

7 LAND, SOILS AND GEOLOGY

7.1 INTRODUCTION

This chapter of the EIAR comprises of an assessment of the likely significant effects of the proposed development on land, soils and the geological environment as well as identifying proposed mitigation measures to avoid, reduce, remedy or offset any effects.

Refer to Chapter 3 (Description of Development) for a detailed site and development description. This Chapter should be read in conjunction with Chapter 8 (Water), Chapter 14 (Material Assets – Traffic & Transport) and Chapter 16 (Material Assets – Utilities).

7.1.1 Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing DBFL, the applicant has ensured that this Chapter has been prepared by “competent expert”.

This Chapter has been prepared Seán Byrne BEng CEng MIEI, who has over 8 years’ experience in civil engineering and the construction industry.

7.2 ASSESSMENT METHODOLOGY

An analysis of the predicted impacts of the proposed development on the land, soils and geology during and after the construction phase, as per Annex IV of Directive 2014/52/EU, EPA Guidance notes (2017) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013), is presented in the following section.

The impact assessment was undertaken using the following considerations:

- **Quality of an Impact:** Described as being Positive, Neutral or Negative.
- **Significance of an Impact:** The significance of each impact was considered as having either an Imperceptible/Not Significant, Slight, Moderate, Significant/Very Significant or Profound impact.
- **Duration of Impacts:** The duration of each impact was considered to be either brief, temporary, short-term, medium-term, long-term or a permanent impact. Brief construction impacts are considered to last a day or so, Temporary impacts last less than one year. Short-term impacts are seen as impacts lasting one to seven years. Medium-term impacts are impacts lasting seven to 15 years. Long-term impacts are impacts lasting 15 to 60 years and Permanent impacts are impacts lasting over 60 years.

This assessment meets the requirements for an EIAR, as outlined in the relevant National and EU ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports legislation and has been prepared in accordance with the Environmental Protection Agency (EPA) guidance documents, 2022’.

The appraisal methodology considered a description of the impact i.e. the “quality” of the effects (i.e. whether it is adverse or beneficial), the “significance” of the effects (i.e. the magnitude of the effect in terms of the environment), the “probability” of the event occurring, and the “duration” of the effects (i.e. whether it is short or long term) and also considers the significance/sensitivity of the existing environment. Terminology for describing the quality, significance, extent, probability and duration of effects is set out in Section 3.7.3 of the EPA EIAR guidance.

Description of the baseline environment and the assessment of the likely impact of the proposed development on soils and the geological environment included the following activities:

- Preliminary Ground Investigations.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.

- Preliminary Ground Investigations for the proposed development were carried out by IGSL in JUNE 2025

Refer to **Appendix 7.1** Ground Investigation Report (IGSL, Issue Date JUNE 2025). See Figure 7.1 below for locations of trial pits and soakaway tests undertaken.



Figure 7-1 Locations of Trial Pits and Soakaway Tests Undertaken in the Vicinity

There Were 86 Trial Pits carried out as part of the site investigation, with pits generally extending to depths of 3.0m. See below details of trial pit description TP37.

Depth (m) Thickness	Description
0.20	Topsoil layer Firm grey slightly sandy gravelly CLAY . Gravels are subangular to subrounded fine to coarse.
0.20 – 1.00	Medium dense brown mottled grey slightly gravelly clayey SAND with low cobble content subangular to subrounded.
1.00 – 2.00	Medium dense grey mottled brown slightly clayey sandy GRAVEL with low cobble content subangular to subrounded and low boulder content subrounded.
2.00 – 2.70	Firm brown slightly sandy gravelly CLAY with medium cobble content subangular to subrounded and low boulder content subangular to rounded

Table 7-1 Trial Pit 01 Description

7.3 RECEIVING ENVIRONMENT

This section describes the baseline situation of the site at present.

7.3.1 Land

The land on which it is proposed to construct the proposed development buildings, roads, and associated infrastructure is currently in agricultural use. The land is currently productive agricultural land.

‘Land’ was introduced as a prescribed environmental factor by Directive 2014/52/EU amending the EIA Directive. Recital 9 of the Directive references ‘the need to address the unsustainable increase of settlement areas over time (‘land take’). Recital 9 goes on to state that ‘public and private projects should therefore consider and limit their impact on land, particularly as regards land take, and on soil, including as regards organic matter, erosion, compaction and sealing: appropriate land use plans and policies at national, regional and local level are also relevant in this regard’.

The proposed Development requires a ‘land take’ of 38.89 ha, whereby the use of the land will change from agricultural use to residential development. The required land take is minor in the context of the productive agricultural land area of County Louth and will result in an imperceptible, negative and permanent impact in respect of the area removed from agricultural production.

Within the Louth County Development Plan 2021 – 2027, the site is zoned A2 – ‘New Residential Phase 1’ and H1 – ‘Open Space’. The site is also subject to spot objective 3 (known as Spot Objective F in the Dundalk LAP).

These lands were previously in agricultural use. The proposed development site is plan-led and consistent with the County Development Plan’s strategic road infrastructure objectives to provide a link road / transport corridor to facilitate the sustainable and plan-led development of the urban area.

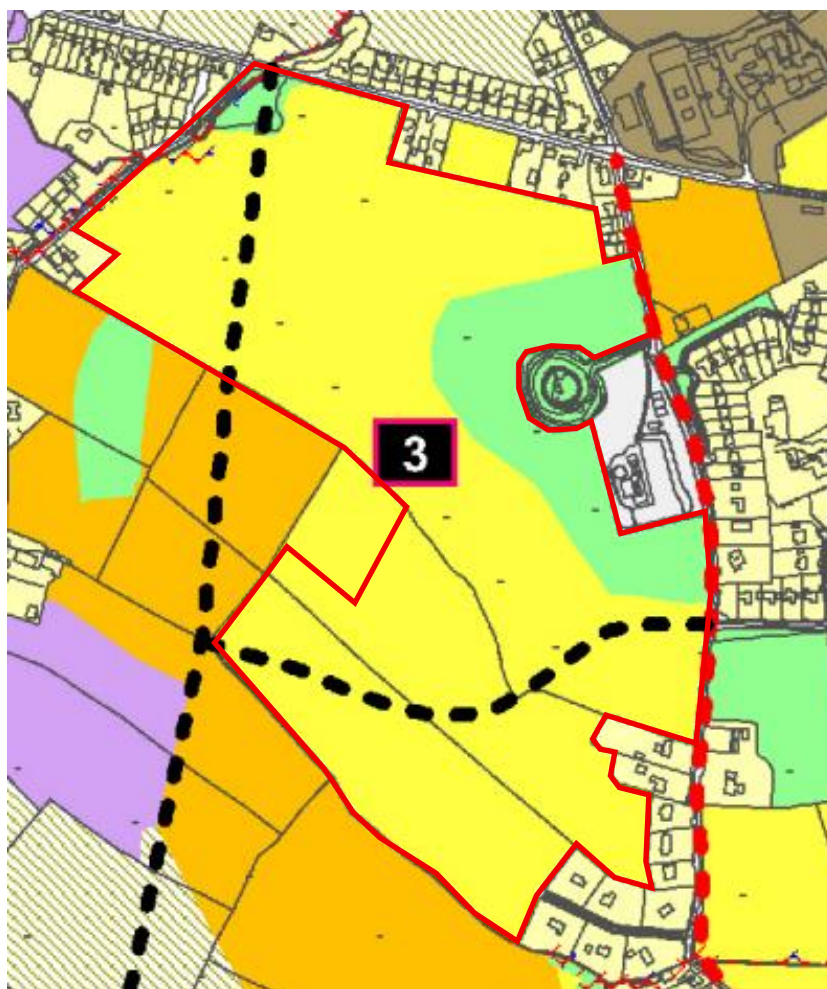


Figure 7-2 extract from Zoning map of the County Development Plan 2021- 2027

7.3.2 Soils

The Soil Map of Ireland (1980) indicates the predominant soil type in the Dundalk area as “Ballylanders”. This series occurs most extensively in the northern and eastern portions of the county. Ballylanders occurring over shale bedrock with fine loamy texture. The soils of this series are deep, well-drained, of Fine loam texture, Refer to Figure 7.2 and Figure 7.3 below.

According to the report by IGSL undertaken in 2025, topsoil was encountered in most of the exploratory trial pits and was present to a maximum depth of 0.4m BGL.

The report also concluded that Made Ground deposits were encountered to a depth in excess of 0.6m BGL in one trial pit and one borehole.

Cohesive deposits were encountered beneath the Topsoil and Made Ground and were described typically as stiff grey slightly sandy CLAY with occasional cobbles and boulders.

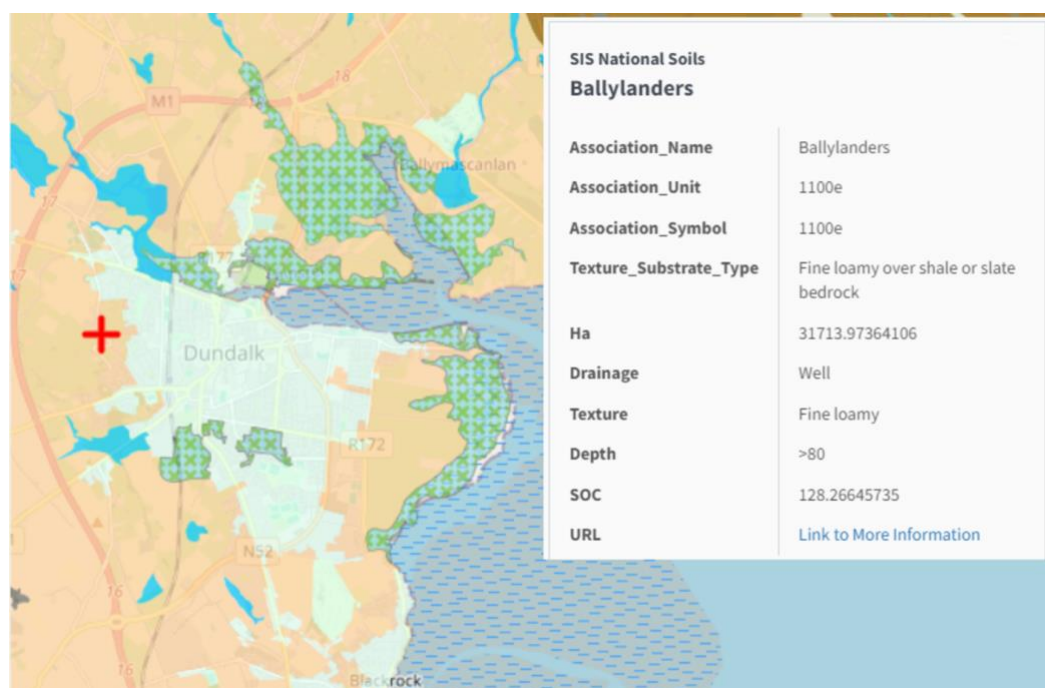


Figure 7-3 Extract from the GIS EPA Website

7.3.3 Geology

The proposed development site is underlain by “Calcareous red-mica Greywacke”, as indicated on the Geological Survey of Ireland.

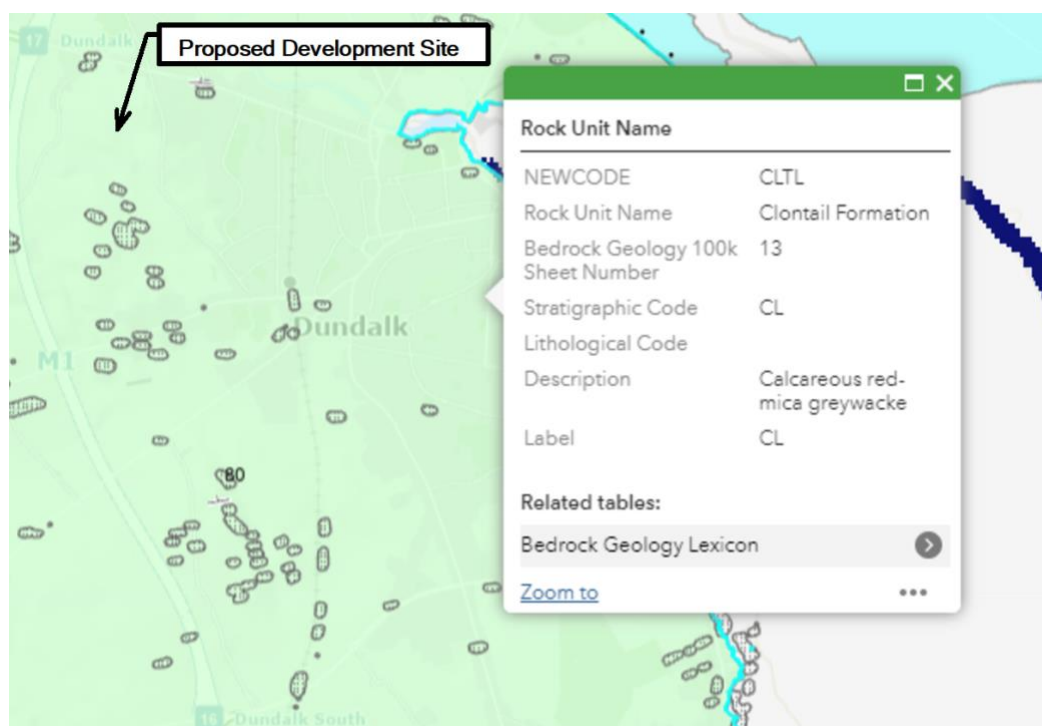


Figure 7-4 Bedrock Geology Map for Dundalk

The Calcareous red-mica Greywacke material is described by the Geological survey Ireland as be below:

Green-grey, medium to thickly bedded, coarse and very fine grained Tae greywackes, with dark grey, thinly bedded, poorly graded, quartzose fine sandstone to siltstone units. Both lithologies contain distinctive brown-red coloured biotite.

The formation is interpreted as proximal and distal turbidites, with a small set of palaeocurrent indicators suggesting a source to the northeast or east.

The GSI bedrock aquifer map indicates a “Poor Aquifer – bedrock which is generally unproductive except in local areas.

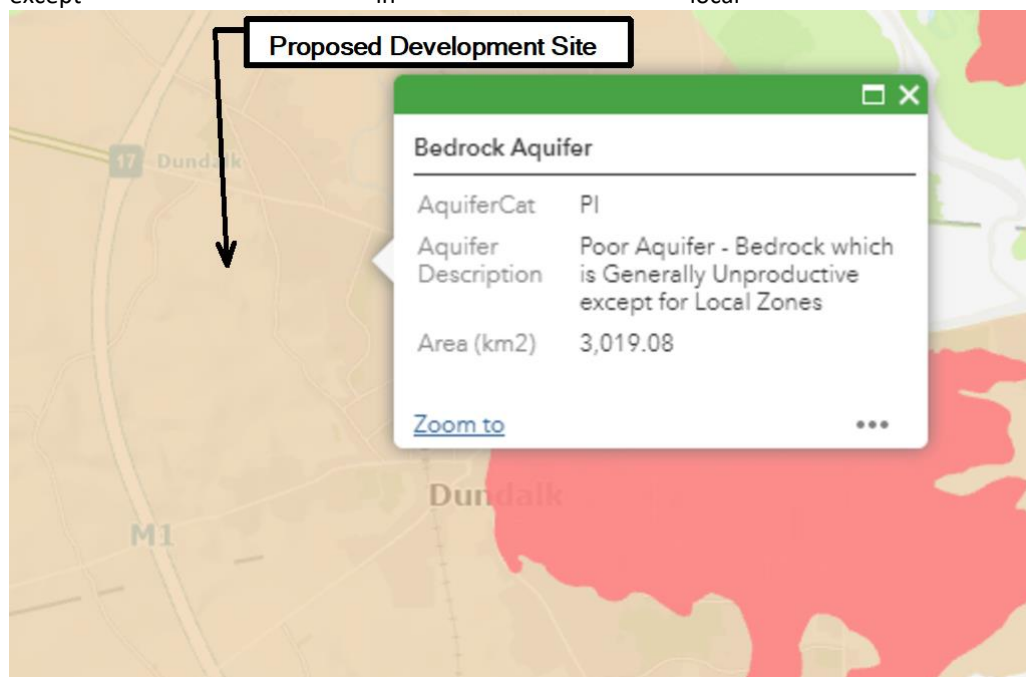


Figure 7-5 GIS Aquifer Classification Map

The groundwater vulnerability map for Dundalk indicates a general vulnerability rating for the proposed development lands as moderate (yellow) and high (Orange). See Figure 7.6 below.

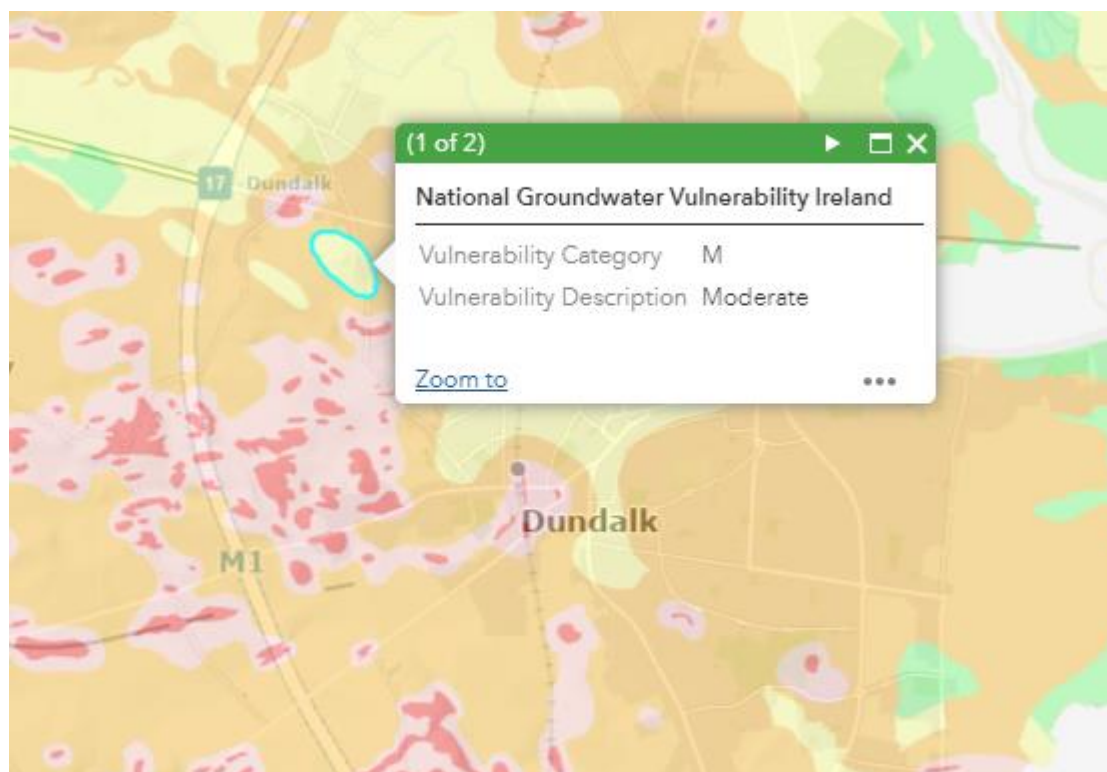


Figure 7-6 GIS Groundwater Vulnerability Map

Upon analysing the GSI map, it can be stated that the groundwater vulnerability throughout the site is classified as a mix from moderate to high.

7.3.4 Radon Risk

A review of the EPA's online mapping service ("Radon Map") shows that between 10% of the homes within the area are estimated to be above the reference level of 200 bequerel per cubic metre (Bq/m³). Refer to Figure 7.7 below.

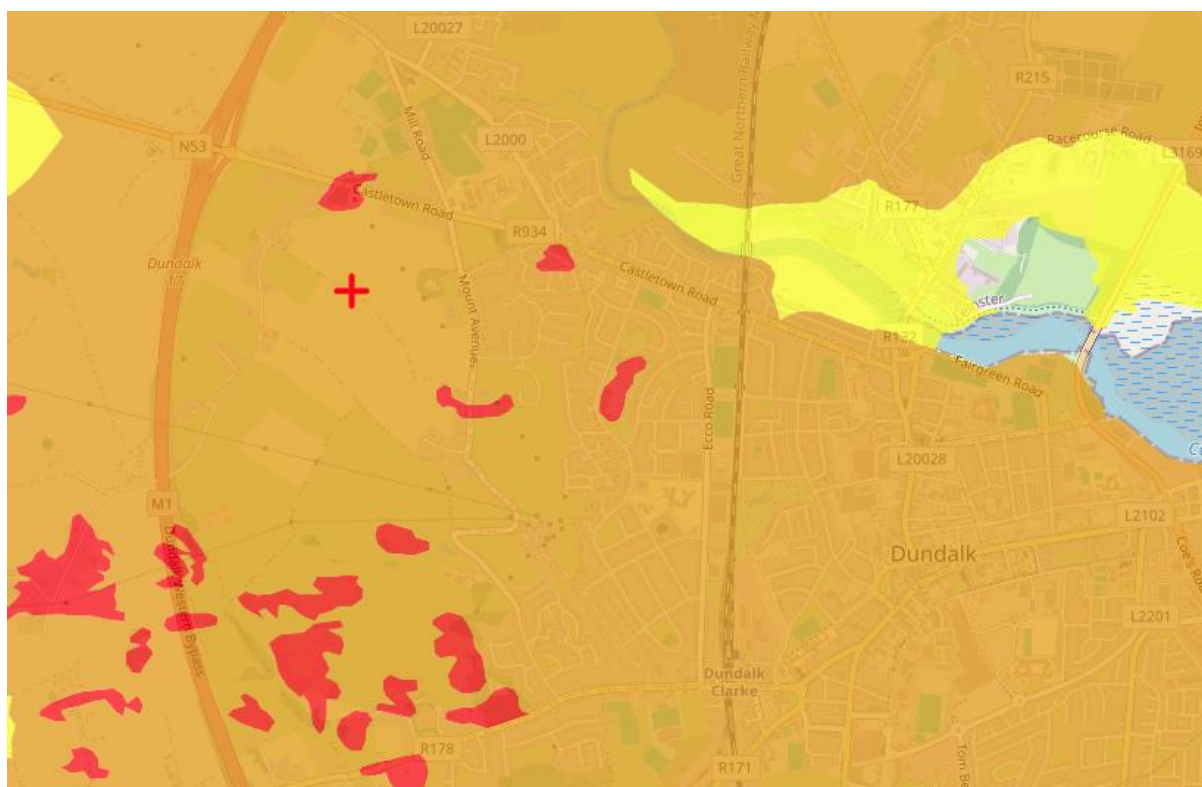


Figure 7-7 Extract from EPA Mapping Service (Radon Mapping)

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

7.4.1 Proposed Development

Site development works will include stripping of the 0.2m to 0.4m thick topsoil layer. It is expected that all stripped topsoil will be reused on site, incorporated into landscaping of back gardens and public open spaces. Excavation of subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water. Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material). Where bedrock is encountered in excavations, the rock will be crushed, screened and tested for use within the designed works as fill material for road construction and backfill to service trenches.

The proposed Development requires a 'land take' of 38.89 ha, whereby the use of the land will change from agricultural use to residential and roads infrastructure. The land will be removed from agricultural use early in the construction phase of the project.

7.4.2 Cumulative

Although there are several smaller granted and pending projects in the vicinity of the development, it is unlikely that there will be any cumulative impact on lands, soils and geology in this area.

Please see the table below of all known planning permissions/applications in the area and figure 7-8 of their location.

LOCATION	LCC REG. REF. / ABP REF.	DATE	DESCRIPTION / SUMMARY
FARNDREG / MOUNT	18156 / ABP 303188	—	Demolition of 995 sqm industrial unit; construction of 88-bed nursing home with support facilities.

AVENUE HEADFORD /			
	18943	18 Jan 2019	80 dwellings (50 houses, 30 apartments, 1–3 storeys).
	20210	19 Oct 2020	47 dwellings (mix of detached, semi-detached, incl. 4 bungalows, 1–2 storeys).
	20211	19 Oct 2020	67 dwellings (mix of houses and apartment/duplex units).
	2360190	11 Aug 2023	Revisions to 25 dwellings in “Hearthfield” (Ref. 18/943 / ABP 303628-19).
	2460240	19 Sept 2024	Revisions to phases 2 & 3 of “Hearthfield” (Ref. 20210).
MOUNT AVENUE	211173	11 Jan 2022	93 residential units and all associated works.
	2460792	28 Jul 2025 (FI)	63 houses (2–3 storeys, semi-detached/terraced).
MILL ROAD	18985	31 May 2019	Demolition of commercial units; construction of 7 dwellings (3 semi-detached pairs + 1 detached).
CASTLETOWN CROSS / CASTLEBLAYNEY RD	2360406	12 Jan 2024	Two-storey dwelling , new site entrance and site works.
	20861	03 Dec 2020	Dormer-style dwelling and associated site works (2 Castletown Cross).
	20711	05 Nov 2020	Dormer-style dwelling and associated site works (Castletown Cross, Newtownbalregan).

Table 7-2 summary of known planning grants/applications in the vicinity of the development



Figure 7-8 Map location of all known planning grants/applications

The proposal will result in the permanent loss of agricultural land. This isolated land take is considered minor relative at a county level, however, with other proposed developments granted planning in Dundalk, they contribute to the expansion of the urban footprint of Dundalk into agricultural land reducing the amount of available agricultural land in the Dundalk area.

Construction activity within Dundalk's urban expansion also could potentially cumulatively increase soil sealing, compaction and erosion.

Given the scale of the proposed development and the capacity of the surrounding environment to accommodate developments of this nature, it is considered that the overall cumulative development in this area will have a moderate, long-term impact on the land, soils and geology of the area via the proposed structures, roads, infrastructure etc on the subject site.

7.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The likely significant effects are described in accordance with Section 3.7.3 'Descriptions of Effects' of the EPA's Guidelines. This section will include an assessment of cumulative impacts and unplanned events.

7.5.1 Do Nothing Scenario

There will be no impact on land, soils and the geological environment if the development does not proceed.

7.5.2 Construction Stage

This section identifies a list of likely and significant effects on land, and on the soil and geology of the subject site caused by the construction of the proposed development in Navan.

7.5.2.1 Stripping of Topsoil

Removal of the existing topsoil layer will be required across the site. As noted previously, it is expected that all stripped topsoil will be reused on site (incorporated into landscaping and public open spaces). **Table 7.2** gives the approximately topsoil material volumes to be handled.

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff. The impact of these works will have a slight impact and negative effect over the short term. Mitigation measures outlined in Section 7.6 will be employed to reduce the residual effect on stripping of topsoil.

	Volume (m ³)
Topsoil Strip (200mm to 400mm thick layer)	98,000
Topsoil Reuse (landscaping of open spaces etc.)	98,000

Table 7-3 Preliminary Estimated Topsoil Volumes (Approximate)

7.5.2.2 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required to allow road construction, foundation excavation, drainage and utility installation and provision of surface water attenuation facilities. Table 7.3 gives the approximately cut and fill material volumes to be handled.

Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath roads and in fill of existing stream) however, unsuitable excavated subsoil is expected and will have to be removed to an approved landfill. The impact of these works will have a slight impact and negative effect over the short term. Mitigation measures outlined in Section 7.6 will be employed to reduce the residual effect on excavation of topsoil layers.

	Volume (m ³)
Cut	107,000
Fill	155,000
Removal of Unsuitable Material	10,000

Table 7-4 Estimated Cut / Fill Volumes (Approximate)

To negate the need for soil and sub-soil to be removed or imported for the proposed works finished building levels etc for the subject lands have been optimized, to maximize the reuse of excavated

material and to minimize where possible the volume of material requiring disposal from and importation to the site.

7.5.2.3 Construction Traffic

Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

The impact of these works will have a slight impact and neutral effect over the short term. Mitigation measures outlined in Section 7.7 will be employed to reduce the residual effect on stripping of topsoil.

7.5.2.4 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Storage of oils and fuels on site;
- Oils and fuels leaking from construction machinery;
- Spillage during refuelling and maintenance of construction machinery; and
- Use of cement and concrete during construction works.

It is considered that impact of any accidental spills or leaks could have a significant negative effect over the short term. However, with the implementation of mitigation measures outlined in Section 7.6 the residual effect is minimised and it is considered unlikely that any accidental spills or leaks would occur.

7.5.2.5 Geological Environment

Limited Rock was not encountered in some trial pits excavated as part of the preliminary ground investigation. Groundwater was also encountered in some trial pits and exploratory boreholes. Therefore, it is not expected that the installation of drainage will require excavation of bedrock. Notwithstanding this, excavations associated with development of the site have been designed as shallow as possible in the unlikely event that rock is encountered. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works.

A more detailed Ground Investigation will be undertaken prior to construction to verify the Preliminary Ground Investigation.

Based on the above it is considered unlikely that there will be any effect on the bedrock geology during construction.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a Neutral, Short Term, Moderate cumulative impact.

7.5.3 Operational Stage

On completion of the construction phase, there will be no further impact on land, soils and the geological environment.

7.5.4 Cumulative Impacts

Given the scale of the proposed development and the capacity of the surrounding environment to accommodate developments of this nature, it is considered that the overall cumulative development in this area will have a moderate, long term impact on the land, soils and geology of the area via the proposed structures, roads, infrastructure etc on the subject site. However, with the detailed mitigation measures in place, as required under this EIAR and in the following section, the overall impact on land and soils will be permanent, not significant and have a neutral effect.

7.6 MITIGATION MEASURES (AMELIORATIVE, REMEDIAL OR REDUCTIVE MEASURES)

This section lists the proposed mitigation measures to avoid, reduce, remedy or offset any effects.

7.6.1 Construction Stage

7.6.1.1 Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.

At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. These stockpiles will be monitored throughout the construction phase.

Topsoil stockpiles will also be located so as not to necessitate double handling.

7.6.1.2 Excavation of Subsoil Layers

The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations.

The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).

Similar to stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. These stockpiles will be monitored throughout the construction phase. Monitoring of ground conditions and stability of excavations will be monitored on an on-going basis.

Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

7.6.1.3 Weather Conditions

Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion and silt generation. The approach of extreme weather events will be monitored to inform near-term operational activities.

7.6.1.4 Surface Water Runoff

Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat

sediment laden runoff prior to discharge of surface water at a controlled rate. Monitoring of these sediment control measures will be undertaken throughout the construction phase.

Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.

On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed on site.

Surface water discharge points during the construction phase are to be agreed with Louth County Council's Environment Section prior to commencing works on site.

7.6.1.5 Water Pumped from Excavations

Rainwater pumped from excavations is to be directed to on-site settlement ponds.

Groundwater pumped from excavations is to be directed to on-site settlement ponds.

On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion. Monitoring of same will be undertaken.

Surface water discharge points during the construction phase will be agreed with Louth County Council prior to commencing works on site.

7.6.1.6 Construction Traffic

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site. The cleanliness of the adjacent road network will be monitored throughout the construction phase.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

A construction traffic management plan will be prepared by the contractor prior to any works commencing on site.

7.6.1.7 Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets and outlets (when not possible to carry out such activities off site).

A response procedure shall be put in place to deal with any accidental pollution events and spillage kits shall be available and construction staff will be familiar with the emergency procedures and use of the equipment.

Monitoring of all fuel / oil storage areas will be undertaken and spill kits will be available on site.

7.6.1.8 Geological Environment

A more detailed Ground Investigation will be undertaken prior to construction to verify the Preliminary Ground Investigation and where possible the works will be designed to minimize the bedrock excavation required. At any given time, the extent of exposed bedrock will be limited to the

immediate vicinity of active work areas. Where bedrock is encountered, it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.

With the consideration of mitigation measures the construction phase of the proposed development will likely have an overall Neutral, Short Term, imperceptible residual impact.

7.6.2 Operational Stage

For the operational phase no specific mitigation measures are proposed as there will be no further impact on land, soils and the geological environment.

Character of potential impact	Mitigation measure
Construction Phase	
Stripping of topsoil	Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
Excavation of subsoil layers	The need to excavate subsoil layers has been minimised as the proposed levels have been designed to follow the natural
Materials imported to site for use as fill	Fill material will be natural stones sourced from locally available quarries or materials that have been approved as by-products by the EPA
Construction Traffic	Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site and designated delivery areas. Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
Accidental Spills and Leaks	Response procedure will be put in place to deal with any accidental pollution events. Refuelling and servicing of construction machinery will take place in a designated hardstand area (when not possible to carry out such activities off site).

7.7 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

This section will describe effects arising once mitigation measures are fully implemented.

7.7.1 Proposed Development

7.7.1.1 Construction Stage

Implementation of the mitigation measures specified in Section 7.6 will ensure that the potential impacts of the proposed development on land, soils and the geological environment will be avoided, remedied or minimised. The residual impact is considered to be not significant for the construction phase and any residual impacts will be short term, and neutral.

The primary residual impact is the removal of material unsuitable for reuse as fill material. This impact is unavoidable given the nature of the proposed development. With the implementation of all mitigation measures these effects will be slight short-term effects that should have a neutral impact on the surrounding environment.

7.7.1.2 Operational Stage

There are no predicted impacts arising from the operational phase.

7.7.2 Do Nothing Scenario

There are no predicted impacts should the proposed development not proceed.

7.7.3 Worst Case Scenario

The 'Worst Case Scenario' in terms of land and soil would be accidental fuel loss from machinery or spillage of fuel during the re-fuelling of construction machinery. This would impact on soil quality which could contaminate sub-soil and potentially contaminate groundwater. Considering the nature of the proposed development and the absence of a requirement to store large volumes of fuel on site this scenario is considered unlikely.

Another potential 'worst case scenario' would be the collapse of soil from excavations or stockpiles which would pose a risk to human health. This scenario is deemed very unlikely once steep excavations are correctly supported and stockpile heights are managed as per the Construction and Environmental Management Plan (CEMP), which is submitted as part of the Planning Application.

7.7.4 Cumulative

The cumulative residual impacts (after mitigation) described in Section 7.7 are the same as those identified in Section 7.5.4 — the proposed development will result in a permanent, neutral, and not significant impact on land, soils, and the geological environment once mitigation measures are in place.

7.8 MONITORING

7.8.1 Construction Stage

Proposed monitoring by the main contractor during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the Construction and Environmental Management Plan (CEMP).
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas and having spill kits available to hand.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).

7.8.2 Operational Stage

No ongoing monitoring is proposed on completion of the construction phase.

7.8.3 Reinstatement

7.8.3.1 Construction Stage

No reinstatement requirements have been identified in relation to the construction phase of the proposed development.

7.8.3.2 Operational Stage

No reinstatement requirements have been identified in relation to the operational phase of the proposed development.

7.8.3.3 Cumulative

No cumulative reinstatement requirements have been identified in relation to the proposed development.

7.9 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered in compiling and assessing the data for this section of the EIAR.