7 LAND, SOILS AND GEOLOGY

7.1 INTRODUCTION

This chapter was prepared by DBFL Consulting Engineers. It identifies, describes and assesses the direct and indirect significant effects of the proposed development on geology, soil and land, including those arising from the construction and operation of the proposed development. It also addresses the characteristics, potential effects, mitigation measures and residual effects arising from the proposed development.

This chapter was prepared by Aislinn Murtagh (Civil Engineer) and Darren Richardson (Civil Engineer), DBFL Consulting Engineers and checked by Dieter Bester (Chartered Civil Engineer)

This chapter addresses earthworks proposed on the subject site including cut and fill works required.

7.2 ASSESSMENT METHODOLOGY

7.2.1 Guidelines

The assessment of the potential effects of the proposed development on geology, soil and land was carried out according to best practice and the methodologies specified in the available guidance documents. Various bodies - including Transport Infrastructure Ireland (TII, formally National Roads Authority), the Institute of Geologists of Ireland (IGI), and the Environmental Protection Agency (EPA) - provide detailed guidance on the preparation of and content required for an EIAR in relation to the geological environment, as listed below.

Body	Guidance
Transport Infrastructure Ireland (TII)	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)
	Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008)
	Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan
	The Management of Waste from National Road Construction Projects
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (DN-DNG-03066)
Environmental Protection Agency (EPA)	Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports (Draft August 2017)
	EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) Sept. 2003
	Geo Portal (https://gis.epa.ie/EPAMaps/)
Construction Industry Research and Information Association (CIRIA)	The SUDS Manual (CIRIA C753)
	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA C532)
	Control of Water Pollution from Linear Construction Sites (CIRIA C648)
	Environmental Good Practice on Site (C692) (2010)
South Dublin County Council (SDCC)	South Dublin County Council Planning (https://www.sdcc.ie/en/services/planning/)
Institute of Geologists of Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements. (2013)

Dept of the Environment Heritage and Local Government	Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects
Department for Environment, Food and Rural Affairs (UK)	Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

Table 7-1

7.2.2 Consultation

Baseline information was gathered from relevant bodies as per table 7.1. A consultation meeting was conducted with ESB representatives regarding matters relating to the existing ESB infrastructure and substation in relation to flood risks. A consultation meeting was conducted with SDCC roads department in February 2025 regarding relevant roads and access matters.

7.2.3 Desktop Study

A desktop study was carried out, which involved collation and consideration of relevant information, as follows:

- Acquisition and compilation of all available regional information on the geology, soil, and land aspects of the study area.
- Interrogation of the Geological Survey of Ireland (GSI) online mapping service, including:
    - GSI Teagasc Soils Mapping
    - GSI Teagasc Subsoils Mapping
    - GSI Bedrock Geology Mapping
    - GSI Landslide Events
    - GSI Mineral Localities
    - GSI Mineral Active Quarries
- Acquisition and examination of the Ordnance Survey of Ireland (OSI) mapping and aerial photography.
- Examination of topographical survey of the site.
- Findings of ground investigation carried out by IGSL Ltd at the proposed site. The Ground Investigation & Geotechnical Interpretative Report (Ground Investigation Report) is included in Appendix 7.1 of the EIAR.

7.2.4 Application of Methodology

This chapter has been prepared particularly in accordance with the following best practice methodology: EPA “Guidelines on the Information to be Continued in Environmental impact Assessment Reports (Draft August 2022)” and the TII “Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes”.

7.2.5 Study Area

The proposed development sites are in the administrative area of South Dublin County Council (SDCC) and are part of the Clonburris Strategic Development Zone (SDZ). The subject sites are located within the northwest, southwest and northeast areas of the Kishoge Development Area, within Clonburris SDZ.

Site 3 is situated west of the R136 Grange Castle Road and north of the Kildare/Cork Railway line.

Site 4 is situated south of the Kildare/Cork Railway line and west of the R136 Grange Castle Road.

Site 5 is situated north of the Kildare/Cork Railway line, east of the R136 Grange Castle Road, and is bisected by the Thomas Omer Way Road.

Figure 7-1 below illustrates the subject sites and their location in relation to nearby roads.

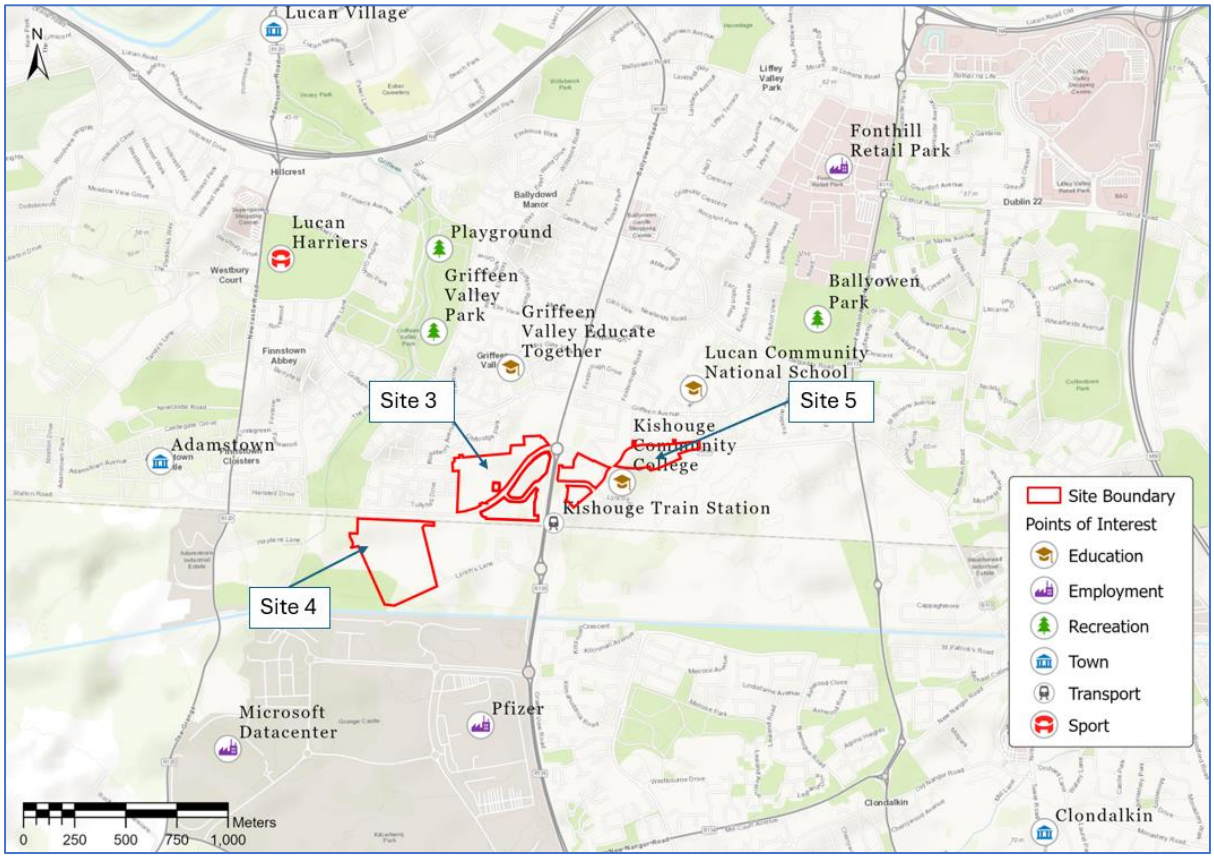

Figure 7-1 Site Location (Site Boundary Indicative)

7.3 RECEIVING ENVIRONMENT

7.3.1 Existing Site Conditions

The subject sites are spread across the Kishoge area within the Clonburris SDZ. They are located both sides of the Kildare/Cork Railway line, with Sites 3 and 5 north of the railway line and Site 4 to the south.

Site 3: The lands at Kishoge Phase 3, measuring approximately 34 acres, are currently characterised by transitional agricultural landscapes and border mature housing developments to the west and north. An existing ESB substation is located within the site, northwest of Adamstown Avenue.

Site 4: The lands at Kishoge Phase 4, measuring approximately 26 acres, currently have both an emergency traveller accommodation site (Lynch's Lane) and a South Dublin County Council Parks Department depot. A plantation of semi-mature trees comprises much of the north of the site. The Kildare/Cork Railway line forms the northern boundary, with Lynch's Lane marking the southern extent.

Site 5: The lands at Kishoge Phase 5 comprises two separate plots on opposing sides of the E-W trending Thomas Omer Way (L1059). The plot to the south of the road measures almost 10 acres and is bounded by the R136 to the west and by Lynch's Lane (L5218) to the east. The site tapers to the south where it meets the Kildare/Cork Railway line at Kishoge rail station. North of Thomas Omer Way, a 3.5 acre greenfield site is wedged between the L1059 to the south and Foxborough housing

estate to the north. New social housing developments - Griffeen Court and Omer Walk - have recently been constructed east of the site.

7.3.2 Topography

Overall, the topography of the subject sites is relatively flat throughout, with some localised gradients on all sites. On Site 3 there is slight fall from the southeast, with the lowest area on the northwest area of the site. Site 4 shows a steady fall from south to north, Site 5 north of Thomas Omar Way is overall relatively flat and south of Thomas Omer Way the site falls north to south. A topographic survey is included in Appendix 7.1 of this report.

7.3.3 Topsoil

Site 3: Where naturally occurring topsoil was found, it was found to be present in layers of thickness ranging from 200mm to 450mm. A gradational lower transition was present whereby the topsoil was underlain by a SILT/ CLAY subsoil, almost devoid of gravel (see Ground Investigation Report).

Site 4: Topsoil was found to be present in layers ranging from 100mm to 500mm thick. Similarly to Site 3 a gradational lower transition was present where the topsoil was underlain by yellowish brown SILT/CLAY subsoil, almost devoid of gravel.

Site 5: Naturally occurring topsoil was found to be present in layers around 400mm thick. It is underlain by a sandy clayey Gravel subbase with cobbles and boulders.

7.3.4 Bedrock Geology

The Bedrock Geology Map (below Figure 7.2) indicated that the subject site is underlain in its entirety by limestone. The bedrock is described in geological mapping as a Visean Limestone and calcareous shale and is part of a formation known as the Lucan Formation.

Site 3: Rotary drilling was carried out at 6 locations and revealed bedrock at depths ranging from 2.30m to 2.70m north of Adamstown Avenue with rock coring commencing at the deeper depths of 4.30m and 4.50m south of Adamstown Avenue. The recovered cores were logged as weak to strong, medium to thinly bedded, grey/dark grey/black, fine grained, limestone.

Site 4: Rotary drilling was conducted at 21 locations and recovered cores were logged at strong to locally weak, medium to thinly bedded, grey/dark grey/black, fine-grained limestone. Based on the abundance of calcite in the rock record, a probable fault zone was identified from 3.7m to 6.0m below ground level.

Site 5: Rotary drilling was carried out at 10 locations and recovered cores described as strong to locally moderately weak, medium to thinly bedded, to thinly laminated fissile mudstone/shale, grey/dark, grey/black, fine-grained, LIMESTONE. Drillholes were taken to depths ranging from 5.10m to 8.60m below ground level.

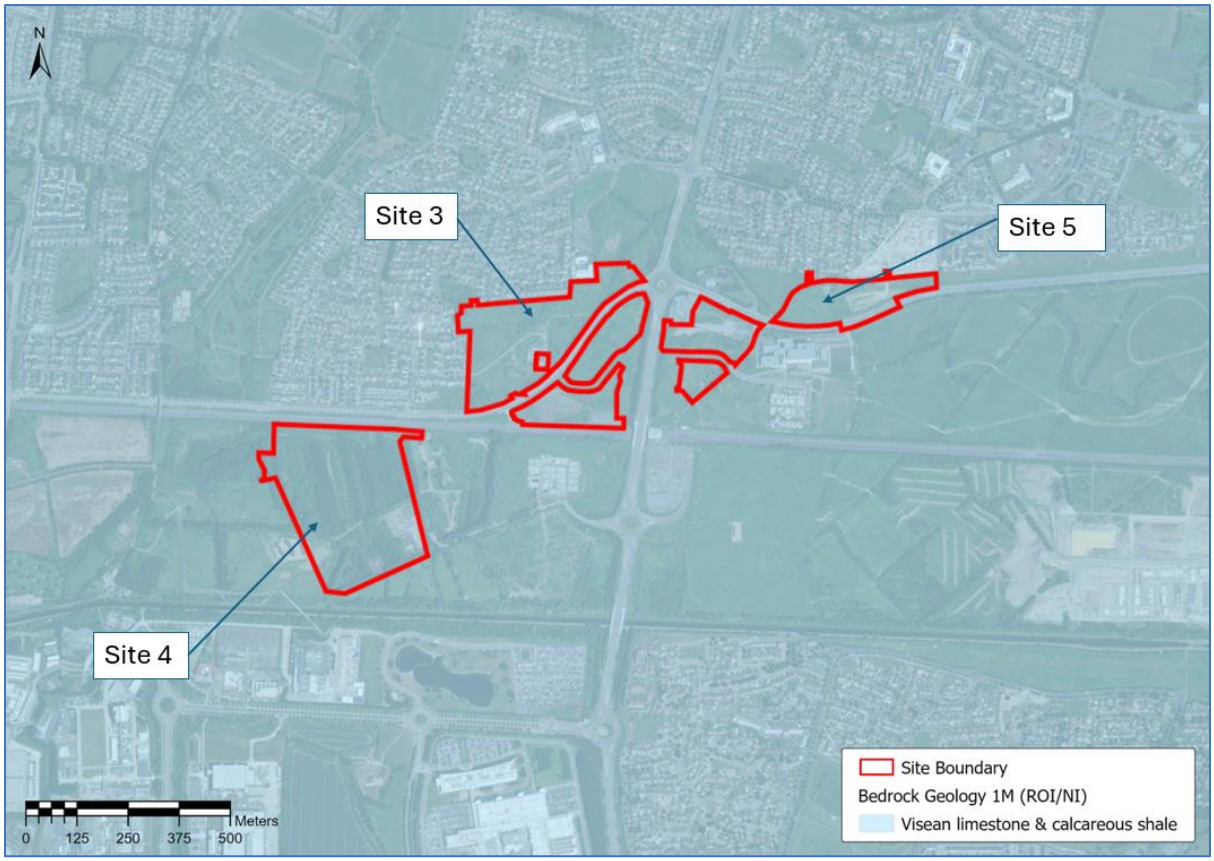

Figure 7-2 Bedrock Geology (Geological Survey Ireland) (Application Site Boundary Indicative)

7.3.5 Quaternary & Soil

The GSI online mapping service indicated the quaternary deposits underlying the subject site are comprised of clay-dominant tills derived from limestones. The Teagasc Soils and subsoils map from the online GSI mapping service shows the sites are underlain with "deep well drained material" soils and "mineral poorly drained" soils. See figures 7.3 and 7.4.

Made Ground:

Site 3: the existence of made ground has been recorded north of Adamstown Avenue and is not unexpected due to the soil disturbance during the construction of the R136. Dark brown and dark grey sandy gravelly CLAY soils extended to 1.7m where a greyish brown CLAY/SILT was unearthed. Overall, across the southern part of the site south of Adamstown Avenue, there were variable thicknesses of made ground exposed during pitting.

Site 4: Made ground was most evident towards the southern portion of the site. Pits were found to be surfaced with tarmacadam (100mm thick), underlain by angular Gravel hardcore/ placed aggregate and sandy gravely CLAY. The pits in the depot were gravel surfaced without tarmacadam cover. The hardcore buildup extended from 0.3m to 0.45m depth below ground level.

Site 5: Significant ground disturbance is noted on the plot south of Thomas Omer Way; this area was used for stockpiling of soils with the creation of soil beams in the landscape. A 3.6m thick sequence of made ground was uncovered comprising of brown sandy gravelly CLAY with rare wood pieces, cobbles and boulders.

Glacial Deposits:

Site 3: With reference to the Ground Investigation Report, a Fine-grained light brown occasionally mottled orange/ brown SILT/CLAY subsoil layer, generally firm in consistency, was found underlying the topsoil. Occasionally this was noted as firm to stiff with grey/ brown mottling also observed.

The soil increased in strength where indigenous deposits were encountered; the soils increased in strength to stiff and were found to contain an increasing gravel sized clast content with depth. Colour change to grey was observed with depth.

An increasingly gravelly, stiff dark grey layer completed many of the pits, with angular cobble and boulder-sized fragments frequently noted. Towards the base of this layer, the increased volume of angular tabular and platy material caused the layer to be described as a "Possible Weathered Rockhead" horizon.

Site 4: A fine-grained light brown and grey brown occasionally mottled range/ yellow brown CLAY subsoil layer was found underlying the topsoil. It was generally firm to stiff or firm becoming stiff in consistency.

Where indigenous deposits were encountered, the soils increased in strength to stiff and were found to contain an increasing gravel sized clast content with depth. Colour change to grey was observed with depth.

Site 5: South of Thomas Omer Way a stiff brown mottled light grey sandy gravelly CLAY with cobbles was found. This passed to a stiff greyish brown gravelly CLAY from 2.20m below ground level. The overburden soils were reported as gravelly CLAY and sandy gravelly CLAY with cobbles and boulders. North of Thomas Omer Way a stiff to very stiff orange brown sandy gravelly CLAY was intercepted. This was underlain by a stiff to very stiff grey brown sandy gravelly CLAY from 1.70m below ground level.

Weathered Bedrock

The recovered cores were logged as weak to strong, medium to thinly bedded, grey/dark grey/black, fine grained, LIMESTONE. The rock was described as predominantly argillaceous limestone with layers of calci-silitite limestone, local stylolites and with pyrite present. The rock mass was slightly weathered to moderately weathered at fissile mudstone/shale zones.

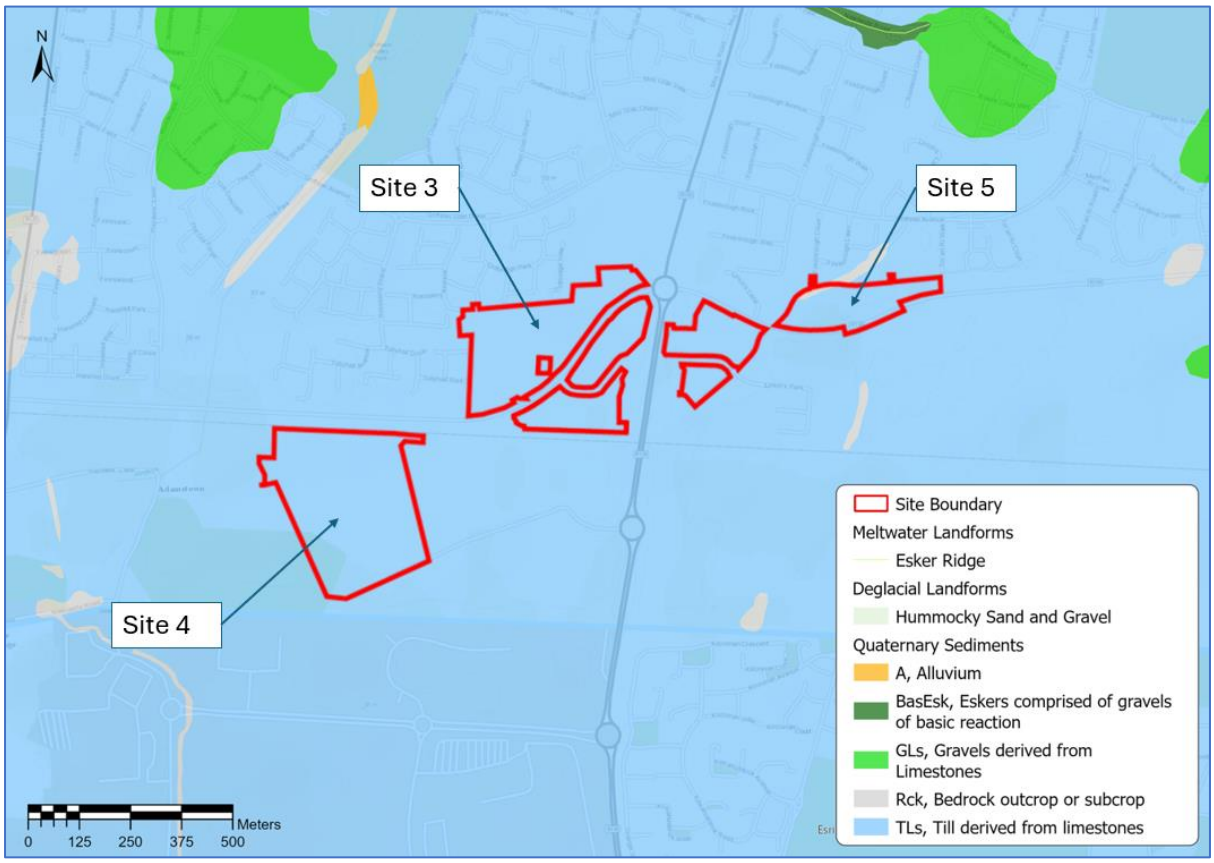

Figure 7-3 Quaternary Deposits (Geological Survey Ireland)

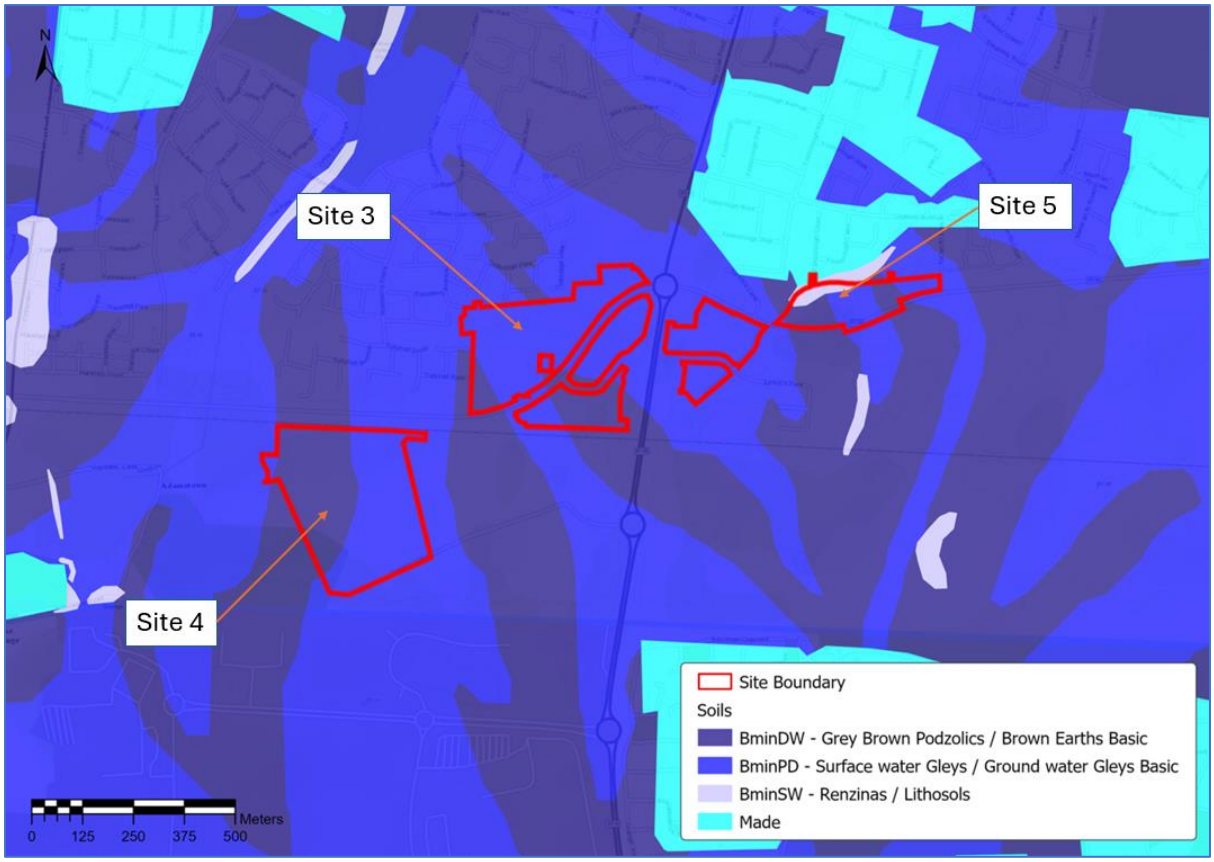

Figure 7-4 Teagasc Subsoils (Geological Survey Ireland)

7.3.6 Hydrogeological Aspects

Limestone bedrock underlies all sites. The bedrock is described in geological mapping as a Dark Limestone & Shale and is part of a formation known as the Lucan Formation.

The bedrock aquifer underlying all sites is classified by GSI as a *"Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones".* See figure 7.5 below.

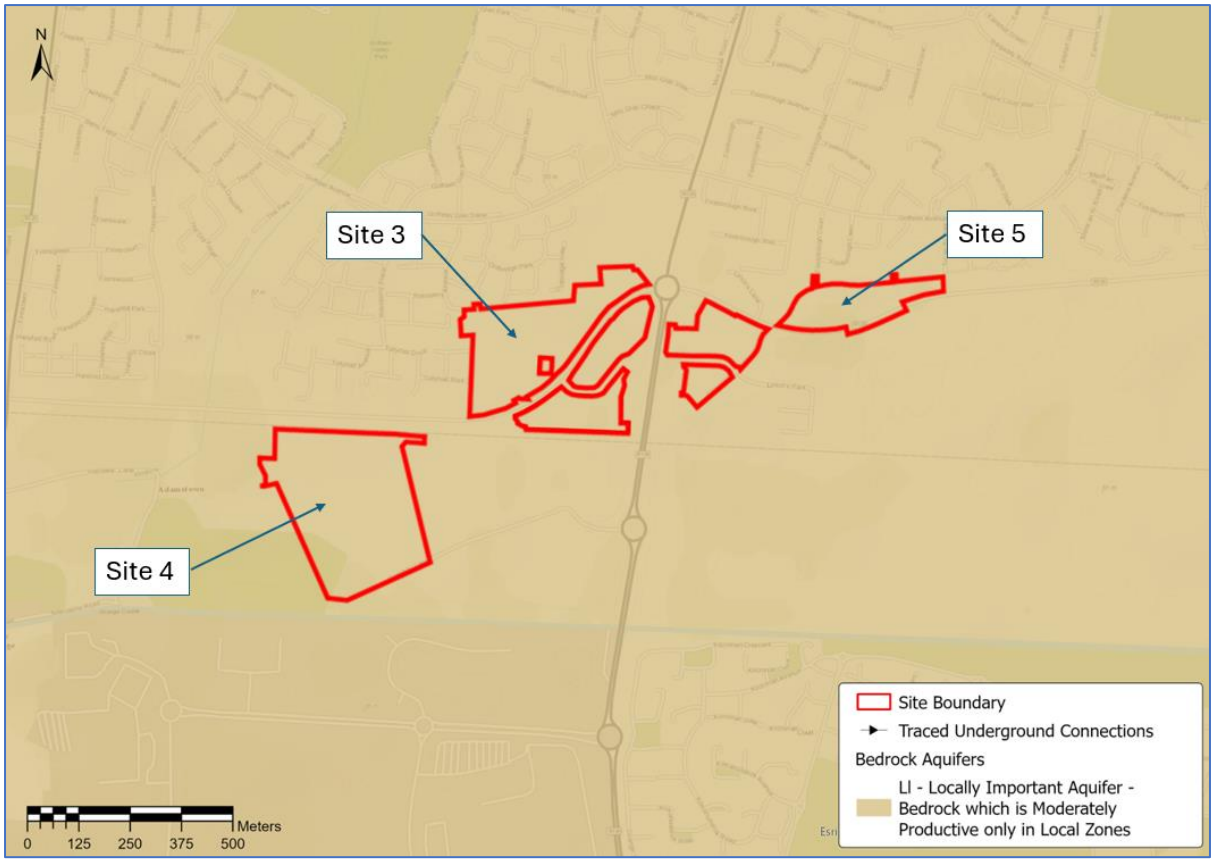

Figure 7-5 Bedrock Aquifers Extracted from GSI Online Mapping Service (Groundwater Resources)

Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrological characteristics that determine the ease with which groundwater may be contaminated by human activities. The groundwater vulnerability is classed as follows:

Site 3: High Vulnerability

Site 4: High Vulnerability

Site 5: High vulnerability to west side of the site, Extreme to east of site and Rock at or near surface to the northeast.

Areas of highest vulnerability correspond to areas of near surface bedrock and thin soil depths. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying receiving aquifer with respect to resource value and significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.

Infiltration testing in accordance with BRE Digest 365 methodologies was carried out as part of Site Investigations. Infiltration testing indicated that infiltration rates are typically quite low on the subject sites.

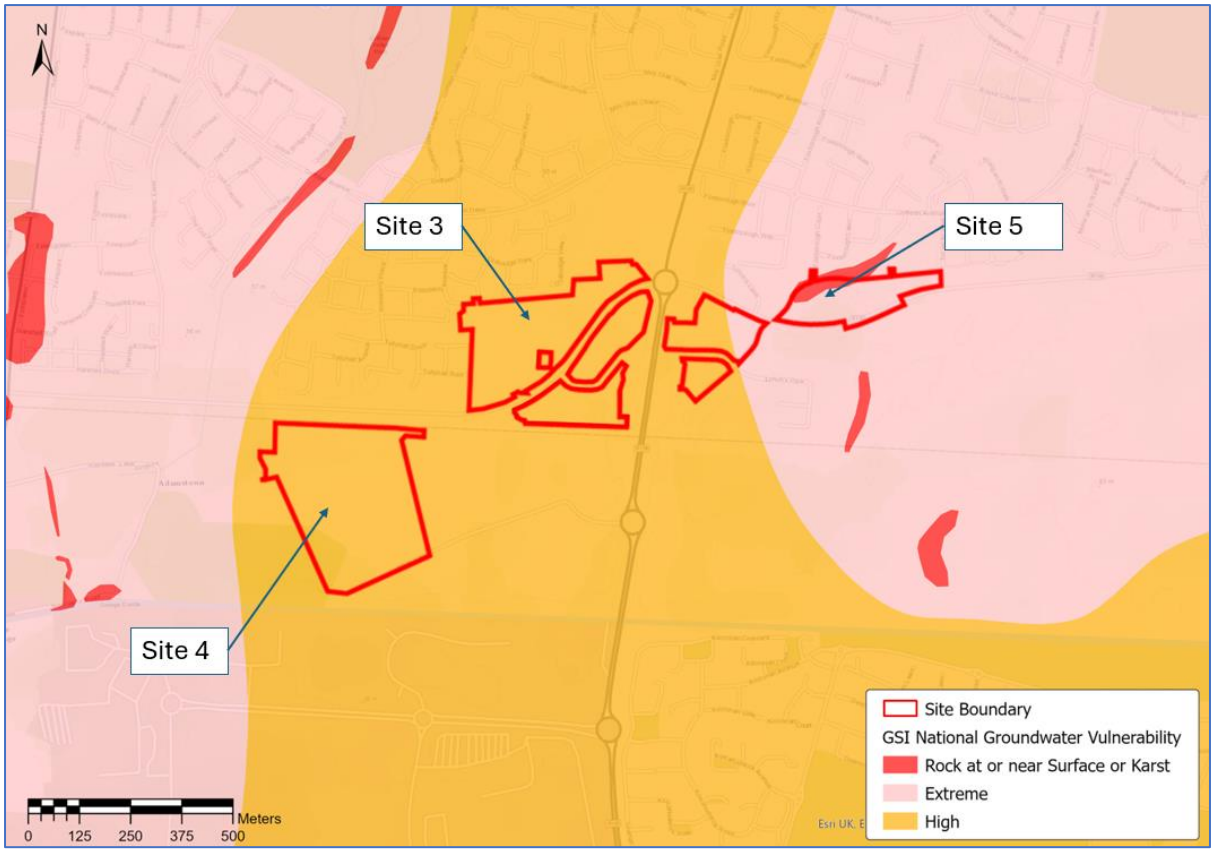

Figure 7-6 Extract from GSI Online Mapping Service (Groundwater Vulnerability)

7.3.7 Contaminated Land

Site 3: Asbestos was not detected in any of the samples tested. The samples were classified largely as non-hazardous, Category A – 'Meets Soil Recovery Criteria' and Category B-1 – 'Suitable for disposal/recovery to inert landfill'.

Site 4: Potential Asbestos associated with Grange House and the Parks Depot buildings. Other than that, the samples were classified as non-hazardous Category A – 'Meets Soil Recovery Criteria'.

Site 5: Asbestos was not detected in any of the samples tested. The samples were classified as non-hazardous, Category A – 'Meets soil Recovery Criteria' and Category B-2 – 'Suitable for disposal/recovery to Inert Landfill with increased Limits'.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Consideration of the characteristics of the proposed development allows for a projection of the *'level of impact'* on any aspect of the proposed environment that could arise. For this chapter, the potential impact on land and soils is discussed.

The proposed development comprises 3 sites, described below:

Site 3: The proposed development comprises 580 no. residential units in a mix of house, apartment, duplex and triplex units comprising 1-bedroom, 2-bedroom and 3-bedroom typologies; 2-storey childcare facility; all associated and ancillary site development and infrastructural works including surface level car parking, bicycle parking, hard and soft landscaping and boundary treatment works, including public, communal and private open space, public lighting, bin stores and foul and water services. Vehicular access to the site will be from existing Adamstown Avenue and the consented Northern Link Street, granted permission under application Ref. SDZ24A/0033W.

Site 4: The proposed development comprises 436 no. residential units in a mix of house, apartment, duplex and triplex units comprising 1-bedroom, 2-bedroom, 3-bedroom and 4-bedroom typologies; a childcare facility on the ground floor of Block F; retail unit; community building; employment uses and all associated and ancillary site development and infrastructural works including surface level car parking, bicycle parking, hard and soft landscaping and boundary treatment works, including public, communal and private open space, public lighting, bin stores and foul and water services. Vehicular access to the site will be via the Southern Link Road permitted under SDZ20A/0021

Site 5: The proposed development comprises 236 no. residential units including 55 no. social housing units, 113 no. affordable purchase units and 68 no. cost rental units. The scheme provides for a mix of 1, 2 and 3-bedroom units in a range of dwelling typologies, as follows:

a) 35 no. houses,

b) 110 no. duplex units,

c) 33 no. triplex units, and

d) 58 no. apartments.

The proposal also includes all associated and ancillary site development and infrastructural works including a total of 219 no. car parking spaces at undercroft and surface level, bicycle parking, hard and soft landscaping and boundary treatment works, public, communal and private open space, public lighting, waste storage areas and foul and water services. Vehicular access to the site will be from existing Thomas Omer Way and the consented Northern Link Street (NLS) granted permission under application Ref. SDZ24A/0033W.

It is anticipated that the main construction activities impacting soils and geology will comprise the following:

- Removal of topsoil and subsoil to allow road construction, foundation excavation, services installation.
- Construction of the main access routes into the development.
- Installation of the main underground services and utilities to serve the site.
- Construction of landscaped and public open space areas.

Excavated topsoil and subsoil material will be reused where possible to ensure no unnecessary disposal of excavated materials occurs.

7.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

7.5.1 Construction Phase

It is anticipated that the main construction activity impacting geology, soils and land will comprise the following:

- Stripping storage and transportation of topsoil, storage of topsoil and removal of topsoil from site to allow the development construction to proceed.
- Excavation, storage and transportation of subsoil layers for construction of the roads, building foundations and services.

7.5.2 Stripping of Topsoil

The proposed site area consists of green field, undeveloped land. Removal of the existing topsoil layer for the greenfield areas will be required. Stripping of topsoil will result in a negative effect from the exposure of the underlying subsoil layers to the effects of weather and construction traffic, which may result in subsoil erosion and generation of sediment laden runoff.

It is anticipated topsoil strip will be to an approximate depth of 0.2m and will be phased in line with the overall development phasing. Topsoil will be stored on site in carefully managed stockpiles and

will generally be reused within landscaped areas within the site. Site levels have generally been designed to be slightly above existing levels in order to minimise the requirements for offsite disposal of soil and to ensure adequate drainage gradients can be applied.

7.5.3 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required in order to allow foundation construction, road structure, drainage and utility installation. Excavation of subsoil layers will result in a negative effect from the exposure of the underlying subsoil layers and rock to the effects of weather and construction traffic, which may result in subsoil erosion and generation of sediment laden runoff.

Foundations for houses are anticipated to be shallow strip foundations. For apartment and duplex buildings, foundations are expected to consist of pad excavations for columns which would be founded on the bedrock. Based on available information, subsoil is expected to be generally suitable for reuse as non-structural fill (e.g. build-up of back garden areas or build-up of open space).

The estimated cut/fill volumes are given in Table 7.2 below.

Site 3	**Volume (m^3)**
Subsoil excavation (Cut)	9,398
Subsoil used on site as fill (Fill)	9,393
Net imported material	17,169
Topsoil Strip (for Re-Use)	6,886
Site 4	**Volume (m^3)**
Subsoil excavation (Cut)	4,609
Subsoil used on site as fill (Fill)	4,609
Net imported material	87,680
Topsoil Strip (for Re-Use)	65,129
Site 5	**Volume (m^3)**
Subsoil excavation (Cut)	3220
Subsoil used on site as fill (Fill)	50,005
Net imported material	46,785

Table 7-2 Estimated Cut/Fill Volumes (Approximate)

7.5.4 Construction Traffic

Earthwork Plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries etc.) have potential to cause negative effects from 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.

7.5.5 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 negative effects from 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.
- Use of cement and concrete during construction works.

7.5.6 Geological Environment

Excavations associated with development of the site have been designed to be as shallow as possible. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works. Excavation of rock will have negative effects from the exposure of the bedrock to adverse weather conditions resulting in erosion of the rock layers.

7.5.7 Human Health

A potential risk to human health due to the associated works during construction is the direct contact, ingestion or inhalation of receptors (i.e. construction workers) of any soils which may potentially contain low level hydrocarbon concentrations from Site activities (potential minor leaks, oils and paint).

No human health risks associated with long term exposure to contaminants (via direct contact, ingestion or inhalation) resulting from the proposed development are anticipated.

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (pre mitigation)
Soils/Subsoils	Chemical Pollution of soils/subsoils	Negative	Low – Potential for local effects to soil value and distribution	Slight
Limestone Bedrock	Chemical Pollution of bedrock	Negative	Low – Potential for local effects to rock value and distribution	Slight
Soils/Subsoils	Loss of soil value	Negative	Low – Potential for local effects to soil value and distribution	Slight
Soils/Subsoils	Material Generation	Negative	Low – Potential for local effects to soil value and distribution	Slight
Limestone Bedrock	Material Generation	Negative	Low – Potential for local effects to rock value and distribution.	Not Significant

Table 7-3 Summary of Unmitigated Significance (Construction Phase)

7.5.8 "Do-Nothing" Scenario

Should no development be carried out on the site and the site remains as open undeveloped land, this would remove any potential for contamination issues over the operational or post development phases. There will be no effect on geology, soil and land if the development does not proceed. Notwithstanding this, the land is zoned for the type of development applied for.

7.5.9 Operational Phase

The operational effects are those associated with the completed development, including final surface treatments, conveyance of traffic flows, occupation of buildings and all operation and maintenance activities. The main effects arising from construction activities include:

- Any exposed soils or those which remain unplanted have potential to be eroded by wind and water, which may result in soil erosion and generation of sediment laden runoff.
- During the operational phase there is a risk of accidental spills from development users, which may result in negative effects from contamination of the soils underlying the site.

Once the development is completed, the operational impacts on the land and soils would be minimal. The biggest risk item is cross contamination of ground water from the operational phase of the development from accidental oil spillages: refer to the Mitigation section below for proposed remedial issues.

Receptor	Quality of Effects	Quality of Effects	Magnitude of Effect	Significance of Effects (pre mitigation)
Soils/Subsoils	Loss of soil value	Negative	Low – Potential for local effects to soil value and distribution	Slight
Soils/Subsoils	Pollution of soils/subsoils from spills	Negative	Low – Potential for local effects to soil value and distribution	Slight

Table 7-4 Summary Significance (Operational Phase- Prior to Mitigation)

7.6 MITIGATION MEASURES

7.6.1 Incorporated Design Mitigation

The site layout has been designed to minimise impact on the land and soil environment. The design has evolved to minimise environmental impact throughout the various design stages.

The vertical and horizontal alignment of the road and development levels have been optimised to minimise cut and fill requirements and seek to obtain a balance of cut and fill materials (within constraints of road design criteria and landscape considerations).

Sufficient space has been provided within the works area for segregated spoil storage.

Pre-construction soils testing has been carried out to determine if any contamination exists.

7.6.2 Construction Phase

A preliminary Construction and Environmental Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction and Environmental Management Plan (CEMP) will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Outline Construction Management Plan includes a range of site-specific measures which will include the following mitigation measures in relation to geology, soils, land:

LS_1: Stripping of topsoil and asphalt will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.

LS_2: 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 stripping will not take place during inclement weather.

LS_3: 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. Topsoil stockpiles will also be located so as not to necessitate double handling.

LS_4: The design of site levels has been carried out in such a way as to minimise the interaction with rock. Rock will likely be encountered during the installation of drainage due to the topography of the subject site and levels of drainage outfalls.

LS_5: The duration that rock layers are exposed to the effects of weather will be minimised by back filling excavations as soon as practicable after construction.

LS_6: Stockpiles of excavated and crushed rock will be protected for the duration of the works.

LS_7: 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 water bodies).

LS_8: Earthworks plant and vehicles exporting soil and delivering construction materials to site will be confined to predetermined haul routes around the site.

LS_9: 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.

LS_10: Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

LS_11: In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

LS_12: Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

LS_13: An emergency response plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.

LS_14: Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.

LS_15: Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination.

LS_16: All materials exported from site to be in accordance with the Waste Management Acts.

LS_17: Imported materials (including imported materials) to be suitably separated to avoid contamination or mixing.

LS_18: Any potential for use of surplus material within local sites shall be pursued at construction and detailed design stage (subject to compliance with Waste Management Acts). If any material is to be reused on another site as a by-product (and not as waste), this will be done in accordance with Article 27 of the Waste Directive Regulations.

7.6.3 Operational Phase

Once the development is completed, risks to geology, soil and land will be from loss of soil value and pollution of soils/subsoils due to accidental spills. The following mitigation measures will be implemented:

LS_20: A detailed landscape plan will be prepared and constructed in accordance with good practice and design standards to ensure slope stability.

LS_21: Earthworks will be designed and constructed in accordance with good practice and design standards to ensure slope stability.

LS_22: All new drainage on the proposed sites will be pressure tested and have a CCTV survey carried out prior to being made operational to ensure it is adequately constructed.

LS_23: Oil interceptors will be installed on all surface water drainage networks.

LS_24: Vegetated Sustainable urban drainage systems will be installed to treat run-off.

7.7 RESIDUAL IMPACTS

The proposed developments will alter the current land use from a somewhat vacant greenfield site to new residential, community and private open space, creche and landscaped areas. The impact on land, soil, geology, and hydrogeology from accidental spillages of fuel and lubricants used during the construction phase of the developments is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended above for the construction phase, the proposed developments will not give rise to any significant long term adverse impact.

Implementation of the measures outlined in Section 7.6 will ensure that the potential impacts of the development on soils and the geological environment are minimised during the construction phase and that any residual impacts will be short term and imperceptible.

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

Implementation of the mitigation measures outlined above will ensure that potential significant effects of the proposed development on land, soils and geology do not occur during the construction phase and that any residual effects will be short term and not significant.

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Chemical Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Limestone Bedrock	Chemical Pollution of bedrock	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include best practice soil handling and construction practices and reinstatement of affected areas.	Not Significant
Soils/Subsoils	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of site levels, reuse of materials and use of local quarries/waste receivers.	Not Significant
Limestone Bedrock	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of road levels, reuse of materials and use of local quarries/waste receivers.	Not Significant

Table 7-5 Significance (Construction Phase Post Mitigation)

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include design and construction of detailed earthworks and landscaping proposals.	Not Significant
Soils/Subsoils	Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control chemical pollution mitigates effect. Measures include testing of drainage networks, oil interceptors and sustainable urban drainage systems.	Not Significant

Table 7-6 Significance (Operational Phase Post Mitigation)

7.7.1 Construction Phase ("Worst-Case Scenario")

Under a worst-case scenario, the accidental release of fuel, oil, paints or hazardous material occurs on site during the construction phase, through the failure of secondary containment or a materials handling accident on all sites. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the soil zone. If the materials were not recovered promptly, then the contaminants could contaminate the down gradient groundwater and surface water receptors causing a significant contamination event.

If the materials were not recovered promptly, then the contaminants could contaminate the down gradient groundwater and surface water receptors, and the ground water could become poisonous, undrinkable and unusable for general agricultural methods. The impacts from such an accident would be negative and long-term. Given the likely small quantity in any spillage, the effects would be localised and imperceptible.

The contactor must adhere to the CEMP to ensure that all containment is kept in working order which should result in this worst-case scenario being unlikely to occur.

7.7.2 Operational Phase ("Worst-Case Scenario")

As noted, from an operational viewpoint, the worst-case scenario would be an accidental spill of oils from cars or effluent from a leak in the foul drainage system or damage to the oil separator serving the roads for the proposed scheme.

The worst-case impact relates to the potential for oil or effluent entering the ground. There is a potential risk for local residents to encounter the contaminated ground. Due to the expected low volume of oil run-off, this impact would be negative, short term and imperceptible. However, the mitigation measures outlined above in Section 7.6.2 should ensure that this does not occur.

Under a worst-case scenario, soil slippage due to poorly constructed earthworks causes ground instability in the surrounding areas. If this were to occur, the surrounding lands could become unstable, adversely affecting any potential future development in the area. The mitigation measures outlined above in Section 7.6.3 should ensure no such scenario occurs.

7.8 MONITORING

7.8.1 Construction Stage

Proposed monitoring during the construction phase in relation to geology, soil and land is as follows:

- Adherence to the 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.
- 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 used as fill).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).

7.8.2 Operational Phase

Proposed monitoring during the operational phase in relation to geology, soil and land are as follows:

- Regular inspection and maintenance of the drainage system and any oil interceptors.

7.9 REINSTATEMENT

There are no reinstatement works considered to be necessary in this case.

7.10 CUMULATIVE IMPACTS

The proposed development is situated within close proximity to the Clonburris Northern Link Street (CNLS) which has been granted approval under reference SDZ24A/0033W

Refer to the below list for committed and planned projects in the wider vicinity of the project.

	Applicant	Description	No. Dwellings	Non-Resi (sqm)
Ref: **SD179A24/0004** Date of Grant: **Nov 2024** Status: **Granted Permission**	SDCC	118no. homes located off Lynch's Lane to the east of the R136 Outer Ring Road and south of Thomas Omer Way, in the townland of Kishoge, Lucan, Co. Dublin.	118	N/A
Ref: **SDZ24A/0032W** Date of Grant: **TBC** Status: **At further information stage (requested 24.01.2025)**	Department of Education	The retention and completion of revisions to a section of the northern site boundary comprising the omission of the pedestrian/cycle access off Thomas Omer Way.	N/A	N/A
Ref: **SDZ24A/0033W** Date of Grant: **10.02.2025** Status: **Granted Permission**	Clonburris Infrastructure Limited	Stage 2 Roads- The construction of c. 2.3km of a new Link Street Clonburris Northern Link Street (CNLS) and approximately 800m of side streets. Provision/upgrade of 12 signalised junctions. Approximately 2 km of upgrade of existing streets. Provision of 2 main public parks centrally and drainage infrastructure works.	N/A	N/A

Ref: **SDZ23A/0043** Date of Grant: **17-Apr-2024** Status: **Granted Permission**	Cairn Homes Properties Limited	Kishoge Urban Centre- construction of a mixed-use development arranged in 11 no. blocks, ranging between 3 & 7 storeys, comprising: 495 no. residential units, including 449 no. apartments.	495	2,502sq.m of retail floorspace 483 sq. m creche
Ref: **SDZ23A/0018** Date of Grant: **11-Dec-2023** Status: **Granted Permission**	Cairn Homes Properties Limited	Clonburris SW- construction of 565 dwellings (mixture of apartments, duplex apartments and houses.	565	N/A
Ref: **SDZ23A/0004** Date of Grant: **15-Dec-2023** Status: **Granted Permission**	Clear Real Estate Holdings Limited	Adamstown Extension- 385 dwelling units (139 houses, 70 Build-to-Rent duplex / apartments, 72 duplex / apartments and 104 apartments), ranging between two to six storeys in height. This permission was amended under SDZ24A/0018W.	385	N/A
Ref: **SDZ22A/0018** Date of Grant: **31-Oct-2023** Status: **Granted Permission**	Cairn Homes Properties Limited	Clonburris UC & SW- mixed-use development comprising 594 apartments, office floorspace, 4 retail units, a creche and urban square. This permission was amended under SDZ24A/0019W.	594	creche c. 609sq. m office use c. 4,516sq.m Block B retail: 1 unit (c.147.5sq. m) Block E retail: 3 units (c.106.2sq.m, c.141.6sq.m and c.492.2sq.m)
Ref: **SDZ22A/0017** Date of Grant: **16-May-2023** Status: **Granted Permission**	Cairn Homes Properties Limited	Clonburris SW- Construction of 157 dwellings.	157	N/A
Ref: **SDZ22A/0011** Date of Grant: **16-Feb-2023** Status: **Granted Permission**	Department of Education	Proposed 2-storey primary school comprising 16 no. classrooms with an additional 2 classroom Special Educational Needs Unit	N/A	Primary School (3,355sqm)
Ref: **SDZ22A/0010** Date of Grant: **02-May-2023** Status: **Commenced August 2023**	Kelland Homes Limited	Clonburris UC & SE- construction of 294 no. dwellings, creche and retail / commercial unit. This permission was amended under SDZ24A/0030W.	294	1 no. 2 storey creche (c.520.2m2) 1 no. 2 storey retail /commercial unit (c.152.1m2)
Ref: **SD228/0003** Date of Grant: **11-Jul-2022** Status: **Part 8 Approved by SDCC**	SDCC	Kishogue SW- 263 residential units	263	N/A
Ref: **SD228/0001** Date of Grant: **13-Jun-2021** Status: **Part 8 Approved by SDCC**	SDCC	Canal extension-118 residential units made up of houses, duplexes, triplexes, and an apartment building.	118	N/A

Ref: **SDZ21A/0022** Date of Grant: **23-Aug-2022** Status: **Commenced Jan 2023**	Cairn Homes Properties Limited	Clonburris SW- The construction of 569 dwellings, a creche, innovation hub and open space. This permission was amended under SDZ23A/0029 resulting in 2no. additional units. This permission was amended again under SDZ24A/0028W.	569	innovation hub (626sq.m) creche (c. 547sq.m)
Ref: **SDZ21A/0013** Date of Grant: **21-Feb-2022** Status: **Granted Permission**	Department of Education	Kishoge Cross- A 3 storey, 1,000 pupil post primary school including a 4 classroom Special Educational Needs Unit with a gross floor area of 11,443sq.m including sports hall	N/A	Post Primary School
Ref: **SDZ20A/0021** Date of Grant: **12-Aug-2021** Status: **10 year permission**	Clonburris Infrastructure Limited	Southern Link Street- construction of c. 4.0km of a new road, known as Clonburris Southern Link Street	N/A	Roads & Drainage Infrastructure

No cumulative impact or consequences are anticipated with the proposed developments.

7.11 "DO-NOTHING" EFFECT

The "Do-Nothing" scenario would have no significant effects on lands, soils and geology.

7.12 DIFFICULTIES IN COMPILING THE CHAPTER

No particular difficulties were encountered in completing this section.