
1 Bed Units	MCC Development Plan	1 space per bedroom	35	29	N/A
2 Bed Units	MCC Development Plan	1 space per bedroom	70	140	N/A

3 Bed Units	MCC Development Plan	1 space per bedroom	9	19	N/A
Visitor	MCC Development Plan	1 space per 2 units	108	N/A	57
Provisions				187	57

Mobility Management Plan

A development specific *Mobility Management Plan* will be implemented at the site which sets out a series of measures to facilitate and encourage a positive modal shift towards more sustainable modes of transport. These measures will be refined based on travel surveys conducted at the occupied development but typically include:

- Appointment of a site Mobility Manager to oversee the implementation of the plan;
- Ongoing liaison with relative bodies including public transport providers such as Dublin Bus and Irish Rail;
- Providing ongoing information with respect to existing, amended and proposed public transport, cycle and pedestrian infrastructure and services;
- Providing information with respect to technological advances which improve the use of public transport such as apps and integrated ticketing systems;
- Developing new or advising of existing databases to facilitate and promote car sharing, walking groups, cycle groups etc.;
- Organising learning opportunities which promote travel by sustainable means such as bike maintenance and repair tutorials;
- Advising of and providing information with respect to available initiatives such as tax saver tickets and the Cycle to Work scheme which may be of benefit to residents.

Drawing from the above, it is considered that the impact of the operational phase on Traffic and Transport will be *likely, positive, moderate, and permanent*.

The table below summarises the identified likely significant effects of the proposed development with mitigation in place.

Table 18-6: Summary of Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Car usage	Neutral	Slight	Local road network	Likely	Long term	Residual
Traffic congestion	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual

Site permeability for pedestrian and cycle movements	Positive	Moderate	Travel routes in the immediate area	Likely	Long term	Residual
Risk of accident due to vehicle movements	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Realising local and national sustainable transport objectives	Positive	Moderate	Wider transport network	Likely	Long term	Residual

18.2.11 Material Assets – Waste Management

18.2.11.1 Construction Phase

As outlined in the Resource Waste Management Plan (RWMP) and the Outline Construction Environmental Management Plan (OCEMP) for the Site, it is proposed to ensure the highest possible levels of waste reduction, waste reuse and waste recycling are achieved for the Proposed Development. Specifically, the OCEMP aims to achieve waste prevention, maximum recycling and recovery of waste. The plan has as a central tenet, the diversion of waste from landfill wherever possible.

The OCEMP describes the applicable legal and policy framework for C&D waste management in Ireland (both nationally and regionally), it also estimates the category and quantity of waste generated by the Proposed Development and makes recommendations for the bespoke management of the various waste streams. The RWMP also provides guidance on collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g., contamination of soil or water resources).

Any soil removed off-site will be carried out by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

It will be the role of an appointed Waste Manager to try to find alternative options for demolition waste before sending it to landfill. It is preferable, where possible, to retain the soil on site for reuse rather than soil leaving the Site. Some wastes may be transported to another site for reuse on that site. All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility.

The Waste Manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc. All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off site will be covered to prevent dust or particle emissions from the load.

18.2.11.2 Operational Phase

The typical wastes that will be generated during the Operational Phase of the Proposed Development will include the following:

- **Dry Mixed Recyclables (DMR)** - These materials could potentially catch fire, and this would be a significant local effect with a short-term impact. This is mitigated by the risk being considered by the Fire consultant in the production of their strategy for the scheme.

- Organic waste – These materials could attract vermin if it is not appropriately stored, and the stores maintained. As mitigation there will be appropriately designed and managed WCAs for all common waste areas in the development.
- Glass – No significant environmental concerns have been identified for the storage of domestic glass waste at the Proposed Development.
- Mixed Non-Recyclable (**MNR**) / General Waste – These materials could attract vermin if it is not appropriately stored, and the stores maintained. As mitigation there will be appropriately designed and managed WCAs for all common waste areas in the development.

More detail is provided in the Operational Waste Management Plan prepared by AWN Consulting Limited and included with the submission.

18.2.12 Material Assets – Utilities

18.2.12.1 Electricity

Construction Phase

Construction related activities will require temporary connection to the local electrical supply network, for the servicing of the temporary site compound.

The development site will be connected to the local electricity network system, but given the scale and transient nature of construction works, the power demand on the local electricity systems is not considered significant and is not anticipated to impact upon local power supply.

The diversion of the overhead power lines to sub-terrain ducting will be carried out by ESB under planned outages conditions, as a result these works are normally characterised as a temporary, regionally short term, with minimal impact to existing users or to the local electrical grid. These works will occur once the in ground services are provided, tested and proven safe prior to making live.

Operational Phase

The operation phase of the proposed development will be within the remit of ESB Networks to manage, maintain and upgrade as is required.

The impact of the operational phase of the proposed development on the electrical supply network is likely to increase the demand on the existing supply.

The potential impact from the operational phase on the electricity supply network is long term in nature and will require additional power from the national grid. The additional load falls within the expected simulation of future energy needs as per of CRU's "Tomorrow's Energy Scenarios (TES) publications" requirements up to the year 2040, however with the used of Solar Photovoltaic systems the overall demand will be offset by generation and storage of power using batteries as generated from the Suns energy.

18.2.12.2 Gas

Construction Phase

The supply of gas to the proposed development site will not be operational during the construction phase.

Where the proposed works will involve a live tap into the existing infrastructure carried out in accordance with standard rules relating to these works as outlined under Bord Gais requirements for same.

It is expected that no potential loss of supply from the Gas Networks Ireland infrastructure while carrying out works to provide service connections.

These works are normally characterised as a temporary, regionally short term, with minimal impact to existing users.

Operational Phase

The development is not being connected to the Gas Networks Ireland national gas supply network. However, should gas pipe in the proposed ring main be requested by Gas Network Ireland, then impact of the operational phase of the proposed development on the gas supply network is not likely to increase the demand on the existing supply as no load is required as heating is by means of Electrically driven heat pumps.

The potential impact from the operational phase on the gas supply network is minimal due to policy changes expected and being enacted to reduce societies demand on fossil fuels.

18.2.12.3 Telecommunications

Construction Phase

Telecommunications requirements during the construction phase will be primarily provided by means of mobile phones and or fixed line broadband.

The site compound will require a power and telecommunications connection, which comprise of connecting to the existing network. These connections shall be temporary and negligible in nature.

Fixed telecoms will not be operational during the construction phase.

The construction phase is unlikely to give rise to the requirement to divert fixed telecom lines but extend the existing infrastructure to suit site temporary construction requirements.

The local telecom ducted service may require to be extended into the site to facilitate telecoms on very focused and limited manner.

Operational Phase

The operational phase on telecommunications systems will be minimal.