

Proposed Large Scale Residential  
Development at Rathgowan, Mullingar,  
Co. Westmeath  
**Applicant: Marina Quarter Ltd.**

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# Volume II

## Main Statement

### CHAPTER 5

#### Land, Soils & Geology



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## 5 Land, Soils and Geology

### 5.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on the receiving land, soils and geology at Rathgowan, Mullingar, Co. Westmeath (hereafter referred to as the Site) and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Land, soils, and geological characteristics of the Site;
- Potential impacts that the Proposed Development may have on land, soils and geology including geological heritage assessments including “worst case” scenario assessment;
- Potential constraints that these features may place on the Proposed Development;
- Required mitigation measures which may be necessary to prevent or minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

This chapter of the EIAR should be read in conjunction with Chapter 6 Hydrology and Hydrogeology, Chapter 7 Air Quality, Chapter 10 Landscape and Visual, Chapter 11 Waste, Chapter 12 Material Assets – Traffic and Transport and Chapter 14 Biodiversity of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

### 5.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Gareth Carroll, a Principal Consultant of Enviroguide Consulting.

Gareth Carroll holds a BA in Mathematics and a BAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. Gareth Carroll, a Member of the Institute of Environmental Sciences (MEnvSci) with over 10 years’ experience as an Environmental Consultant, has carried out environmental assessments for a range of project types and geological and hydrogeological Site settings and been involved in the preparation of EIARs for the following projects:

- Strategic Housing Development at Wayside, Enniskerry Road and Glenamuck Road, Kiltarnan, Dublin 18;
- Large-Scale Residential Development at White Car Park site (Site A) at Blanchardstown Town Centre, Coolmine, Dublin 15; and
- Strategic Housing Development at Claremont, Howth Road, Howth, Co. Dublin.

### 5.3 Proposed Development

The full description of the Proposed Development is outlined in Chapter 2 ‘Development Description’ of this EIAR.

The Site Layout for the Proposed Development is presented in Figure 1.1 of this EIAR.

### 5.3.1 Aspects Relevant to this Assessment

The Proposed Development will include the following components which are of particular relevance with respect to land, soils and geology.

#### 5.3.1.1 Construction Phase

The Construction Phase of the Proposed Development will include:

- Cut and fill to maintain the maximum and minimum road gradient of 1/21 and 1/200 and to ensure units are level.
  - Maximum fill depths up to 1.6m, typically 0.5 to 1.0m.
  - Maximum cut depths up to 1.2m
- Excavation to reduce the levels to construction the building foundations to a maximum depth of 1.0 meter below ground level (mbGL).
- Excavation for construction of drainage infrastructure to a maximum depth of 3.5mbGL.
- There will be no requirement for the excavation of bedrock during the Construction Phase of the Proposed Development.
- The total excavated volume of soil for excavation to construct the Proposed Development is 12,020m<sup>3</sup>. It is intended to reuse suitable excavated topsoil for landscaping and engineering use.
- Temporary stockpiling of excavated material pending re-use onsite .
- Based on the preliminary cut & fill analysis, the construction of the Proposed Development will also require the importation of 5,200m<sup>3</sup> soils to achieve the finished floor levels and road levels. There will also be a requirement for the importation of aggregates for the construction of roads and other infrastructure.
- Foundation will likely consist of reinforced strip footings, pads and reinforced concrete rafts.

#### 5.3.1.2 Operational Phase

The Operational Phase of the Proposed Development consists of the typical activities in a residential development and with the exception localised gardening works by residents, there will be no bulk excavation of soils or bedrock or infilling of waste.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase as the main operating system for heating will be air to water heat pump and further details are provided in Chapter 13 of this EIAR.

## 5.4 Methodology

### 5.4.1 Relevant Legislation & Guidance

The methodology adopted for this assessment takes cognisance of the relevant guidelines in particular, the following:

- S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014;

- S.I. No. 98 of 2008- European Parliament and of the Council on waste and repealing certain Directives;
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013); and
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).
- Westmeath County Council, 2021. Westmeath County Development Plan 2021-2017 (WCC, 2021);
- Westmeath County Council, 2014. Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).

## 5.4.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

**Element 1:** An Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the development, the baseline conditions, and the type of land, soils and geological environment, to establish the activities associated with the Proposed Development and to undertake an assessment and impact determination. This element of the assessment also included developing the Conceptual Site Model (CSM) for the Site of the Proposed Development and receiving environment.

This stage of the assessment included a desk top study that comprised a review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping 2023 (EPA, 2023);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2023 (GSI, 2023);
- Google Earth Mapping and Imagery, 2023 (Google Earth, 2023);
- Ordnance Survey Ireland (OSI) webmapping, 2023 (OSI, 2023);
- National Parks and Wildlife Services (NPWS) webmapping, 2023 (NPWS, 2023);
- Teagasc webmapping, 2023 (Teagasc, 2023); and
- Information provided by the Applicant including:
  - Information pertaining to the design proposals for the Proposed Development; and
  - IGSL Ltd., 2020. Report on a Site Investigation for a Proposed Housing Development at Rathgowan, Mullingar (IGSL, 2020) including trial pit and borehole logs, soil laboratory testing, infiltration tests and site map.

The study area, for the purposes of assessing the baseline conditions for the Land, Soils and Geology Chapter of the EIAR, extends beyond the Site boundaries and includes potential receptors with which

there may be a pathway to/from the Proposed Development and receptors that may be indirectly impacted by the Proposed Development. The extent of the wider study area was based on the IGI, 2013 Guidelines which recommend a minimum distance of 2.0km from the Site.

A site walkover survey to establish the environmental site setting and baseline conditions at the Site of the Proposed Development relevant to the land, soil and geology environment was undertaken by Enviroguide Consulting on the 21<sup>st</sup> April 2023.

**Element 2:** Involves Direct and Indirect Site Investigation and Studies stage where necessary to refine the CSM developed as part of Element 1 and evaluate the potential impacts associated with the Proposed Development. It was determined that there was adequate site-specific scientific data available for the assessment and no additional ground investigation in relation to land, soils and geology was undertaken.

**Element 3:** Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 and of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction and Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

**Element 4:** Completion of the Land, Soil and Geology sections of the EIAR in this Chapter which includes all the associated figures and documents.

### 5.4.3 Description and Assessment of Potential Impact

The Transport Infrastructure Ireland (TII) criteria for rating of the importance of geological features at the Site as documented in the National Roads Authority Guidelines (NRA, 2009), are summarised in Table 5.1.

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter of the EIAR is described in Table 5.1.

**Table 5.1 Criteria for Rating Site Importance of Geological Features (Source: IGI, 2013)**

Importance	Criteria	Typical Example
Very High	<p>Attribute has a high quality, significance, or value on a regional or national scale.</p> <p>Degree or extent of soil contamination is significant on a national or regional scale.</p> <p>Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.</p>	<p>Geological feature rare on a regional or national scale (NHA).</p> <p>Large existing quarry or pit.</p> <p>Proven economically extractable mineral resource.</p>

Importance	Criteria	Typical Example
High	<p>Attribute has a high quality, significance, or value on a local scale.</p> <p>Degree or extent of soil contamination is significant on a local scale.</p> <p>Volume of peat and/or soft organic soil underlying route is significant on a local scale.</p>	<p>Contaminated soil on-site with previous heavy industrial usage.</p> <p>Large recent landfill site for mixed wastes.</p> <p>Geological feature of high value on a local scale (County Geological Site).</p> <p>Well drained and/or high fertility soils.</p> <p>Moderately sized existing quarry or pit.</p> <p>Marginally economic extractable mineral resource.</p>
Medium	<p>Attribute has a medium quality, significance, or value on a local scale.</p> <p>Degree or extent of soil contamination is moderate on a local scale.</p> <p>Volume of peat and/or soft organic soil underlying route is moderate on a local scale.</p>	<p>Contaminated soil on-site with previous light industrial usage.</p> <p>Small recent landfill site for mixed wastes.</p> <p>Moderately drained and/or moderate fertility soils.</p> <p>Small existing quarry or pit.</p> <p>Sub-economic extractable mineral resource.</p>
Low	<p>Attribute has a low quality, significance, or value on a local scale.</p> <p>Degree or extent of soil contamination is minor on a local scale.</p> <p>Volume of peat and/or soft organic soil underlying route is small on a local scale.</p>	<p>Large historical and/or recent site for construction and demolition wastes.</p> <p>Small historical and/or recent landfill site for construction and demolition wastes.</p> <p>Poorly drained and/or low fertility soils.</p> <p>Uneconomically extractable mineral resource.</p>

#### 5.4.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 5.2 as per EPA,2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports.



**Table 5.2 Assessment of Potential Terminology and Methodology (Source: EPA, 2023)**

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

## 5.5 Difficulties Encountered

There were no difficulties were encountered in the preparation of this Chapter of the EIAR.

## 5.6 Baseline Environment

### 5.6.1 Site Location and Surrounding Land Use

The site of the Proposed Development, which is 5.95 hectares (HA) in area, is located at Rathgowan, Mullingar, Co. Westmeath. The Site is accessed via the existing entrance off the roundabout on the R394 Regional Road (known locally as the 'c-link' road) which adjoins the northwest boundary of the Site.

The area surrounding the Site is characterised by a mix of land uses. The site is bound to the northwest by the R394 or C-Link with agricultural land beyond, to the southwest the R393 (known locally as 'Ashe

Road') and an ESB substation with b, and to the northeast and southeast by residential lands comprising two-storey detached and semi-detached dwellings.

The Site location is presented in Figure 5.1.

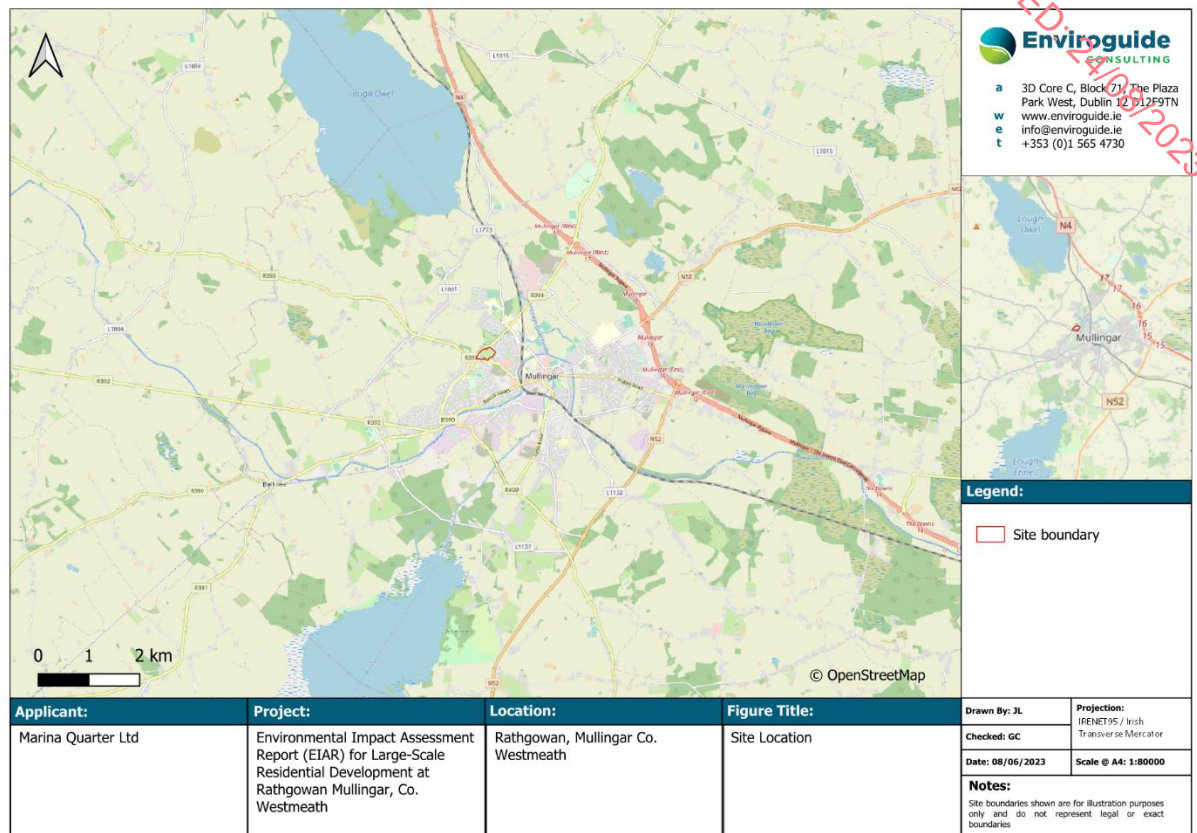


Figure 5.1. Site Location

### 5.6.2 Current and Historical Land Use

The primary land use at the site is currently agricultural farmland within two fields under grass pasture.

The lands across the site is zoned as 'Proposed Residential' to provide for residential development, associated services and to protect and improve residential amenity under Westmeath County Council's (WCC) Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014-2020).

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2023) and Google Earth (Google Earth, 2023) were reviewed and key observations on-site and off-site are summarised in Table 5.3.

Table 5.3 Historical Land Use (Source: OSI, 2023 and Google Earth, 2023)

Date	Information Source	Site Description
1837-1842	OSI map 6inch	<b>On-site:</b> The site is comprised of undeveloped grasslands separated by field boundaries. There are two small buildings/structures identified along the southwest boundary of the site. A historic gravel pit is identified encroaching into the southern corner of the site.

Date	Information Source	Site Description
		<p><b>Off-site:</b> There is a road identified along the southwest boundary of the site. The surrounding lands are predominantly open fields divided by field boundaries with a number of one-off buildings/structures. Columbs Barracks and the town of Mullingar are located to the east of the site. The Royal Canal is identified 0.59km east of the site at its closest point.</p>
1888-1913	OSI 25 inch	<p><b>On-site:</b> The two small buildings/structures identified along the southwest boundary of the site is no longer identified.</p> <p><b>Off-site:</b> There are several additional one-off buildings/structures identified in the surrounding lands. The Midland Great Western Railway line is located 0.52km west of the site at its closest point. There is increased development to the north of the site and the town of Mullingar extends beyond the eastern side of the Midland Great Western Railway line.</p>
1830-1930	OSI 6-inch Last Edition Map	<p><b>On-site:</b> No significant changes</p> <p><b>Off-site:</b> A sewerage works is identified 0.19km east of the site at its closest point. There is increased development in the town of Mullingar on the western side of the Midland Great Western Railway line and.</p>
1995	OSI Aerial photography	<p><b>On-site:</b> The historic gravel pit is no longer encroaching onto the site. The site is comprised of undeveloped lands.</p> <p><b>Off-site:</b> There is a building structure, which is understood to be the ESB substation, located along the southwest boundary of the site. A second building/structure is identified adjoining the southeast boundary of the site. There are also a number of additional one-off buildings/structures identified in the surrounding lands. There is some ground disturbance identified off the southern corner of the site, where the historic gravel pit was previously mapped. The sewerage works previously mapped to the east of the site is no longer identified.</p>
1999-2003	OSI Aerial photography	<p>On-site: No significant changes.</p> <p>Off-site: There are residential developments identified adjoining the southeast and northeast boundaries of the site. The land off the southern corner of the site, where the historic gravel pit was previously mapped, appears to be overgrown.</p>
2004 -2006	OSI Aerial photography	<p>On-site: No significant changes.</p> <p>Off-site: There is an increase in residential developments identified to the south of the road adjoining the southwest boundary of the site.</p>
2005-2012	OSI Aerial photography	<p>On-site: No significant changes.</p> <p>Off-site: A road (R394) with two roundabouts is identified along the northwest boundary of the site.</p>
2023	Google Maps Photography	<p>On-site: No significant changes.</p> <p>Off-site: No significant changes.</p>

### 5.6.3 Topography

The site is relatively flat with gentle undulations and a slight sloping gradient to the northwest.

The topographic survey, presented in the site investigation report (IGSL, 2020) available in Volume 3 of this EIAR, identified that ground elevation across the site range from approximately 98.5m to 99m along the R394 at the northwest boundary of the site, rising to approximately 105mOD in the south-east corner of the site.

### 5.6.4 Soils

The soils beneath the site are mapped by the GSI (GSI, 2023) as follows:

- The majority of the site is underlain by grey, brown Podzolics, brown Earths (medium-high base status) (IFS Soil Code: BminDW). The parent material is ‘till derived chiefly from limestone’ (TLs).
- A small area along the southwest boundary of the site is underlain by surface water Gleys, ground water Gleys (IFS soil code: BminPD). The parent material is ‘till derived chiefly from limestone’ (TLs).

The GSI (GSI, 2023) mapped soils at the site are presented in Figure 5.2.

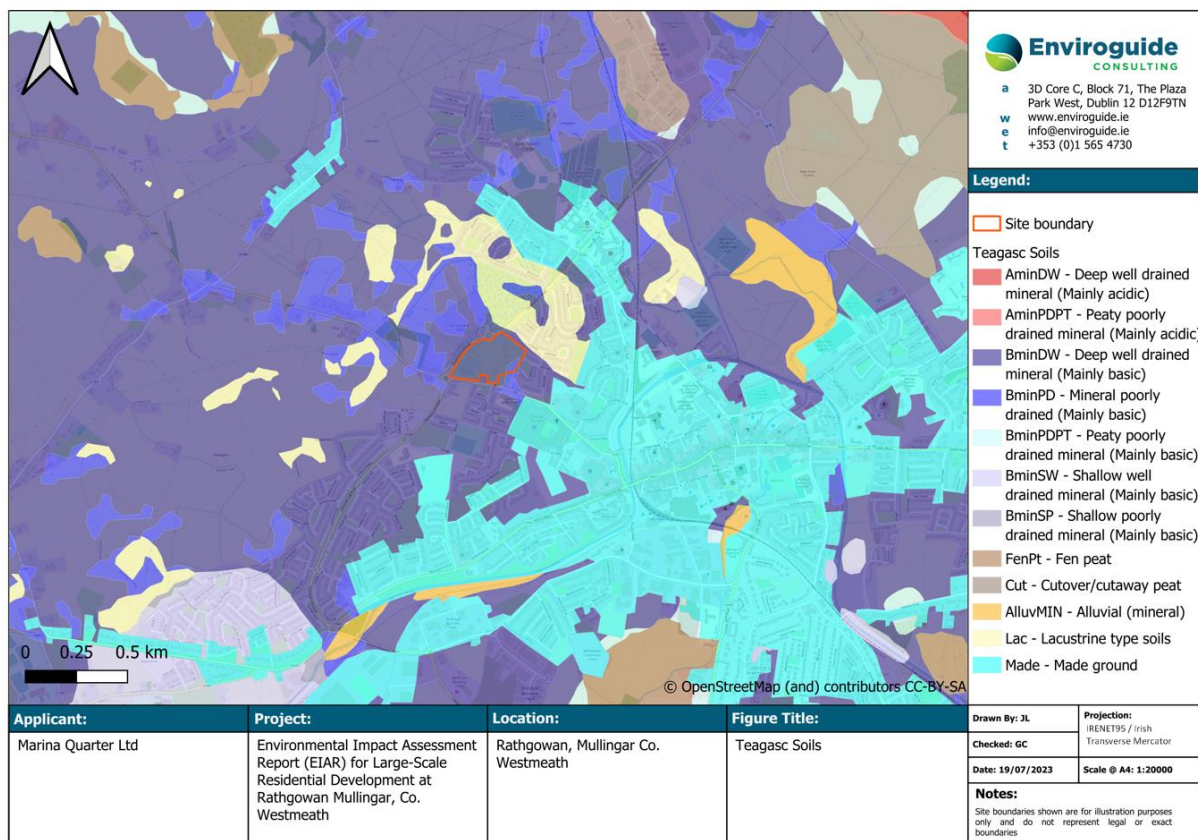
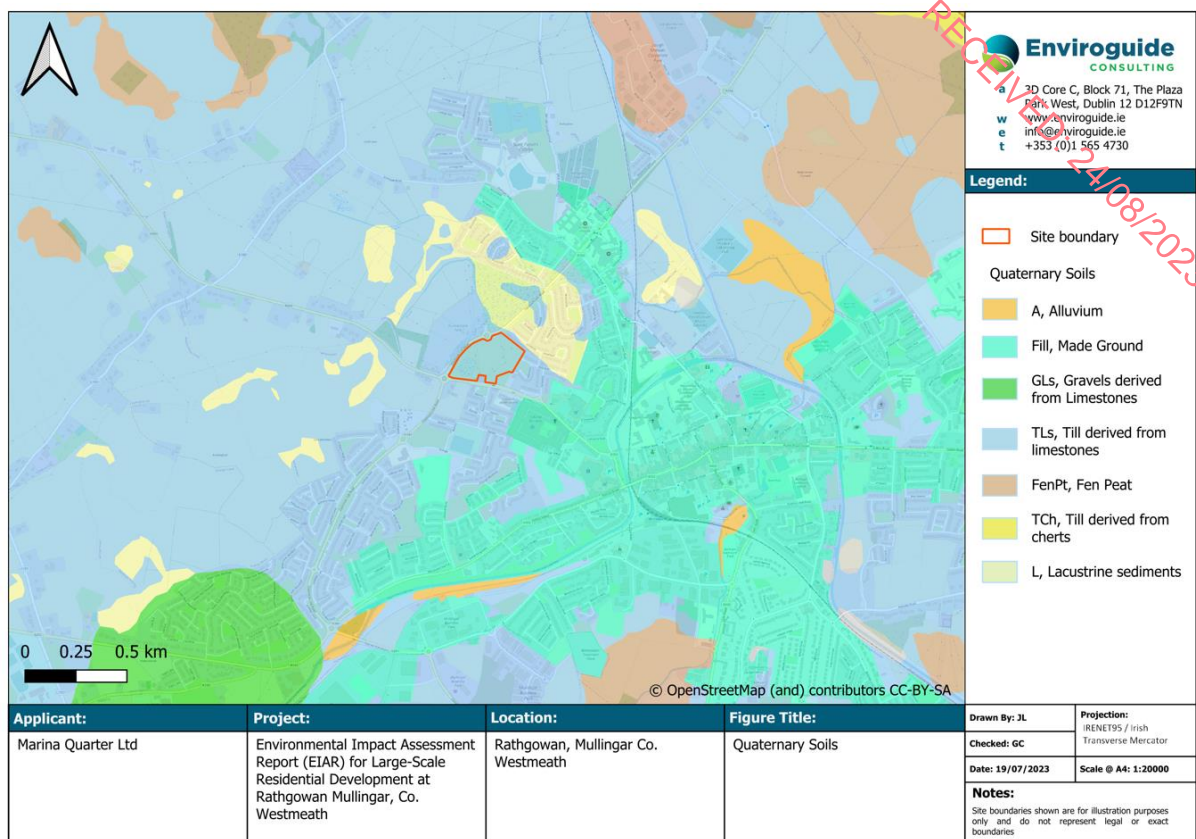


Figure 5.2 Soils

### 5.6.5 Quaternary Soils

The quaternary sediments beneath the site, are mapped by the GSI (GSI, 2023) as ‘till derived from limestones’ (TLs). The subsoil permeability is mapped as ‘moderate’ beneath the site (GSI, 2023).

The quaternary geology at the site, is presented in Figure 5.3.



**Figure 5.3 Quaternary Soils**

### 5.6.6 Quaternary Geomorphology

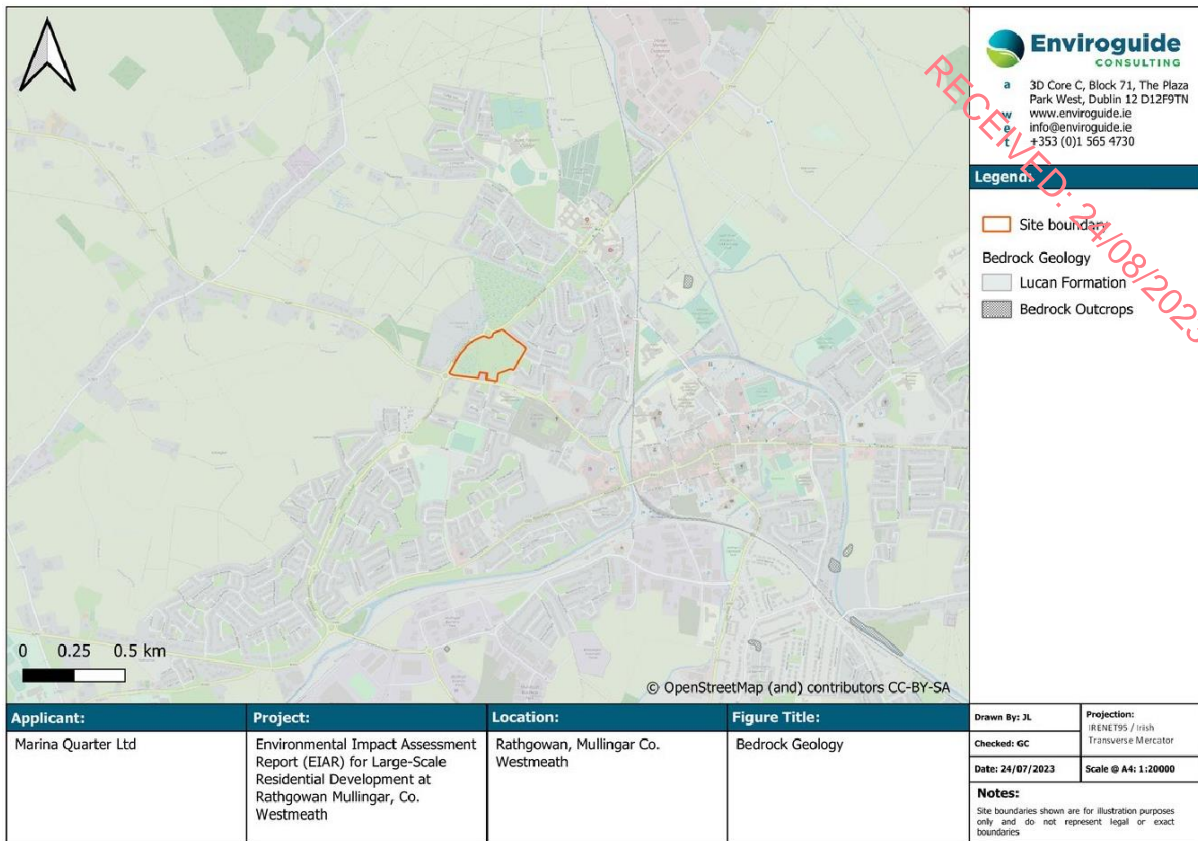
There are a number of subglacial lineation's (drumlins) mapped by the GSI (GSI, 2023) within a 2km radius (GSI, 2023) to the northwest and southeast of the site. The subglacial lineation's are orientated in a northwest to southeast direction.

There is a deglacial landform area (hummocky sand and gravel) mapped by the GSI (GSI, 2023) approximately 1.33km southwest of the site.

### 5.6.7 Bedrock Geology

Based on the GSI database (GSI, 2023) the bedrock beneath the site is mapped as the Lucan Formation (Stratigraphic Code: LU, New Code: CDLUCN) which is comprised of 'dark grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey from the lower Carboniferous period'. The formation ranges from 300m to 800m in thickness.

There are no outcrops mapped within the site however, there are a number of outcrops mapped within a 2km radius of the site, the closest of which is located 0.83km northeast of the site. The GSI bedrock geology map is presented in Figure 5.4.



**Figure 5.4 Bedrock Geology**

## 5.6.8 Site Investigation Results

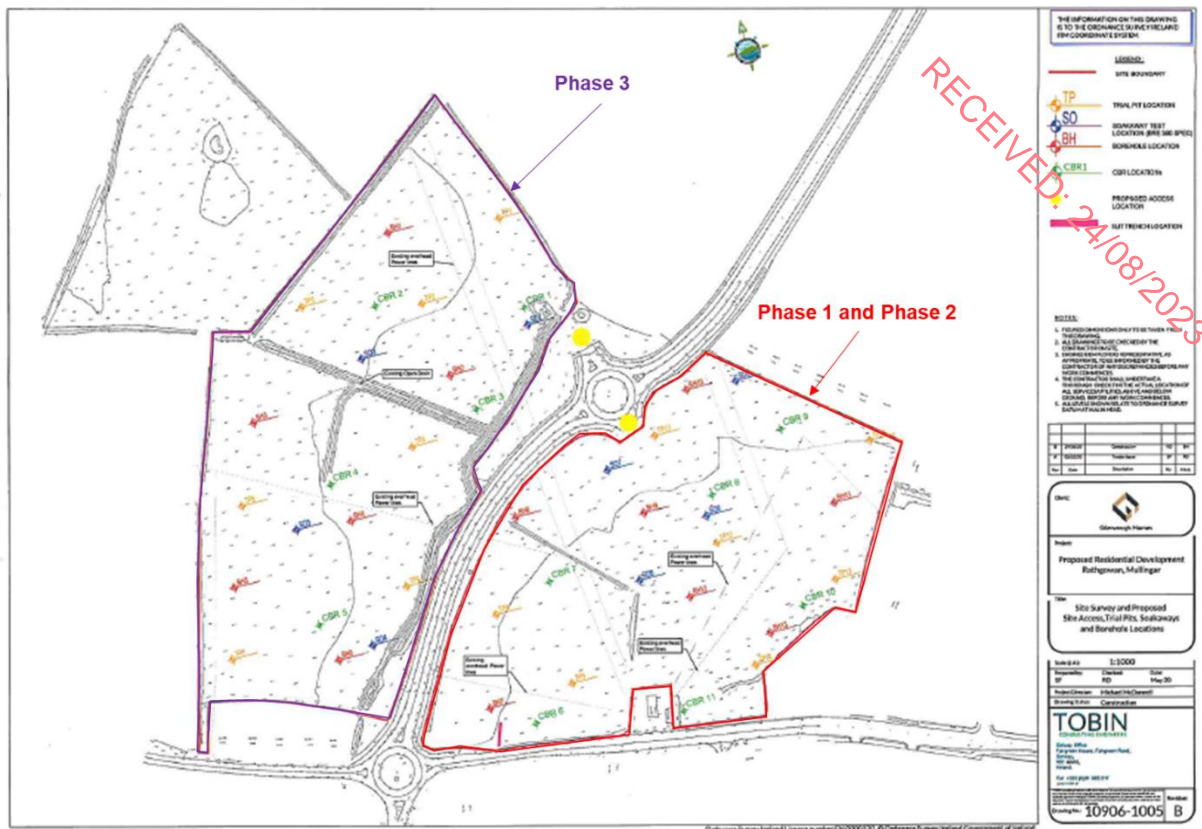
### 5.6.8.1 Soil and Geology

The soils and geology encountered during the site investigation (IGSL, 2020) available in Volume 3 of this EIAR are summarised as:

- Upper layer of soft light brown mottled grey slightly sandy gravelly SILT / CLAY, generally to depths ranging between 0.5 meters below ground level (mbGL) and 0.8mbGL; and
- Underlain by firm to stiff brown sandy gravelly SILT / CLAY with varying cobble and boulder content to the maximum depth of investigation at 5.7mbGL.
- An isolated occurrence of slightly silty gravelly SAND extended below the soft loamy CLAY from 0.5mbGL to the maximum depth of excavation at 2.7mbGL (TP13).
- Bedrock was not encountered during site investigations.

A groundwater strike at 4.2mbGL was recorded during drilling of borehole BH07. Groundwater was not encountered at remaining borehole and trial pit locations. Groundwater is assessed in Chapter 6 of this EIAR.

The site investigation locations are presented in Figure 5.5.



**Figure 5.5 Site Investigation Locations (Source: IGSL, 2020)**

### 5.6.8.2 Soil Analytical Results

Soil analytical data for soil samples collected from the site is provided in the site investigation report (ISGL, 2020) available in Volume 3 of this EIA. The six (6No.) soil samples collected were tested in accordance with the RILTA suite, which is used to determine the suitability of soils for disposal to a landfill. The results of the analysis are provided in Appendix VII of the site investigation report (ISGL, 2020).

The results of the WAC analysis show all samples are in compliance with the inert landfill limits as stipulated in the European Landfill Directive and the excavated soils would be classified as inert material if removed from Site (IGSL, 2022).

Based on a review of the results, there is no evidence of anthropogenic contamination in sampled soils:

- The reported concentration of benzene, toluene, ethylbenzene, m/p-xylene and o-xylene (BTEX), mineral oil and Total Petroleum Hydrocarbons (TPHs) for all six (6No.) samples collected were less than the Limit of Detection (LOD); and
- No asbestos was detected in all six (6No.) samples collected.

### 5.6.9 Geochemical Domain

The GSI (GSI, 2023) defined Geochemical Domains maps indicates that the site of the Proposed Development is located within Domain 2 which is characterised as “carboniferous limestone, shale and related rocks”.

A summary of the metals values for Domain 2 are presented below in Table 5.4.

**Table 5.4 Geochemically Appropriate Levels for Domain 2 (Source: GSI, 2023)**

Element	Units	Value
Arsenic	mg/kg	24.9
Cadmium	mg/kg	3.28
Chromium	mg/kg	50.3
Copper	mg/kg	63.5
Mercury	mg/kg	0.36
Nickel	mg/kg	61.9
Lead	mg/kg	86.1
Zinc	mg/kg	197

### 5.6.10 Radon

The site of the Proposed Development is mapped by the EPA (EPA, 2023) as being in an area where about 1 in 10 homes in that areas are likely to have high radon levels.

The EPA cite the reference level for radon as 200 Bq/m<sup>3</sup> and a High Radon Area where more than 10% of homes may have more than the reference level of radioactivity. As 10% of the houses in the area are mapped by the EPA as being over this reference level it indicates that the site is considered a High Radon Area however, it is noted that a high radon level can be found in any home, in any part of the country.

### 5.6.11 Geohazards

Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database (GSI, 2023) indicated that the site is located within an area of 'low' on the landslide susceptibility classification map.

The GSI (GSI, 2023) records for karst features indicates that there are no karst features within the site boundary or within a 2km radius of the site. The closest karst feature to the site is mapped by the GSI (GSI, 2023) a spring (Karst Feature I.D.: IE\_GSI\_Karst\_40K\_7669) located approximately 4.5km southeast of the site. The spring is not located within the Lucan Formation, which is the bedrock formation beneath the site.

### 5.6.12 Geological Heritage

A review of the GSI Geological Heritage Database (GSI, 2023) indicates that there are no geological heritage sites located at the site or within a 2km radius of the site. The closest geological heritage site is mapped by the GSI (GSI, 2023) as Mullingar Bypass (Site Code: MH019) a roadcut section along the N4 road north of Mullingar which exposes the limestone bedrock of the Lucan Formation.



### 5.6.13 Economic Geology

The lands within the site have no mapped granular aggregate potential (GSI, 2023). The bedrock beneath the site has been identified by the GSI (GSI, 2023) as having a 'moderate potential' for crushed rock aggregate.

There are a number of historical pits and quarries mapped by the GSI (GSI, 2023) located within a 2km radius of the site which are listed in Table 5.5.

**Table 5.5 Historic Pits and Quarries within a 2km Radius of the Site (Source: GSI, 2023)**

Name/Type	Status	Distance from Proposed Development(km)	Location from Site
Pit	Historic	0.0 (adjoins southeast boundary of the site)	Southeast
Quarry	Historic	1.27	Northwest
Pit	Historic	1.27	Northwest
Pit	Historic	1.91	Southwest
Pit	Historic	1.17	South
Quarry	Historic	1.31	South
Quarry	Historic	1.80	Southeast
Quarry	Historic	1.84	Southeast
Quarry	Historic	2.0	Southeast
Quarry	Historic	0.78	Northeast
Pit	Historic	1.53	Northwest
Pit	Historic	1.91	Northwest

### 5.6.14 Importance of Baseline Environment

It is noted that, in accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 5.1, the soil and geology underlying the Proposed Development would be rated as attributes of 'low' importance as the site is underlain by thick (in excess of 5.7m) of low permeability subsoils (comprised of firm to stiff sandy gravelly SILT / CLAY with low infiltration potential). There are no geological heritage sites, granular aggregate potential materials or geohazards recorded within the site boundary. The economic extraction of crushed rock aggregate (with 'moderate' potential) would not be feasible.

## 5.7 The 'Do nothing' Scenario

The 'Do Nothing' scenario assesses the potential impact on the receiving land, soils, and geological environment if the Proposed Development did not proceed. It is considered that there would be no change or resulting impact on the nature of the site with respect to land, soil and geology as the site of the Proposed Development would remain as undeveloped land.

## 5.8 Potential Significant Effects

The procedure for determination of potential impacts on the receiving land, soils and geology is to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the desk study and Site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

The potential impacts associated with the construction phase and operation phase of the Proposed Development are summarised below.

### 5.8.1 Construction Phase

#### Land Take and Land Use

The Proposed Development will require a land take of 5.95 Ha and the land use at the site will change from greenfield agricultural land to residential. The lands across the site are zoned as 'Proposed Residential' to provide for residential development, associated services and to protect and improve residential amenity under the Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014). Therefore, there will be an unavoidable land take with loss of undeveloped land and soil with a 'negative', 'significant' and 'permanent' impact taking account of the surrounding land and zoning objectives.

#### Excavation of Soil and Subsoil

There will be unavoidable loss of in-situ soils and subsoils from the site as result of landscape development and to achieve formation levels for the Proposed Development. It is proposed that excavated soil will be used to build up the site to achieve the required ground levels for the Proposed Development. Excavation of bedrock is not anticipated.

The construction of the Proposed Development will require the excavation of 12,020m<sup>3</sup> of soil and subsoil to depths of up to 1.2mbGL to achieve formation levels, to 1.0mbGL for foundations and to 3.5mnGL for drainage and infrastructure. Where possible, it is intended to retain and re-use suitable excavated soil and subsoil at the Proposed Development for engineering fill and landscaping. The soils underlying the site are considered to have 'low' importance. Accordingly, there will be a 'negative' 'slight' and 'permanent' impact on the underlying soils at the site.

Any material not suitable for re-use onsite will be removed offsite in accordance with applicable statutory requirements. may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011. The potential impact with removal offsite of surplus soil and other material as wastes is assessed in Chapter 11 of this EIAR.

#### Soil Quality and Contamination

The site currently comprises greenfield agricultural land. Laboratory analysis of soil samples collected as part of the site investigation (IGSL, 2020) indicate that the sampled soil can be classified as inert. The excavation and re-use of soil onsite will be subject to control procedures to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development.

There is a potential risk associated with the use of cementitious materials during construction of the building foundations, infrastructure and other in ground works at the site. It is considered that this may result in a 'negative', 'moderate' and 'long-term' impact on existing quality of soil within a localised area underlying the site of the Proposed Development.

The potential accidental release of deleterious materials including fuels and other materials being used onsite, through the failure of secondary containment or a materials' handling accident on the Proposed Development could potentially result in a 'negative', 'moderate to significant', 'long-term' impact on the receiving soil and geology depending on the nature of the incident.

### **Dust Generation**

There is a potential for creation of windblown dust generation from the temporary stockpiling of materials on site. There will be some exhaust emissions generated from use of excavators, HGVs and vibrating rollers during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development with regard to the generation of dust is addressed in Chapter 7 of this EIAR.

### **Soil Structure**

The excavation and re-use of soil and bedrock at the subject site will result in the exposure of the materials to various elements including weather and construction traffic. The temporary stockpiling of excavated soils pending reuse onsite will have a potential 'negative,' slight' and 'long term' impact' on the natural strength of the materials.

### **Importation of Soils, Subsoils and Aggregates**

The Proposed Development will require the importation of 5,200m<sup>3</sup> soils to achieve the finished floor levels and road levels. There will also be a requirement for the importation of aggregates for the construction of roads and other infrastructure. The potential impacts may include loss of attribute and changes in the geological regime at the source site. It is anticipated that the required soils, subsoils and aggregates identified for importation onsite will be 'indirect' and have a 'indirect', 'neutral,' 'imperceptible' and 'permanent' impact on the source site taking account of the fact that the statutory consent process would have required the necessary environmental impacts to be assessed and mitigated as appropriate at the source site.

## **5.8.2 Operational Phase**

During the operational phase of the Proposed Development there is a limited potential for any direct adverse impact on the receiving land, soil and geological environment at the site taking account of the design for the Proposed Development.

The design and construction of the proposed development in accordance with current Building Regulations will ensure that the site will be suitable for use for operational phase as a residential development taking account of the geological site setting.

The site has been identified as being located within a high radon area. Standard design measures including appropriate radon membranes will be incorporated into the design of building in accordance with relevant Building Regulations.

### 5.8.3 Cumulative Effects

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A search of planning applications located within a 2km radius of the Proposed Development was conducted using online planning resources including the National Planning Applications Database (MyPlan.ie) and Westmeath County Council’s online planning database. Any planning application listed as granted, application registered or application pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on land, soils and geology. The larger-scale developments identified within the vicinity of the site of the Proposed Development and considered for potential cumulative effects are listed in Table 5.6.

**Table 5.6 Planning Applications in the Vicinity of Site**

Planning reference	Location relative to the Proposed Development	Development description
22515	North of the C-Link Road	Permission for the following Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location.
Part 8 Application	0.3km east of the Proposed Development.	Part 8 application for the construction of 22 no. dwelling units adjacent to Ashfield/Abbeylands/Green Road and St. Bridget’s Terrace, Mullingar, Co. Westmeath.
Part 8 Application	2km east of the Proposed Development	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, Co. Westmeath.
Part 8 Application	0.8km south of the Proposed Development.	The construction of 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, Co. Westmeath.
Part 8 Application	1.3km east of the Proposed Development.	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2 bed units and 13 no. 1 bed units at Friar’s Mill Road / Canal Avenue, Mullingar, Co. Westmeath.
21568	0.6 km northwest of the Proposed Development Site.	An extension of duration was sought for 16/6001: planning reference no: 11/5121 for the construction of a new housing development, consisting of 28 no. houses to be constructed in 3 phases made up of a combination of 26 no. detached 2 storey houses (as per condition no.5 of outline permission planning ref. no. 11/4121) with associated services.

Planning reference	Location relative to the Proposed Development	Development description
196159	This site lies 1.8km south of the Proposed Development.	Planning permission was sought for the construction of 98 no. residential units consisting of 14 no. 2 bed terraced houses, 10 no. 3 bed end-terraced houses, 12 no. 3 bed semi-detached houses, 8 no. 4 bed semi-detached houses and 54 no. duplex units (comprising 27 no. 1 bed units and 27 no. 3 bed units). Provision of a creche and community facility, 142 no. car parking spaces, 8 no. motorcycling spaces and 102 no. bicycle spaces. Access from the R390. All site development and servicing works, bin stores, ESB substation, pumping station, open space, landscaping and boundary treatments.
196121	Directly east of the Proposed Development.	Planning permission was sought for the construction of 18 Apartment units in 2 Blocks (Block A & B). Block A consists of 1 no. 1 bedroom units, 3 no. 2 bedroom units and 2 no. 3 bedroom duplex apartment units in 2 and 3 storey high building with private balconies and patios. Block B consists of 6 no. 1 bedroom units and 6 no. 2 bedroom duplex apartment units in 3 storey high building with private balconies and patios. The proposed development will also consist of a new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.

Excavated soil and stone during the Construction Phase of the Proposed Development could potentially be directed to the same receiving waste facilities for recovery / disposal as excavated soil and stone from other developments in the vicinity of the site or within the wider Westmeath area. While it is proposed to reuse all soils onsite, some proportion of cut material may be considered unsuitable. All surplus soils and stone from the site will be removed offsite in accordance with all statutory legislation. Accordingly, it is considered that any cumulative impact on land, soils and geology associated with the Proposed Development will be 'neutral' 'imperceptible' and 'permanent'.

There are no other cumulative impacts associated with land, soil and geology associated with the Construction and Operational Phase of the Proposed Development.

## 5.9 Mitigation

### 5.9.1 Construction Phase Mitigation

The mitigation measures as outlined below, will ensure that there will be no significant impact on the receiving land, soil and geology.

A preliminary Construction Environmental Management Plan (CEMP) has been prepared by Tobin Consulting Engineers (Tobin Consulting Engineers, 2023a). Following appointment, the contractor will be required to implement the measures set out CEMP and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Westmeath

County Council for inspection on request. The CEMP is considered as a 'Live Document' and will be updated accordingly throughout the project as required.

Mitigation works will be adopted as part of the construction works for the proposed development. The measure will address the main activities of potential impact which include:

- Control and Management of water and surface runoff;
- Control of Management of works nears water courses;
- Control of Management of materials from off-site sources;
- Appropriate fuel and Chemical handling, transport and storage; and
- Management of accidental release of contaminants at the subject site.

A Construction Demolition & Operational Waste Management Plan (CDOWMP) has been prepared by Tobins Consulting Engineers for the Proposed Development (Tobins Consulting Engineers, 2023b). The purpose of the CDOWMP is to ensure that waste storage and movement within the development takes place in a manner which complies with relevant legislation and has a minimum impact on the nearby existing commercial and residential areas.

The CDOWMP (Tobin Consulting Engineers, 2023b) includes estimated quantities of construction waste which will be produced during the Construction of the Proposed Development. The CEMP (Tobin Consulting Engineers, 2023a) and CDOWMP (Tobin Consulting Engineers, 2023b) will take cognisance of measures outlined in the EIAR.

### **Import of Aggregates**

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), all fill and aggregates will be sourced from reputable, approved suppliers. As a minimum, all suppliers will be required to:

- Provide aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development.
- Provide proof of an acceptable environmental management status; and
- Provide proof of the regulatory and legal compliance status of the company.

Contract and procurement will ensure that all imported aggregates required for the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates shall be subject to management and control procedures which shall include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

### **Airborne Dust Generation**

Excavated soils will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. Handling of soils will be undertaken in accordance with documented procedures that will be set out in order to protect ground and minimise airborne dust. The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place including measures to prevent uncovered soil drying out leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties. This will require additional wetting at the point of dust release, dampening down during dry weather and wheel

cleaning for any vehicles leaving the site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 7 of this EIAR.

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), excavated material will be removed as soon as possible minimising the potential for stockpiles to create windblown dust. Daily inspections by the main contractor will be carried out to identify potential sources of dust generated along with implementation measures to remove causes which are found.

Impacts of dust from the use of excavators, HGVs and vibrating rollers are considered to be temporary in duration and not considered to give rise to significant air quality impacts following the implementation of the following measures as set out in the CEMP:

- All machinery will be suitably maintained to ensure that emissions of engine-generated pollutants shall be kept to a minimum in accordance with Measures Against the Emission of Gaseous and Particulate Pollutants from Internal Combustion Engines to be Installed in Non-Road Mobile Machinery (2002/88/EC) and Emissions of Pollutants from Diesel Engines (2005/21/EC);
- Vehicles will not be left unnecessarily idling on the site and trucks removing demolition waste from the site will turn off engines during loading.
- Pre-start checks on all machinery will be conducted daily prior to commencement of activities.
- Low emission fuels will be used insofar as possible; and
- Mains power will be used for small plant and equipment, where possible, in preference to generators.

### **Reuse of Soil**

Soil and subsoil materials to be reused within the Proposed Development (i.e., for landscaping on site) will be subject to assessment of the suitability of for use in accordance with engineering and environmental specification for the Proposed Development.

### **Management and Control of Soils and Stockpiles**

The re-use of suitable cut material on-site for the Proposed Development (i.e., landscaping, raising levels or engineering fill) will be undertaken in accordance with the engineered design of the Proposed Development. Surplus or unsuitable soils will be removed offsite.

Segregation and storage of soils for re-use onsite or removal off-site and waste for disposal off-site will be segregated and temporarily stored on-site pending removal or for reuse on-site in accordance with the CEMP (Tobin Consulting Engineers, 2023a).

As detailed in the CEMP (Tobin Consulting Engineers, 2023a), temporary storage of soil and stockpiles will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. No soil storing will be allowed within 30m of the open water where sufficient working areas are available within the site boundary, which is in line with Inland Fisheries Ireland guidelines.

The surplus material, not suitable for reuse onsite, will be segregated, and stockpiled appropriately for removal offsite. For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area shall be identified and designated;
- All stockpiles shall be assigned a stockpile number;

- Material identified for reuse on site, off site and waste materials will be individually segregated; and all segregation, storage and stockpiling locations will be clearly delineated on the site drawings;
- Tarpaulins or polythene sheets will be used to cover stockpiles of material during heavy rainfall to avoid sediment release;
- Material identified for reuse on site, off site and waste materials will be individually segregated;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will be a minimum of 10m from drains.

### **Export of Resource (soil) and Waste**

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWOMP (Tobin Consulting Engineers, 2023b) and will be managed in accordance with all legal obligations. It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site.

The re-use of soil and rock offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus material not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.

Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site.

Vehicles transporting material with potential for dust emissions to an off-site location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site, in particular the R394, shall be regularly inspected for cleanliness and cleaned as necessary. The main contractor will carry out road sweeping operations, employing a suction sweeper or similar appropriate method, to remove any project related dirt and/or material deposited on the road by construction/ delivery vehicles. A wheel-wash system will be set up in the event there is a risk of debris deposited on the road as outlined in the CEMP (Tobin Consulting Engineers, 2023a).

### **Concrete Works**

The cementitious grout and other concrete works during the Construction Phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the Contractor and in accordance with the CEMP (Tobin Consulting Engineers, 2023a) and relevant industry standards.



All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

A suitable risk assessment for wet concreting shall be completed prior to works being carried out.

### **Handling of Fuels, Chemicals and Materials**

Fuelling and lubrication of equipment will be carried out in a designated areas of the site away from any existing manholes or gullies. Fuelling and lubrication of equipment will only be carried out in a designated area of the site away from any existing manholes or gullies. At present, it is proposed that fuel and lubricants will be stored adjacent to the office compound.

Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013c). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

This bunded area will be roofed appropriately to exclude rainwater. Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gully's (Tobin Consulting Engineers, 2023a).

The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the appointed contractor in advance of any works commencing. Construction staff will be familiar with the emergency response plan.

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), spill kits will be made available onsite and identified with signage for use in the event of an environmental spill or leak. A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit.

### **Emergency Procedures**

In the event of an environmental incident, the appointed Project Environmental Manager will be notified immediately, and absorbent materials used to prevent the spread of the spill/leak. The contaminated materials will be transferred to leak-proof storage containers and any contaminated soils or gravels excavated and removed off-site. A record of the incident will be kept, and Westmeath County Council will be notified.

Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;

- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards;
- All construction works staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geological environment associated with the Construction Phase of the Proposed Development.

### **Welfare Facilities**

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Portaloos will be provided in the compound initially, with a dedicated toilet block installed later. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by tankering of waste offsite by an appropriately authorised contractor.

#### **5.9.1.1 Monitoring**

During the Construction Phase of the Proposed Development the following monitoring measures will be considered:

- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures;
- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality are fully implemented and effective;
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
  - Management of soils on-site and for removal offsite.
  - Record keeping.
  - Traceability of all materials, surplus soil and other waste removed from the site; and
  - Ensure records are maintained of material acceptance at the end destination.

### **5.9.2 Operational Phase Mitigation**

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the proposed development.

#### **5.9.2.1 Monitoring**

Ongoing regular operation monitoring of the SUDs measure will be undertaken throughout the lifetime of the operational phase of the Proposed Development. The management and maintenance requirements for each of the SUDs are developed in line with the CIRIA SUDs Manual.

### **5.9.3 Cumulative Mitigation**

Not relevant.

## 5.10 Residual Impact Assessment

Residual Impacts are defined as ‘effects that are predicted to remain after all assessment and mitigation measures. They are the remaining ‘environmental costs’ of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

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**Table 5.7 Residual Impacts**

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
<b>Construction Phase</b>								
Construction of the Proposed Development	Land Take and Land Use	The Proposed Site will development land for residential use, resulting in a change in land from greenfield to residential.	Negative	Significant	Permanent	Direct	Unavoidable and no mitigation. The Proposed Development is in line with 'Proposed Residential' zoning objectives of the Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).	Significant
Excavation of In-situ soils and subsoil	Soils and Bedrock	There will be an unavoidable a loss of in-situ soil and subsoil through excavation works to achieve the formation levels for the Proposed Development including the foundations, roadways, parking, drainage	Negative	Slight	Permanent	Direct	None required. It is proposed to retain and re-use suitable excavated soil and subsoil at the Proposed Development for landscaping and to raise site levels.  The removal of all surplus soil will be undertaken in accordance with applicable statutory requirements.	Slight

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Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Accidental release of deleterious materials including cement, fuel and other material being used on-site.	Soils, Subsoils and Bedrock	Potential (albeit low) for uncontrolled release of deleterious materials including fuels, cement and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident, to the land, soil, and geological environment.	Negative	Moderate to Significant	Long-term	Direct	<p>Refuelling and lubrication of plant during the construction phase will only be carried out in designated impermeable areas on site.</p> <p>Any other diesel, fuel or hydraulic oils stored on-site or within fuel containing equipment will be stored in bunded storage tanks / drip trays.</p> <p>The cementitious materials will avoid contamination of using appropriate design and methods implemented by the appointed Contractor and in accordance with industry standards.</p>	Imperceptible
Stockpiling of excavated topsoil and subsoils	Soil structure	The temporary stockpiling of excavated soils will result in exposure of the materials to various elements including weather.	Negative	Slight	Long-term	Direct	The segregation and stockpiling of soil and stone at the site pending reuse or removal offsite will be carefully managed and maintained in order to	Slight

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Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
							minimise potential impact on soil quality.	
Import of required soil, subsoil and aggregates	Land, Soil and geology at the source Site	The Proposed Development will require the importation of 5,200m <sup>3</sup> soils and subsoils. There will also be a requirement for the importation of aggregates. The potential impacts may include loss of attribute and changes in geological setting at the source site.	Negative	Slight	Permanent	Indirect	Only certified materials from authorised sources will be used.	Imperceptible.
<b>Operational Phase</b>								
Use of Proposed Development	Land, Soil and Geology	In a worst-case scenario of accidental spillage of fuel from a car engine and failure of SUDs, there is a potential risk on the receiving land, soil and geology.	Negative	Moderate	Long-term	Indirect	The SUDs measures will be incorporated into the design of the Proposed Development.  Ongoing regular operational monitoring and maintenance of drainage and the SUDs measure will be undertaken throughout the lifetime of operational phase of the proposed development.	Imperceptible

## 5.11 Risk of Major Accidents or Disasters

Earthquakes are not likely to occur in the vicinity of the site at sufficient intensity to pose a risk for the Proposed Development. The GSI database (GSI, 2023) indicate the subject site is located within an area of 'Low' susceptibility to landslides.

The subject site is not located within in an area associated with karst geology and therefore there is no identified risks associated with karst features.

Therefore, there is no identified geohazard risk and the potential risk of major accident or disaster at the Proposed Development is considered 'neutral' 'imperceptible' and 'permanent'.

## 5.12 Significant Interactions

### 5.12.1 Population and Human Health

An assessment of the potential impact of the Proposed Development on human health is included in Chapter 4 of this EIAR. There is a potential risk of dust generated from excavation and stockpiling of soil during the Construction Phase of the Proposed Development posing a human health risk in the absence of standard avoidance and mitigation measures which will be implemented to be protective of human health.

Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase of the Proposed Development that will be protective of site workers.

### 5.12.2 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted a result of the excavation and importation of materials to the site are included in Chapter 14 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

### 5.12.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 6 of this EIAR. In the absence of avoidance, remedial and mitigation measures, there is a potential for sediment from excavated soils entering runoff and discharging into the site drainage during the Construction Phase. Procedures for the protection of receiving water environment are set out Chapter 6 of this EIAR.

### 5.12.4 Air Quality and Climate

The excavation of soils across the site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust) during the Construction Phase. An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 7 of this EIAR.

### 5.12.5 Landscape and Visual

During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from greenfield to residential with landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 10 of this EIAR.

### 5.12.6 Material Assets – Waste, and Traffic & Transportation

An assessment of the potential impact of the Proposed Development on the Material Assets (Waste) and Material Assets (Traffic and Transportation) are included in Chapter 11 and Chapter 12 of this EIAR respectively.

It is proposed to reuse all the soils generated on site for the construction phase to level the ground. Any surplus material not suitable for reuse on site will be removed offsite. There is a requirement of approximately 5,200m<sup>3</sup> net import to achieve the required ground levels. Importation of aggregates will be required during the construction of the Proposed Development.

### 5.12.7 Cultural Heritage and Archaeology

An assessment of the potential impacts of the Proposed Development on Cultural Heritage and Archaeology is included in Chapter 15 of this EIAR. During construction of the Proposed Development there will be interactions between the land, soil and geology and the Archaeology during the excavations of soils across the site with the potential for disturbance of archaeological remains.

## 5.13 References & Sources

Construction Industry Research and Information Association (2015) Environmental good practice on site guide (CIRIA -C741).

Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA – C532).

Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines.

Environmental Protection Agency, 2023. EPA Envision Maps. <https://gis.epa.ie/EPAMaps/>. Consulted on 05/07/2023.

Environmental Protection Agency, 2020. Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities.

Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Geological Society of Ireland, 2023. GSI web mapping. <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>. Consulted on 03/07/2023.

Google Earth Pro, 2023. Consulted on 05/07/2023.

IGSL Ltd., 2020. Report on a Site Investigation for a Proposed Housing Development at Rathgowan, Mullingar



Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002);

Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013); and

National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).

S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014;

S.I. No. 98 of 2008- European Parliament and of the Council on waste and repealing certain Directives;

Tobin Consulting Engineers, 2023. Preliminary Construction Environmental Management Plan Proposed Residential Development at Rathgowan, Mullingar.

Tobin Consulting Engineers, 2023. Construction Demolition & Operational Waste Management Plan Proposed Residential Development at Rathgowan, Mullingar.

Westmeath County Council, 2021. Westmeath County Development Plan 2021-2017 (WCC, 2021);

Westmeath County Council, 2014. Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).

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