

7. LAND, SOILS, AND GEOLOGY

7.1 Introduction

7.1.1 Background & Objectives

MKO, on behalf of Roscommon County Council (RCC), has assessed the potential significant effects of the Proposed Development on the local land, soils and geology. A full description of the Proposed Development is detailed in Chapter 4.

This chapter provides a baseline assessment of the environmental setting of the Proposed Development site (the Site), focusing on land, soils, and geology. It identifies and evaluates the potential impacts associated with the construction and operational stages of the Proposed Development and outlines appropriate mitigation measures designed to avoid or minimize any significant effects. Additionally, it includes an evaluation of residual effects following the implementation of mitigation measures and determines the significance of these effects.

7.1.2 Statement of Authority

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Dr Bébhinn Anders and reviewed by Colin Fitzgerald and Monika Kabza, all of MKO.

Bébhinn Anders has a BSc. in Earth and Ocean Sciences and a PhD from the University of Galway in geochemistry and sedimentary provenance. Bébhinn has 4 years of practical field experience with projects that involve environmental monitoring, hydrogeological data analysis, and flood risk assessments. She has conducted geological mapping, supervised borehole drilling, and led water sampling campaigns. Her experience also includes preparing both Land, Soils, and Geology and Hydrology and Hydrogeology chapters for EIARs.

Colin Fitzgerald is an environmental geologist with over fourteen years' experience in impact assessment, contaminated land, hydrogeology, catchment science, GIS, mining, and exploration. Colin has a BSc. in Geology from UCC and a postgraduate diploma in Environmental Engineering from Trinity College Dublin. He is a professional geologist (EurGeol, PGeo) and has worked on greenfield and brownfield impact assessment for over ten years, with experience in preparing and leading teams through Land, Soils and Geology, and Hydrology and Hydrogeology chapters for EIARs.

7.1.3 Relevant Legislation

The EIAR has been prepared in accordance with the requirements of Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive'), as amended by Directive 2014/52/EU.

The assessment has been undertaken with regard to the following legislation and regulatory requirements:

- › The Planning and Development Acts 2000, as amended;
- › The Planning and Development (Amendment) Act 2025;
- › Directive 2011/92/EU and Directive 2014/52/EU, including Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive);
- › The Planning and Development Regulations 2001, as amended including the European Union (Planning and Development) (Environmental Impact Assessment);
- › Regulations 2018, which transposes Directive 2014/52/EU into Irish law; and,
- › The Heritage Act 1995, as amended.

7.1.4 Relevant Guidance

The Land, Soils, and Geology Chapter of this EIAR was prepared with due regard to relevant guidance, including:

- › Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports;
- › Institute of Geologists of Ireland (IGI) (2013). Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters of Environmental Impact Statements;
- › Transport Infrastructure Ireland (TII) (formerly NRA) (2008). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- › Department of Housing, Planning and Local Government (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; and
- › European Commission (2017). Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).

7.2 Assessment Methodology

7.2.1 Desk Study

A desk study of the Site (as defined in Section 1.2.1 and shown on Figure 1-1) and the cumulative study area was completed. The desk study involved the collection and review of geological, soil, and land-use information relevant to the assessment. This included consultation with the following data sources:

- › Geological Survey Ireland (GSI) database (www.gsi.ie);
- › Soil Information System (SIS) National Soils Map, produced by Teagasc, EPA, and GSI; and
- › Tailte Éireann (TÉ) Historic Maps (www.tailte.ie).

7.2.2 Baseline Data & Site Investigations

A walkover survey was conducted in April 2025 by Colin Fitzgerald (MKO). During this walkover particular attention was paid to topography, existing land use, soils, bedrock exposures (where present) drainage features, and any notable geological or geomorphological features within the Site of the Proposed Development.

A topographic survey and utilities survey were completed by CIVIC engineers on 17th September 2025. The utilities survey comprised mapping and referencing of all manholes and gullies onsite. No intrusive ground investigations were completed as part of this assessment.

7.2.3 Scoping & Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility, and other interested parties. This consultation process is outlined in Section 2.5 of this EIAR. The GSI was consulted as part of the EIAR scoping process, however, no response was received at the time of report writing.

7.2.4 Impact Assessment Methodology

The importance (sensitivity) of the land, soils and geological environment within the Site was assessed using information obtained from the desk study and site walkover. Receptor sensitivity was classified using the criteria set out in Table 7-1, adapted from Table 4.1 of TII (2008). The criteria have been

applied, where relevant, to reflect the characteristics of the Proposed Development and the receiving environment.

Table 7-1 Estimation of Importance (Sensitivity) of Land, Soil and Geological Receptors.

Importance	Criteria	Typical Example
Very High	Attribute has international or national importance with no/little potential for replacement or substitution.	Nationally designated geological heritage site; geological feature of national scientific importance; nationally important mineral resource; unique geomorphological feature.
High	Important at a national scale with limited potential for replacement or substitution.	County Geological Site (CGS); regionally important geological exposure; high-quality agricultural soils; extensive undeveloped natural soils; significant area of contamination requiring remediation mineral resource.
Medium	Important at a local scale with some potential for replacement or substitution.	Resources are of some economic importance; Some potential for replacement/substitution.
Low	Important at a local scale with potential for replacement or substitution.	Local geological/ geomorphological importance; Resources not economically important; Some potential for replacement/substitution.
Negligible	Low quality and/or common with potential for replacement or substitution.	Disturbed lands of low quality (and/or contaminated). Resources not economically important. No geological/ geomorphological importance Potential for replacement/substitution.

The significance of effects was determined using the EPA (2022) significance criteria presented in Chapter 1 of this EIAR. Effects were described in terms of their quality (positive, neutral or negative/adverse), significance, extent, magnitude, probability, duration and frequency, and type. The descriptors used in this assessment are those presented in Chapter 1, Table 1-1.

In addition, the impact characteristics of proximity are described for each effect, with their definitions provided in Table 7-2.

Table 7-2 Additional Effect Characteristics.

Impact Characteristic	Degree/ Nature	Description
Proximity	Direct	An effect which occurs within the area of the proposed project, as a direct result of the Proposed Development.
	Indirect	An impact which is caused by the interaction of effects, or by off-site developments.

The assessment of likely significant effects on land, soils, and geology is based on professional judgment, taking account of the sensitivity of the receiving environment, the nature and scale of the Proposed Development, and the characteristics of the predicted effects, in accordance with EPA (2022) guidance.

7.3 Receiving Environment

7.3.1 Existing Land Use & Topography

The Site covers approximately 9 hectares (ha) and is located within the townland of Barrymore, approximately 4 kilometres (km) northwest of Athlone. The Irish Transverse Mercator (ITM) coordinates for the centre of the Site are X 600814, Y 746366.

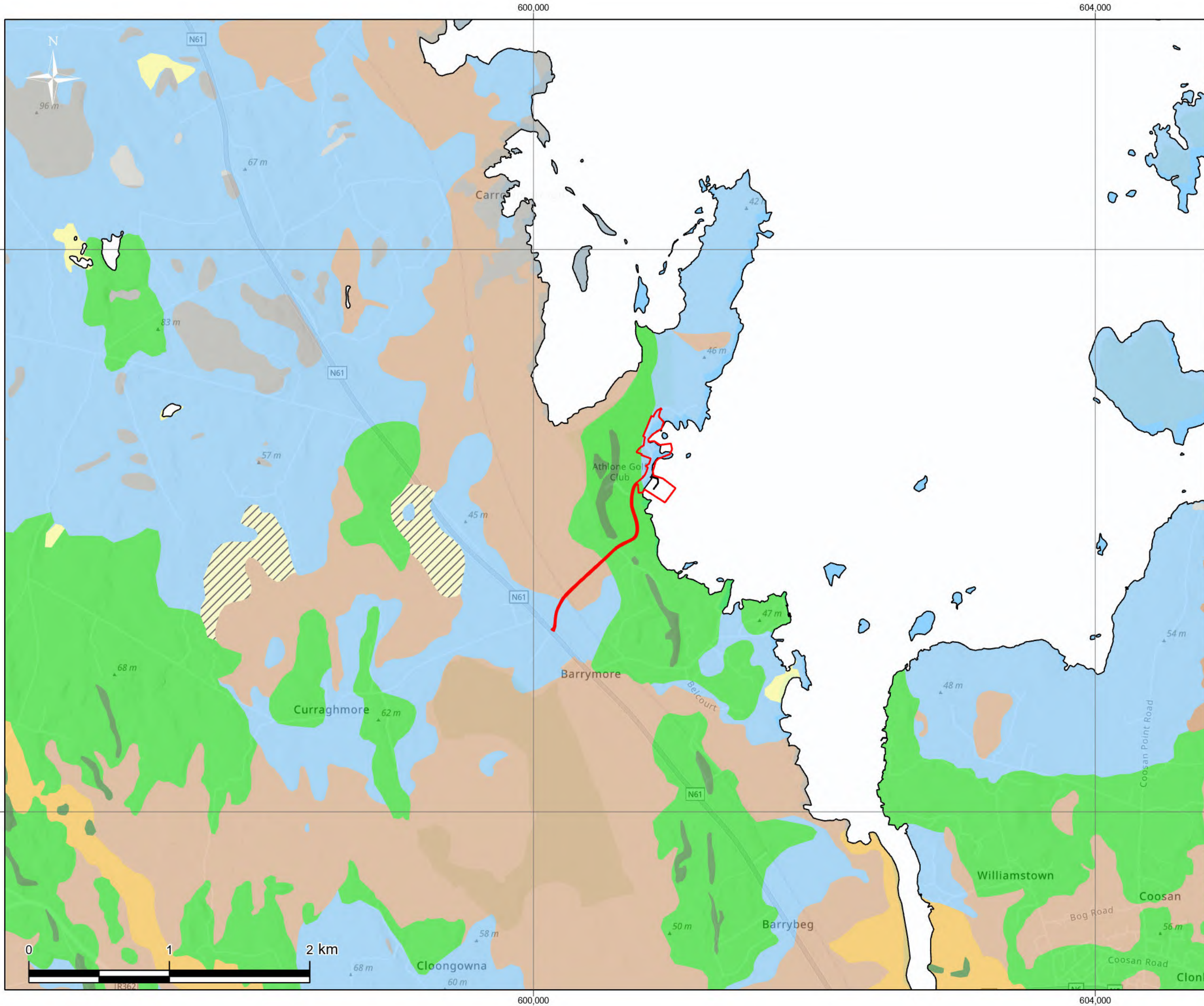
The Site comprises a mixture of artificial surfaces associated with sports and leisure facilities in the north and a discontinuous urban fabric in the south. The Site also contains areas of alluvial woodland and reedbeds. The Site extends from the existing road and car parking spaces associated with the Hodson Bay Hotel and marina along the Hodson Bay access road (L2020 Local Road) to the N61 National Road. The surrounding area is primarily artificial vegetated grassland (golf course) to the north, and a mix of residential and agricultural land to the south of the Site.

The Site's elevation ranges from approximately 34 to 44 mAOD (metres above Ordnance datum), based on the topographic survey. The overall local topography is generally flat and gently slopes from northwest to southeast. The Site location context is shown on Figure 1-1 of Chapter 1 of this EIAR.

7.3.2 Soils and Subsoils

According to the National Soils Map (Teagasc), the marina and waterfront areas of the Site is predominantly classified as made ground, reflecting the existing developed nature of the area. South of the Site, along the L2020 Local Road corridor, soils are mapped as shallow, poorly drained mineral soils (BminSP), derived from glaciofluvial sands and gravels. Further south, soils are mapped as poorly drained mineral soils (BminPD) and peaty, poorly drained mineral soils (BminPDPT), both are tills derived chiefly from limestone. The soils map is shown in Figure 7-1.

According to GSI Quaternary Sediments (Subsoils) mapping, the Site is predominantly underlain by till (TLs) and gravels (GLs), both derived from limestones. An area of cut over raised peat is mapped at the southwestern extent of the Site. Eskers comprised of gravels of basic reaction (BasEsk) run in a northwest to southeast direction around the Site boundary. The quaternary sediments (subsoils) map is presented in Figure 7-2.



Map Legend

- EIA Site Boundary
- Quaternary Sediments**
 - A, Alluvium
 - BasEsk, Eskers comprised of gravels of basic reaction
 - Cut, Cut over raised peat
 - FenPt, Fen Peat
 - GLs, Gravels derived from Limestones
 - KaRck, Kartsified bedrock outcrop or subcrop
 - L, Lacustrine sediments
 - Mrl, Lake marl
 - Rck, Bedrock outcrop or subcrop
 - TLs, Till derived from limestones
 - Water

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Quaternary Sediments (Subsoils)		
Project Title Hodson Bay EIA		
Project No. 241220	Drawing No. 7-2	Scale 1:25,000
Drawn By BOC	Checked By BA	Date 23/06/2026

Email: info@mkofireland.ie / Website: www.mkofireland.ie

7.3.3 Bedrock Geology

Based on the GSI 1:100,000 scale bedrock map of the region, the Site is underlain by undifferentiated Viséan Limestones. A bedrock geology map (GSI) of the area is presented in Figure 7-3.

According to the aggregate potential overburden scores (GSI), bedrock may be greater than 10 m below ground level (bgl) across the Site.

7.3.4 Geological Heritage Sites and Designated Sites

The potential for the Proposed Development to have an impact on designated sites and protected areas considered the mapping and listing by NPWS of:

- › Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs), which are designated under the EU Habitats Directive and EU Birds Directive, respectively. SACs and SPAs are collectively referred to as ‘Natura 2000’ or ‘European Sites’.
- › Natural Heritage Areas (NHAs), which are designated under Section 18 the Wildlife (Amendment) Act 2000.
- › Proposed Natural Heritage Areas (pNHAs), which are designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated.
- › Candidate SACs and SPAs listed (but not designated) under the terms of the EU Habitats Directive.

The Site is located adjacent to and partially within three designated sites, in association with Lough Ree:

- › Lough Ree Special Area of Conservation (SAC) [000440];
- › Lough Ree Special Protection Area (SPA) [004064]; and
- › Lough Ree proposed Natural Heritage Area (pNHA) [000440].

There are no recorded geological heritage sites within the Site, the nearest recorded geological heritage sites are:

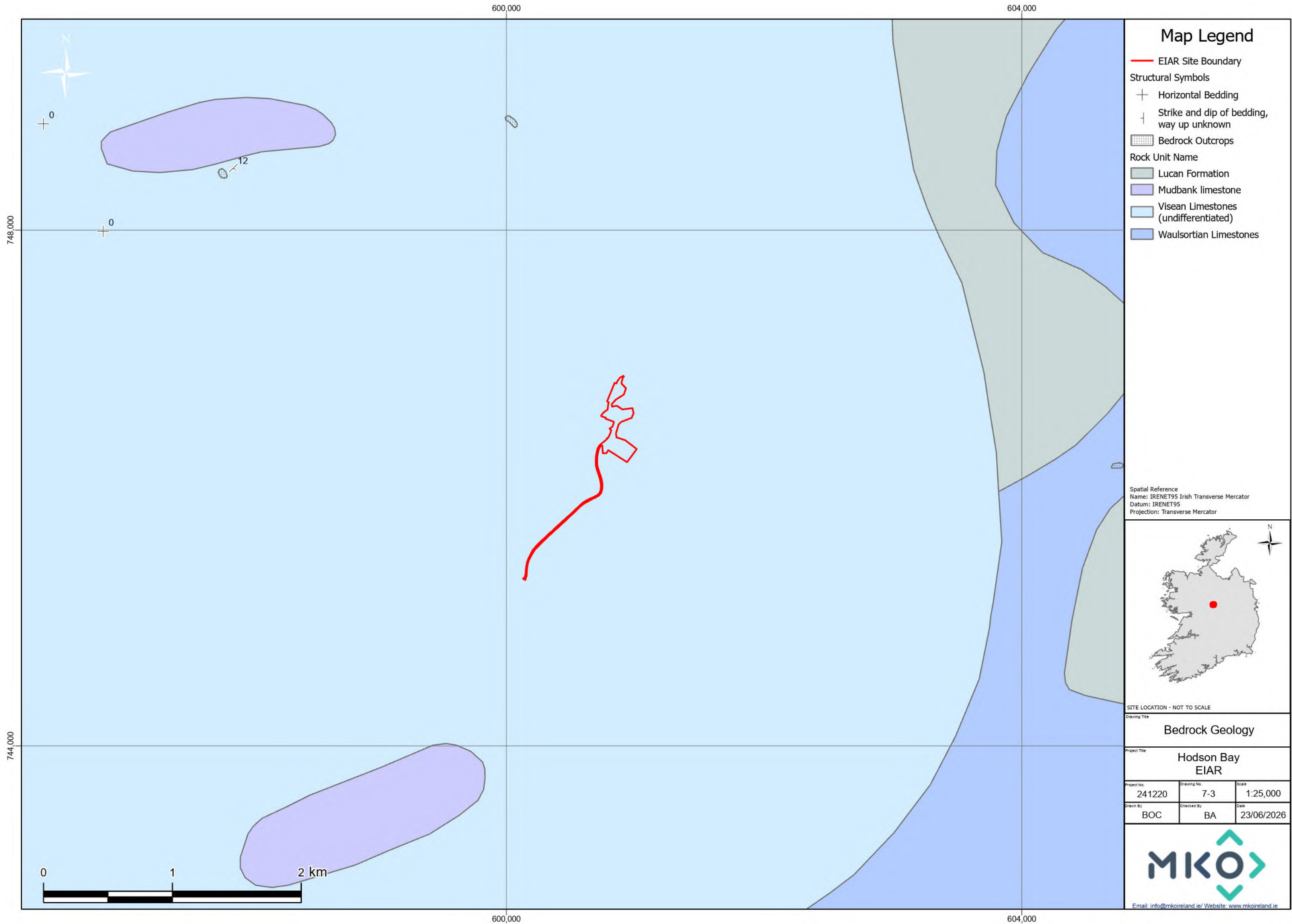
- › Moyvannon Mushroom Rocks, located approximately 0.7 km to the east; and
- › Carrowmurragh Mushroom Rocks, approximately 1.2 km to the northeast.

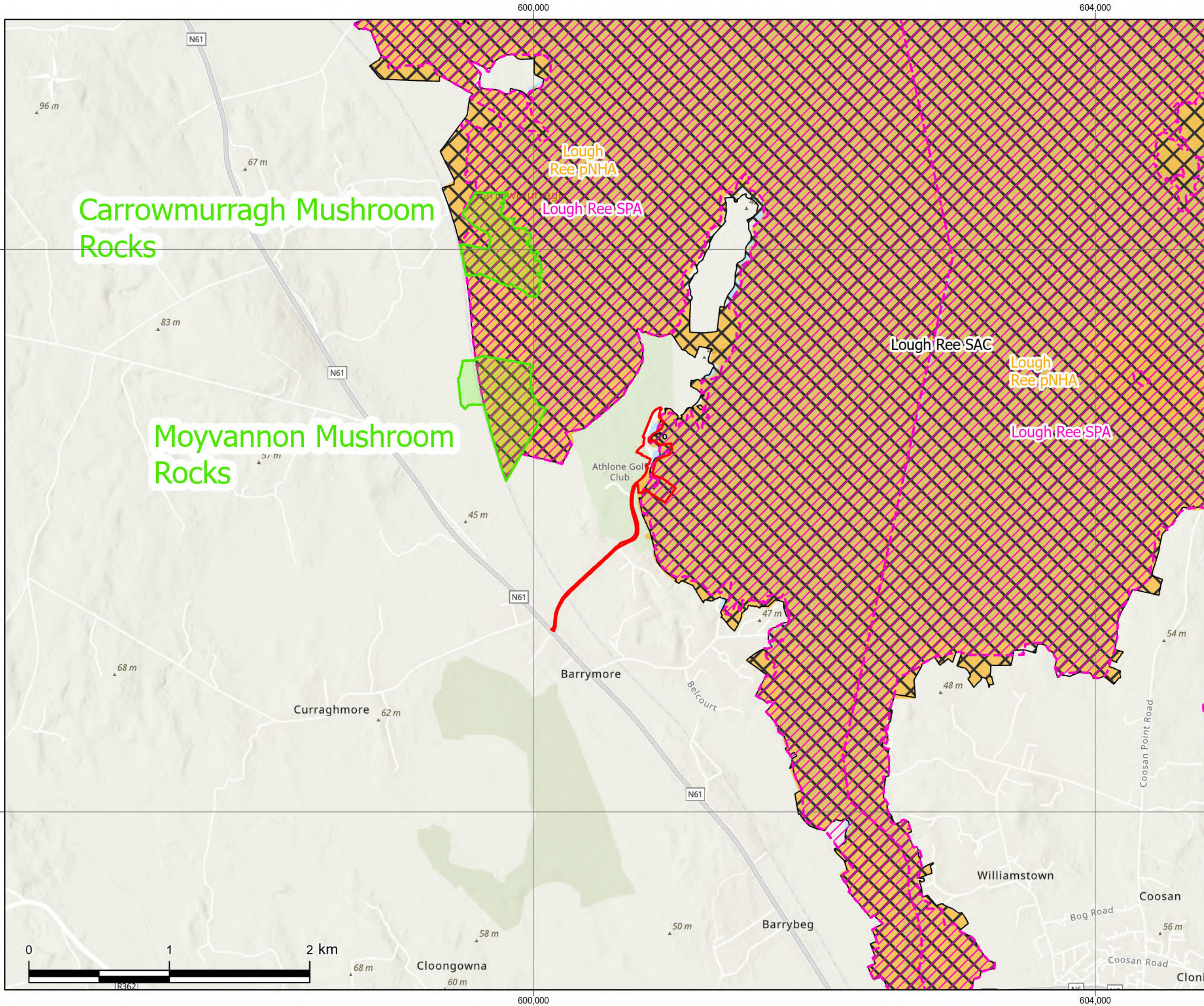
Distances to receptors are calculated from the Proposed Development boundary. The locations of the geological heritage and designated sites relative to the Site are presented in Figure 7-4.

The screening of all other protected sites in the area and downstream of the Site are discussed and presented in Chapter 6, Section 6.5.

7.3.5 Soil Contamination

The Site is situated on hardstanding car parks, an access road, a recreational sports building, an Uisce Éireann pumping station and lacustrine sediments (the substrate of Lough Ree beneath the water). Other than the adjacent Hodson Bay Hotel and the existing marina, there are no potential historical commercial or industrial land uses known for the Site. There may have been historical fuel or lubricant leaks at the existing marina. These would have been light non-aqueous phase liquid, floating on water, carried downstream away from the Site, and would not have interacted with the substrate beneath the lacustrine parts of the Site. Significant sources of known land contamination have not been identified at the Site. There was no visual evidence of soil contamination observed during the site walkover survey. There are no recorded historic mines or landfills at or near the Site.





Map Legend

- EIAR Site Boundary
- ▭ GSI Geoheritage Audited Sites
- ▨ Special Protection Area (SPA)
- ▩ Special Area of Conservation (SAC)
- ▭ Proposed National Heritage Area (pNHA)

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Geological Heritage and Designated Sites Map

Project Title
Hodson Bay EIAR

Project No. 241220	Drawing No. 7-4	Scale 1:25,000
Drawn By BOC	Checked By CF	Date 16/07/2026

Email: info@mkofireland.ie / Website: www.mkofireland.ie

7.3.6 Economic Geology

The active quarry directory (GSI) indicates there are no active quarries within 5 km of the Site. There are no disused quarries present on historical maps of the Site (TÉ). The mineral localities map (GSI) indicates the presence of sand and gravel, as part of an esker deposit, within the footprint of the Hodson Bay Hotel.

According to the aggregate potential map (GSI), the central area of the Site has been categorised as high potential for granular aggregate, due to the presence of glaciofluvial sediments. Most of the Site has been categorised as moderate potential for crushed rock aggregate.

The Site is largely occupied by existing development and infrastructure, and no evidence of economically significant aggregate resources was identified during the Site walkover survey. Consequently, the Site is not considered to represent a significant aggregate resource.

7.3.7 Geohazard

The landslide susceptibility classification (GSI) for the Site has been mapped as low. There have not been any landslide locations mapped (GSI) within 10 km of the Site.

7.4 Description of the Proposed Development

The Proposed Development includes rebuilding the Water Sports Pavilion (WSP), redeveloping and extending the marina to around 59 berths, adding new public realm features like a playground, promenade and event spaces, upgrading the L2020 Local Road for cycling and walking with traffic calming and relocated parking, and delivering associated site infrastructure such as landscaping, drainage, utilities and boundary safety upgrades. A full description of the Proposed Development is outlined in Section 4.3 of this EIAR. An overview of the Proposed Development site layout is provided in Planning Drawings HB-RKD-ZZ-ZZ-DR-A-1020 to HB-RKD-ZZ-ZZ-DR-A-1023.

Elements of the Proposed Development with the potential to interact with the land, soils, and geology include:

- › Construction of the new, proposed WSP building. The WSP will be designed to incorporate three main buildings and a plaza canopy structure;
- › Demolition of the existing water sports building and associated structures;
- › Redevelopment and extension of the existing marina, and associated infrastructure;
- › Construction of public realm infrastructure, including the lakeshore promenade and pathways;
- › Provision of active travel infrastructure;
- › Installation of drainage and utility services;
- › Construction of additional parking; and
- › Landscaping and ground regrading works.

The Proposed Development will require alteration of ground levels to facilitate the construction of buildings, access infrastructure, parking areas, and drainage systems to ensure appropriate surface water management and flood risk mitigation. Detailed drawings in respect of proposed ground levels are provided in Appendix 4-1.

Construction activities will include site clearance, stripping of soil and subsoil, excavation for foundations, drainage infrastructure, utility services and associated landscaping works. Excavated material will be temporarily stockpiled and reused on site where suitable. Rock required for construction purposes will be sourced from local licenced quarries.

The current design includes a basement storage area beneath part of the WSP. Construction of the basement will require deeper excavations than those associated with conventional shallow foundations and may require excavation into subsoil and/or bedrock, depending on the final design and ground conditions encountered.

To provide a secure pile foundation for the marina, 42 no. individual piles will be installed into the lakebed. Near-water construction works are required to develop the WSP. The installation of a cofferdam is recommended as a source control method between the works area and the lake shore, and to prevent the main works area (the WSP) from flooding.

Collectively, the proposed works have the potential to affect existing land, soils and geological receptors through excavation, earthworks, construction activities, and permanent land take. These potential effects are assessed in the following sections.

7.5 Receptor Importance and Sensitivity

The sensitivity and importance of land, soil, and geological receptors within the Site have been assessed using the criteria set out in Table 7-1.

The Site is largely occupied by existing development and is not located within a designated geological site. No rare, protected, or economically significant mineral or aggregate (granular), or economically extractable mineral or aggregate (crushed) resources have been identified within the Site.

The Site is located adjacent to and partially within, Lough Ree SPA which is designated for a number of Special Conservation Interest (SCI) species as detailed in Chapter 6 Biodiversity.

The Proposed Development includes the redevelopment and extension of the existing marina extending into Lough Ree and in-water construction works are required. To provide a secure pile foundation for the marina, 42 no. individual piles will be installed into the lacustrine substrate; soil, subsoils and bedrock are considered lacustrine substrate in this regard. Piling activities are likely to last four to six weeks, however, these pile structures will be permanent. The area occupied by each of these piles will be approximately 1 m². Therefore, approximately 42 m² (or 0.0042 ha) of lacustrine substrate habitat will be lost for SCI species of Lough Ree SPA.

The soils, subsoils and underlying bedrock are considered to be of very high importance and sensitivity, given that the site is located adjacent to and partially within the Lough Ree SPA, and lacustrine substrate habitat will be lost for SCI species. However, the magnitude of this loss is very small: the area of lakebed surface affected (0.0042 ha) represents approximately 0.00004% of the total lakebed surface of Lough Ree, which covers approximately 10,500 ha. Based on this assessment, and given that the Proposed Development will affect such a small proportion of the Lough Ree lakebed, the impact of the proposed marina extension is not considered to be significant on the land, soil and geological environment.

Please refer to Section 6.8.2.1.3 of this EIAR.

7.6 Likely Significant Effects and Associated Mitigation Measures

7.6.1 Do Nothing Scenario

If the Proposed Development was not progressed, the Site would remain in its current form as a waterfront, marina, and recreational facility with associated buildings, access roads, parking areas, and landscaped grounds. No changes to the existing land, soil, and geological environment would be anticipated under the 'Do Nothing Scenario'. As such, the effects on land, soils, and geology are considered to be neutral, imperceptible, and long-term.

The Hodson Bay/ Barrymore Area Plan which is within the RCDP (RCC, 2022) encourages and supports the retention and appropriate expansion of existing facilities to accommodate appropriate forms of additional leisure, tourism and amenity related development, subject to satisfying all environmental considerations and normal siting and development criteria. The document further states that 'In particular, appropriate low intensity green tourism developments adjacent to the shore of Lough Ree will be supported'.

7.6.2 Construction Stage

The construction stage has the greatest potential to affect the existing land, soil and geological environment due to excavation, earthworks and construction activities. The likely significant effects of the Proposed Development and associated mitigation measures are assessed in the following sections.

The likely significant effects of the Proposed Development and mitigation measures that were considered during the approximate 30-month construction stage (see Chapter 4 of this EIAR) relate to:

- › Land (land-take);
- › Subsoil and bedrock excavation;
- › Piling foundations;
- › Accidental spills, leaks or other releases; and
- › Designated sites.

7.6.2.1 Land (Land-Take)

The Proposed Development includes the construction of additional parking areas, widening of existing roads and pathways, redevelopment of the marina and associated infrastructure, and construction of the WSP. The permanent footprint of the existing water sports infrastructure is approximately 3,800 m². The Proposed Development will result in the construction of a new Water Sports Pavilion comprising a permanent footprint of approximately 6,200 m². The increased footprint will require some land-take from the current public realm area at Hodson Bay. As the Proposed Development is located within an existing developed recreational and marina setting, the extent of land-take is limited and confined to the Site.

Mechanisms: Site clearance, excavation, and infrastructure construction activities.

Receptors: Land (i.e. land upon which the Proposed Development will occur).

Pre-Mitigation Potential Effects: Without mitigation, the potential effects on land (land-take) will be direct, negative, slight, permanent, and likely.

Proposed Mitigation Measures / Impact Assessment: Land-take has been minimised through the design of the Proposed Development, which makes use of existing developed areas and infrastructure footprints where practicable.

Land-take associated with the Proposed Development is limited in extent and occurs within an existing developed recreational setting. The proposed works will not result in the loss of any strategic land resource, agricultural land, or adverse effects on adjoining land uses.

Post-Mitigation Residual Effect: Following implementation of the proposed mitigation measures, the residual effect on land (land-take) will be direct, negative, slight, permanent, and likely.

Significance of Effects: Based on the assessment above there will be no significant effects.

7.6.2.2 Subsoil and Bedrock Excavation

Excavation of existing fill, subsoil, and potentially underlying bedrock depending on overburden depth, will be required for site levelling, construction of building foundations, the proposed basement, extension of access roads and parking areas, installation of drainage and utility services, and associated landscaping works. These activities will result in a permanent disturbance and redistribution of soil, subsoil, and potentially bedrock, materials within the Site.

The excavated materials will likely comprise made ground, topsoil, subsoil, and potentially limited quantities of bedrock. Suitable excavated material will be reused on site, where practicable, for backfilling and landscaping purposes, while surplus or unsuitable material will be removed to an authorised waste recovery facility.

Mechanism: Extraction/excavation and earthworks.

Receptor: Topsoil, subsoil, and bedrock.

Pre-Mitigation Potential Effects: Without mitigation, the potential effects on topsoil, subsoil, and bedrock will be direct, negative, slight, permanent, and likely.

Proposed Mitigation Measures / Impact Assessment:

- › Excavation works will be designed and managed to minimise the volume of topsoil, subsoil and bedrock removed during construction;
- › Topsoil and subsoil stripping will be limited to the minimum extent necessary to facilitate the proposed works;
- › Excavated (existing) overburden material will be reused on site, where practicable, for backfilling and landscaping purposes;
- › Temporary stockpiles will be stabilised as required to minimise erosion and sediment generation. Where necessary, stockpiles will be surrounded with silt fencing and covered with sheeting to prevent sediment release during heavy rainfall;
- › Any surplus excavated material that cannot be reused on site will be removed by a suitably authorised contractor to an appropriately authorised recovery or disposal facility;
- › Excavation, soil handling and stockpiling activities will be managed to minimise exposure and erosion of bare soil during periods of heavy rainfall; and
- › All excavation, soil handling and stockpiling activities will be undertaken in accordance with the Construction and Environmental Management Plan (CEMP) (Appendix 4-2). Appropriate erosion and sediment control measures will be implemented to ensure that silt-laden runoff does not leave the Site or enter the receiving surface water environment.

Suitable excavated material will be reused on site where practicable and excavation works will be limited to the minimum extent necessary to facilitate the Proposed Development. Given the localised nature of the excavation works, any effect will be limited.

Post-Mitigation Residual Effect: Following implementation of the proposed mitigation measures, the residual effect on topsoil, subsoils and bedrock will be direct, negative, not significant, permanent, and likely.

Significance of Effects: For the reasons outlined above, likely significant effects on topsoil, subsoils or bedrock will not occur.

7.6.2.3 Piling Foundations

The Proposed Development includes the construction of a new marina extending into Lough Ree and in-water construction works are required. To provide a secure pile foundation for the marina, 42 no. individual piles installed into the lacustrine substrate; soil, subsoils and bedrock are considered lacustrine substrate in this regard. Piling activities are likely to last four to six weeks, however, these pile structures will be permanent. The area occupied by each of these piles will be approximately 1 m². Therefore, approximately 42 m² of lacustrine substrate habitat will be lost for SCI species of Lough Ree SPA (see Section 7.5).

Mechanisms: Replacement of lacustrine substrate, with pile foundations.

Receptors: Lough Ree habitat (lacustrine substrate).

Pre-Mitigation Potential Effects: Without mitigation, the potential effects will be direct, negative, not significant, permanent, and likely.

Proposed Mitigation Measures / Impact Assessment: There will be a permanent loss of habitat from the lacustrine substrate, there are no mitigations to reduce this effect.

There is potential for the alteration of lacustrine sediments around the immediate piling locations. Differing drilling techniques cause differing levels of ground disturbance. Accordingly, percussive hammers will be minimised, and vibrative hammers will be utilised when drilling.

Disturbance of lake-substrate will be minimized through careful positioning of plant and adoption of low-impact construction methodologies. Equipment will not be dragged across the lakebed; this will limit the disturbance of lacustrine substrate.

Post-Mitigation Residual Effects: Following implementation of the proposed mitigation measures, the residual effects will be direct, negative, imperceptible, permanent, and likely.

Significance of Effects: For the reasons outlined above, likely significant effects on lacustrine substrate will not occur.

7.6.2.4 Accidental Spills, Leaks or Other Releases

Accidental spillage of chemicals, fuels during refuelling of construction plant with petroleum hydrocarbons, or cement-based products has the potential to be a significant pollution risk. The accumulation of spills of fuels, lubricants, or cement-based products can also be a potential pollution risk. Large spills, such as concrete or hydrocarbons, or leaks of chemicals, have the potential to adversely affect the geological environment.

Pathway: Topsoil, subsoil, and bedrock pore space.

Receptor: Topsoil, subsoil, and bedrock.

Pre-Mitigation Potential Effects: Without mitigation, the potential effects on topsoil, subsoil, and bedrock will be direct, negative, short-term, significant, and likely.

Proposed Mitigation Measures / Impact Assessment:

- › Highest standards of site management will be maintained, with the utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction.
- › An Emergency Response Plan for accidental spillages will be implemented as part of the CEMP; all construction staff will be familiar with the emergency procedures and the use of the relevant equipment;
- › Where possible, refuelling will occur at an off-site controlled fuelling station. On-site refuelling will be confined to the temporary construction compound(s) only, using appropriate containment measures and spill response equipment;
- › On-site refuelling will be undertaken using a double skinned bowser with spill kits readily available for accidental leakages or spillages;
- › Refuelling bowzers will be operated by suitably trained personnel only;
- › Refuelling of construction machinery will take place using drip trays at all times;
- › All plant and machinery will be serviced before being mobilised to site and will be regularly inspected and maintained to minimise the risk of leaks and spillages;
- › Refuelling and maintenance of construction vehicles or plant will, where practicable, be undertaken off site;
- › Fuels stored on-site will be minimised. Storage areas, where required, will be bunded appropriately for 110% of the fuel storage volume for the time period of construction and fitted with a storm drainage system and an appropriate oil interceptor;
- › Concrete will be delivered in sealed concrete delivery trucks. Batching of wet-cement products will not occur on-site.
- › Ready-mixed supply of wet concrete products and emplacement of pre-cast elements will take place.
- › Pre-cast elements for cofferdams, pile foundations, culverts, and concrete works will be used.
- › Concrete trucks will not be washed out on-site but will be directed back to their batching plant for washout.

- › Where concrete is delivered on-site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement-contaminated waters to ground will be allowed. Chute cleaning water will be undertaken at lined washout ponds.
- › Where temporary lined impermeable containment areas are used, such containment areas are built using straw bales and lined with an impermeable membrane. These are covered when not in use to prevent rainwater collecting.
- › Concrete will not be transported around the site in open trailers or dumpers so as to avoid spillage while in transport.
- › All concrete used in the construction will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete locally to the location where it is needed.
- › Arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, confirming routes, prohibiting on-site washout and discussing emergency procedures.
- › Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Site.
- › Weather forecasting will be used to assist in planning large concrete pours and large pours will be avoided where prolonged periods of heavy rain is forecast.
- › Any potential, small surplus of concrete remaining after completion of a pour will be disposed at a suitable off-site facility.
- › All waste tar material arising from the potential chipping and resurfacing of roads will be removed off-site and taken to a licenced waste facility; and
- › Appropriate erosion, sediment and pollution control measures will be implemented throughout the construction stage in accordance with the CEMP and relevant industry guidance.

The use and storage of hydrocarbons and small volumes of chemicals is a standard risk associated with all construction sites. Proven and effective measures to mitigate the risk of spills and leaks have been proposed above and will break the pathway between the potential source and the receptor.

Post-Mitigation Residual Effect: Following implementation of the proposed mitigation measures, the residual effect on topsoil, subsoils and bedrock will be direct, negative, imperceptible, short-term and unlikely.

Significance of Effects: For the reasons outlined above, likely significant effects on topsoil, subsoils or bedrock will not occur.

7.6.2.5 Designated Sites

There are three designated sites adjacent to and partially within the Site boundary, in association with Lough Ree:

- › Lough Ree SAC [000440];
- › Lough Ree SPA [004064]; and
- › Lough Ree pNHA [000440].

Approximately 42 m² of lacustrine substrate habitat will be lost for the SCI species of Lough Ree SPA. See Section 7.5 for further details.

The working of sediments and bedrock near-water and in-water will disturb the in-situ geological environment and has the potential to create suspended solids; the latter of which is assessed in Chapter 8 of this EIAR.

Mechanisms: Replacement of lacustrine substrate, with pile foundations.

Receptors: Lough Ree habitat (lacustrine substrate).

Pre-Mitigation Potential Effects: Without mitigation, the potential effects will be direct, negative, not significant, permanent, and likely.

Proposed Mitigation Measures / Impact Assessment: See Section 7.6.2.3.

Post-Mitigation Residual Effects: Although the land, soil and geological environment within the Site is considered as of ‘very high’ importance and sensitivity (see Section 7.5), with the implementation of the above mitigation measures, the significance of potential effects on designated sites is considered imperceptible.

Following implementation of the proposed mitigation measures, the residual effects will be direct, negative, imperceptible, permanent, and likely.

Significance of Effects: For the reasons outlined above, likely significant effects on designated site will not occur.

7.6.3 Operational Stage

No significant effects on land, soils, and geology are anticipated during the operational stage of the Proposed Development. The operational stage will consist of typical activities related to this type of recreational area and will not involve further disturbance to the topsoil, subsoils, and bedrock within the Site.

There is a low potential for accidental spillages or leakages of hydrocarbons and chemicals associated with the operation and maintenance of the marina and the proposed Water Sports Pavilion buildings. Such materials will be stored and handled in accordance with best practice and applicable regulatory requirements.

Accordingly, any effects on land, soils, and geology during the operational stage are predicted to be not significant.

7.6.3.1 Assessment of Health Effects

Potential health effects arise mainly through the potential for soil and ground contamination. Recreational developments are not a recognized source of significant pollution and so the potential for effects during the operational stage are negligible. Hydrocarbons will be used onsite during construction; however, the volumes will be small in the context of the scale of the project and will be handled and stored in accordance with best practice mitigation measures.

The potential residual impacts associated with soil or ground contamination and subsequent health effects are imperceptible.

7.6.4 Cumulative Effects

7.6.4.1 Interactions between Various Elements of the Proposed Development

The potential for cumulative effects arising from interaction between the various elements of the Proposed Development was considered as part of the assessment of land, soils, and geology. This included consideration of land-take, subsurface disturbance and excavation work, material handling, and the potential for accidental contamination during construction.

With mitigation measures, the assessment concluded that the individual effects associated with the Proposed Development are imperceptible and slight. The interactions of these activities do not alter the overall assessment, as the effects remain localised in extent and will be managed through the implementation of the mitigation measures described in this chapter.

Accordingly, no significant cumulative effects on land, soils, and geology are predicted to arise from interaction between various elements of the Proposed Development.

7.6.4.2 In-Combination Effects

The potential cumulative effects of the Proposed Development in combination with the other projects listed in Section 2.6 of Chapter 2 of this EIAR have been considered in respect to land, soils and geology. Where relevant, available application documentation, EIAR and Natura Impact Statement (NIS) have been reviewed to inform the assessment.

There are no active quarries, major earthworks, or other associated activities which could impact upon the geological environment in the immediate vicinity of the Proposed Development. The extent of the proposed excavation and earthworks associated with the Proposed Development is limited and will be managed through the implementation of the mitigation measures outlined in this chapter.

Accordingly, no significant cumulative effects on land, soils, and geology are anticipated during either the construction or operational stages of the Proposed Development in combination with other developments.

7.6.5 Conclusion

Excavation of existing fill, topsoil, subsoil, lacustrine substrate, and bedrock will be required for the construction of the pavilion basement, base layers, site levelling, drainage, services, and the marina pile foundations. This will result in a permanent removal of subsoil and bedrock at most excavation locations.

Where possible, excess material will be used for reinstatement and landscaping works around the Site at the end of the construction stage. Storage and handling of hydrocarbons/chemicals will be carried out using best practice methods. Measures to prevent subsoil erosion during excavation and reinstatement will be undertaken.

No significant effects on the land, soil, and geology of the Site will occur due to the Proposed Development provided the mitigation measures are implemented.