Moyvannan Electricity Substation

Environmental Impact Assessment Report

Annex 1.1: Environmental Impact Assessment Scoping Report

Energia Renewables ROI Limited

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DOCUMENT CONTROL

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1.0 Introduction

Energia Renewables ROI Limited ('the Developer') intends to apply for planning permission for the construction and operation of an electricity substation and associated underground grid connection cables ('the project') to facilitate the connection of the permitted Seven Hills Wind Farm to the national electricity network. The project will be located approximately 8 kilometres (km) northwest of Athlone.

The location of the project, in a regional context, is illustrated at Figure 1 below.

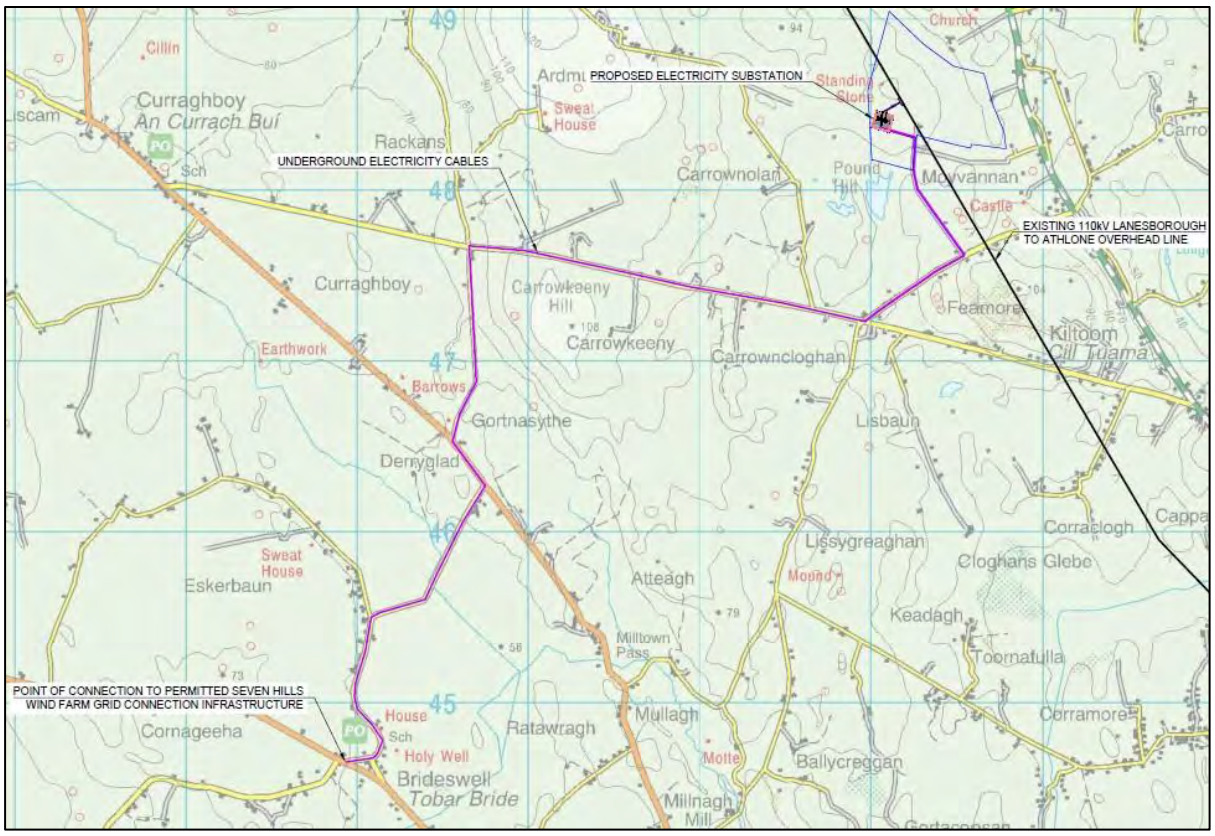

Figure 1: Site Location

1.1 The Developer

Energia Renewables ROI Limited is a joint venture between Energia Renewables Limited and Galetech Energy Developments Limited.

Energia Renewables Limited is a subsidiary company of the Energia Group with offices in Dublin, Belfast, Antrim and Omagh; and has extensive experience in the development, design, construction and operation of wind energy developments throughout Ireland. As a leading and long term energy provider and infrastructure investor, the Energia Group currently supplies approximately 17% of the island of Ireland's total electricity requirements and is responsible for approximately 21% of wind power capacity installed on the island. Energia Renewables Limited's growing renewable energy portfolio consists of 16 no. onshore wind farms, which generate over 300-megawatts (MW) of green electricity while an additional 900MW is supplied through Power Purchase Agreements (PPAs).

Currently, Energia Renewables Limited's has a development pipeline comprising onshore wind projects, offshore wind projects, solar energy developments, battery energy storage developments and hydrogen production.

Galetech Energy Developments Limited is an Irish owned company, based in County Cavan, with a focus on the development of renewable energy projects in Ireland and worldwide. Galetech Energy Developments Limited has been involved in the delivery of in excess of 300MW of renewable energy developments on the island of Ireland and has a global development pipeline of in excess of 3-gigawatts (GW) comprising onshore wind developments, offshore wind developments, solar developments and battery energy storage developments.

1.1.1 The Agent

Galetech Energy Services (GES) has been engaged by the Developer to coordinate the preparation of an Environmental Impact Assessment Report (EIAR) including the environmental scoping process and constraints analysis. GES is an Irish multi-disciplinary renewable energy consultancy that specialises in the delivery of planning, environmental and project management services to renewable energy developments from project feasibility through the development cycle and onto the operational phase. GES combines the expertise of leading experts in renewable energy design, planning and environmental assessment and has extensive experience in managing and coordinating EIAR projects for wind energy and associated electricity grid and substation developments.

1.2 Purpose of this Report

The purpose of the Environmental Impact Assessment (EIA) scoping process is to identify key environmental elements which may be affected by the project thus requiring assessment in the EIA process and to eliminate those which are not likely to be affected from further assessment. The scoping process identifies sources or causes of potential environmental effects, the pathways by which the effects can happen, and the sensitive receptors which are likely to be affected. It defines the appropriate level of detail for the information to be provided in the Environmental Impact Assessment Report (EIAR). In essence, the primary focus of scoping is to define the most appropriate assessment of likely significant effects related to the project.

The aims of this document are to:-

- set out the overall approach to the preparation of the EIAR;
- describe the proposed content and structure of the EIAR;
- summarise key baseline information;
- describe the proposed assessment methodology;
- identify potential effects at all stages of the project; and,
- identify topics/factors which do not require further assessment and can be scoped out.

2.0 Environmental Impact Assessment

2.1 What is EIA?

EIA is a process required by the European Union (EU) Environmental Impact Assessment Directive 2011/92/EU, as amended by 2014/52/EU ('the 2014 EIA Directive'), and transposed into Irish law by way of Part X of the Planning & Development Act 2000 (as amended).

EIA is carried out by the relevant competent authority to ensure that projects, where the likelihood of significant effects on the environment cannot be excluded, are subject to a comprehensive and independent examination, analysis and evaluation of their likely significant effects on the environment. EIA provides for an assessment of

all effects; including direct, indirect, secondary, cumulative, transboundary, short-term, medium-term, long-term, permanent, temporary, positive and negative; of as they may relate to the construction, operational and decommissioning phases of a project.

2.2 EIA Screening

In accordance with the provisions of the Planning & Development Act 2000 (as amended), EIA is mandatory when certain classes of projects exceed specific sizes and thresholds. Planning applications for such projects must be accompanied by an EIAR. Schedule 5 of the Planning and Development Regulations 2001 (as amended) provides the classes of development proposals which shall be subject to EIA. The project is not, of itself, a category or type of development listed as requiring EIA. Therefore, there is no statutory requirement for the project to be accompanied by an EIAR.

Notwithstanding the above, a judgement of the High Court in respect of *O'Grianna & Ors. v. An Bord Pleanála ([2014] IEHC 632)* determined that a wind farm and its connection to the national grid are considered a single indivisible project for the purpose of the EIA Directive. As the project will form part of an overall development that was formerly subject to EIA (i.e. the Seven Hills Wind Farm), an EIAR will be prepared and submitted to allow An Bord Pleanála undertake a complete in-combination EIA of the overall development.

2.3 What is an EIAR?

An EIAR is a written statement of the likely significant effects, if any, which the project, if carried out, will have on the environment. The EIAR consists of a systematic analysis of the project, including its construction, operational and decommissioning phases, in relation to the existing environment. It is an iterative process carried out throughout the full lifecycle of the project design and consenting process so as to allow for preventative and ameliorative action, as necessary, at a point in time when changes can still be made to the project that anticipate, avoid and mitigate any likely significant effects foreseen.

The EIAR is the principal document that informs the EIA process and provides integral information which consenting authorities can use, amongst other considerations, in independently undertaking EIA and informing a decision making process.

The EIAR can also be used by third parties, including members of the public concerned, as part of the public participation process, to evaluate the project and its likely significant environmental effects, and to inform any submissions made to the planning application process.

The EIAR will be prepared in accordance with the provisions contained within Schedule 6 of the Planning and Development Regulations 2001 (as amended) and the 2014 EIA Directive; each of which set out the information to be contained in an EIAR.

2.4 Purpose of the EIAR

The EIAR provides for a system of sharing information about the environment, within which a project sits, and enables effects to be foreseen and prevented during the design and consent stages. The purpose of the EIAR is to:-

- Anticipate, avoid and reduce significant effects;
- Assess and mitigate effects;

- Maintain objectivity;
- Ensure clarity and quality;
- Provide relevant information to decision makers; and,
- Facilitate better consultation.

It is a statutory requirement that the EIAR pays particular regard to the:-

- Key alternatives;
- Proposed project;
- Receiving environment;
- Likely significant effects;
- Mitigation and monitoring measures; and,
- Residual effects.

A non-technical summary must also be provided.

2.5 EIAR Methodology

In May 2022, the Environmental Protection Agency (EPA) published the *Guidelines on the Information to be contained within an Environmental Impact Assessment Report* and these guidelines reflect the 2014 EIA Directive and the provisions contained therein. The guidelines are a statutory document and provide guidance on the role of the EIAR in the EIA process, the key activities involved in the EIAR process, and guidance on the presentation of the information contained in the EIAR.

GES, and all experts involved in the preparation and production of the EIAR, will have regard to these guidelines; while best practice guidance related to each individual environmental discipline or topic addressed by the EIAR will also be adhered to.

The EPA guidelines include a 7 no. stage approach (sequence) in the production of the EIAR. This includes:-

- Screening;
- Scoping;
- Consideration of Alternatives;
- Project Description;
- Baseline Description;
- Assessment of Likely Significant Impacts; and,
- Mitigation/Monitoring.

The guidelines outline that adherence to this sequence ensures an objective and systematic approach is achieved. Using this sequence, the environment is described using a number of specific headings and this provides for a separate section for each topic. The description of the existing environment, the likely significant effects (positive, negative, & cumulative), mitigation and monitoring measures, and residual impacts are then grouped together in each section, covering each topic. This format allows for ease of investigation into each topic and for specialist studies/input to be integrated seamlessly.

2.6 Content and Structure of the EIAR

In order to be relevant, complete and legally compliant, the content of this EIAR includes all of the information required by the EIA Directive and national legislation, as appropriate and necessary to the specific characteristics of the project, and includes:-

(a) A description of the project comprising information on the site, design, size and other relevant features of the project;

(b) A description of the likely significant effects of the project on the environment;
(c) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
(d) A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
(e) A non-technical summary of the information referred to in points (a) to (d); and,
(f) Any additional information specified in Annex IV of the EIA Directive relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

In order to provide for a consistent approach and to communicate clear, concise, unambiguous information, each chapter of the EIAR will be systematically organised so as to follow a similar basic structure, as follows:-

- The existing environment: A description of the context, character, significance and sensitivity of the receiving (baseline) environment using standard descriptive methods, in order to predict the likely significant effects of the project;
- The likely significant effects of the project: The aspects of the construction, existence and operation of the project that are likely to affect the existing environment including, as appropriate, predicted, potential, residual, 'do nothing' and 'worst case' effects. The likely significance of any effects is determined with reference to magnitude, intensity, integrity, duration and probability; and,
- The measures to mitigate and monitor adverse effects: The range of methods which are proposed for mitigation by avoidance, reduction and remedy of any likely significant effects (including unplanned events) together with ongoing monitoring of the efficacy of mitigation measures.

This structure, which clearly separates data (descriptions of the receiving environment and of the project) from impact predictions (likely significant effects, mitigation measures and residual effects), is designed to ensure that replicable impact assessments, based on rigorous scientific information and verifiable evidence, is carried out using recognised methods that are presented and documented in a fully legible, transparent and objective manner.

This methodological structure is designed to reduce any possible subjective information and bias in order to facilitate the competent authority in its independent EIA of the project.

2.7 Format of the EIAR

The EIAR will be set out in the following chapter format:-

- Introduction;
- Assessment of Project Alternatives;
- Description of the Project;
- Population and Human Health;
- Biodiversity;
- Land & Soil;
- Water;
- Air Quality & Climate;
- Landscape;

- Cultural Heritage;
- Noise & Vibration;
- Material Assets; and,
- Interaction of the Foregoing.

Each chapter of the EIAR will be structured using the following general format:-

- Introduction;
- Methodology;
- Description of the Existing Environment;
- Description of Likely Significant Effects;
- Mitigation & Monitoring Measures;
- Residual Effects; and,
- Summary.

2.7.1 Introduction

This section will introduce the environmental topic to be assessed and the elements and receptors to be examined within the assessment.

2.7.2 Methodology

Specific topic-related methodologies will be outlined in this section. This will include the methodology used in describing the existing environment and undertaking the impact assessment. It is important that the methodology is documented to ensure that that the reader understands how the assessment was undertaken.

2.7.3 Description of the Existing Environment

An accurate description of the existing environment is necessary to predict the likely significant effects of a new development. Existing baseline data will be used as a valuable reference for the assessment of actual effects from a development once it is in operation. To describe the existing environment, desktop reviews of existing data sources will be undertaken for each specialist area relying on published reference reports and datasets to ensure the objectivity of the assessment. Desktop studies will also supplemented by field surveys in order to verify the accuracy of the desktop study and/or to gather additional environmental information for incorporation into the EIAR.

The existing environment will be evaluated to determine its importance, significance and sensitivity. The significance and sensitivity of a specific environment will be derived from legislation, national policies, local plans and policies, guidelines and/or professional judgements.

2.7.4 Description of the Likely Effects

In this section, assessments will be made as to how the existing or receiving environment will interact with the project. The full extent of the project's effects prior to the implementation of mitigation measures are introduced will be assessed and described. Effects from the construction, operation and decommissioning phases of the project will be discussed; while interactions with other environmental topics and cumulative effects with other developments will also be assessed.

The evaluation of the significance of the effect will be undertaken. Where possible, pre-existing standardised criteria for the significance of effects will be used in accordance with the guidelines set out in the EPA *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (May 2022). Additional assessment criteria can include Irish legislation, international standards, European

Commission and EPA guidelines or good practice guidelines. Where appropriate criteria do not exist, the assessment methodology section will set out the criteria used to evaluate the significance based on the assessor's professional judgement.

2.7.5 Mitigation & Monitoring Measures

If significant effects are assessed as likely to arise, mitigation measures will be devised to minimise effects on the environment. Mitigation measures 'by avoidance', 'by reduction' and 'by remedy' may be implemented. It is likely that mitigation measures will also be proposed even where predicted effects are not assessed to be significant which will ensure that environmental effects are minimised to the greatest possible extent.

Proposals to undertake pre- or post-construction monitoring, or monitoring during construction activities, may also be proposed to obtain additional information on the project site to inform construction methods, to ensure that activities are been completed in accordance with best practice guidelines and/or to ensure the efficacy of the proposed mitigation measures. These measures, and a clear justification for their implementation, will be described in this section.

2.7.6 Residual Effects

This section will describe those environmental effects which will remain following the implementation of mitigation and monitoring measures. These effects will be described in detail and an assessment of their significance undertaken.

2.7.7 Summary

A summary of the assessment undertaken will be provided in this section along with an overall assessment of the significance of the likely effects.

2.8 Contributors to the EIAR

The EIA Directive requires that an EIAR must be prepared by a team of competent, qualified experts with an appropriate combination of experience, expertise and knowledge related to the significance, complexity and range of effects that an EIAR needs to assess, including the early anticipation of effects. In order to ensure that the information included in the EIAR is complete to a high level of objective quality, such competences include relevant prior experience and knowledge of the characteristics of the project type and sensitivities likely to be present in the receiving environment; an understanding of the legal context of the decision-making process, including relevant case law; and an appropriate range of specialist technical experts to address different environmental factors, and their interactions.

The preparation of this Scoping Report has been managed by GES with recognised experts carrying out specialist scoping assessments within their individual field. GES will also coordinate the preparation of the EIAR and, in addition to the appointed specialist experts, will prepare a number of specific chapters, as detailed at Table 1 below.

Chapter	Environmental Factor/Topic	Specialist Consultant
1	Introduction	GES
2	Assessment of Project Alternatives	GES
3	Description of the Project	GES
4	Population & Human Health	GES

5	Biodiversity	SLR Consulting
6	Land & Soil	Hydro-Environmental Services
7	Water	Hydro-Environmental Services
8	Air Quality & Climate	GES
9	Landscape	Macro Works
10	Cultural Heritage	Horizon Archaeology
11	Noise & Vibration	AWN Consulting
		GES (noise monitoring)
12	Material Assets	GES
13	Interaction of the Foregoing	GES
Non-Technical Summary		GES

Table 1: Specialist Consultants involved in the preparation of this Scoping Report

3.0 Consultation

Consultation, to date, has predominately comprised engagement with organisations and authorities, key service providers (e.g. utilities and telecommunications) and other stakeholders to whom the project may be of interest or may be affected by the project; and consultation with the local community and general public.

3.1 Stakeholder Consultation

A wide range of statutory and non-statutory organisations were contacted in writing at an early stage in the scoping process to gather their views on the EIAR scope and the likely significant environmental effects of the project. The process involved furnishing each organisation with a 'Preliminary Scoping Report' accompanied by a set of maps and drawings, and requesting written feedback. All responses received will be fully assessed and taken into consideration in the scope of the EIAR and, where necessary, the layout and design of the project will be revised in accordance with specific recommendations.

The following stakeholders were consulted with:-

- An Garda Síochana;
- An Taisce;
- Bat Conservation Ireland;
- Birdwatch Ireland;
- Bord Gáis Energy
- Broadcasting Authority of Ireland;
- Commission for Communications Regulations;
- Commission for Regulation of Utilities;
- Department of Agriculture, Food and the Marine;
- Department of Defence;
- Department of Environment, Climate and Communications;
- Department of Housing, Local Government & Heritage;
- Department of Tourism, Culture, Arts, Gaeltacht, Sport & Media;
- Department of Transport;
- Eir;
- EirGrid;
- Enet Telecommunications Networks Limited;
- Environmental Protection Agency;
- ESB Networks;

- Fáilte Ireland;
- Gas Networks Ireland;
- Geological Survey of Ireland;
- Health & Safety Authority;
- Health Service Executive – Environmental Health Department;
- Iarnród Éireann;
- Imagine Group;
- Inland Fisheries Ireland;
- Irish Aviation Authority;
- Irish Peatland Conservation Council;
- Irish Raptor Study Group;
- Irish Wildlife Trust;
- Magnet Plus;
- National Ambulance Service;
- National Federation of Group Water Schemes;
- National Parks & Wildlife Service;
- North & Western Regional Assembly;
- Office of Public Works;
- Open Eir;
- Radio Services & Building Limited;
- Roscommon County Council;
- RTE Transmission Network Limited (2rn);
- Shannon IRBD Project;
- Sport Ireland Outdoors;
- Sustainable Energy Authority of Ireland;
- Tetra Ireland Communications Limited;
- The Arts Council;
- The Heritage Council;
- Three (3) Ireland;
- Towercom;
- Transport Infrastructure Ireland;
- Údarás na Gaeltachta;
- Uisce Éireann;
- Virgin Media Ireland;
- Viatel Ireland;
- Vodafone Ireland; and,
- Waterways Ireland.

3.2 Community Consultation

The Developer carried out extensive public consultation throughout the project design and EIAR process. In June 2024, door-to-door visits were undertaken with local residents together with leaflet drops. In addition, a public information event was held on 19 June 2024 at the St. Brigid's GAA Club, Kiltoom, Co. Roscommon where members of the public and community groups were afforded the opportunity to discuss the project directly with the project team.

The public consultation process was managed by a dedicated Community Liaison Officer and expertly structured and managed to ensure clarity and consistency, and to maintain an objective and factual approach. A website (www.moyvannansubstation.ie) was also established where members of the public concerned could view details of the project, receive updates on public consultation and contact the Developer via email or phone number.

4.0 Description of the Project

The project will be located within Co. Roscommon approximately 8 kilometres (km) northwest of Athlone and will include a 110 kilovolt (kV) electricity substation and approximately 7.5km of underground electricity line. Site plans and drawings are provided at Annex 1.

4.1 Electricity Substation

The proposed electricity substation, and associated infrastructure, will be located in the townland of Moyvanann. The electricity substation shall comprise the following elements:-

- A compound with a hardcore surface enclosed by security fencing and gates containing electrical plant and equipment;
- An electrical control building containing electrical plant and equipment;
- 2 no. interface masts and underground electricity line to facilitate connection to the existing Athlone-Lanesborough 110kV overhead transmission line; and,
- Associated site development works including the upgrading of an existing agricultural site entrance, construction of an access track and installation of site drainage infrastructure.

The electricity substation is centred at the coordinates provided at Table 1 below.

ID	Easting	Northing	Approximate Altitude (mAOD)
Substation	597015	748535	76

Table 1: Proposed Substation Location

Coordinates provided in Irish Transverse Mercator (ITM)

The electricity substation site is located in a relatively flat area of pastoral grassland; however, there will be a requirement to undertake minor modifications to ground levels in order to achieve a level platform for the control building and electrical equipment. In order to provide a level compound footing, a cut/fill exercise will be implemented where soil from higher elevations will be deposited at areas of lower elevations to avoid the importation of substantial volumes of aggregates. The compound surface will be finished with free-draining crushed stone, such that rainwater can percolate to ground, imported to the site.

The footprint of the substation (overall compound area) will measure approximately 8,400m^2 and will be surrounded by a palisade fence, with associated gates, of 2.6m in height for safety and security reasons. The substation will contain a control building and all necessary electrical equipment and apparatus to facilitate the export of electricity to the national grid.

The substation will also contain a control building from which the substation will be operated and maintained. The control building will measure 25m x 18m (gross floor area of 450m^2) and will have an overall height of 8.5m (to ridge height). The building will be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The control building will contain a control room to allow operatives monitor and manage the operation of the electrical apparatus and will also include a generator room, workshop/storage facility and welfare facilities. Uisce Éireann have been consulted and have confirmed that a water connection can be provided to the electricity substation; while wastewater will be stored in a sealed foul

holding-tank and removed from site by a local licensed waste collector.

Underground electricity line, c. 270m, will be installed between the proposed substation and the existing Athlone-Lanesborough 110kV overhead transmission line. The connection of the underground electricity line to the existing overhead line will be accommodated through the installation of 2 no. interface masts which will have an overall height of between 15m and 18m.

The electricity substation will be accessed via an existing agricultural site entrance which will be upgraded to accommodate construction traffic and heavy-goods vehicles (HGVs) and to provide sufficient vehicular visibility splays to ensure that public and road safety is maintained.

Approximately 630m of on-site access track will be required to access the proposed substation for construction purposes and for site access during the operational phase. The access track proposed shall be similar to normal agricultural tracks but with a slightly wider typical running width of approximately 4m.

4.2 Underground Electricity Line

The proposed electricity line will be located within the townlands of Moyvannan, Feamore, Moyvannan, Feamore, Lisbaun, Carrownolan, Carrowncloghan, Carrowkeeny, Ardmullan, Curraghboy, Gortnasythe, Derryglad, Eskerbaun, and Brideswell; and within the L7551, L7556, L2018, L7731, R362, L2023, and L7636. At this point, the electricity line will connect to electricity line permitted as part of the Seven Hills Wind Farm.

The electricity line will be installed in ducts within a trench approximately 1.3m deep and c. 0.6m in width. The trench will be located predominately within the paved surface of the above regional and locally-classed public roads; with a short section to be located within private lands as it approaches the proposed electricity substation.

At a bridge crossing of the Cross (Roscommon) Stream along the L2023 local road, it is proposed that the electricity line will be installed below the stream via horizontal direction drilling.

4.3 Construction Materials Haul Route

It is likely that the vast majority of construction materials for the proposed substation; for example, control building materials and electrical equipment, external electrical equipment and apparatus, and security fencing, etc.) will be delivered to the substation site via the N61 national road and the L7556 and L7551 local roads. The source of stone aggregates and concrete cannot be confirmed until the post-consent pre-construction procurement process has been completed and, as such, a number of routes may be utilised. However, all suppliers will be required to utilise nationally and regionally-classed routes insofar as possible to minimise the use of, and potential damage to, locally-classed roads.

Materials related to the underground electricity line will be delivered to the applicable works location and/or temporary storage location (e.g. an existing farmyard) which may be identified by the construction contractor. As above, all suppliers will be required to minimise the use of locally-classed roads insofar as possible.

5.0 Scope of the EIAR

This section provides a brief overview of the level of scoping which has taken place to date, as well as the potential effects which have been identified and the proposed

methodology for further assessment in the EIAR.

5.1 Project Alternatives

Prior to the selection of the development under consideration, the Developer undertook an extensive iterative process to assess a range of alternatives at both the macro-level and micro-level. The assessment of alternatives ranged from connecting to existing electricity substations, alternative proposed substation locations, alternative substation configurations and designs, and alternative electricity line route options. This process has so far determined that the development as proposed represents the most solution, both environmentally and technically, having regard to all reasonable available alternatives.

However, the project in its current layout and design (at the time of writing) remains subject to further revision in line with continued project scoping and ongoing statutory and non-statutory consultation.

5.2 Population & Human Health

As part the scoping process, a desk based review of existing conditions in the area has been undertaken. It is anticipated that, during the construction phase, effects on community, recreation and tourism receptors are likely to be primarily associated with traffic, noise, air quality and water impacts. Once the project becomes operational, effects will be primarily associated with visual and noise effects.

In terms of human health, it is noted that impacts here will be closely linked with other environmental aspects associated with the project which are relevant to human health, namely soils, water, air quality, noise, and radiation. Other effects may include employment effects and impacts on the local economy.

The potential effects identified above along with potential cumulative effects with other wind farms and infrastructure projects, will be considered within the 'Population and Human Health' chapter of the EIAR.

The project includes the construction and operation of electricity infrastructure. The provision of electricity infrastructure of 110kV capacity is common practice on similar projects throughout Ireland. The radiation emitted from this type of electrical infrastructure can give rise to the generation of electromagnetic fields (EMF) which has the potential to affect human health where high levels are experienced.

Potential operational effects are limited to EMF impacts on properties (residential or other uses) within close proximity to the electricity lines or substation compound. The assessment of EMF in the EIAR will focus on the predicted level of the EMF and an evaluation of the predicted level against health protection standards.

The EIAR chapter will also take into consideration the results of other assessments in the EIAR which have relevance to health. Recognised health evaluation criteria will be used and accurate baseline data provided. The findings of these assessments will be cross referenced in order to avoid duplication of findings.

Employment effects and direct expenditure will be quantified using data provided by the Developer and, where necessary using standard industry data. Opportunities for local business and the local labour market to be involved in supply chain activities will be identified and, where possible, quantified.

The following sections set out the proposed approach to the preparation of the Population & Human Health chapter of the EIAR.

5.2.1 Methodology

The spatial focus of the study will be undertaken at two levels. Firstly, effects on specific community, recreation and tourism receptors will be assessed at a local level which will be defined as 5km from the boundary of the project. This will be referred to as the 'Local Study Area'.

Economic effects will be considered with regard to a wider study area that takes account of a likely 'catchment' for provision of domestically sourced goods and services relating to the construction and operation of the project. This study area will comprise County Roscommon and will be referred to as the 'Wider Study Area'. Given the scale of the project, it is not intended to measure effects at a national or international level.

5.2.2 Description of Existing Environment

A desk-based review of existing conditions in the area will be undertaken, including the following themes:-

- population demographics;
- labour market;
- economic diversity and investment including local business supply chain;
- education and skills;
- community receptors;
- visitor attractions (e.g. cultural heritage, fishing lakes, views);
- accommodation and other businesses/services serving the tourism economy;
- recreational assets (e.g. walking, cycling, views, equine use); and,
- land use.

Data on sensitive receptors will be gathered within the Local Study Area and this will focus on community receptors, recreational assets and visitor assets. Baseline data on population demographics and employment will be gathered within the Wider Study Area. The sensitivity of each receptor or receptor group will be based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects.

Key literature sources, in evaluating the baseline environment, will include:-

- Central Statistics Office (CSO);
- *Roscommon County Development Plan 2022-2028*;
- Pobal Profiling GIS Data;
- Fáilte Ireland; and,
- *A Tourism Masterplan for the Shannon 2020-2030*.

5.2.3 Description of Likely Effects

The assessment will be primarily focussed on assessing the likely effects arising from the construction and operational phases. Decommissioning phase effects are considered, based on experience, to be similar to construction phase effects but of a reduced magnitude. Effects on the local economy (employment opportunities and economic output), local population, recreation and tourism assets and land use will each be assessed.

5.2.3.1 Receptor Sensitivity

There are no published standards that define receptor sensitivity relating to Population & Human Health assessments. As a general rule, the sensitivity of each receptor or

receptor group will be based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects. In assigning receptor sensitivity, consideration will be given to the following:-

- importance of the receptor e.g. local, regional, national, international;
- availability of comparable alternatives;
- ease at which the resource could be replaced;
- capacity of the resource to recover or adapt to identified impacts over a period of time; and,
- level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

Based upon professional judgement, it is proposed that four levels of sensitivity are used: High; Medium, Low and Negligible.

5.2.3.2 Magnitude Criteria

The magnitude of effect will be evaluated based on the change that occurs to the baseline conditions relating to supply chains, local labour market, tourism and visitor economy, land use, and tourism and recreation assets.

It is proposed that four degrees of magnitude are used: high; medium; low and negligible.

5.2.3.3 Significance of Effect

The level of effect will be assessed by combining the magnitude of the effect and the sensitivity of the receptor. It is proposed that significance ratings of imperceptible, slight, moderate and significant will be used. Where an effect is classified as moderate, this may be considered to represent a 'significant effect' but should always be subject to professional judgement and interpretation, particularly where the sensitivity or magnitude levels are not clear or are borderline between categories or the effect is intermittent.

5.2.4 Mitigation & Monitoring Measures

Mitigation measures, additional to those incorporated into the design of the project, will be considered in order to mitigate any significant adverse effects that are identified.

5.2.5 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

No comments specifically related to effects on Population & Human Health or matters with should be addressed in the EIAR have been received from consultees.

5.3 Biodiversity

A detailed Biodiversity Scoping Report has been prepared by SLR Consulting and is enclosed at Annex 2. The report has identified environmental constraints in respect of the project which will require detailed consideration and also identifies effects which may occur as a result of the construction, operation and decommissioning of the project. Finally, the report describes the proposed approach in the preparation of the Biodiversity chapter of the EIAR.

5.3.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

Consultation responses were received from the Development Applications Unit (DAU) and the Irish Wildlife Trust; however, the Irish Wildlife Trust advised that it did not have the capacity to provide a response. With regard to biodiversity, the DAU recommended that the likely effects of the project be assessed in combination with those of the permitted Seven Hills Wind Farm and the Athlone-Lanesborough overhead transmission line.

Separately, the DAU also commented that, in its opinion, the failure to have incorporated and assessed the project in the planning application for the permitted Seven Hills Wind Farm represented a lacuna in the planning process for the permitted development (per *O'Grianna & Ors. V. An Bord Pleanála ([2014] IEHC 632)*). The DAU was subsequently advised that grid connection infrastructure, attendant to the Seven Hills Wind Farm, was assessed and proposed as part of the permitted development. Notwithstanding the comments of the DAU, given that the in-combination effects of the permitted Seven Hills Wind Farm (and associated permitted grid connection infrastructure) will be fully assessed in-combination, the Developer submits that no such lacuna will exist with respect to the subject project.

While not specifically related to Biodiversity, a consultation response was also received from the Department of Agriculture, Food and the Marine which advised on the procedures to be followed in the event of tree felling.

No other comments regarding the assessment of effects on Biodiversity have been received.

5.4 Land & Soil

A Land, Soil & Water Scoping Report has been prepared by Hydro Environmental Services and is enclosed at Annex 3. Given the highly inter-related nature of the geological, hydrogeological and hydrological environments, a consolidated scoping assessment has been undertaken addressing each of these topics. The report describes the characteristics of the existing environment having regard to site investigations undertaken, identifies environmental receptors which may experience effects as a result of the construction, operation and decommissioning of the project, and describes the methodologies to be followed in the preparation of the Land & Soil chapter of the EIAR.

5.4.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

A consultation response was received from Geological Survey Ireland (GSI) which, while not raising any particular concerns regarding the project, advised that the assessment be cognisant of GSI's publicly available databases particularly with regard to geoheritage, groundwater and groundwater monitoring, groundwater vulnerability, groundwater protection schemes, geological mapping, natural resources (minerals/aggregates), and the geochemistry of soils, surface waters and sediments.

No other comments regarding the assessment of effects on Land & Soil have been received.

5.5 Water

A Land, Soil and Water Scoping Report has been prepared by Hydro Environmental Services (HES) and is enclosed at Annex 3. Given the highly inter-related nature of the geological, hydrogeological and hydrological environments, a consolidated scoping assessment has been undertaken addressing each of these topics. The report describes the characteristics of the existing environment having regard to site investigations undertaken, identifies environmental receptors which may experience effects as a result of the construction, operation and decommissioning of the project, and describes the methodologies to be followed in the preparation of the Water chapter of the EIAR.

5.5.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

Consultation responses were received from the National Federation of Group Water Schemes (NFGWS), the Office of Public Works (OPW) and Uisce Éireann. The NFGWS noted that there are no regulated group water schemes in the vicinity of the project; however, it was advised that consultation with Roscommon County Council be conducted to confirm the absence of any unregulated group water schemes.

The OPW noted that there are no arterial catchment drainage schemes within the project site; and advised that approval would be required, in accordance with Section 50 of the 1945 Arterial Drainage Act, where any works are to be undertaken to a new or existing bridging structure over a watercourse. The OPW advised that where the proposed underground electricity line crosses a river or watercourse, the invert of the cable crossing should be a minimum of 1m below the channel bed; and that the project should not give rise to any additional flooding.

In its consultation response, Uisce Éireann (UÉ) advised that where the project comes within close proximity to UÉ assets, consultation should be undertaken to ensure that appropriate design measures are being implemented to avoid any adverse effect on UÉ assets. UÉ also provided guidance on details which should be provided as part of any such consultation. UÉ noted that it does not have capacity to respond to specific scoping requires but advised that matters related to effects on drinking supplies, water quality monitoring, effects on UÉ infrastructure, wastewater management, surface water management, and water supply be considered.

As the proposed electricity substation will require a water supply, UÉ was separately consulted by the project design team as part of a pre-connection enquiry. In response, UÉ advised that a water connection can be provided without the requirement for any upgrading of UÉ infrastructure while there is sufficient capacity to supply the project.

No other comments regarding the assessment of effects on Water have been received.

5.6 Air Quality & Climate

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the

Air Quality Standards Regulations 2022, which incorporate the European Commission Directive 2008/50/EC (on ambient air quality and cleaner air for Europe). Council Directive 2008/50/EC (CAFÉ Directive) combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and also includes ambient limit values relating to Particulate Matter (as $PM_{2.5}$).

The limit values or 'Air Quality Standards' are health or environmental-based levels and for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* ('the Regulation'). Ireland's obligation under the Regulation is a 30% reduction in non-emissions trading system (ETS) greenhouse gas (GHG) emissions by 2030 relative to its 2005 levels.

Following Ireland's declaration of a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government published the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) ('the 2021 Climate Act') in July 2021. The 2021 Climate Act was prepared for the purposes of giving statutory footing to the core objectives stated within the Climate Action Plan.

In relation to carbon budgets, the 2021 Climate Act states *"A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')"*. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change.

In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications ('the Minister') shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors.

The 2024 Climate Action Plan outlines the status across key sectors including electricity, transport, built environment, industry and agriculture and outlines the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2024 Climate Action Plan set a national target of up to 80% of electricity demand by renewables by 2030 for the national electricity grid. Currently, approximately 40% of the national grid electricity comes from renewable sources.

The following sections set out the proposed approach to the preparation of the Air Quality & Climate chapter of the EIAR.

5.6.1 Methodology

The assessment methodology will include the following:-

- Detail the scoping and consultation process undertaken and describe the scope of the impact assessment;
- Identify the key legislation, policy and guidance with reference to the latest updates in guidance and approaches;
- Confirm the study area for the assessment;
- Describe and characterise the baseline environment established from desk studies, project survey data and consultation;
- Define the project design parameters for impact assessment and describe any embedded mitigation measures relevant to the assessment;
- Present the assessment of likely significant effects or benefits and identify any assumptions and limitations encountered in compiling the impact assessment; and,
- Detail any additional mitigation and/or monitoring necessary to prevent, minimise, reduce or offset potentially significant effects.

5.6.2 Description of Existing Environment

A desk-based review of existing conditions in the area will be undertaken, including the following:-

- Ambient Air Quality;
- Weather conditions; and,
- Long-term climactic monitoring.

5.6.3 Description of Likely Effects

The assessment will be primarily focussed on assessing the likely effects arising from the construction and operational phases. Decommissioning phase effects are considered, based on experience, to be similar to construction phase effects but of a reduced magnitude. Effects arising from dust, vehicular emissions and the delivery of renewable energy to the national grid will be fully assessed.

5.6.3.1 Receptor Sensitivity

There are no definitive standards that define receptor sensitivity relating to Air Quality & Climate assessments. As a general rule, the sensitivity of each receptor or receptor group will be based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects.

Based upon professional judgement, it is proposed that 3 no. levels of sensitivity will be used: high; medium and low.

5.6.3.2 Magnitude Criteria

The magnitude of effect will be evaluated based on the change that occurs to the baseline conditions relating to air quality and climate.

It is proposed that four degrees of magnitude will be used: high; medium; low and negligible.

5.6.3.3 Significance of Effect

The level of effect will be assessed by combining the magnitude of the effect and the sensitivity of the receptor. It is proposed that significance ratings of imperceptible,

slight, moderate and significant will be used. Where an effect is classified as moderate, this may be considered to represent a 'significant effect' but should always be subject to professional judgement and interpretation, particularly where the sensitivity or magnitude levels are not clear or are borderline between categories or the effect is intermittent.

5.6.4 Mitigation & Monitoring Measures

Mitigation measures, additional to those incorporated into the design of the project, will be considered in order to mitigate any significant adverse effects that are identified.

5.6.5 Stakeholder Engagement

No specific comments regarding the assessment of effects on Air Quality & Climate have been received.

5.7 Landscape

A Landscape scoping report has been prepared by Macro Works and is provided at Annex 4. The report provides an initial evaluation of the baseline environment and discusses landscape and visual effects which are likely to arise. In addition, the Scoping Report identifies an initial set of potential locations from where photo-realistic images of the project may be prepared.

5.7.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

No specific comments regarding the assessment of effects on Landscape have been received.

5.8 Cultural Heritage

An Archaeological, Architectural and Cultural Heritage scoping report has been prepared by Dermot Nelis Archaeology and is enclosed at Annex 5. The scoping report has been prepared to provide an initial evaluation of the baseline environment and to identify effects which the project may have on the archaeological, architectural and cultural heritage resource of the surrounding area. The report also provides details of the methodology to be followed in the preparation of the EIAR chapter and potential mitigation measures which may be proposed.

5.8.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

A consultation response was received from the Development Applications Unit (DAU) and recommends that, due to the presence of archaeological features proximate to the project site and the presence of waterbodies, an Underwater Archaeological Impact Assessment should be conducted. The nature of the project and the presence of recorded archaeological features were considered at length by the project archaeologist who advised that an underwater archaeological survey was not warranted in this instance.

No other comments regarding the assessment of effects on features of Cultural Heritage have been received.

5.9 Noise & Vibration

A Noise & Vibration scoping report has been prepared by AWN Consulting and is enclosed at Annex 6. The scoping report has been prepared to identify the potential for noise and vibration effects at sensitive receptors surrounding the project. The scoping report also describes the principal objectives, and the proposed methodologies, of the assessment.

5.9.1 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

No other comments regarding the assessment of Noise & Vibration effects have been received.

5.10 Material Assets

5.10.1 Transport & Access

The assessment of traffic & access will include an examination of the existing road network surrounding the site, as well as reviewing the likely haul route for the delivery of the construction materials and electrical equipment to the project site.

The project is likely to have both construction, operational and decommissioning phase effects in terms of transport & access. Construction and decommissioning phase effects may include increased traffic flows, changes to the traffic composition, traffic disruption, reduction in safety and degradation of road surfaces. Operational stage impacts on traffic are likely to be much less than that associated with the construction stage; however, the level of effect will be examined in line with the operational life span of the project.

The Transport & Access section will undertake a range of including the capacity of the haul route to accommodate construction traffic, an appraisal of any damage to road structures or surfaces, and a traffic impact assessment to determine the effects of construction and operational phase traffic movements. Given that the project will be constructed concurrently with the permitted Seven Hills Wind Farm, the cumulative effects of both developments will be assessed.

5.10.1.1 Methodology

A desktop review of the road network in the vicinity of the proposed substation location and along the electricity line route has been conducted and supplemented by a driven survey of the electricity line route. A walkover survey of the proposed access point to the substation location was also conducted; while key locations along the electricity line route and construction materials haul route were also walked and visually assessed.

A transport and access assessment will be conducted having regard to the Transport Infrastructure Ireland (TII) *Traffic and Transport Assessment (TTA) Guidelines*, May 2014. The methodology for the transport & access assessment will include a comprehensive assessment of the road network's ability to accommodate construction phase traffic, the suitability of the electricity line route to accommodate electrical infrastructure, a

review of predicted traffic volumes and effects likely to be generated during the construction and operation of the project by the construction workforce and by the transport of materials and equipment. Future traffic volumes associated with maintenance-related activities will also be predicted. The potential disruption to the road network and local traffic movements during the construction phase and the availability of alternative routes (particularly in relation to the proposed electricity line route) will be assessed, where required.

Recommendations will be made to mitigate any potential traffic effects on the road network.

5.10.1.2 Description of Existing Environment

The road network in the vicinity of the project site includes the N61 national secondary road in addition to a number of regionally-classed roads (the R362 and R363) and locally classed roads. Road conditions are assessed to be of generally good quality; however, there is evidence of surface and structural deterioration along some of the lower-classed local roads.

It is anticipated that the most substantial volume of traffic will be generated by the construction of the electricity substation. It is likely that the vast majority of construction materials for the proposed substation; for example, control building materials and electrical equipment, external electrical equipment and apparatus, and security fencing, etc.) will be delivered to the substation site via the N61 national road and the L7556 and L7551 local roads.

Based on anecdotal evidence and experience, the locally-classed road network in the vicinity of the substation site and along the electricity line route is unlikely to carry significant volumes of traffic; however, it is anticipated that these routes will be of local importance to residents, landowners and business owners.

5.10.1.3 Description of the Effects

The following effects have been identified as having the potential to arise as a consequence of the construction of the project:-

- Increased traffic flows (construction phase);
- Changes to traffic/vehicular composition;
- Temporary traffic disruption/delays;
- Reduced road safety due to construction activities; and,
- Degradation of road structures/surfaces due to traffic movements and construction activities (i.e. excavations).

Operational stage effects on traffic are likely to be much less than that associated with the construction stage; however, the level of impact will be examined in line with the operational life span of the project.

5.10.1.4 Mitigation & Monitoring Measures

A comprehensive suite of mitigation measures will be set out, as required, to reduce the likely effects of the project on transport and access. The majority of such measures are likely to be techniques which will be inherent and intrinsic to the completion of works in accordance with accepted best practice construction methodologies (e.g. appropriate traffic management measures); however, specific measures are also likely to be proposed to minimise traffic disruption and maintain traffic flows, ensure public safety is not adversely affected and to maintain the structural integrity of roads and associated structures.

5.10.1.5 Stakeholder Engagement

As described at Section 3.1 above, a range of stakeholders have been consulted with and invited to provide comment on the project and the scope of environmental assessments.

A consultation response was received from Transport Infrastructure Ireland (TII) and advises that consultation should be undertaken with the relevant local authority. In addition TII notes that effects on the national road network (including haul route) should be assessed, that visual effects from national roads are assessed, that proposed or permitted road schemes in the area be considered, that relevant TII publications are considered, that a road safety audit is conducted if required, that haul route and abnormal size/weight loads are assessed, that PPP companies, motorway maintenance contractors and local authorities be consulted, and that any damage to road surfaces shall be remediated by the Developer.

No other comments regarding the assessment of Transport & Access have been received.

5.10.2 Telecommunications

5.10.2.1 Methodology

The scoping process was commenced at an early stage of project design to identify the presence of telecommunication links in the area and, if present, their specific route. Consultation with a number of key service providers was undertaken and all feedback and recommendations have been incorporated into the project design.

The scoping methodology, which is ongoing and will continue throughout the EIAR preparation process, will include:-

- Consultation with service providers, regulatory authorities and emergency services;
- Analyses of the effects of the project on telecommunications operators' point-to-point microwave radio links and apply appropriate buffer distances around links and masts where required;
- Further specialist investigations will be carried out if significant effects are likely to occur;
- Where necessary, mitigation measures to be agreed with operators.

5.10.2.2 Description of Existing Environment

While the project site is not assessed to be a particularly important location for telecommunications links or infrastructure, a number of telecommunication masts/structures were identified within the surrounding landscape. However, no links were identified as traversing the subject site and/or have the potential to be affected.

5.10.2.3 Description of Likely Effects

Consultation responses were received from a number of service providers including RTE Transmission Network Limited, Eir, Enet, Tetra Ireland, Towercom and Virgin Media. None of the service providers identified any concerns with the project.

5.10.2.4 Mitigation & Monitoring Measures

A wide range of technological measures are available to avoid any disruption to telecommunication links and services. Such measures will be fully examined within the

EIAR and will be proposed for implementation where necessary.

6.0 Cumulative Assessment

The assessment of cumulative effects arising from the project will take two forms, as follows:-

- The cumulative effects of the project with the permitted Seven Hills Wind Farm will be assessed to evaluate the effects of the project as a whole; and,
- The cumulative effects of the entire project with other existing, permitted or projects (for which there is publicly available information).

The cumulative assessment will be undertaken under each individual chapter heading. Where potentially significant cumulative effects are identified, mitigation and monitoring measures will be proposed to minimise this effect.

7.0 Assessment of Interactions

The interactions between effects on different environmental factors will also be addressed, as relevant, throughout the EIAR by ensuring that effects are cross-referenced between topics, thus reducing the need to duplicate coverage of such topics. Close co-ordination and management within the EIAR project team, and careful read-across editing, will ensure that assessors are vigilant for complex interactions (direct, indirect, secondary and cumulative) and, where they are likely to arise, they are adequately identified and assessed. This includes interactions between effects, and possible cumulative effects, arising from the mitigation measures proposed that could magnify effects through the interaction or accumulation of effects.

8.0 Appropriate Assessment

As a separate, but interrelated, process, screening for the likelihood of any significant effects on European nature conservation sites (Natura 2000) designated under the EU Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) will be undertaken through the preparation of an Appropriate Assessment (AA) Screening Report (Stage 1). This is formally a separate assessment process, with discrete reporting requirements, but is obviously highly interrelated with EIA.

Article 6(3) of the Habitats Directive provides for a two-stage assessment process, which is implemented into Irish law (with some additional requirements) by the provisions of sections 177U and 177V of the Planning & Development Act 2000 (as amended). Screening for AA in accordance with section 177U is the first stage of the AA process in which the possibility of there being a significant effect on a European site is considered. Plans or projects that have no appreciable effect on a European site are thereby excluded, or 'screened out', at this stage of the process.

The first step in the screening process is to develop a list of European-designated sites which may be affected by the construction, operation or decommissioning of the project. Each relevant European site is evaluated to examine whether or not the project is likely to have a significant effect on the European site.

The project is not located within any designated nature conservation areas; however, there are a number of Special Protection Areas (SPA) and Special Areas of Conservation (SAC) within 10km of the project site. Such designated sites include; but not limited to; Lough Ree SPA, Middle Shannon Callows SPA, Lough Croan Turlough SPA, Lough Ree SAC, River Shannon Callows SAC, Lough Croan Turlough SAC, and Lough Funshinagh SAC.

An Appropriate Assessment Screening Report found that it could not be confirmed, on the basis of objective evidence and in light of best scientific knowledge, that there will not be any likely significant effects on Natura 2000 sites arising from the project, either individually or in combination with other plans and projects, having regard to their conservation objectives.

As a result, and in accordance with the precautionary principle, it was concluded that the project should proceed to be subject to a Stage 2 AA and that a Natura Impact Statement (NIS) should be prepared and submitted with the planning application alongside the EIAR. In the NIS, the effect of the project on the integrity of the European site(s), and their conservation objectives, will be assessed.

In the NIS, mitigation measures can be proposed to minimise effects on European sites to reduce the significance of any effects. Mitigation measures will follow the 'Avoidance–Reduction–Remedy' hierarchy. The mitigation measures will be described in detail, including in relation to their practical implementation, efficacy, timing and monitoring.

The NIS is presented and submitted as a separate standalone document. The NIS will include both the Stage 1 AA Screening Report and the Stage 2 Appropriate Assessment.

The Biodiversity chapter of the EIAR (Chapter 5) will not repeat the detailed assessment included in the NIS but will cross reference the findings of the separate assessment, as necessary. This is in accordance with the EPA *Guidelines on the Information to be contained within Environmental Impact Assessment Reports* which states "*a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement*" but should "*incorporate their key findings as available and appropriate*".

Annex 1 –
Maps and Drawings

PROPOSED ELECTRICITY SUBSTATION

UNDERGROUND ELECTRICITY CABLES

EXISTING 110kV LANESBOROUGH TO ATHLONE OVERHEAD LINE

POINT OF CONNECTION TO PERMITTED SEVEN HILLS WIND FARM GRID CONNECTION INFRASTRUCTURE

LEGEND:

LANDOWNERSHIP BOUNDARY

Date:	Rev:	Description:	Drawn By:

Prepared By:

Galetech Energy Services
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Client:

ENERGIA RENEWABLES ROI LIMITED

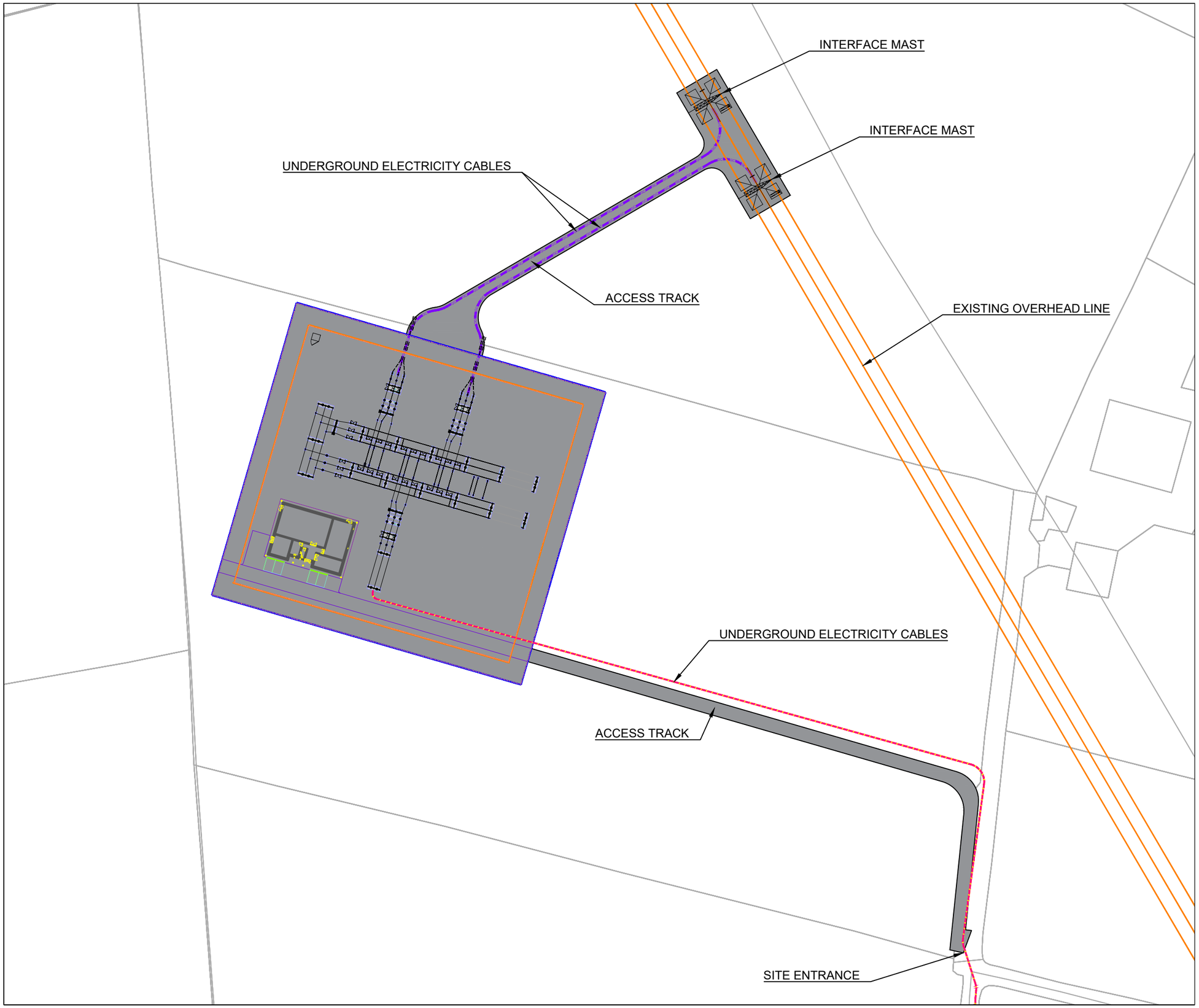
Job Title:

MOYVANNAN ELECTRICITY SUBSTATION

Drawing Title:

FIGURE 1: OVERALL SITE LOCATION

Drawing No.:	Stage:	
SEV001SS_PAS_LOC-0.01	ENVIRONMENTAL SCOPING	
Scale: (A3) 1:22,500	Date: 26/03/2024	Revision No.: REV 0
Drawn By: JB	Checked By: SC	Confirmed By: SC



LEGEND:

LANDOWNERSHIP BOUNDARY

N

Date:	Rev:	Description:	Drawn By:

Prepared By:

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Client:
ENERGIA RENEWABLES ROI LIMITED

Job Title:
MOYVANNAN ELECTRICITY SUBSTATION

Drawing Title:
FIGURE 2.01: INDICATIVE SUBSTATION LAYOUT AND LOOP IN / LOOP OUT CONNECTION

Drawing No.:	Stage:	
SEV001SS_PAS_LAY-0.01	ENVIRONMENTAL SCOPING	
Scale: (A3) 1:1,250	Date: 26/03/2024	Revision No.: REV 0
Drawn By: JB	Checked By: SC	Confirmed By: SC

LEGEND:

LANDOWNERSHIP BOUNDARY

N

Date:	Rev:	Description:	Drawn By:

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Job Title:

MOYVANNAN ELECTRICITY SUBSTATION

Drawing Title:

FIGURE 2.02: INDICATIVE SUBSTATION LAYOUT AND LOOP IN / LOOP OUT CONNECTION

Drawing No.:	Stage:	
SEV001SS_PAS_LAY-0.02	ENVIRONMENTAL SCOPING	
Scale: (A3) 1:1,250	Date: 26/03/2024	Revision No.: REV 0
Drawn By: JB	Checked By: SC	Confirmed By: SC

Annex 2 –

Biodiversity Scoping Report

Constraints Report

Moyvannan Electricity Substation and Grid Route

Galetech Energy Services

Clondargan, Stradone, Cavan, H12 NV06

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

City Gate, Mahon 1000, Cork, T12 W7CV

SLR Project No.: 501.065165.00001

Client Reference No: 065165

24 July 2024

Revision: 2

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0	15 November 2023	Dr Jonathon Dunn	Michael Bailey	Dr Jonathon Dunn
1	16 November 2023	Dr Jonathon Dunn		Dr Jonathon Dunn
2	24 July 2024	Dr Jonathon Dunn		Dr Jonathon Dunn
	Click to enter a date.			
	Click to enter a date.			

Basis of Report

This document has been prepared by SLR Environmental Consulting (Ireland) Ltd (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Galetech Energy Services (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Appendices

1.0 Introduction

SLR Environmental Consulting (Ireland) Ltd (SLR) were commissioned by Galetech Energy Services (Galetech) in October 2023 to carry out a desktop study and a scoping visit to identify ecological constraints present along the route of underground electricity cables and substation location (hereafter 'the Project' with the area itself 'the Project Site') for the Moyvannan Electricity Substation (see Figure 1).

Fortnightly feeding distribution surveys for wildfowl have been carried out between October 2023 to March 2024 inclusive and an extended habitat survey has been carried out in May 2024.

The aim of this report is to present the results of the scoping visit and desktop study with recommendations for additional field surveys and/or any likely mitigation.

This report presents the results for the revised underground electricity cable route.

2.0 Methodology

2.1 Desk-Based Study

The desk-based study collated information from the following:

- Satellite imagery[1];
- Environmental Protection Agency (EPA) viewer[2];
- Environmental Sensitivity Mapper (ESM) viewer[3];
- National Biodiversity Data Centre (NBDC) database[4]; and
- National Parks and Wildlife Service (NPWS) website[5].

The NBDC species data were collated within grid squares from 100 m to 10 km in size. A 1 km grid square resolution was used for the electricity substation site and where the underground electricity cables intersect with the Cross [Roscommon] (EPA code 26C10) watercourse (M9748 and M9445, respectively). The remainder of the underground electricity cables will be located within existing roads apart from a small section near the electricity substation. Consequently, NBDC data were not examined for the rest of the cable route.

As a starting point, all designated nature conservation sites within 15 km from the Project were identified. This included SACs, SPAs, Ramsar sites, NHAs, pNHAs and nature reserves.

2.2 Scoping Survey

A scoping survey was carried out on the 19th October 2023 to search for any habitats or species that are either protected by law or are otherwise subject to legal restrictions. This survey was repeated on the 22nd and 23rd May 2024 for the revised underground electricity cable route. Photographs, GPS coordinates and target notes were recorded. Conditions were suitable for survey.

[1] https://www.google.ie/maps Last accessed 24/07/2024
[2] https://gis.epa.ie/EPAMaps/ Last accessed 24/07/2024
[3] https://airomaps.geohive.ie/ESM/ Last accessed 24/07/2024
[4] https://maps.biodiversityireland.ie/Map Last accessed 24/07/2024
[5] https://www.npws.ie/protected-sites Last accessed 24/07/2024

2.3 Limitations

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the vicinity of the Project Site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

The scoping visit was carried out outside the optimal season for botanical surveys and so it is possible that certain plant species could have been missed. Also, no access to the riverbank along the Cross [Roscommon] watercourse was possible, as it was within third-party lands.

The site visit was high-level in nature and so should not be considered in lieu of more detailed ecological surveys.

3.0 Results

3.1 Designated Nature Conservation Sites

There are 12 SACs, five SPAs, five NHAs and four pNHAs within 15 km of the Project Site, with details provided in Appendix A and shown in Figure 2.

Those with potential connections to the Project include:

- Hydrogeological connections: Ballynamona Bog and Corklip Lough SAC 002339, Lough Ree SAC 000440 and Lough Funsinagh SAC 000611. These sites are designated for *inter ali*a groundwater dependent terrestrial ecosystem (GWDTE) habitats such as turloughs and fens and are in the same groundwater body as the Project Site.
- Downstream hydrological connections: River Shannon Callows SAC 000216 and Middle Shannon Callows SPA 004096 are downstream of the Project Site and are connected via the Cross [Roscommon] river.
- Ecological connections: River Shannon Callows SAC, Lough Ree SAC, Lough Ree SPA, Middle Shannon Callows SPA, Lough Croan Turlough SPA, River Suck Callows SPA, Four Roads Turlough SPA, Suck River Callows NHA 000222 and Cranberry Lough pNHA 001630 all have mobile ex situ species, such as otter *Lutra lutra* and birds, which could travel to the Project Site.

3.2 Habitats

There are no previously mapped ancient woodlands or Annex I habitats nearby the Project Site.

The scoping visits confirmed that there were confirmed turlough habitats c. 420 m south of the electricity substation location and c. 200 m from the electricity cable route. These are the habitats with the highest value and correspond to priority Annex I habitat turloughs (3180). They are also GWDTEs.

Other higher value habitats that bound the cable route include treelines and hedgerows. The Cross [Roscommon] river is also a higher value habitat. There are also hedgerows and treelines nearby the electricity substation site, along with stone walls.

Almost all the cable route will be buried within lower value existing roads, which are artificial in nature. Most of the electricity substation location will be located within lower value improved agricultural grassland.

Higher value habitats are shown in Figure 3.

3.3 Species

3.3.1 Plants

There are no desktop records of rare, protected or invasive plants at the proposed substation location. The scoping visits did not identify any rare or protected plant species; however, young invasive Japanese knotweed *Fallopia japonica* was recorded within a verge along local road L2019, adjacent to the cable route. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011).

Non-native box honeysuckle *Lonicera pileata* and montbretia *C. x crocosmiiflora* were located adjacent to the mapped Cross [Roscommon] watercourse crossing and the underground cable route, respectively. Non-native snowberry *Symphoricarpos albus* was also located in hedges along the underground cable route. These three species are not subject to the same legal restrictions as Japanese knotweed.

Plant observations are shown in Figure 3.

3.3.2 Birds

There are no desktop records of rare or protected birds at the Project Site. The 2023 scoping visit recorded common buzzard *Buteo buteo*, Eurasian curlew *Numenius arquata*, mallard *Anas platyrhynchos* and northern lapwing *Vanellus vanellus* nearby the substation location, and the 2024 scoping visit recorded swallow *Hirundo rustica*, house martin *Delichon urbica*, black-headed gull *Chroicocephalus ridibundus*, mute swan *Cygnus olor*, great cormorant *Phalacrocorax carbo*, Eurasian coot *Fulica atra* and little egret *Egretta garzetta* at the same.

The turlough and nearby improved agricultural grassland habitats afford foraging opportunities for wildfowl that are qualifying interests (QIs) of nearby SPAs. The grasslands at the electricity substation site could also be used by ground nesting birds, although this is unlikely due to heavy cattle usage.

Treelines and hedgerows at the substation and along the cable route could be used by nesting passerines and other birds.

Bird observations are shown in Figure 3.

3.3.3 Mammals

There was a desktop record of badger *Meles meles* recorded within the 1 km grid square overlapping the electricity substation site. However, no badger evidence was recorded during the scoping visits. There could be badger setts within third-party lands alongside the cable route; however, these were not accessible.

Regarding bats, the habitats at the substation site are of low-moderate importance for commuting and foraging bats. Most linear features such as hedgerows and treelines were truncated. There were also a few trees with low bat roosting potential within and adjacent to the Project Site. The culvert spanning the Cross [River] is unlikely to be used by roosting bats, due to its height.

Mammal observations are shown in Figure 3.

3.3.4 Amphibians and Reptiles

There are no desktop records of rare or protected amphibians and reptiles and none were recorded during the scoping visits. The turlough habitats, damp fields and drainage ditches

at the substation location could be used by common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*.

3.3.5 Invertebrates

There are no desktop records of rare or protected invertebrates and none were recorded during the scoping visits. It is unlikely that the habitats within and bounding the Project Site are suitable for rare and protected invertebrate species.

3.3.6 Aquatic Ecology

Only one watercourse crosses the Project Site, the Cross [Roscommon] (EPA code 26C10). No desktop records of rare or protected aquatic ecology receptors were present. No otter holts were detected within 150 m of the crossing.

4.0 Summary and Recommendations

A summary is provided for each ecological receptor with recommendations shown underneath as bullet points.

4.1 Designated Nature Conservation Sites

There could be potential groundwater links to three nearby SACs. GWDTE QI habitats could be affected by accidental spread of pollution from surface run-off of silt and/or fuel/oil leaks from construction machinery.

There is one downstream hydrological link to one SAC and overlapping SPA. Riparian QI habitats such as alluvial forests and wetlands could be affected by downstream pollution and accidental spread of invasive plant species.

There are potential ecological connections to two SACs, as mobile otter could travel along watercourses to the Project Site. Any downstream pollution could affect ex-situ populations via depletion of prey species. Direct disturbance to holts nearby the Cross [Roscommon] watercourse could also affect breeding otters.

Mobile ex-situ birds from all nearby SPAs, one NHA and one pNHA could be affected by disturbance or displacement if they are found to use the habitats at the Project Site.

Recommendations:

- The hydrological consultants should investigate groundwater links to the SACs named in section 3.1.
- Appropriate mitigation should be outlined in the Water and Biodiversity EIAR chapters and AA as required. This will be dependent on the results of the current and planned surveys, as well as the hydro- and hydrogeological assessment.
- Recommendations for otter, birds and invasive plants are outlined in relevant sections below.
- Given that there are clear hydrological, and potential ecological and hydrogeological links to European sites, it is likely that preparation of an NIS will be required.

4.2 Habitats

Nearby GWDTE turlough habitats could be affected by pollution and disruption to groundwater and surface water levels. The same is true for the Cross [Roscommon] river.

Higher value terrestrial habitats such as hedgerows, treelines and stonewalls could be permanently or temporarily lost due to the Project.

Recommendations:

- The extended habitat survey should investigate whether the turlough habitats near the electricity substation shares links with the Annex I type via dedicated botanical surveys. This is item 1 and 2 from Table 2 (Indicative Fees for Additional Items) from our original proposal. This item has now been completed.
- The Water EIAR chapter should fully assess whether there are hydro- or hydrogeological connections between the Project and the turlough habitats.
- Appropriate mitigation should be outlined in the Water and Biodiversity EIAR chapters as required.
- Hedgerows, treelines and stonewalls due to be lost will need to be replaced as part of compensatory planting / creation within the Project Site as recommended by County Roscommon's Development Plan[6]. This could also include enhancing the electricity substation area via planting new hedgerows to provide screening.

4.3 Plants

Invasive Japanese knotweed and non-native box honeysuckle, montbretia and snowberry could be spread along the cable route, which could have implications for the EIAR and the AA.

Recommendations:

- Invasive and non-native species should be searched for during the extended habitat survey, as some could have been missed because the first scoping visit was undertaken outside the optimal botanical survey season. This item has now been completed.
- An invasive species management plan should be submitted as recommended by County Roscommon's Development Plan[6]. This should either included with the EIAR or submitted post-planning consent.

4.4 Birds

Nesting, roosting and foraging QI and non-QI birds could be disturbed or displaced by the Project (see section 4.1), with turloughs, hedgerows and treelines representing the most important habitats for birds. Key groups include wildfowl using turlough habitats and passerines breeding in hedgerow and treelines.

Recommendations:

- The feeding distribution surveys completed will help provide the relevant ornithological baseline information for assessment within the EIAR biodiversity chapter and AA.
- The extended habitat survey should search for any nests or nesting habitat for QI birds within the development footprint to be conducted during the bird nesting season 1st March to 31st August. This item has now been completed.
- No additional bird surveys are recommended but the extended habitat survey should check for any nesting birds within the development footprint. This item has now been completed.

[6] https://www.rosdevplan.ie/roscommon-county-development-plan-2022-2028/ Last accessed 24/07/2024

- Appropriate mitigation measures should be outlined in the Biodiversity EIAR chapter as required.
- Enhancement measures should be considered such as swift towers and bird boxes within the Project Site as recommended by County Roscommon's Development Plan[6].

4.5 Mammals

No terrestrial mammal signs or sightings were recorded by the scoping visits. However, there were a few trees with low-moderate potential for bat roosts. Thus, bat roosts could be lost due to the Project.

Recommendations (note otters are considered under aquatic ecology):

- The extended habitat survey should search for any mammals that could have moved into the Project Site in the interim period. This item has now been completed.
- A full roost inspection of moderate potential bat roosts should be undertaken as part of the extended habitat survey in 2024 and depending on these results, emergence surveys undertaken if required. This item has now been completed.
- Appropriate mitigation measures should be outlined in the Biodiversity EIAR chapter as required.
- Enhancement measures should be considered such as bat boxes within the Project Site as recommended by County Roscommon's Development Plan[6].

4.6 Amphibians and Reptiles

No amphibians or reptiles were recorded by the scoping visits. However, if any are breeding within wet habitats near the electricity substation these could be lost or damaged by the Project.

Recommendations:

- Amphibians and reptiles should be searched for during the extended habitat survey. This item has now been completed.
- Appropriate mitigation measures should be outlined in the Biodiversity EIAR chapter as required.
- Enhancement measures should be considered such as provision of amphibian hibernacula within the Project Site as recommended by County Roscommon's Development Plan[6].

4.7 Invertebrates

No rare or protected invertebrates were recorded by the scoping visits and it is unlikely that any key habitats for this group will be affected by the Project.

Recommendations:

- Rare and protected invertebrates should be searched for during the extended habitat survey. This item has now been completed.
- Appropriate mitigation measures should be outlined in the Biodiversity EIAR chapter as required.
- Enhancement measures should be considered such as insect hotels and managing field margins for pollinators within the Project Site as recommended by County Roscommon's Development Plan[6].

4.8 Aquatic Ecology

There are no desktop records of rare or protected aquatic receptors at the location where the Cross [Roscommon] watercourse is intersected by the electricity cable route.

Recommendations:

- Surveys should be undertaken 150 m either side of the watercourse crossing to search for otter holts. This will require permission from third-party landowners. This could be undertaken as part of the extended habitat survey. This item has now been completed.
- Appropriate mitigation measures should be outlined in the Water and Biodiversity EIAR chapters as required.

Appendix A Designated Nature Conservation Sites

Constraints Report

Moyvannan Electricity Substation and Grid Route

Galetech Energy Services

SLR Project No.: 501.065165.00001

24 July 2024

Table A-1 shows the designated nature conservation sites recorded within 15 km of the Project Site. The legal protection of an SAC or SPA exceeds the limited protection given to a pNHA and so where a pNHA fully overlaps with an SAC or SPA, the pNHA has not been reported.

Table A-1: Designated Nature Conservation Sites within 15 km of Project Site

Site Code	Site Name	Distance and Direction from Project Site	Qualifying Interests	Likely Connectivity
SACs				
002339	Ballynamona Bog and Corkip Lough SAC	0.9 km south	• Turloughs [3180] • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the Rhynchosporion [7150] • Bog woodland [91D0]	• Potential remote hydrogeological connection from Project to GWDTE turlough habitats via shared Funshinagh groundwater body
000440	Lough Ree SAC	1.9 km east	• Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Alkaline fens [7230] • Limestone pavements [8240] • Bog woodland [91D0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	• Potential remote hydrogeological connection from Project to GWDTE fen habitats via shared Funshinagh groundwater body, although unlikely due to location of fen habitats relative to Project • Potential ecological connection via mobile ex situ otter

Site Code	Site Name	Distance and Direction from Project Site	Qualifying Interests	Likely Connectivity
			• *Lutra lutra* (Otter) [1355]	
000611	Lough Funshinagh SAC	2 km northwest	• Turloughs [3180] • Rivers with muddy banks with *Chenopodion rubri* p.p. and Bidention p.p. vegetation [3270]	• Potential remote hydrogeological connection from Project to GWDTE turlough habitats via shared Funshinagh groundwater body
001625	Castlehampson Esker SAC	3.8 km south	• Turloughs [3180] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	• None
000610	Lough Croan Turlough SAC	5.3 km northwest	• Turloughs [3180]	• None
002214	Killeglan Grassland SAC	7.2 km southwest	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	• None
000216	River Shannon Callows SAC	8.8 km southeast	• *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Alkaline fens [7230] • Limestone pavements [8240] • Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • *Lutra lutra* (Otter) [1355]	• Downstream hydrological connection via Cross [Roscommon] river (10.1 km instream distance). • Potential ecological connection via mobile ex situ otter
001637	Four Roads Turlough SAC	10.6 km northwest	• Turloughs [3180]	• None

Site Code	Site Name	Distance and Direction from Project Site	Qualifying Interests	Likely Connectivity
002337	Crosswood Bog SAC	12.4 km southeast	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120]	• None
000609	Lisduff Turlough SAC	12.4 km northwest	• Turloughs [3180]	• None
002336	Carn Park Bog SAC	14.1 km southeast	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120]	• None
000448	Fortwilliam Turlough SAC	14.9 km northeast	• Turloughs [3180]	• None
SPAs				
004064	Lough Ree SPA	1.9 km east	• Little Grebe (*Tachybaptus ruficollis*) [A004] • Whooper Swan (*Cygnus cygnus*) [A038] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Mallard (*Anas platyrhynchos*) [A053] • Shoveler (*Anas clypeata)* [A056] • Tufted Duck (*Aythya fuligula*) [A061] • Common Scoter (*Melanitta nigra*) [A065] • Goldeneye (*Bucephala clangula*) [A067] • Coot (*Fulica atra*) [A125] • Golden Plover (*Pluvialis apricaria*) [A140] • Lapwing (*Vanellus vanellus*) [A142] • Common Tern (*Sterna hirundo*) [A193] • Wetland and Waterbirds [A999]	• Potential ecological connection via mobile ex situ birds

Site Code	Site Name	Distance and Direction from Project Site	Qualifying Interests	Likely Connectivity
004139	Lough Croan Turlough SPA	5.4 km northwest	• Shoveler (*Anas clypeata*) [A056] • Golden Plover (*Pluvialis apricaria*) [A140] • Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] • Wetland and Waterbirds [A999]	• Potential ecological connection via mobile ex situ birds
004097	River Suck Callows SPA	8.8 km west	• Whooper Swan (*Cygnus cygnus*) [A038] • Wigeon (*Anas penelope*) [A050] • Golden Plover (*Pluvialis apricaria*) [A140] • Lapwing (*Vanellus vanellus*) [A142] • Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] • Wetland and Waterbirds [A999]	• Potential ecological connection via mobile ex situ birds
004096	Middle Shannon Callows SPA	8.8 km southwest	• Whooper Swan (*Cygnus cygnus*) [A038] • Wigeon (*Anas penelope*) [A050] • Corncrake (*Crex crex*) [A122] • Golden Plover (*Pluvialis apricaria*) [A140] • Lapwing (*Vanellus vanellus*) [A142] • Black-tailed Godwit (*Limosa limosa*) [A156] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Wetland and Waterbirds [A999]	• Downstream hydrological connection via Cross [Roscommon] river (10.1 km instream distance) • Potential ecological connection via mobile ex situ birds
004140	Four Roads Turlough SPA	10.6 km northwest	• Golden Plover (*Pluvialis apricaria*) [A140] • Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] • Wetland and Waterbirds [A999]	• Potential ecological connection via mobile ex situ birds
NHAs				

Site Code	Site Name	Distance and Direction from Project Site	Qualifying Interests	Likely Connectivity
001623	Carrickynaghtan Bog NHA	10.5 km southeast	• Peatlands [4]	• None
000222	Suck River Callows NHA	8.8 km west	• Peatlands [4] • Birds [12]	• As for SPA of same name
001448	Forthill Bog NHA	13.1 km northeast	• Peatlands [4]	• None
002344	Annaghbeg Bog NHA	13.1 km southwest	• Peatlands [4]	• None
001244	Castle Ffrench East Bog NHA	15 km west	• Peatlands [4]	• None
pNHAs				
001634	Feacle Turlough pNHA	2.9 km west	• Turloughs	• None
001443	Lough Slawn pNHA	10.7 km northeast	• Habitat diversity	• None
001630	Cranberry Lough pNHA	11.1 km southwest	• Lake habitats, sedge warbler (*Acrocephalus schoenobaenus*), reed bunting (*Emberiza schoeniclus*), common snipe (*Gallinago gallinago)*, Eurasian curlew (*Numenius arquata*), little grebe (*Tachybaptus rufficolis*), moorhen (*Gallinula chloropus*) and whooper swan (*Cygnus cygnus*).	• Potential ecological connection via mobile ex situ birds
001732	Waterstown Lake pNHA	12.2 km east	• Fen and peat habitats	• None

Appendix B Figures

Constraints Report

Moyvannan Electricity Substation and Grid Route

Galetech Energy Services

SLR Project No.: 501.065165.00001

24 July 2024

592000 594000 596000 598000 600000

750000

748000

746000

CURRAGHBOY

Figure 1.2

Figure 1.4

Figure 1.3

Figure 1.5

Figure 1.6

BRIDESWELL

N61

KILTOOM

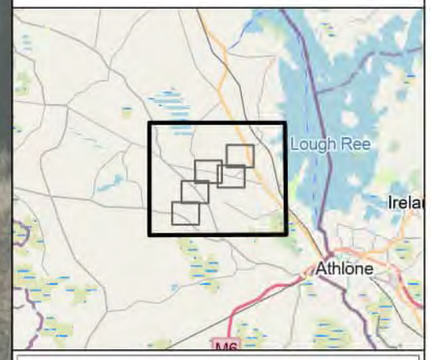
N

LEGEND

Land Ownership Boundary

Proposed Grid Route

Proposed Substation



0 1 2

Kilometres

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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

PROJECT SITE

FIGURE 1.1

Scale 1:25,000 @ A3

Date JULY 2024

501.065165.00001.0003.1 Project Site

597000
597500
598000
749000
748500
N
L2008
L7554
N61
L2019
0
250
500
Metres
LEGEND
Land Ownership Boundary
Proposed Grid Route
Proposed Substation
Lough Ree
Irela
Athlone
M6
GALETECH
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CONSTRAINTS REPORT
PROJECT SITE
FIGURE 1.2
Scale 1:5,000 @ A3
Date JULY 2024
501.065165.00001.0003.1 Project Site

596000
596500
597000
597500
747500
747000

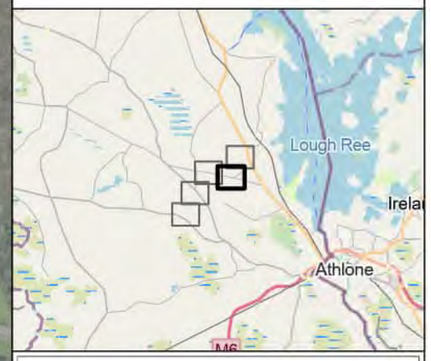
N

L2019

L2018

LEGEND

Proposed Grid Route



0
250
500
Metres

501.065165.00001.0003.1 Project Site

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SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

PROJECT SITE

FIGURE 1.3

Scale 1:5,000 @ A3

Date JULY 2024

595000
595500
596000
748000
747500
N
L2017
L2018
0
250
500
Metres
LEGEND
Proposed Grid Route
Lough Ree
Athlone
M6
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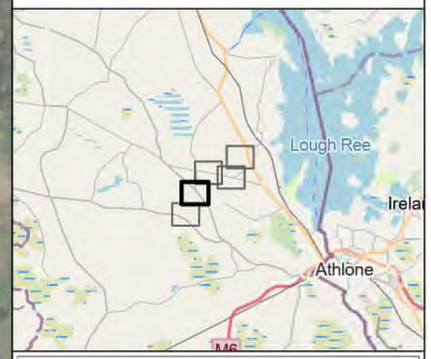
PROJECT SITE
FIGURE 1.4
Scale
1:5,000 @ A3
Date
JULY 2024
501.065165.00001.0003.1 Project Site

LEGEND

Proposed Grid Route



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CONSTRAINTS REPORT

PROJECT SITE

FIGURE 1.5

Scale	Date
1:5,000 @ A3	JULY 2024

501.065165.00001.0003.1 Project Site

593500
594000
594500
745500
745000
L7541
R363
L2024
BRIDESWELL
N
0
250
500
Metres
LEGEND
Proposed Grid Route
Lough Ree
Athlone
GALETECH
ENERGY SERVICES
SLR
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WINDY ARBOUR
DUBLIN D14 N2Y7
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SUBSTATION AND GRID ROUTE
CONSTRAINTS REPORT
PROJECT SITE
FIGURE 1.6
Scale 1:5,000 @ A3
Date JULY 2024
501.065165.00001.0003.1 Project Site

585000 600000 615000

765000 750000 735000

N60 N63 N61 N55 N6 N62 M6

Roscommon Athlone Ballymahon Moate Ireland

Lisnanarriagh Bog NHA
Fortwilliam Turlough SAC
Forthill Bog NHA
Ballinturly Turlough SAC
Funshin Bog NHA
Suck River Callows NHA
Aughrim Bog NHA
Aughrim (Aghrane) Bog SAC
Lisduff Turlough SAC
Kilmore Bog NHA
Ghrane Woods
Ballygar Bog NHA
Ballygar (Aghrane) Bog SAC
Four Roads Turlough SAC
Four Roads Turlough SPA
Lough Croan Turlough SAC
Lough Croan Turlough SPA
Lough Funshinagh SAC
Lough Ree SPA
Lough Ree SAC
Lough Ree
Castle Ffrench East Bog NHA
Castle Ffrench West Bog NHA
River Suck Callows SPA
Waterstown Lake pNHA
Feacle Turlough pNHA
Killeglan Grassland SAC
Ballynamona Bog and Corkip Lough SAC
Castlesampson Esker SAC
Ballynagrenia And Ballinderry Bog NHA
Crosswood Bog SAC
Carn Park Bog SAC
Carrickynaghtan Bog NHA
River Shannon Callows SAC
Annaghbeg Bog NHA
Crit Island West NHA
Killure Bog NHA
Cranberry Lough pNHA
Clonydonnin Bog NHA
Mongan Bog SPA
Pilgrim's Road Esker SAC
Mongan Bog SAC
Fin Lough (Offaly) SAC
Clara Bog SAC
Lough Nanag Esker pNHA
Glenloughaun Esker SAC
Culliaghmore
Middle Shannon Callows SPA
Ballinasloe

0 5 10
Kilometres

N

LEGEND

- Land Ownership Boundary
- Proposed Grid Route
- Land Ownership Boundary & Proposed Grid Route 15 km Buffer

Designations

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)

Galway Ireland Limerick Kilkenny

GALETECH ENERGY SERVICES

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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

DESIGNATED NATURE CONSERVATION SITES

FIGURE 2

Scale 1:150,000 @ A3

Date JULY 2024

501.065165.00001.0004.1 Designated Sites

592000 594000 596000 598000 600000

750000

748000

746000

N

Figure 1.2

Figure 1.4

Figure 1.3

Figure 1.5

Figure 1.6

CURRAGHBOY

KILTOOM

BRIDESWELL

N61

Cross River

Cross River

0 1 2

Kilometres

LEGEND

Land Ownership Boundary

Proposed Grid Route

Proposed Substation

Surface Water Feature

Watercourse

Turlough

Summer Roost Suitability

Moderate

Low

Negligible

Bird Observations

Curlew

Buzzard

Lapwing Heard

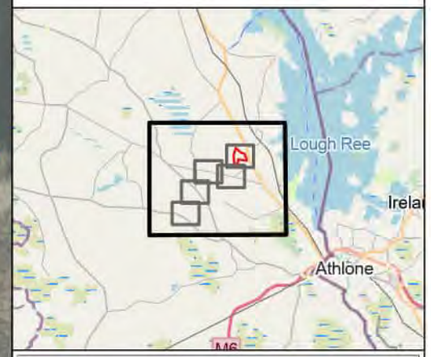
Invasive Plant Species

Box Honeysuckle

Japanese Knotweed

Montbretia

Snowberry



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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

SURVEY RESULTS

FIGURE 3.1

Scale 1:25,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results

597000
597500
598000
749000
748500
N
L2008
L7554
N61
L2019
0
250
500
Metres

LEGEND

- Land Ownership Boundary
- Proposed Grid Route
- Proposed Substation

Surface Water Feature

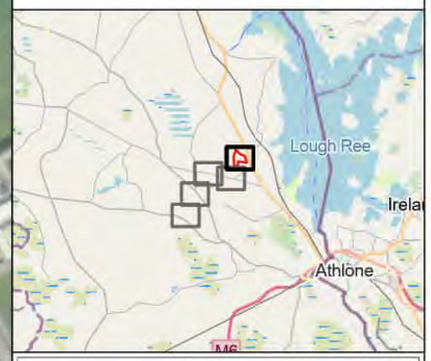
- Turlough

Summer Roost Suitability

- Moderate
- Low
- Negligible

Bird Observations

- Curlew
- Buzzard
- Lapwing Heard



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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

SURVEY RESULTS

FIGURE 3.2

Scale 1:5,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results

596000 596500 597000 597500

747500 747000

N

L2019

L2018

LEGEND

Proposed Grid Route

Surface Water Feature

Turlough

Bird Observations

Curlew

Buzzard

Lapwing Heard

Invasive Plant Species

Japanese Knotweed

0 250 500

Metres

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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

SURVEY RESULTS

FIGURE 3.3

Scale 1:5,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results

595000
595500
596000
748000
747500
N
L2017
L2018
Cross River
0
250
500
Metres

LEGEND

Proposed Grid Route

Surface Water Feature

Watercourse

Bird Observations

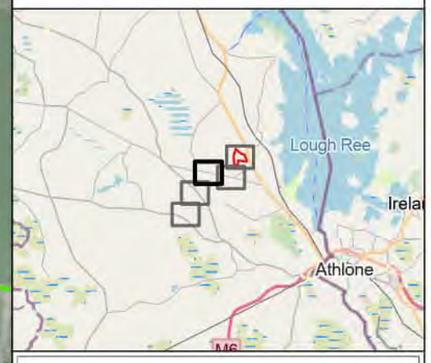
Curlew

Buzzard

Lapwing Heard

Invasive Plant Species

Montbretia



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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

SURVEY RESULTS

FIGURE 3.4

Scale 1:5,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results

594000 594500 595000

747000 746500 746000

R362

L7541

Cross River

N

LEGEND

Proposed Grid Route

Surface Water Feature

Watercourse

Bird Observations

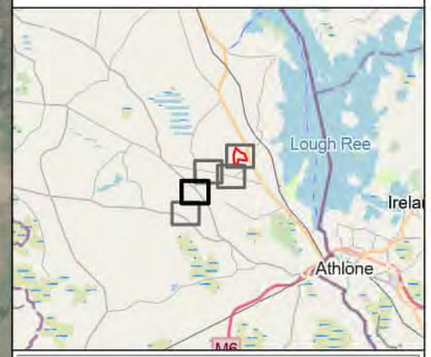
Curlew

Buzzard

Lapwing Heard

Invasive Plant Species

Box Honeysuckle



0 250 500

Metres

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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

SURVEY RESULTS

FIGURE 3.5

Scale 1:5,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results

593500
594000
594500
745500
745000
L7541
R363
BRIDESWELL
L2024
0
250
500
Metres
N

LEGEND

Proposed Grid Route

Surface Water Feature

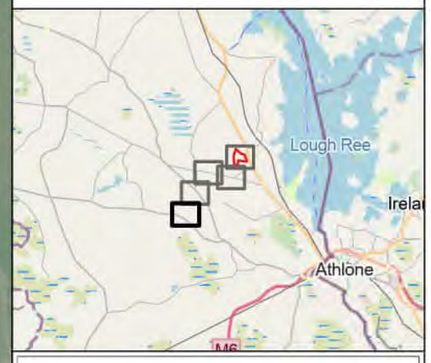
Watercourse

Bird Observations

Curlew

Buzzard

Lapwing Heard



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MOYVANNAN WIND FARM
SUBSTATION AND GRID ROUTE

CONSTRAINTS REPORT

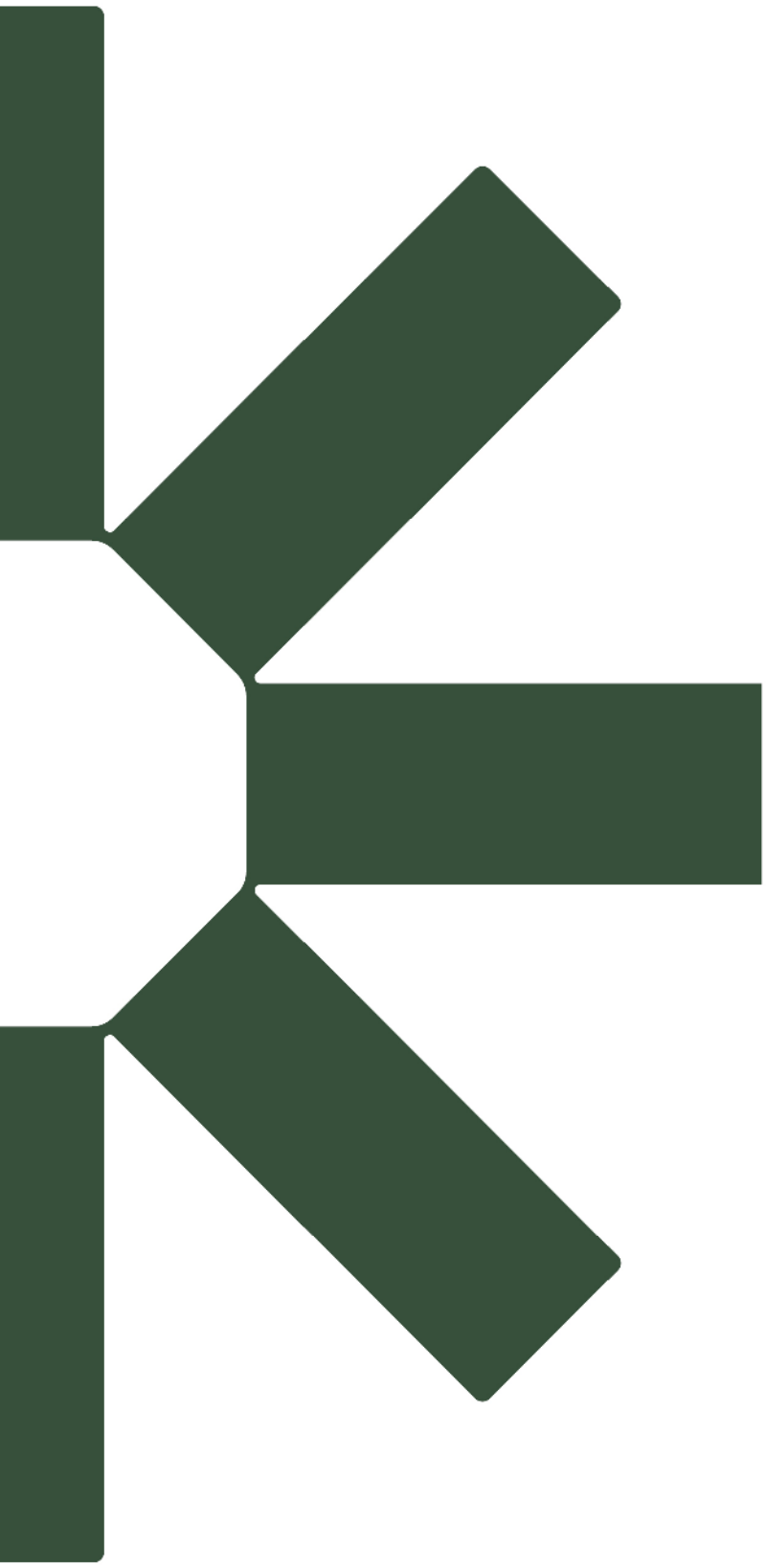
SURVEY RESULTS

FIGURE 3.6

Scale 1:5,000 @ A3

Date JULY 2024

501.065165.00001.0005.1 Survey Results



Making Sustainability Happen

Annex 3 –

Land, Soil & Water Scoping Report

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MOYVANNAN ELECTRICITY SUBSTATION, CO. ROSCOMMON

LAND/SOILS AND WATER INITIAL SCREENING/SCOPING ASSESSMENT

FINAL REPORT

Prepared for:
GALETECH ENERGY SERVICES

Prepared by:
Hydro-Environmental Services

DOCUMENT INFORMATION

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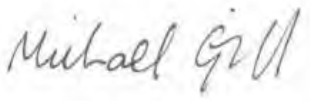
Project Number:	P1500-4
Project Reporting History:	P1500
Current Revision No:	P1500-4_Rev F1
Author(s):	MICHAEL GILL JENNY LAW
Signed:	 _____ Michael Gill B.A., B.A.I., M.Sc., MIEI Managing Director – Hydro-Environmental Services

Disclaimer:
This report has been prepared by HES with all reasonable skill, care and diligence within the terms of the contract with the client, incorporating our terms and conditions and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. The flood risk assessment undertaken as part of this study is site specific and the report findings cannot be applied to other sites outside of the survey area which is defined by the site boundary. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

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TABLES

FIGURES

1 INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by Galetech Energy Services (GES) on behalf of Energia Renewables ROI, to undertake a preliminary review of the proposed Moyvannan Electricity Substation, Co. Roscommon.

The purpose of this screening/scoping assessment is to identify potential receptors in the local (and downstream) geological, hydrological and hydrogeological environments that could potentially be affected by the proposed development works. A brief overview of the potential receptors is described along with their importance / sensitivity, likelihood of impact and if mitigation is likely to be required.

The main objectives of the screening assessment are:

- To complete a desk study review of available information relating to the baseline geological, hydrological and hydrogeological regime in the area of the Proposed Development;
- To identify any geological, hydrological and hydrogeological receptors/constraints that may affect the Proposed Development;
- To identify potential downstream receptors such as designated sites/habitats, geological heritage sites and drinking water supplies;
- To Identify receptors scoped in for further assessment in the EIAR; and,
- To determine likelihood of impact and if mitigation is likely to be required.

This document is based on a desk study assessment, and visual information gathered during a site visit competed by Michael Gill on 22nd February 2023.

APEX Geophysics Limited carried out a geophysical survey at the site of the electricity substation between the 24th and 26th April 2023. Additionally, site investigation works were carried out by Ground Investigations Ireland Ltd at the site between August and October 2023. These works included trial pitting, cable percussion boreholes, Rotary Core Boreholes and the installation of 1 no. groundwater monitoring well.

Initial findings from the geophysical survey and site investigations are summarised in Section 3 below.

1.2 DEVELOPMENT DESCRIPTION

The Moyvannan Electricity Substation will be located in southeast County Roscommon, ~8.5km northwest of Athlone, ~2.5km northwest of Kiltoom and ~8km east of the Seven Hills Wind Farm. A Site Location map is shown below as Figure A.

The Proposed Development will comprise the construction and operation of a 110 kilovolt (kV) electricity substation and c. 7.5km of underground electricity line which will connect to the Seven Hills Wind Farm grid connection infrastructure. The electricity substation will, in turn, connect to the existing Athlone-Lanesborough 110kV overhead electricity line thus facilitating the export of electricity generated at the Seven Hills Wind Farm to the national electricity network.

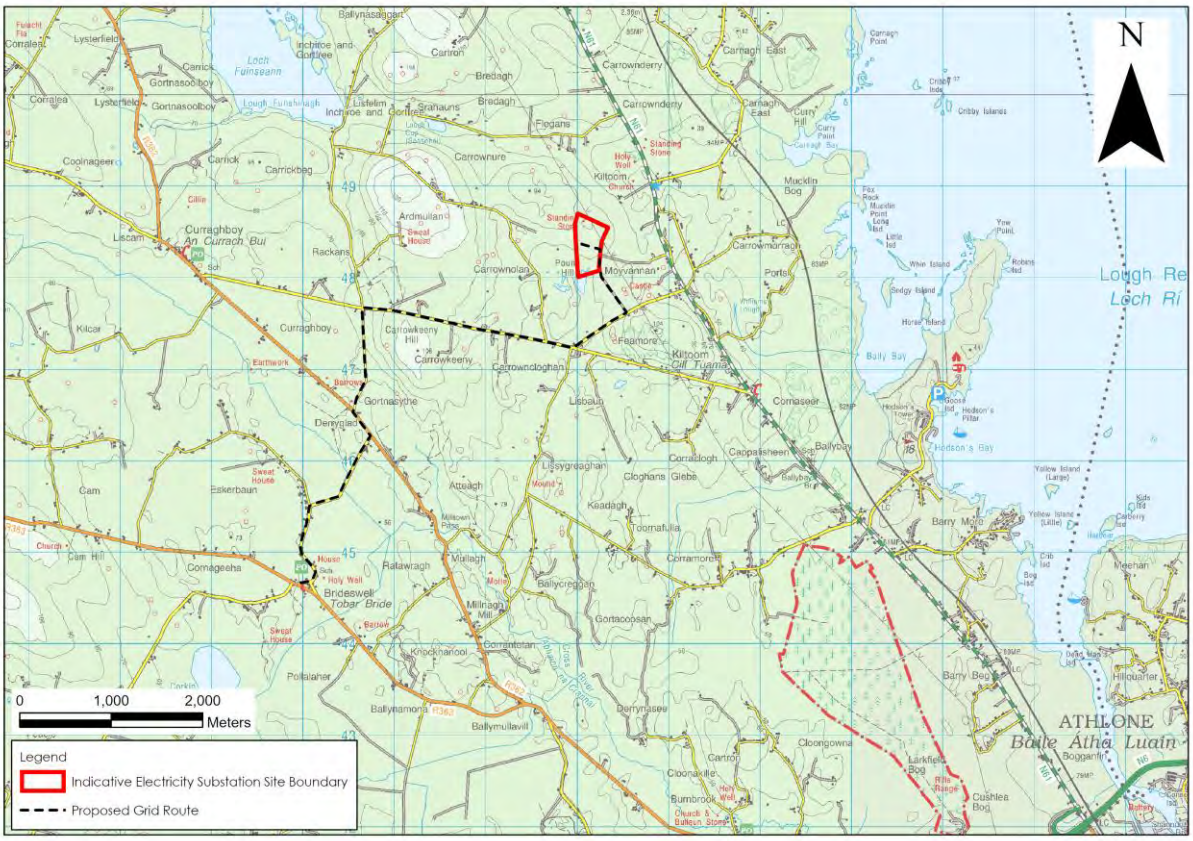


Figure A: Site Location Map

2 DESK STUDY

In order to scope for the assessment of land, soils and geology and water EIAR chapters, we have compiled the following local geological and hydrological information presented in Table A.

Table A: Environmental conditions at the site.

Physical Feature	Details
Topography	Topography at the substation site ranges from ~75 - 81 metres above Ordnance Datum (mOD) with highest elevations found in the north. Topography along the electricity line is hilly and hummocky associated with areas of gravel deposits which results in undulating local topography. Ground elevations range from ~60 – 90mOD along the electricity line.
Historical mapping	25" and 6" base mapping of the local area has been reviewed. There is no identifiable text on the available base mapping which indicates the presence of any notable features in the vicinity of the proposed substation. Nothing else of note was recorded along the electricity line.
Geology	The EPA soils map (www.epa.ie) indicates the presence of shallow, well drained, mainly basic mineral soil (BminSW) in the northeastern portion of the substation. Meanwhile, the southwest of the proposed substation and much of the surrounding area are mapped to be overlain by deep well drained, mainly basic mineral soils (BminDW). Much like the soils mapped in the area of the proposed substation, the dominant soils mapped along the northern section of the electricity line are deep well drained, mainly basic mineral soils (BminDW). Meanwhile, the southern section is mapped to be predominantly overlain by shallow, well drained, mainly basic mineral soil (BminSW). The EPA also map the presence of Cut Peat. After inspection of aerial imagery its noted that much of this cut peat has been reclaimed for grassland. The GSI subsoils map for the substation area (www.gsi.ie) shows that there is little to no subsoil coverage in the northwest of the proposed substation location. The GSI map this area to be underlain by bedrock outcrop or subcrop. Meanwhile, Till derived from limestones are mapped to underlie the southwestern section of the proposed substation and the surrounding lands. Till derived from limestones are also predominantly mapped to underly the northern section of the electricity line. The southern portion of the electricity line is mostly underlain by gravels derived from limestones with some areas mapped as eskers comprised of gravels of basic reaction. The GSI also map the presence of Cut Peat. A subsoil geology map is shown below as Figure B. The GSI bedrock geology map (www.gsi.ie) of the local area shows that the proposed substation location is underlain by an isolated section of Carboniferous, Mudbank Limestone, that's surrounded by undifferentiated Visean Limestones. The electricity line is also mapped to be underlain by these undifferentiated Visean Limestones. There are no mapped faults in the area of the proposed substation or along the electricity line and according to the GSI bedrock mapping of the local area there are no areas of mapped bedrock outcrop. There are no mapped karst features mapped within the immediate vicinity of the proposed substation or along the electricity line (www.gsi.ie). However, there are karst features mapped in the surrounding lands. There are 2 no. enclosed depressions mapped ~550m west of the electricity line and the substation in the north of the study area. Additionally, there are 4 no. Springs mapped ~1.4km downstream of where the electricity line traverses over the

	Cross River. A bedrock geology map with mapped GSI karst features is shown below as Figure C. Following inspection of aerial imagery, it seems there may possibly be more wet/ karstic features (unmapped) in the area surrounding the proposed substation location.
Land use	Land use in the area is predominantly agricultural, mapped as Pastures under the Corine 2018 mapping (www.epa.ie). The proposed substation location is situated within an agricultural field whilst the majority of the electricity line is proposed along existing roads.
Climate	The SAAR (Standard Average Annual Rainfall 1981 - 2010) recorded at Lecarrow G.S (E 196,900, N 254,900), 6.35km north of the site, is ~961mm (www.met.ie).
Surface Water Hydrology	The site is located within 2 no. regional surface water catchments. The north of the site, including the proposed substation and the north of the electricity line, are located in the Upper Shannon (Lough Ree) surface water catchment and Hydrometric Area 26E. Meanwhile, the south of the electricity line is mapped in Hydrometric Area 26G and the Upper Shannon surface water catchment. Both catchments are situated in the Shannon Irish River Basin District. Within Hydrometric Area 26E, all surface water drains to the east towards Lough Ree, however, there is a very low density of surface water features in the vicinity of the site. The substation and the very northern area of the electricity line are mapped in the Shannon (Upper)_110 WFD river sub basin. As the electricity line travels south it enters the Ballybay_010 WFD river sub basin. The electricity line continues westwards and re-enters the Shannon (Upper)_110 WFD river sub basin. No EPA mapped watercourses are mapped in the vicinity of the Proposed Development within this catchment. Further westwards, within Hydrometric Area 26G, the electricity line is mapped in the Cross (Roscommon)_010 WFD river sub basin. The electricity line then turns southwards and traverses between the Cross (Roscommon)_020 and Cross (Roscommon)_010 WFD river sub basins, before reaching the Seven Hills Wind Farm grid connection infrastructure at Brideswell town. There is 1 no. watercourse crossing along an EPA mapped watercourse, named the Cross River. The electricity line crosses along a local road in the townland of Derryglad. Downstream of the electricity line the Cross River discharges into the Upper Shannon River ~11km southeast of the site.
Hydrogeology	The site is located within the Funshinagh Groundwater Body (GWB) which has a karstic limestone flow regime. The main aquifer category in this GWB and underlying much of the Proposed Development is Regionally Important Karstified Aquifer dominated by conduit flow (Rkc). However, a number of small areas occur throughout this GWB which are classified as being Locally Important aquifers - moderately productive only in local zones (Ll), including an area in the north of the site underlying the proposed substation location, correlating with the mapped mudbank Limestone. The Brideswell gravel deposits are approximately 750m east of where the electricity line is mapped within the townland of Derryglad. Although the gravels are classified as a Locally Important Gravel Aquifer, groundwater has generally not been encountered during excavations of nearby sand and gravel pits due to their high elevation. No wells are mapped in these deposits, and there are no data to determine the depth of any groundwater saturation. Given the higher relief and absence of existing groundwater abstractions, this unit is not considered to have a saturated thickness adequate to yield significant groundwater supplies. As such, these

	sand/gravel deposits are not classified as an aquifer (GSI, 2003). These gravels will however provide a permeable pathway for recharge to the underlying karstic aquifer. They can also act to augment storage in the karstic aquifer (GSI, 2003). Groundwater vulnerability ranges from "Moderate" to "High" in the south of the electricity line to "Extreme-E and Extreme-X" in the northern section of the grid route and in the vicinity of the substation. High groundwater recharge coefficients are generally mapped by the GSI throughout the site, ranging from 42.5 – 85%. Average recharge is mapped from 362 - 513 mm/year, given the high permeability subsoils in the area. Groundwater in this body generally shows a rapid response to recharge (GSI, 2003).
Groundwater Chemistry	The Funshinagh GWB characterisation report (GSI, 2003) states that: *"The hydrochemistry of the carbonate rocks, especially pure limestones, is dominated by calcium and bicarbonate ions. Hardness can vary from slightly hard to very hard (typically ranging between 380–450 mg/l). Spring waters tend to be softer, as throughput is often quicker with less time for the dissolution of minerals into the groundwater. Groundwater alkalinity is variable but can be high. Alkalinity is generally less than hardness indicating that ion exchange (where calcium or magnesium are replaced by sodium) is not a significant process.* *These hydrochemical signatures are characteristic of clean limestone and are frequently associated with limescale problems. Like hardness and alkalinity, electrical conductivities (EC) can vary greatly. Typical limestone groundwater conductivities are of the order 500–700 µS/cm. Lower values suggest that groundwater residence times are very short. In some springs and boreholes in karst areas, high turbidity occurs after heavy rainfall (e.g.Killeglan PWS in the adjoining Suck South GWB to the west). Microbial pollution of groundwater in karstic aquifers is also a significant problem. Due to the high level of interaction between groundwater and surface water in karstic aquifers, microbial pollution can travel very quickly from the surface into the groundwater system. The normal filtering and protective action of the subsoil is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock."*
Groundwater Wells	No groundwater wells or boreholes are mapped by the GSI (www.gsi.ie) within the proposed substation location. The nearest GSI mapped borehole has a locational accuracy of 1km and is ~500m to the east of the proposed substation. This borehole is reported as having a moderate yield and is used for agricultural and domestic purposes. The GSI map several boreholes in the vicinity of the electricity line, particularly as it nears the townland of Brideswell. This majority of these wells have 'Poor' yield classes. There are no public or group water source protection areas mapped within the Proposed Development or in the surrounding lands. The Killeglan PWS Tobermore Spring is the nearest public water scheme located ~2.25km southwest of the south of the electricity line and ~7km southwest of the proposed substation location.
Water Framework Directive	The Funshinagh GWB is assigned "Good" status (qualitative and quantitative) under the 2016-2021 WFD round (www.catchments.ie). The Funshinagh GWB is "not at risk" of failing to meet its WFD objectives in 2027. Furthermore, no significant pressures have been identified on this GWB. Within Hydrometric Area 26E, the Shannon (Upper)_110 and the Ballybay_010 river waterbodies received "Poor" and "Moderate" status respectively for the 2016 – 2021 Cycle. The Shannon (Upper)_110 is "at risk" whilst the risk status of

	the Ballybay_010 river is "under review". The Shannon (Upper)_110 is listed as being under significant pressure from agricultural activities and from hydromorphological pressures within its catchment. The electricity line continues into Hydrometric Area 26G, and is mapped within both the Cross (Roscommon)_010 and Cross (Roscommon)_020 river sub basins which both achieved "Moderate" status and are "at risk". The Cross (Roscommon)_010 waterbody is under significant pressure from agricultural and hydromorphological issues. There are no significant pressures identified for the Cross (Roscommon)_020 waterbody.
Flood risk	There are no mapped historic or recurring flood events recorded within the site (www.floodinfo.ie) or in the surrounding lands. National Indicative Fluvial Mapping (NIFM) river flood extents for the present day are mapped along the Cross River where it traverses the electricity line. The GSI Historical Groundwater flood map and the modelled groundwater flood extents map show the occurrence of groundwater flooding ~450m to the south of the proposed substation location.
Designated sites	There are no designated sites mapped within the immediate vicinity of the site. The nearest designated sites include the Ballynamona Bog and Corkip Lough SAC (002339) located ~920m south of the very southern end of the electricity line and the Lough Ree SAC / pNHA (000440) and SPA (004064) situated ~2.3km east of the substation location. Lough Funshinagh SAC / pNHA (000611) is approximately 2.8km northwest of the substation location, whilst the Castlesampson Esker SAC / pNHA (001625) is 3.8km southwest from the very southern end of the electricity line. There are no direct hydrological connections between the Proposed Development and these designated sites. However, the proposed development has hydrological connections with the River Shannon Callows SAC/ pNHA (000216) and the Middle Shannon Callows SPA (004096) situated ~10.65km southeast of the site (as the crow flies).
Article 7 SW Abstractions	The Shannon Upper_120 river waterbody downstream of the Cross River is identified as a Drinking Water River in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007).

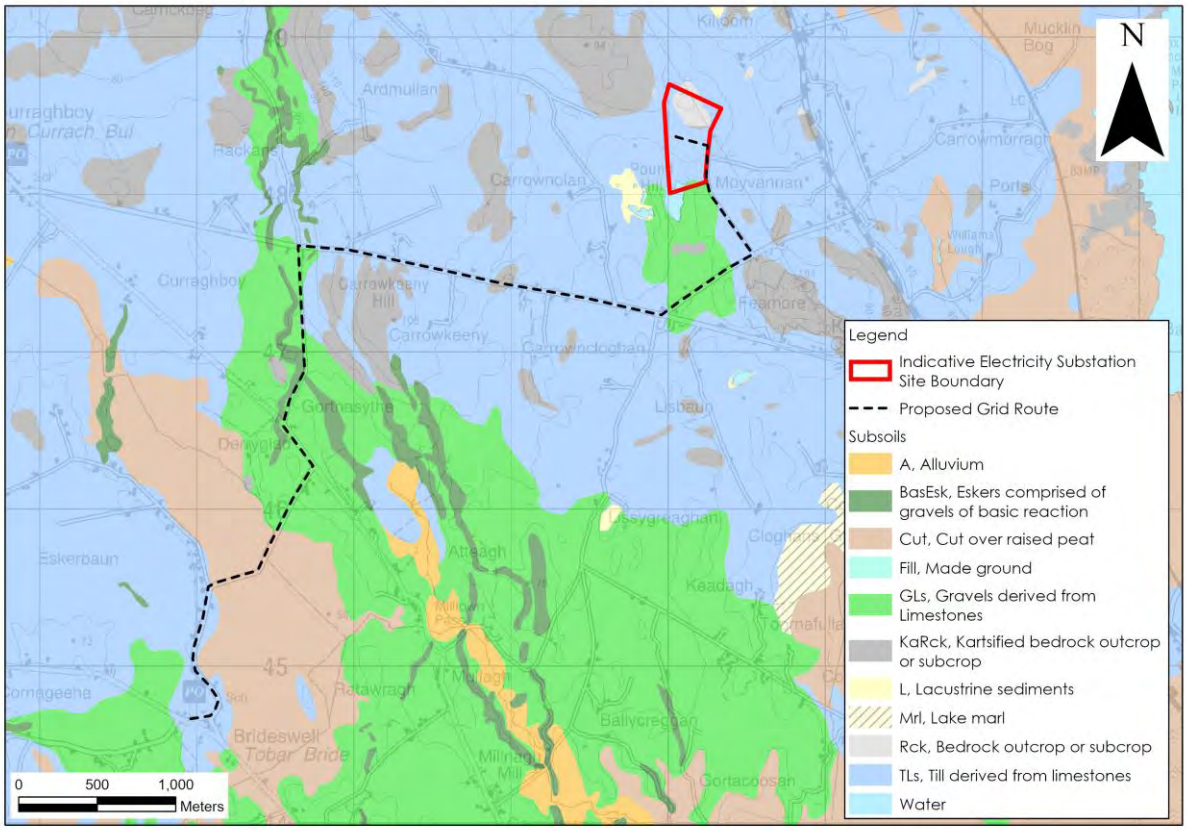


Figure B: Subsoil Geology Map

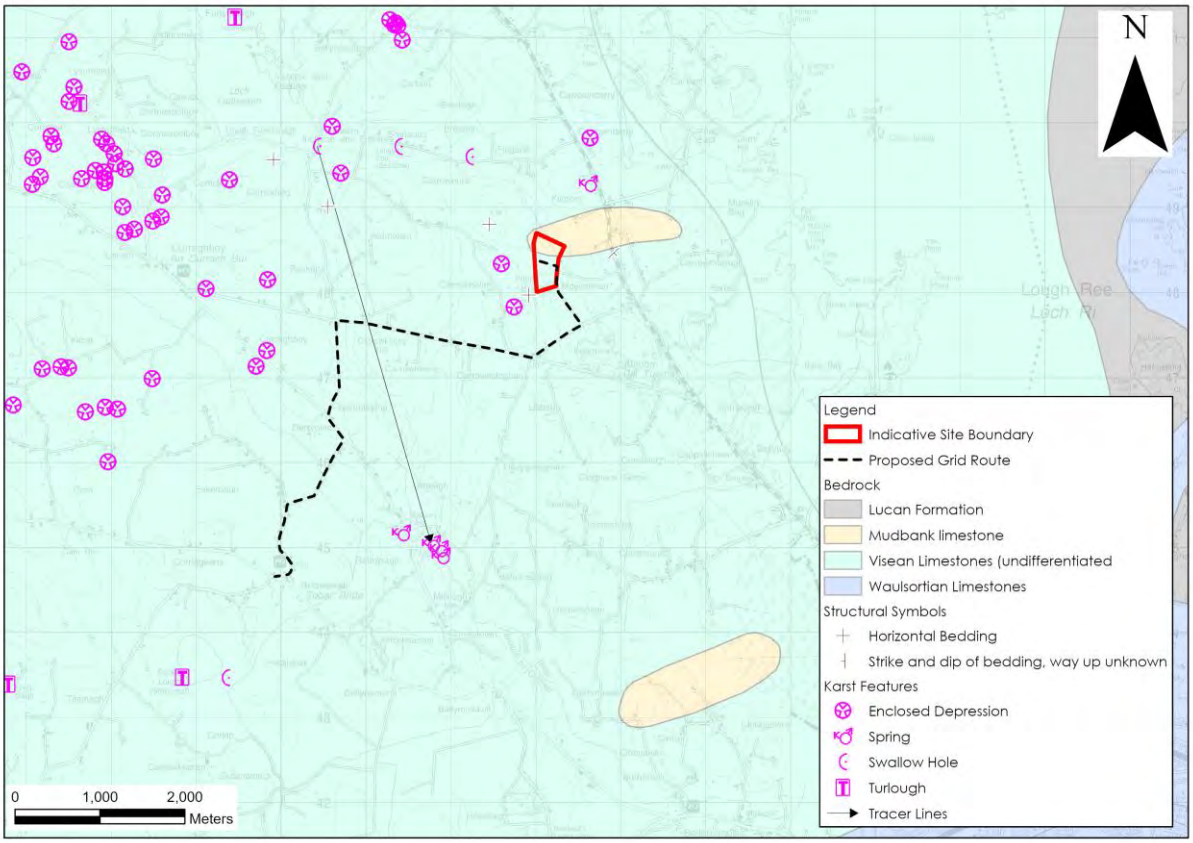


Figure C: Bedrock Geology with mapped GSI Karst Features Map

3 SUMMARY SITE INVESTIGATIONS

3.1 INTRUSIVE GROUND INVESTIGATIONS

Site investigation works were carried out by Ground Investigations Ireland Ltd. between August and October 2023 at the site. The scope of the work undertaken for this project included the following:

- 5 No. Trial Pits to a maximum depth of 4.10m BGL
- 1 No. Soakaway to determine a soil infiltration value to BRE digest 365
- 5 No. Cable Percussion boreholes to a maximum depth of 3.30m BGL
- 6 No. Rotary Core Boreholes to a maximum depth of 24.80m BGL
- Installation of 1 No. Groundwater monitoring well
- Geotechnical & Environmental Laboratory testing

A Site Investigation Layout map is shown in Figure D below.

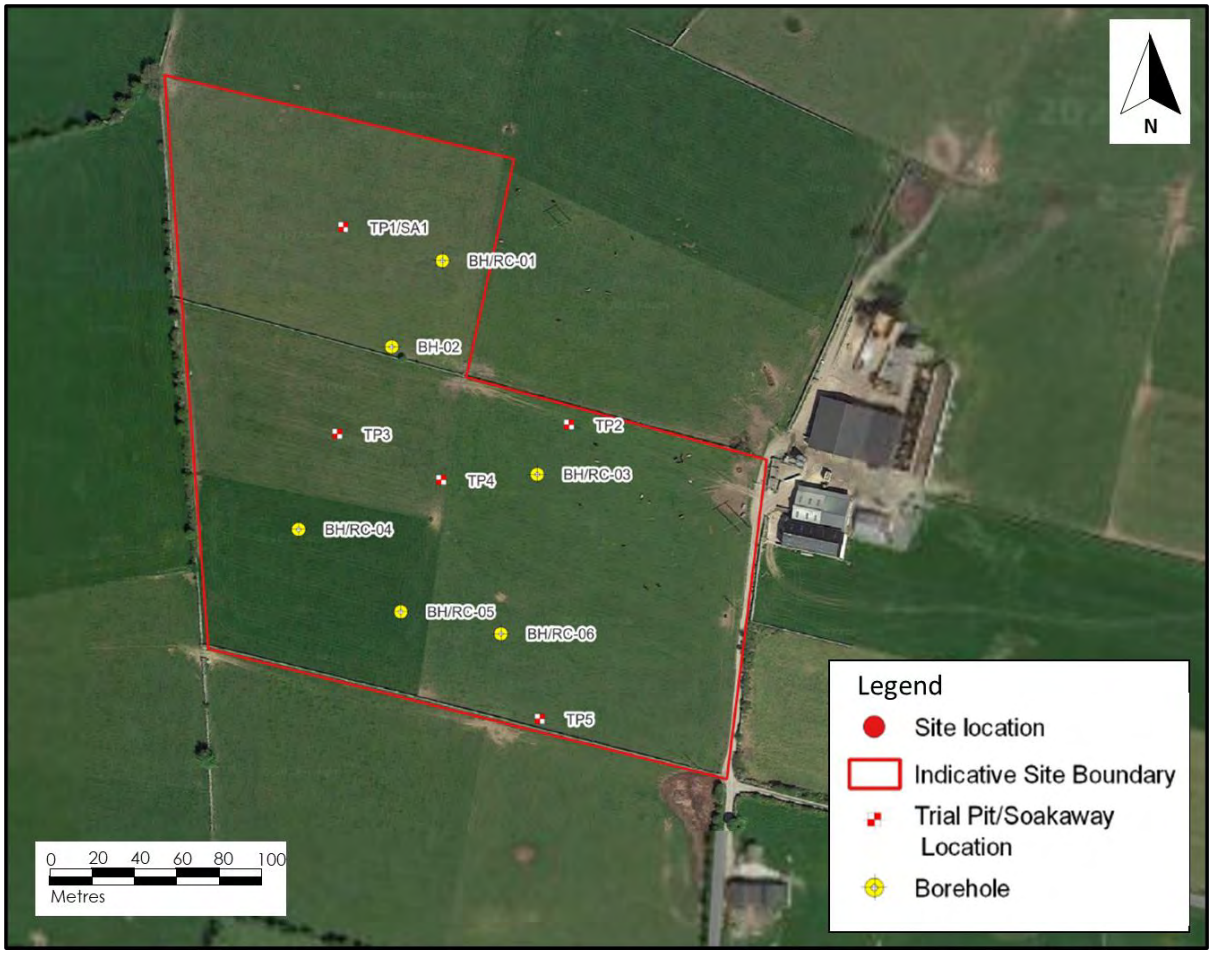


Figure D: GII Site Investigation Map (after GII, 2023)

Overall, the Site Investigations revealed that the sequence of strata encountered were relatively consistent across the site and generally comprised topsoil, cohesive deposits, granular deposits, weathered bedrock and bedrock. Descriptions of the strata encountered are summarised below.

Cohesive Deposits

Cohesive deposits were encountered beneath the Topsoil and were described typically as reddish brown slightly sandy gravelly CLAY with low cobble content. This deposit was present to depths ranging from 0.40m to 0.80m Below Ground Level (BGL).

Granular Deposits
Granular deposits were encountered at the base of the cohesive deposits and were typically described as brown clayey gravelly fine to coarse SAND with medium to high cobble and boulder content. Where granular deposits or groundwater were present, the trial pits experienced instability.

Bedrock
The rotary core boreholes recovered strong to very strong massive light grey fine grained fossiliferous LIMESTONE interstratified with Moderately weak to medium strong massive light brownish grey crystalline medium grained DOLOMITIC LIMESTONE with vugs. Cavities which were infilled with clay or sand were noted in the borehole logs. The depth to rock varies from 4.05m BGL in BH+RC-04 to a maximum of 12.20m BGL in BH+RC-01.

Groundwater
A groundwater monitoring installation was installed upon the completion of the borehole BH-02 to enable sampling and monitoring of groundwater levels. Additionally, groundwater levels were recorded in an exiting on site domestic and agricultural supply well and a Turlough located to the south of the proposed site. Groundwater levels range from 56.14 – 66.09mOD in the area of the site. All groundwater monitoring levels are shown below in Table B.

Table B: Groundwater Level Monitoring

Monitoring Location	Date	Groundwater Level (mBGL)	Monitoring Location Elevation (mOD)	Groundwater Level (MOD)
BH-02	10/10/2023	8.67	74.76	66.09
Turlough	10/10/2023	0	60.95	60.95
Farmers Well	10/10/2023	16.12	72.26	56.14

3.2 GEOPHYSICAL SURVEY

APEX Geophysics Limited initially carried out a geophysical survey at the site of the proposed substation between the 24th and 26th April 2023.

The scope of the work undertaken for this project included the following:

- 4 no. resistivity profiles (ERT)
- 6 no. P-wave seismic refraction profiles

The information obtained from this survey influenced the configuration of the intrusive site investigations described above in Section 3.1. Intrusive site investigations were recommended at certain locations to investigate anomalous features observed within the geophysical data.

On receiving the geological information obtained from the intrusive site investigations in October 2023, an integrated interpretation of both geophysical data and site investigation data was compiled by APEX Geophysics Limited. The overall interpretation of the data compiled is summarised briefly below.

Soils and Subsoils
The geophysical data generally indicates the presence of clayey sandy gravel soils and subsoil layers, typically becoming denser and stiffer with depth. Furthermore, a stiff to very stiff sandy gravelly clay layer is interpreted in the east and northeast of the site. This may act as a founding layer and an aquitard.

While the GSI Quaternary Sediments map Figure B shows bedrock/outcrop in the far northeast of the substation location, the depth to top of interpreted limestone map indicates a localised increase to > 8 mbgl just to the south.

Bedrock

Depth to top of interpreted limestone rock across the site ranges from 0.6 m in the south to 13.5 mbgl in the northeast. The average depth across the site is 6.0 mbgl. Interpreted rock elevation ranges from 57 m OD in the southeast to 71.5 m OD in the west and northwest of the site.

The seismic velocities indicate the upper 1.5 m of rock is highly weathered in places with some cavities and clay infill also present, as encountered in the boreholes. This material overlies moderately weathered to slightly weathered rock over slightly weathered to fresh rock.

Where present within proposed construction depth highly weathered rock will be rippable and underlying rock will be marginally rippable to requiring breaking/blasting

Karst

Two main zones of rock with a potential high degree of karstification with clay infill are interpreted across the site. One (Z1) is present in the central part of the site and is interpreted as a WSW – ENE feature. Borehole BH05/RC05 targeted this zone and encountered fractures with clay smearing, infilled cavities with sandy gravelly clay within highly weathered to slightly weathered to fresh rock over a depth range of 8.65 to 20.3 m bgl.

A second zone (Z2) is present as a broader feature at the top of the rock in the north of the site. This feature (Z2) penetrates to 22 m bgl.

Karst features are not indicated in the area of interpreted shallow moderately to slightly weathered to fresh rock in the south of the site. This area may be suitable for the footprint of the proposed construction, and this should be assessed upon completion of all direct investigations.

A summary map of the above Interpretations from the geophysical report is shown below in Figure E.

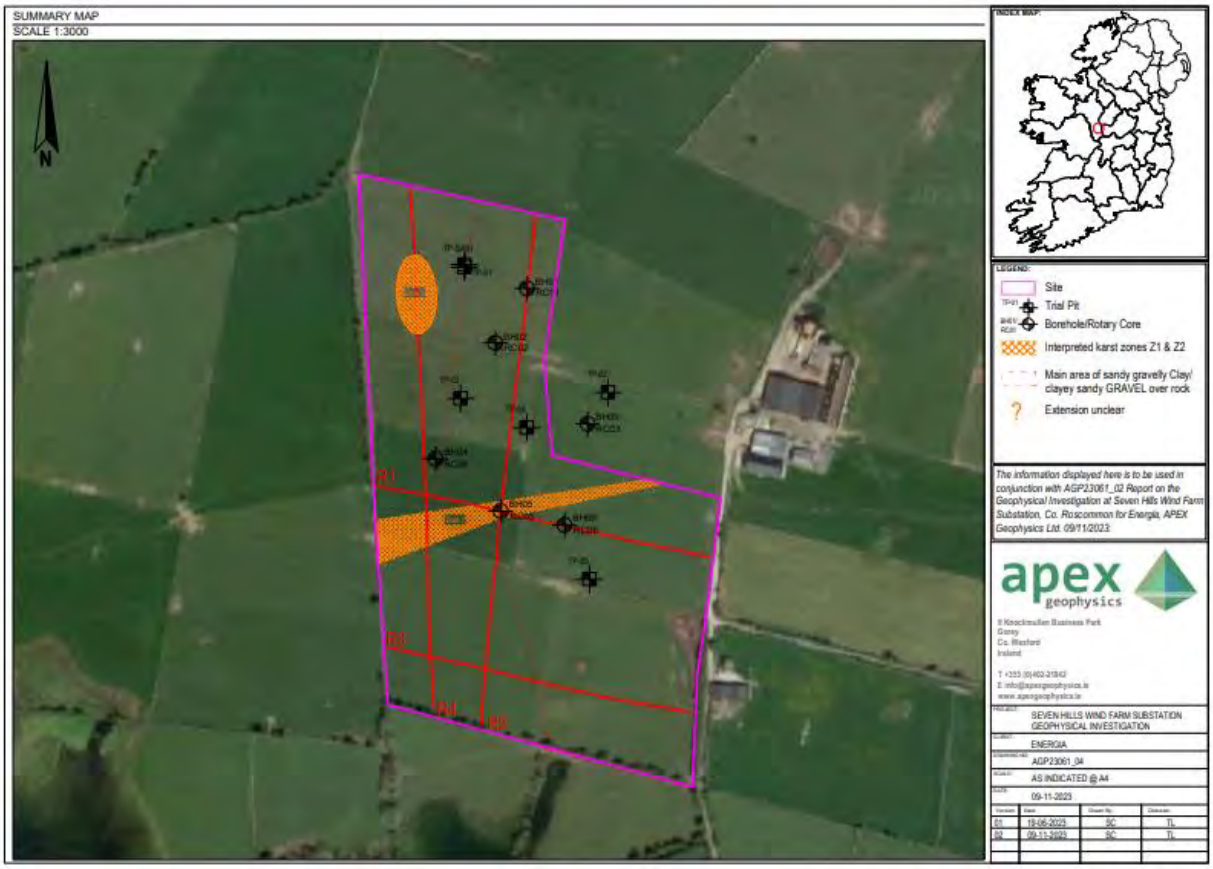


Figure E: APEX Geophysical Survey Interpretation Map (after Apex, 2023)

4 INITIAL HYDROLOGICAL AND HYDROGEOLOGICAL ASSESSMENT

4.1 INITIAL HYDROLOGICAL ASSESSMENT

Based on the information gained through the desk study, the summary of receptors, the likelihood of impacts and layout constraints are outlined and assessed in Table C.

Table C: Summary of Receptors, the likelihood of Impact and Layout Constraints

Potential Receptor	Likelihood of Potential Impact	Impacts Type	Mitigation Required	Layout Constraint
Mineral Soil/Subsoil	High	Quantity & Quality	Yes	Unlikely
Bedrock	High	Quantity & Quality	Yes	Yes (Preferably minimal excavations within Regionally Important Bedrock Aquifer - Karstified (conduit))
Surface Water/Drainage	High	Quality &Quantity	Yes	Unlikely (lack of land drainage within the vicinity of the proposed substation and only 1 no. watercourse crossing along the electricity line)
Flood Risk	Medium	Quantity & Level	Yes	Yes (Potential groundwater flooding to South)
Groundwater	High (“Extreme-X” groundwater vulnerability at substation location)	Quantity & Quality	Yes	Unlikely
Designated Sites	Medium	Quality	Yes	No
Local Private Wells	Medium	Quantity & Quality	Yes	No
Article 7 SW Abstractions	Low	Quality	Yes	No

4.2 MINERAL SOIL/SUBSOIL AND GEOLOGY

Potential effects on the soils, subsoils, and geology will be both in terms of quantity (i.e. excavation and removal of soils/subsoils) and quality (i.e. contamination of soils/subsoils/bedrock by accidental spills and leaks).

The main mitigation requirements will be development design (minimising the volume of material requiring excavation), and best practice controls and use for oils/fuels and cement.

4.3 SURFACE WATER/DRAINAGE

Due to the overall lack of land drainage within the Proposed Development site combined with the well-drained nature of the soils/subsoils, the potential for site runoff to reach downstream watercourses within the Shannon Upper_110, Ballybay_010 or Cross (Roscommon)_020 river sub basins is likely to be limited. Rainfall is expected to percolate to ground within the site.

The proposed electricity line route contains 1 no. crossing over an EPA mapped watercourse, the Cross River. This crossing is located at an existing bridge crossing along a local road. Surface water quality impacts could occur during groundworks associated with the proposed watercourse crossing.

Waterbodies downstream of the site have been deemed to be at risk of failing to meet their respective WFD objectives (Cross River). A Water Framework Directive Compliance Assessment will be required to demonstrate that the Proposed Development has no potential to alter the WFD status of any surface or groundwater body or prevent these waterbodies from meeting their WFD objectives in the future.

Potential impacts on the surface water environment during operation are limited by virtue of the fact that the proposed development site is relatively static during the operational phase, with all construction works being complete, and drainage and runoff will be clean therefore impacts will be limited.

4.4 GROUNDWATER

Due to the presence of moderate to high permeability sand and gravel deposits over karst bedrock, groundwater will be the primary waterbody receptor.

The primary risk to groundwater at the site would be from potential leaks of cementitious materials and from hydrocarbon/chemical spillages at the site.

The Proposed Development site is mapped within the Funshinagh Groundwater Body and is underlain by a Regionally Important Karstified Aquifer. The Regionally Important Karstified Aquifer that underlies the site can be classed as Very Sensitive to pollution. The Locally Important aquifer - moderately productive only in local zones (Ll), mapped to underly the very north of the proposed substation location can be classed as being Sensitive to pollution.

Due to the depth to groundwater level at the substation site (>8m) and the well draining nature of the unsaturated subsoils, dewatering during the substation construction is unlikely.

There may be requirements to manage surface water or shallow perched groundwater during the construction phase of the substation in terms of shallow excavation management, however providing that excavations into the underlying karst bedrock and the local groundwater table will be kept to a minimum, effects on local groundwater levels and groundwater wells will be limited.

Construction of the electricity line will not have the potential to affect groundwater quality or flows/levels/ volumes or local wells due to the shallow nature of the works within the carriageway of the existing road network.

4.5 DESIGNATED SITES

Due to the overall lack of land drainage within the Proposed Development site along the well-drained nature of the soils/subsoils, the potential for direct surface water site runoff reaching nearby designated sites and protected areas will be limited.

However, because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice

versa. The highly karstified nature of the bedrock generally means groundwater flow directions can be highly variable but according to the GSI's Funshinagh GWB Initial Characterisation Report (2003), overall groundwater flow will be towards Lough Ree and the associated SAC/SPA/pNHA designated sites, situated ~2.3km east of the substation location.

The proposed grid route includes 1 no. crossing over an EPA mapped watercourse, the Cross (Roscommon)_020 which flows in a south-easterly direction for approximately 11km before reaching the River Shannon Callows SAC, the Middle Shannon Callows SPA and the Shannon Upper_120 Drinking Water Protected Area (DWPA). There is a potential for surface water quality impacts on these designated sites and the DWPA, however due to the short term, transient nature of the electricity line works, and significant downstream distance (11km) no significant impacts are likely.

The location of these designated sites means that both surface water and groundwater quality protection measures will have to be of a high standard throughout all phases of the Proposed Development.

4.6 FLOOD RISK

Based on the information gained through the initial desk study, with the exception of a minor area along the Cross River mapped towards the south of the electricity line, no parts of the site are mapped within any fluvial flood zones (Flood Zones A - B). Also, with the exception of watercourse crossing along the electricity line, all proposed development locations are at least 50m from a watercourse. Therefore, the Proposed Development is considered to be at low risk of fluvial flooding.

However, the GSI Historical Groundwater flood map and the modelled groundwater flood extents map show the occurrence of groundwater flooding in the vicinity of the Proposed Development, particularly to the south of the proposed substation location. Additionally, after inspection of aerial imagery, it seems there may possibly be more wet/ karstic features in the area of the substation location. Site investigations as described above suggest the presence of 2 no. main zones of rock with a potential high degree of karstification and clay infill within the substation location.

Therefore, a Flood Risk Assessment (FRA) will need to be conducted to assess the risk of groundwater flooding at the Proposed Development due to the presence of potential karstic features/ turloughs in the area.

5 EIAR ASSESSMENT METHODOLOGY

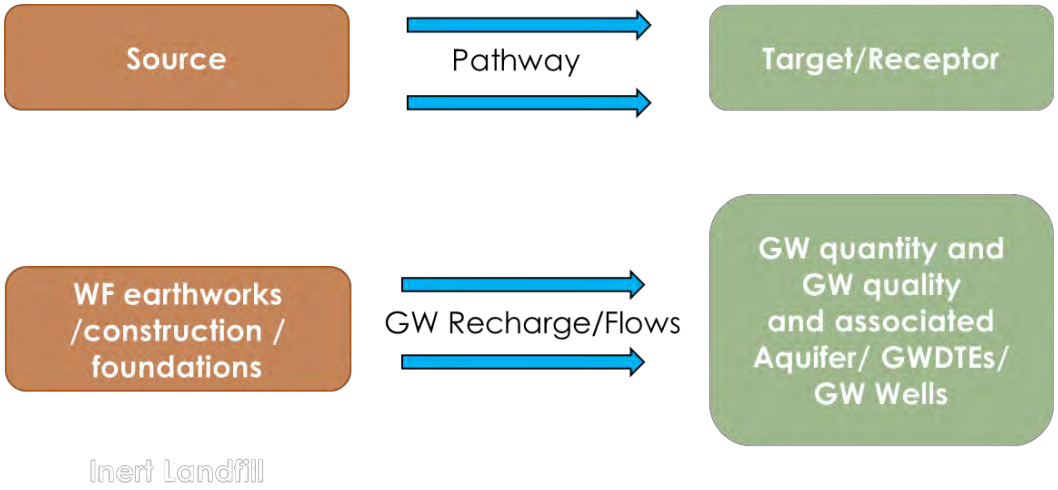
5.1 SITE SURVEYS AND INVESTIGATIONS

The following site surveys and investigations will be undertaken to address the Land/Soil and Water chapters of the EIAR:

- Installation of data loggers in BH02 and the farm well for continuous groundwater level monitoring. This commenced on 18th January 2024;
- Complete field hydrochemistry measurements (electrical conductivity, pH and temperature) to determine the origin and nature of surface water and groundwater flows;
- Groundwater sampling will be undertaken to assess the contemporary baseline groundwater quality at the substation;
- Assessment of downstream receptors such as public water supplies, private wells, surface water abstractions and designated sites using the Source-Pathway-Receptor model (see below; and,
- WFD Compliance Assessment and Flood Risk Assessment.

5.2 IMPACT ASSESSMENT PROCESS

The conventional source-pathway-target model (see below, top) will be applied to assess potential impacts on local and downstream environmental receptors (see below, bottom as an example) as a result of the proposed development.



Where potential impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the following guidance documents produced by the Environmental Protection Agency (EPA):

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

The description process clearly and consistently identifies the key aspects of any potential impact source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature.

In order to provide an understanding of the stepwise impact assessment process that will be applied, we have firstly presented below a summary guide that defines the steps (1 to 7) taken in each element of the impact assessment process. The guide also provides definitions

and descriptions of the assessment process and shows how the source-pathway-target model and the EPA impact descriptors are combined.

Using this defined approach, this impact assessment process is then applied to all project (substation and electricity line) construction and operation activities which have the potential to generate a source of significant adverse impact on the geological and hydrological/ hydrogeological (including water quality) environments.

Step 1	Identification and Description of Potential Impact Source This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.	
Step 2	Pathway / Mechanism:	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of wind farm/electricity line developments, surface water and groundwater flows are the primary pathways, or for example, excavation or soil erosion are physical mechanisms by which a potential impact is generated.
Step 3	Receptor:	A receptor is a part of the natural environment which could potentially be impacted upon, *e.g.* human health, plant/animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only arise as a result of a source and pathway being present.
Step 4	Pre-mitigation Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.
Step 5	Proposed Mitigation Measures:	Control measures that will be put in place to prevent or reduce all identified significant adverse impacts. In relation to wind farm/electricity line developments, these measures are generally provided in two types: (1) mitigation by avoidance, and (2) mitigation by engineering design.
Step 6	Post Mitigation Residual Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impacts after mitigation is put in place.
Step 7	Significance of Effects:	Describes the likely significant post mitigation effects of the identified potential impact source on the receiving environment.

6 REPORT CONCLUSIONS

A desk study was conducted to identify potential geological, hydrological and hydrogeological constraints associated with the proposed Moyvannan Electricity substation at Co. Roscommon.

From this study:

- The primary concern at the site will be the protection of groundwater quality. The low density of surface water features, moderate to high permeability subsoils and the occurrence of mapped karst features indicates that groundwater recharge rates in the area of the site are high;
- Several karst features are located in the wider area and the site is underlain by a Regionally Important Karstified Aquifer. Furthermore, site investigations indicate the presence of potential zones with a high degree of karstification with clay infill underlying the site. Any changes in surface water drainage or groundwater levels associated with proposed construction activities may re-activate dormant karst features and cause subsidence of the overburden materials;
- Risks associated with the Proposed Development include potential contamination sources for the Regionally Important Karstified Aquifer and sensitive downstream designated sites via surface and groundwater pathways;
- Fluvial flooding along the proposed grid route does no appear to be an issue. However, mapped groundwater flood extents occur in the vicinity of the Proposed Development, particularly to the south of the proposed substation location, although no part of the substation site encroaches near the mapped turloughs. A small area of wet ground was noted within the substation site, and site investigations as described above suggest the presence of 2 no. main zones of rock with a potential high degree of karstification and clay infill below the substation site. Through the suitable placement of project infrastructure and associated drainage offset from these features, the Proposed Development can be designed/orientated in a manner that minimises the risk of flooding or impacts on potential subsurface karst features and groundwater quality; and,
- With the application of standard best practice surface water drainage controls and groundwater quality protection within the proposed site, surface runoff and underlying groundwater quality from the proposed development areas will be of a high quality.

* *

7 REFERENCES

GSI	2003	Funshinagh GWB: Summary of Initial Characterisation.
Met Eireann	1996	Monthly and Annual Averages of Rainfall for Ireland 1961 – 1990.
Ground Investigation Ireland Ltd	2023	Seven Hills Wind Farm, Energia, Ground Investigation Report.
APEX Geophysics Limited	2023	Report on the Geophysical Investigation At Seven Hills Wind Farm Substation Co. Roscommon For Energia.

Annex 4 –
Landscape Scoping Report

macroworks

LANDSCAPE & VISUAL SCOPING REPORT

Moyvannan Electricity Substation

Co. Roscommon.

Prepared by Macro Works Ltd on behalf of Energia Renewables ROI Ltd.

April 2024 I Rev B

LVIA I TVIA I Landscape Design I Visibility Analysis I Glint and Glare I Verified Photomontages I CGI I Shadow Flicker Analysis

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Registered Landscape Architect

macroworks APEM Group

1 INTRODUCTION

1.1.1 The purpose of this Scoping Report is to describe the scoping methodology, present outcomes of initial desk study, and to establish the scope of work and methods applied in the identification and assessment of landscape and visual impacts of the proposed Moyvannan Electricity Substation ('the project'). The underground electricity line will also be considered, but it will receive proportionally less attention as it is of less concern to this topic.

1.1.2 It will present key landscape and visual receptors and highlight potential effects that will be assessed. Another key element of the landscape and visual scoping report is the selection of the preliminary set of representative Viewpoints, from which it is intended to prepare photomontage simulations of the development and undertake the visual impact assessment.

1.1.3 The project will be located in south County Roscommon, c. 8km northwest of Athlone and northeast of Brideswell.

2 POLICY PLAN AND CONTEXT

2.1.1 The European Landscape Convention promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. The Convention was adopted on the 20th October 2000 and came into force on the 1st March 2004. The Convention was ratified by Ireland in 2002.

2.1.2 As one of the obligations under the convention, a draft National Landscape Strategy was issued for public consultation by the *Department of Arts*, *Heritage*, Regional, Rural and *Gaeltacht* Affairs, (formally the Department of Art, Heritage and the Gaeltacht in July 2014. Following consideration of submissions, The 'National Landscape Strategy for Ireland 2015-2025' was published in mid-2015 by the Department of Arts, Heritage and the Gaeltacht.

2.1.3 One of the key objectives of the National Landscape Strategy, and a requirement of the European Landscape Convention, is to prepare a National Landscape Character Assessment (LCA). However, this is not likely to be prepared prior to the submission of the planning application.

2.1.4 On this basis, county level Landscape Character Assessments for County Roscommon (contained within the County Development Plan) will be a key consideration. In all cases, these Landscape Character Assessments have also been integral to the development of policy contained within the CDP.

2.1.5 The Landscape and Visual Assessment of Moyvannan Electricity Substation will be undertaken in strict accordance with the Landscape Institute and the Institute of Environmental Management and Assessment publication entitled 'Guidelines for Landscape and Visual Impact Assessment' – Third Edition (2013), commonly referred to as GLVIA3. This is recognised as the principal best practice guidance for landscape and visual assessment of all forms of development in Ireland and the UK.

2.1.6 Regard will also be given to the overarching Environmental Impact Assessments guidelines and advice notes set out by the EPA:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in the Environmental Impact Assessment Reports (EPA, 2022)

2.1.7 Other relevant LVIA guidance that will be considered in relation to the preparation of photomontages includes;

- Scottish Natural Heritage (SNH) Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017).

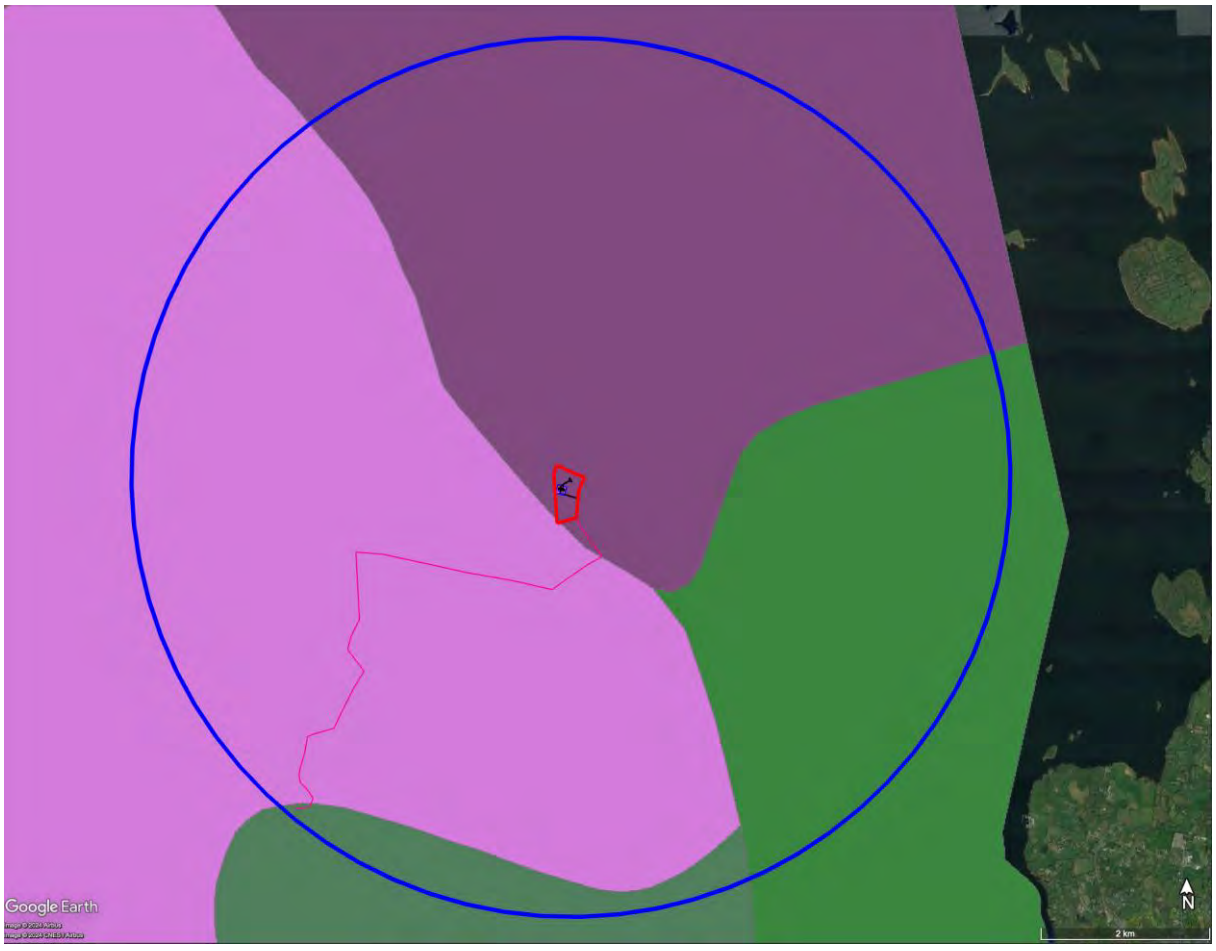
2.1.8 The most relevant landscape and visual policies with regard to the project are contained with the County Development Plan for County Roscommon.

Roscommon County Development Plan 2022-2028

2.1.9 A Landscape Character Assessment for County Roscommon is incorporated in the County Development Plan and divides the county into seven Landscape Character Types (LCTs). The project site falls within the 'River Corridor' LCT. The county is further subdivided into Landscape Character Areas (LCAs) that broadly align with the LCT areas. The electricity substation site is located within LCA 7 'Mid Lough Ree Pastureland' (Purple area - Figure 1 refers).

2.1.10 Lands immediately to the west of the site form LCA 34 'Lough Funshinagh, Stone Wall Grasslands and Esker Ridges', which is likely less sensitive as it is categorised as 'Moderate Value' (pink area - Figure 1 refers). The majority of the proposed underground line route will occur within this LCA (Figure 1 refers).

Figure 1: Landscape Character Areas (Roscommon Landscape Character Assessment) relative to the Project (red line) and the proposed underground line



2.1.11 The Landscape Character Assessment also identifies landscape values in relation to each of the LCAs. LCA 7, together with other LCAs within the wider study area, are identified as being of 'Very High Value'. Of LCA 7 it states:

"The overall image of the Mid Lough Ree Pastureland character area is one of gently rolling good quality farmland, with extensive views of Lough Ree and its islands in more elevated places."

2.1.12 Visual impacts with regard areas of 'Very High Value' require consideration with reference to Policy Objective NH 10.25 of the CDP.

2.1.13 Scenic Routes and Views are considered with relevance to Policy Objective NH 10.26 of the CDP which states:

"Protect important views and prospects in the rural landscape and visual linkage between established landmarks, landscape features and views in urban areas."

2.2 County Development Plan Scenic Designations

2.2.1 Scenic views and routes designations from the Roscommon County Development Plan will be considered. Those considered relevant in terms of viewing direction and potential visibility of the project will be included as a representative viewpoint for the purposes of the visual impact assessment.

3 STUDY AREA

3.1.1 Different radii for examining the Zone of Theoretical Visibility of proposed projects ('ZTV'). The extent of this study area is influenced by height of the structures within the project as follows;

- Substation building (c. 8.6m AGL); and
- Lightning Masts (c. 18m AGL).

3.1.2 The proposed underground electricity line will be c. 7.5km in length and as it will be a below ground feature it has been scoped out of the ZTV analysis. Furthermore, effects from the proposed underground line are likely to be limited to the construction phase and are not anticipated to have the potential to result in any significant effects.

3.1.3 Based on professional judgement with reference to similar projects of comparable scale, the ZTV radius is 5km from the outermost perimeter of the electricity substation.

3.2 Consultation

3.2.1 It is recommended that consultation on the landscape and visual impact assessment will be undertaken with Roscommon County Council, along with local residents.

4 SCOPING METHODOLOGY

4.1.1 Scoping for this LVIA will consist of a combination of a 'Desk Study' and fieldwork in order to understand the nature of the receptors within the study area and the nature of likely impacts that are likely to occur as a result of the project. The Desk Study element precedes fieldwork as the latter is used to scope-in or scope-out potentially affected receptors that are identified as part of the desk study. The fieldwork will be undertaken as part of the preparation of the EIAR.

4.1.2 Establishing the landscape baseline includes consideration of the geographic location and landscape context of the project as well as the essential landscape character and salient features of the wider Study Area and is discussed with respect to; landform and drainage and; vegetation and land use. The visual baseline is more population based, but still overlaps with elements of the landscape baseline. The visual

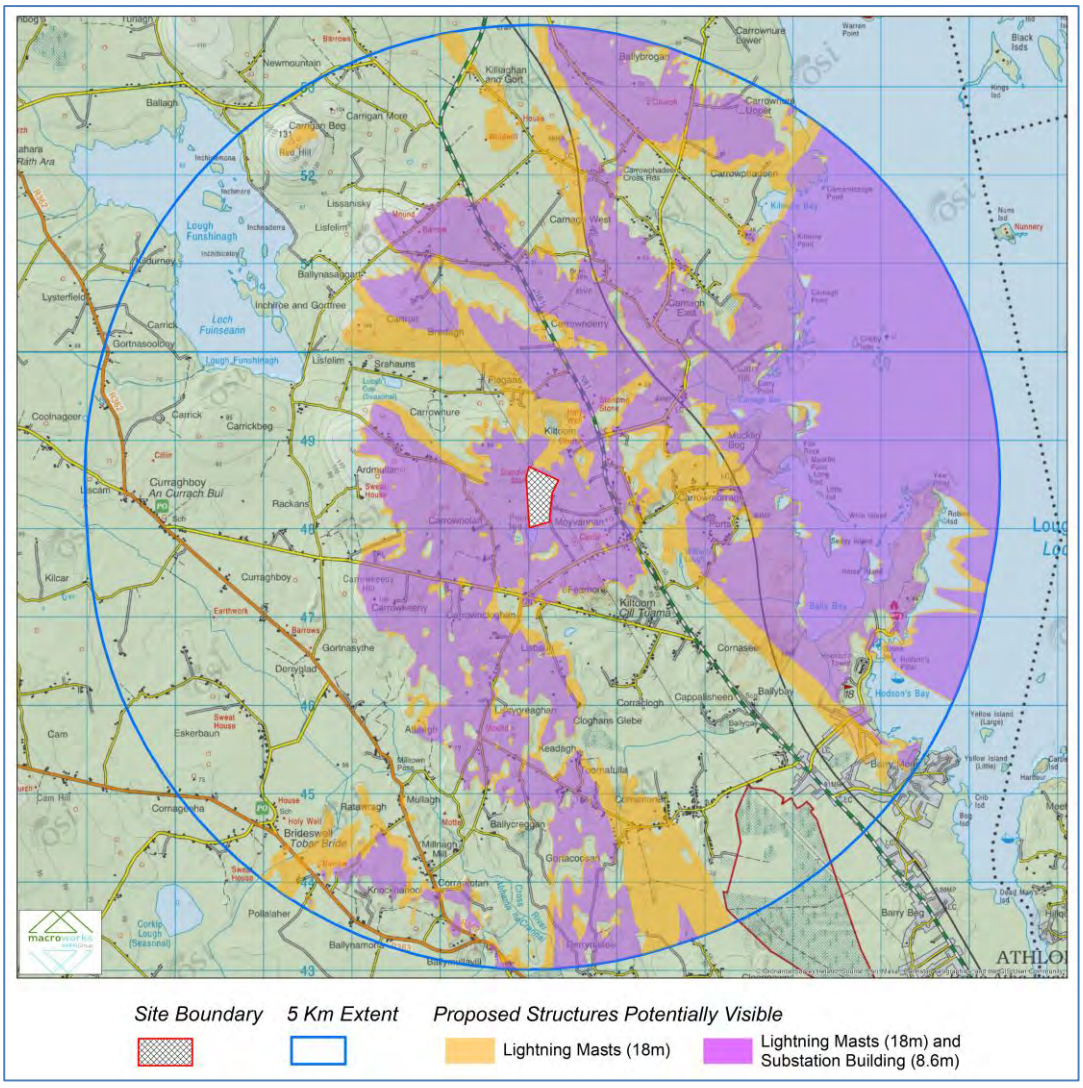
baseline is discussed in relation to; centres of population and houses; transport routes and; public amenities and facilities.

4.2 Desk Study

4.2.1 The desktop study will comprise of the following:

- Review of the Zone of Theoretical Visibility (ZTV) map provided (refer to Figure 1), which indicates areas from which the project is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;
- Online review of tourism, recreational and heritage features within the study area that may be potential visual receptors.
- Selection of representative assessment viewpoints, that reflect views that may be obtained by key visual receptors.

Figure 2: Zone of Theoretical Visibility Map



5 POTENTIAL IMPACTS

5.1.1 Visual effects are most likely to occur at private residential dwellings and on public transport routes. The most prominent of these are:

- The N61 national secondary road is the most notable transport route.
- A railway line occurs to the east of the N61.
- The R362 and R363 regional roads pass within the southwestern portion of the study area (but are generally not within the ZTV pattern, so there is limited potential for visibility of the Project.)
- Green Heartlands Cycle Route passes along several roads within the study area and, at the closest point, passes through the underground line route (and is within the ZTV coverage).

5.1.2 As described at Section 4, analysis of ZTV maps provides the basis for initial desk based VP selection, as these maps identify from where in the study area the development is potentially visible in a bare-ground scenario. Importantly, they also indicate areas where there is no potential for visibility, which can then be confidently scoped-out of further investigation / assessment.

5.1.3 Overall, there is potential for short range and mid-range views of the project, but with the highest potential for significant landscape and visual impacts to occur for short range views, where these might

coincide with highly sensitive receptors. Views of the project from beyond 5km, though feasible, could only occur from elevated vantage points and in very clear viewing conditions. At such distances, any visual impacts from the project are not considered to have potential for significant effects even at highly sensitive receptor locations.

5.1.4 Potential landscape and visual effects could also occur in respect of ancillary development, such as the proposed Underground line but these are likely to be localized and not significant.

5.2 Analysis of ZTV map

- The project will not be visible from the low-lying areas in the western third of the study area due to intervening landform that will screen the Project.
- The elevated landform at the settlement of Kiltoom will screen views of the project from the lands adjacent to the N61 national secondary road as it passes through the southern half of the study area.
- The project is likely to be visible from the slightly elevated areas to the west and north of the Project.
- The project may be visible from sections of the N61 national secondary road as it passes through the northern half of the study area.
- The project may be visually exposed from the lands in the eastern portions of the study area, between the N61 national secondary road and Lough Ree.
- The ZTV indicates that project will theoretically be visible from Lough Ree in the eastern portion of the study area. However, given the intervening distance and existing vegetation in the landscape, it is anticipated that in reality the Project would be difficult to discern.

Scenic Designations

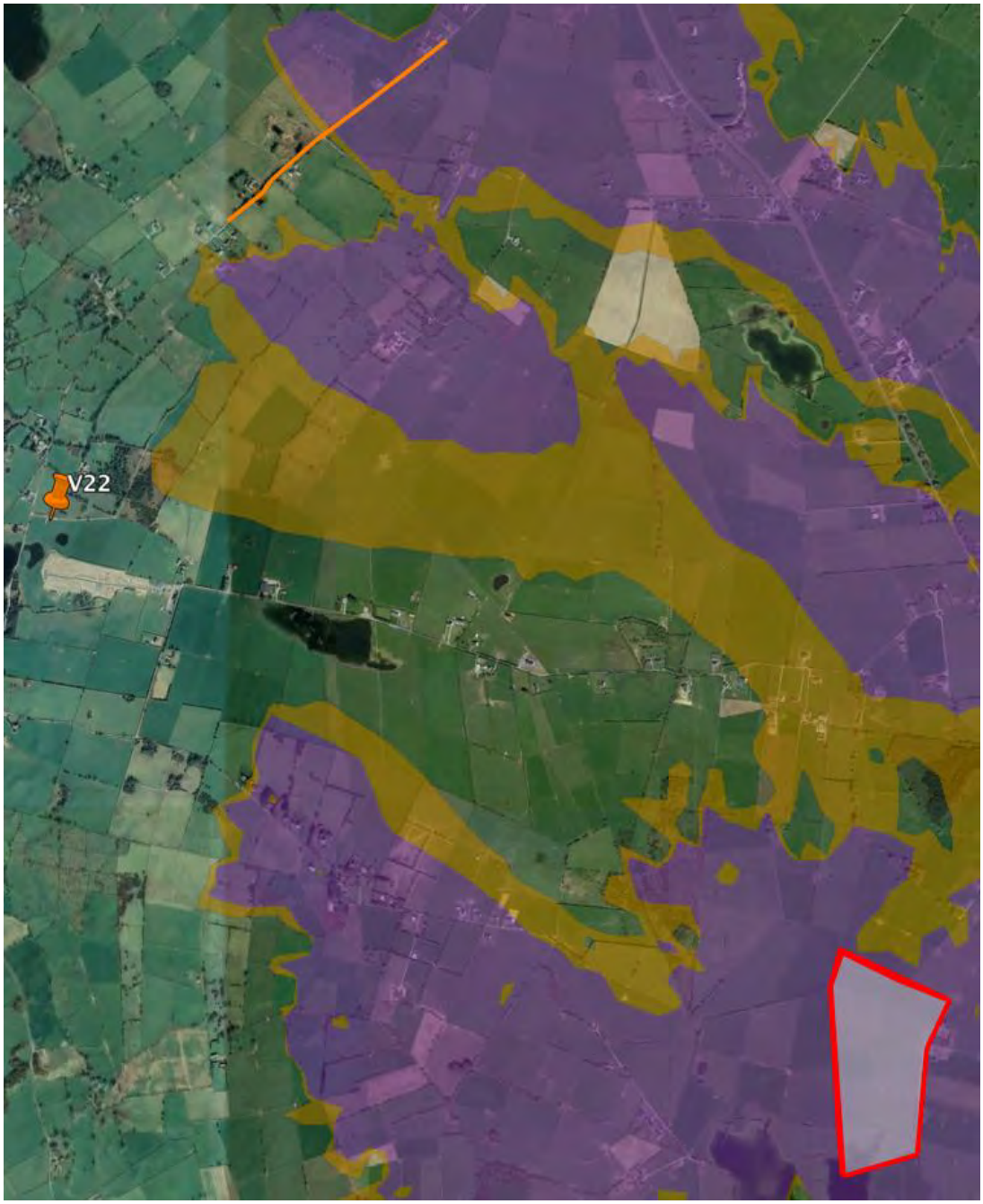
5.2.1 Designated Scenic View V22 (orange pin - Figure 3) occurs within the study area but does not fall within the ZTV pattern; thus, no visual impacts can occur.

5.2.2 Scenic Route/Protected Route R8 (orange line - Figure 3) occurs c. 2.8km to the northwest of the Project on a local road in the townland of Lisfelim. The north-eastern end of the route is locally elevated and thus occurs within the ZTV pattern and views. Therefore, views of the Project are likely. Designated Scenic View V22 (orange pin - Figure 3) occurs within the study area but does not fall within the ZTV pattern thus no visual impacts can occur.

5.2.3 Scenic Route/Protected Route R8 (orange line - Figure 3) occurs c. 2.8km northwest of the Project on a local road in the townland of Lisfelim. The north-eastern end of the route is locally elevated thus occurs within the ZTV pattern and views. Therefore, views of the Project are likely.

5.2.4 Due to the distance from these scenic designations, significant visual impacts are not anticipated.

Figure 3: Zone of Theoretical Visibility Map

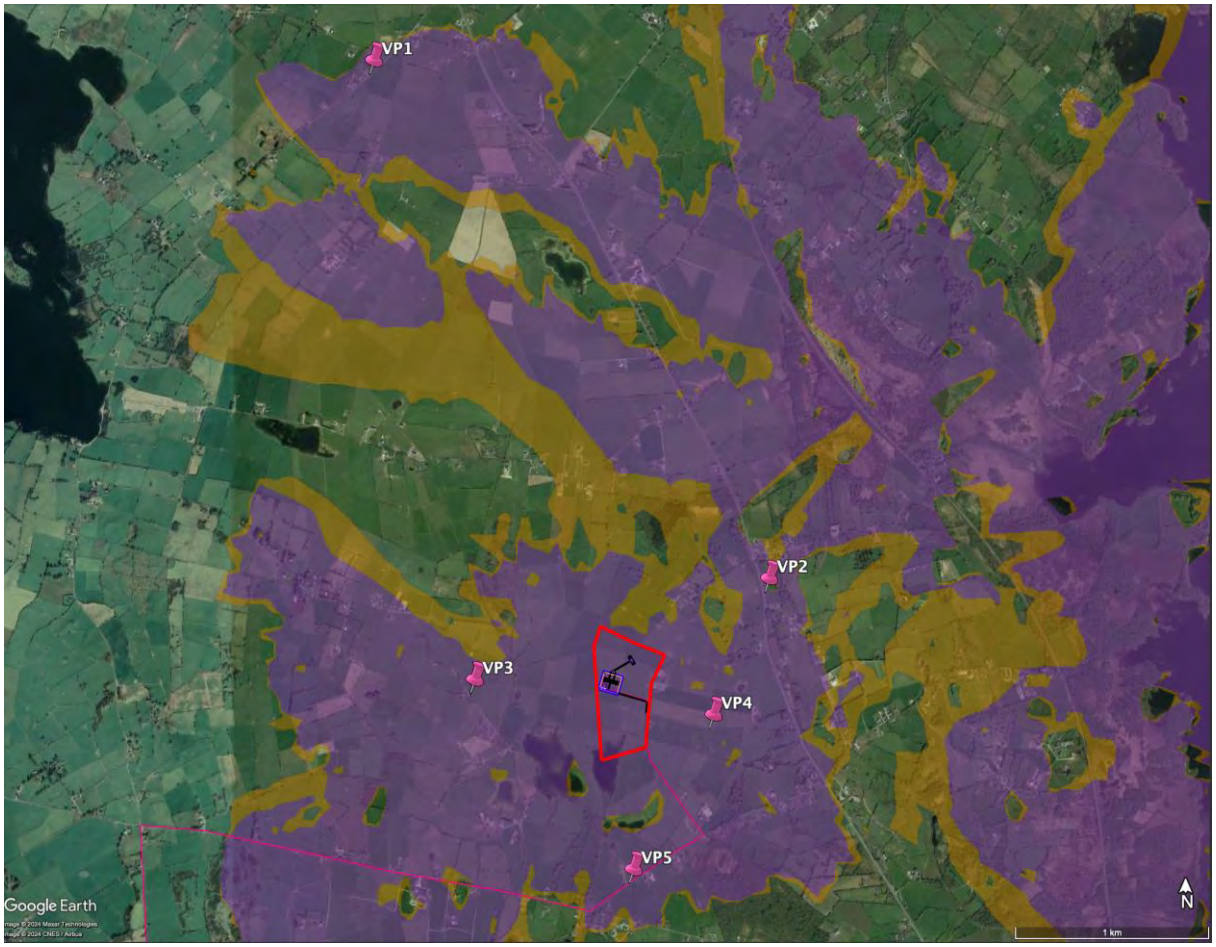


5.3 Viewpoint Selection Report

5.3.1 Based on the ZTV map analysis and a baseline study of the site's wider landscape and visual context, a preliminary viewpoint selection was generated.

5.3.2 Figure 4 illustrates the location of those viewpoints that have been selected for assessment in the EIAR.

Figure 4: Suggested Viewpoints (green pins)



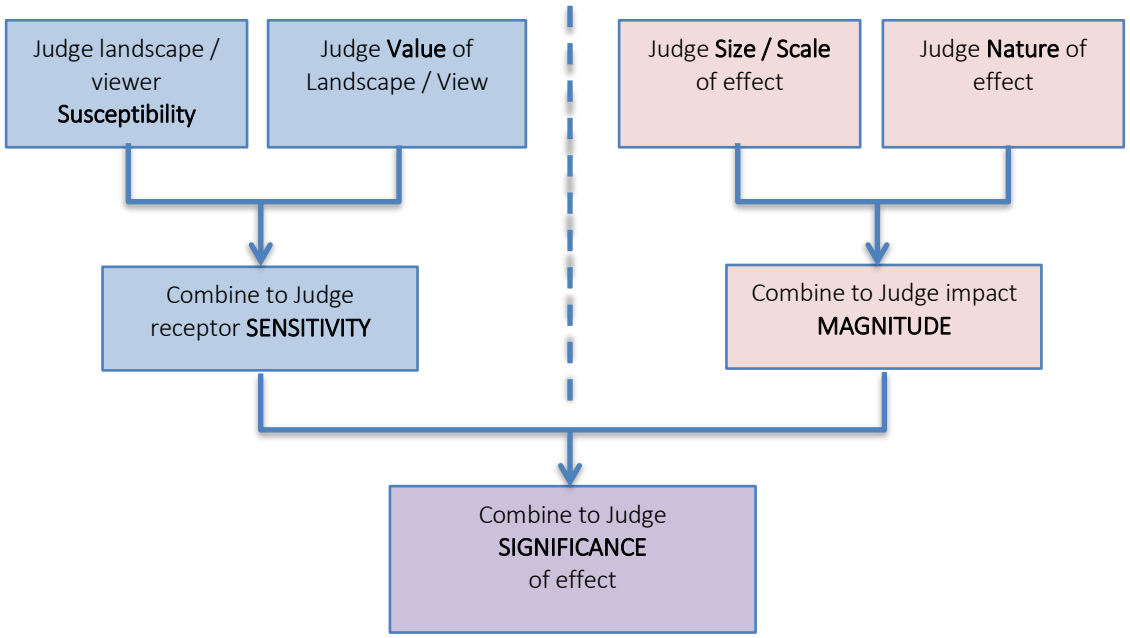
6 EIAR ASSESSMENT METHODOLOGY

6.1.1 Production of the Landscape and Visual Impact Assessment (Landscape EIAR chapter) will involve desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects.

6.2 Assessment

6.2.1 In accordance with the Guidelines for Landscape and Visual Impact Assessment (2013), the method for estimating the significance of landscape impacts and visual impacts is very similar. This is summarised in the diagram below;

Figure 5: Method for assessing Significance (based on GLVIA – 2013)



6.3 Landscape Impact Assessment

6.3.1 This part of the LVIA provides an assessment of how the introduction of the project will affect the physical features and fabric of the landscape, and then how the proposals influence landscape character with reference to published descriptions of character and an understanding of the contemporary character of the landscape as informed through desktop and site studies.

6.3.2 When assessing the potential landscape effects of the development, the value and sensitivity of the landscape receptor is weighed against the magnitude of impact to determine the significance of the landscape effect. Criteria outlined below are used to guide these judgements.

Landscape Sensitivity

6.3.3 The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in Table 1.

Table 1 - Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

Magnitude of change - Landscape

6.3.4 The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the project. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 2 outlines criteria used to inform this judgement.

Table 2 - Magnitude of Change - Landscape

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

6.4 Visual Impact Assessment

6.4.1 This part of the LVIA provides an assessment of how the introduction of the project will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the project upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

6.4.2 It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the project. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

6.4.3 When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

Sensitivity of Visual Receptors

6.4.4 As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

6.4.5 A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

Susceptibility of Visual Receptors to change

6.4.6 In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- "Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
- Visual receptors that are less susceptible to changes in views and visual amenity include;
- "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

Value attached to Views

6.4.7 The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Viewer connection with the landscape. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy roads versus tourists focussed on the character and detail of the landscape;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

6.4.8 Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

6.4.9 It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Magnitude of Change - Visual

6.4.10 The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the project. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant.

6.4.11 A strong visual presence is not necessarily synonymous with adverse impact and this is reflected in Wind Energy Development Guidelines for Planning Authorities (2006/2019 revision) wherein, it is advocated that a clear and comprehensive view of a wind farm might be preferable in many instances to a partial or cluttered view of turbine components that are not so prominent within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding terrain and land cover. It also examines whether the development contributes positively to the existing qualities of the vista or results in distracting visual effects and disharmony.

6.4.12 It should be noted that as a result of this two-sided analysis, a high order visual presence can be moderated by a low level of effect on visual amenity and vice versa. Criteria used to inform judgements are provided in Table 3.

Table 3 - Magnitude of Change - Visual

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual disorder or disharmony is also generated, strongly reducing the visual amenity of the scene
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual disorder or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual disorder or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene

6.5 Significance of Effects

6.5.1 The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

6.5.2 The significance category judgement is arrived at using the Significance Matrix at Table 4 as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)). Indicative criteria descriptions used in relation to the significance of effect category are presented at Table 5.

Table 4 - Significance Matrix

	Sensitivity of Receptor				
Magnitude	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 5 - Indicative significance of effect criteria descriptions

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

6.5.3 It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

6.5.4 As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

6.5.5 Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant' in EIA terms, albeit it is important to note that this is not a reflection on their acceptability in planning terms.

6.6 Quality of Effects

6.6.1 In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

6.6.2 In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

7 CONCLUSION

7.1.1 The project site is located within a broad area of rolling terrain that is defined by a patchwork of agricultural pasture, with some occasional bogland areas to the south and upland areas to the northwest, interspersed with river networks and inland bodies of water. The site occurs and the lands to the east occur within LCA 7 and have been assessed as having 'Very High Value' in the Roscommon Landscape Character Assessment. However the lands to the west occur within LCA 34 and have been assessed as 'Moderate Value'. The overall sensitivity judgement in the assessment in the EIAR will consider to proximity of the site relative to both LCAs, as well as other more granular details observed during fieldwork.

7.1.2 The topographical characteristics of the landscape are complex and undulating with the successive layers of vegetation in the landscape. Varied levels of visibility towards the site and the project are anticipated, and whilst there are locations that have more open visibility (such as occasional locally elevated locations) which afford longer range views over the wider landscape, for the vast majority of locations within the study area views are short to medium distance in nature.

7.1.3 Although there are locations in the study area which are defined for their scenic qualities, sensitive rural qualities, and landscapes that offer visual and recreational amenity (particularly Lough Ree), due to the presence of distinctive or natural features, many of the scenic designations and sensitive areas are located outside of the visual envelope of the Planning Application Boundary which is limited by the visual screening provided by existing vegetation.

7.1.4 Although the environs in the vicinity of both Lough Ree and Lough Funshinagh would have heightened sensitivity to landscape and visual effects as a result of the project, the landscape of the majority of study area is that of a robust rural working landscape setting that encompasses some sensitive elements, and

much of the landscape value relates to the subsistence of the rural economy, where views are in all circumstances influenced by longstanding human intervention in the landscape.

7.1.5 Visual impacts relating to receptors outside of the 5km radius study area are scoped-out of further assessment due to the very limited potential for visibility beyond this distance. Thus, there is not considered to be potential for significant visual impacts to occur with respect to a development of this scale.

7.1.6 As with all development proposals of this type, there is potential for visual effects given the network of roads dissecting the landscape, residential receptors in the wider landscape, and recreational receptors on walking routes.

7.1.7 Whilst the site is considered to be set within an area of reasonably robust landscape character, with the capacity to accommodate change, given the scale of the project and the presence of visual receptors in the surrounding landscape, there is potential for visual effects, particularly in relation to proximate visual receptors in the surrounding landscape, where the perceived scale of the project, and the extent to which it occupies views will naturally be most notable.

7.1.8 It is considered that the approach to the LVIA and to the viewpoint locations outlined is proportionate to the most notable landscape and visual effects, and is appropriate as a base to progress assessment work.

Recommended Mitigation Strategy

7.1.9 It is recommended to bolster any existing hedgerows around the perimeter of the site. It is also recommended that new hedgerows be planted at appropriate locations within the site. Along the underground line route, care should be taken to minimise damage to existing roadside vegetation, with particular attention given to mature trees and their tree roots.

Annex 5 –

Archaeological, Architectural & Cultural Heritage Scoping Report

ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE SCOPING REPORT

MOYVANNAN ELECTRICITY SUBSTATION,

COUNTY ROSCOMMON

PREPARED BY

HORIZON ARCHAEOLOGY

FOR

GALETECH ENERGY SERVICES

7th SEPTEMBER 2024

CONTENTS

Figures

1 INTRODUCTION

1.1 General

This desk-based scoping report has been prepared on behalf of Galetech Energy Services by Horizon Archaeology to assess and define any effects which the construction and operation of the proposed Moyvannan electricity substation and underground electricity line ("project") may have on the archaeological, architectural and cultural heritage resource. The scoping report includes an identification of potential impacts or effects which may arise and outlines mitigation measures, based on current information, which may be used to avoid, reduce or offset any potential adverse impacts or effects.

The project is located in south east County Roscommon, approximately 8km north west of Athlone, approximately 6km south of Lecarrow, and immediately north/north east of Brideswell (Figure 1). The electricity substation will be located within the townland of Moyvannan and the electricity line, connecting the project to the permitted Seven Hills Wind Farm electricity line infrastructure, will be located within the townlands of Moyvannan, Feamore, Lisbaun, Carrownolan, Carrowncloghan, Carrowkeeny, Ardmullan, Curraghboy, Gortnasythe, Derryglad, Eskerbaun, and Brideswell, County Roscommon.

The project comprises a 110kV electricity substation; including all associated development works to accommodate its construction, operation, maintenance and the export of electricity to the national grid via the existing Athlone-Lanesborough overhead electricity transmission line; and a *c*. 7.5km underground electricity line (Figures 2 and 3).

1.2 Objectives of Scoping Report

The key objectives of this scoping report are to assess, as far as is reasonably possible from existing records and current information, any impacts or effects the project may have on the archaeological, architectural and cultural heritage resource. The following key issues are addressed:

- Direct and indirect effects of the construction of the project on the archaeological, architectural and cultural heritage resource;

- Direct and indirect effects of the operation of the project on the archaeological, architectural and cultural heritage resource; and

- Cumulative effects of the construction and operation of the project on the archaeological, architectural and cultural heritage resource with other existing, permitted or proposed developments or projects.

1.3 Project Team

Dermot Nelis BA ArchOxon AIFA MIAI

Dermot Nelis graduated from Queen's University Belfast, and after gaining extensive fieldwork experience undertook postgraduate studies at the University of Oxford in archaeological consultancy and project management.

Dermot has acted as Senior Archaeologist on several road schemes for various County Councils, and directed large-scale multi-period excavations associated with those developments. He has completed over 180 Licensed fieldwork programmes and over 250 archaeological, architectural and cultural heritage desk-based reports and Environmental Impact Assessment Reports.

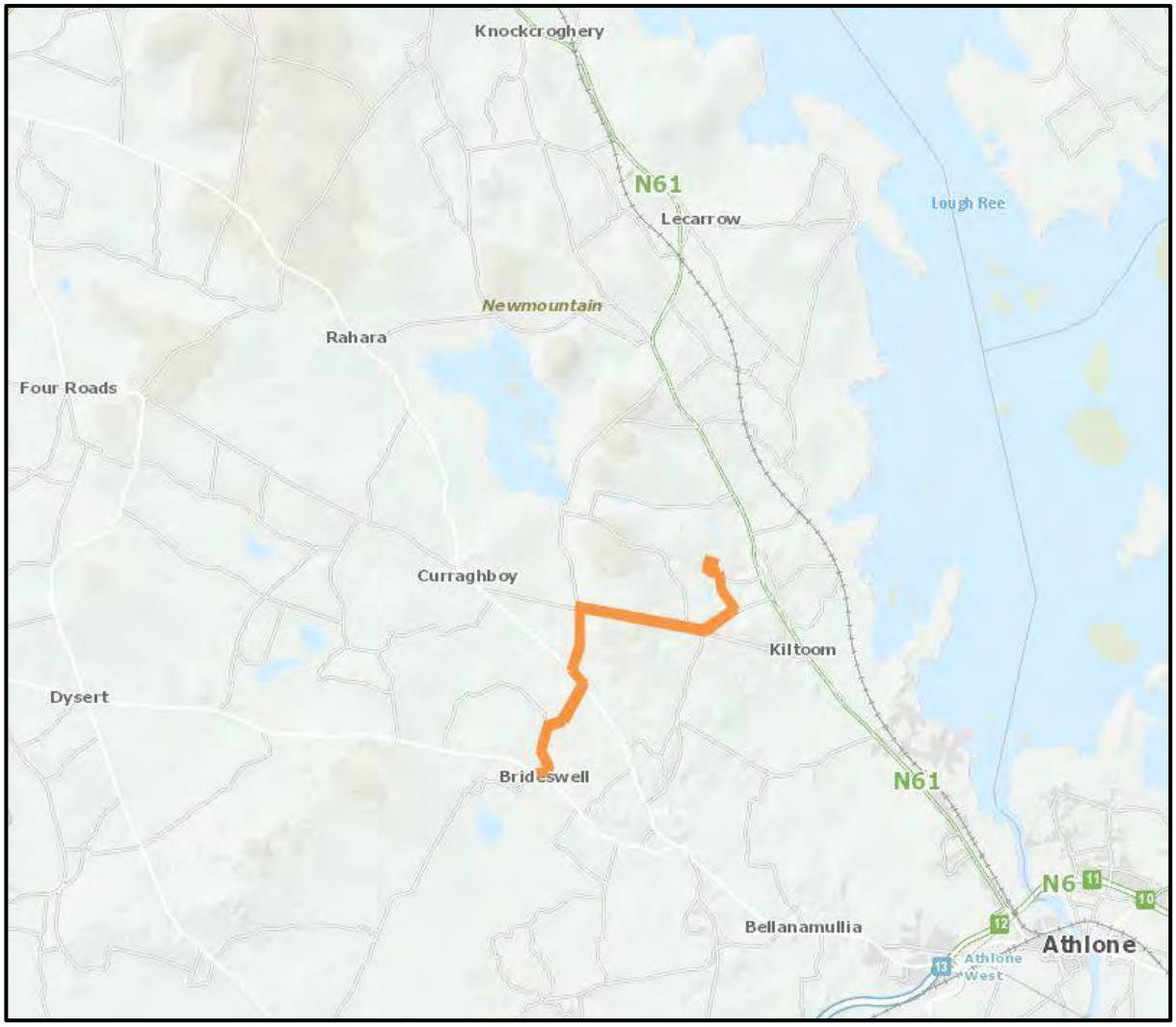


Figure 1: Location of electricity substation and electricity line

2 METHODOLOGY

2.1 Study Area

There is no professional standard for defining the extent of a study area when assessing the likelihood of effects on archaeological, architectural or cultural heritage remains. A 1km study area has been applied around the electricity substation to assess the presence of statutorily protected archaeological remains (RMP sites). In addition, a 2km study area has been applied around the electricity substation to assess the presence of any World Heritage Sites, sites included in the Tentative List as consideration for nomination to the World Heritage List, National Monuments, sites with Preservation Orders or Temporary Preservation Orders, Protected Structures, Conservation Areas, Proposed Conservation Areas, or structures recorded on the National Inventory of Architectural Heritage (NIAH).

As the electricity line will be underground and the majority of cabling will be within the existing road network, a 100m study area either side of the route has been applied to look for the presence of statutorily protected archaeological, architectural or cultural heritage features.

An assessment has been made of any historic gardens or designed landscapes as recorded on the NIAH that may exist within the electricity substation or electricity line.

2.2 Data Sources

The following sources were examined, and a list of sites and areas of archaeological, architectural and cultural heritage potential was compiled:

- Record of Monuments and Places of County Roscommon;
- Cartographic and documentary sources relating to the study area;
- Aerial photographs of Ordnance Survey Ireland and Bing aerial photography;
- Roscommon County Development Plan (2022 – 2028); and
- National Inventory of Archaeological Heritage.

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Service. Back-up files of the Sites and Monuments Record (SMR) provide details of documentary sources and field inspections where these have taken place.

Cartographic sources are important in tracing land-use development within an area of land take, as well as providing important topographical information on sites and areas of archaeological potential. Cartographic analysis of relevant maps has been made to identify any topographical anomalies that may no longer remain within the landscape. **Documentary sources** were consulted to gain background information on the historical and archaeological landscape of the development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its potential to contain previously unidentified archaeological remains.

Roscommon County Development Plan (2022 – 2028) contains Policy Objectives on the preservation and management of archaeological, architectural and cultural heritage features.

National Inventory of Architectural Heritage is a section within the Department of Housing, Local Government and Heritage. The work of NIAH involves identifying, recording and evaluating on a non-statutory basis the architectural heritage of Ireland from 1700 to the present day.

2.3 Site Visit

Field inspection is necessary to determine the extent, character and condition of archaeological, architectural and cultural heritage remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information. Site visits were carried out on 7th November 2023 and 4th September 2024, and all areas of land take associated with the electricity substation were walked and visually assessed. A windshield survey of the underground electricity line route was carried out.

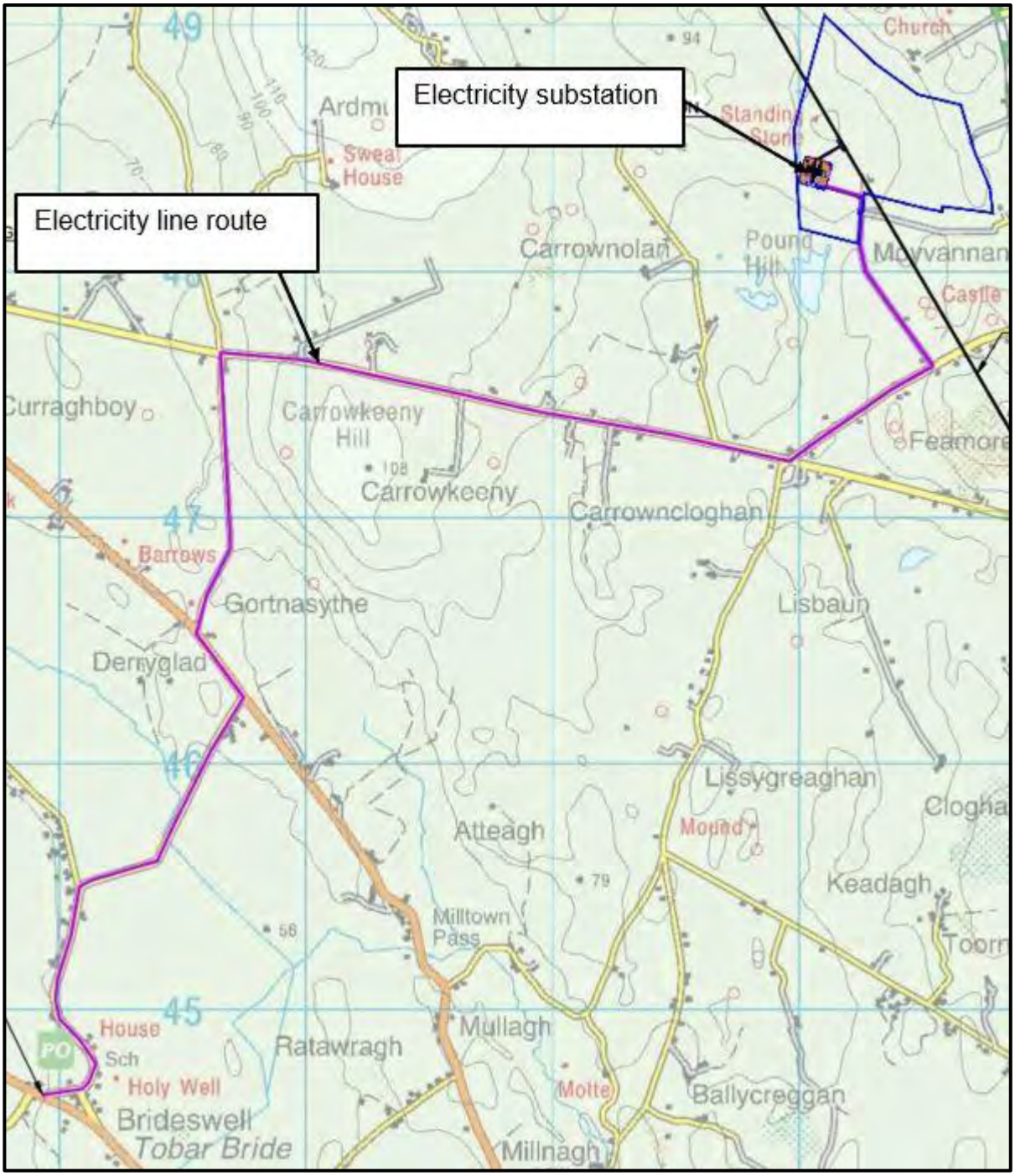


Figure 2: Site layout showing electricity substation and route of electricity line

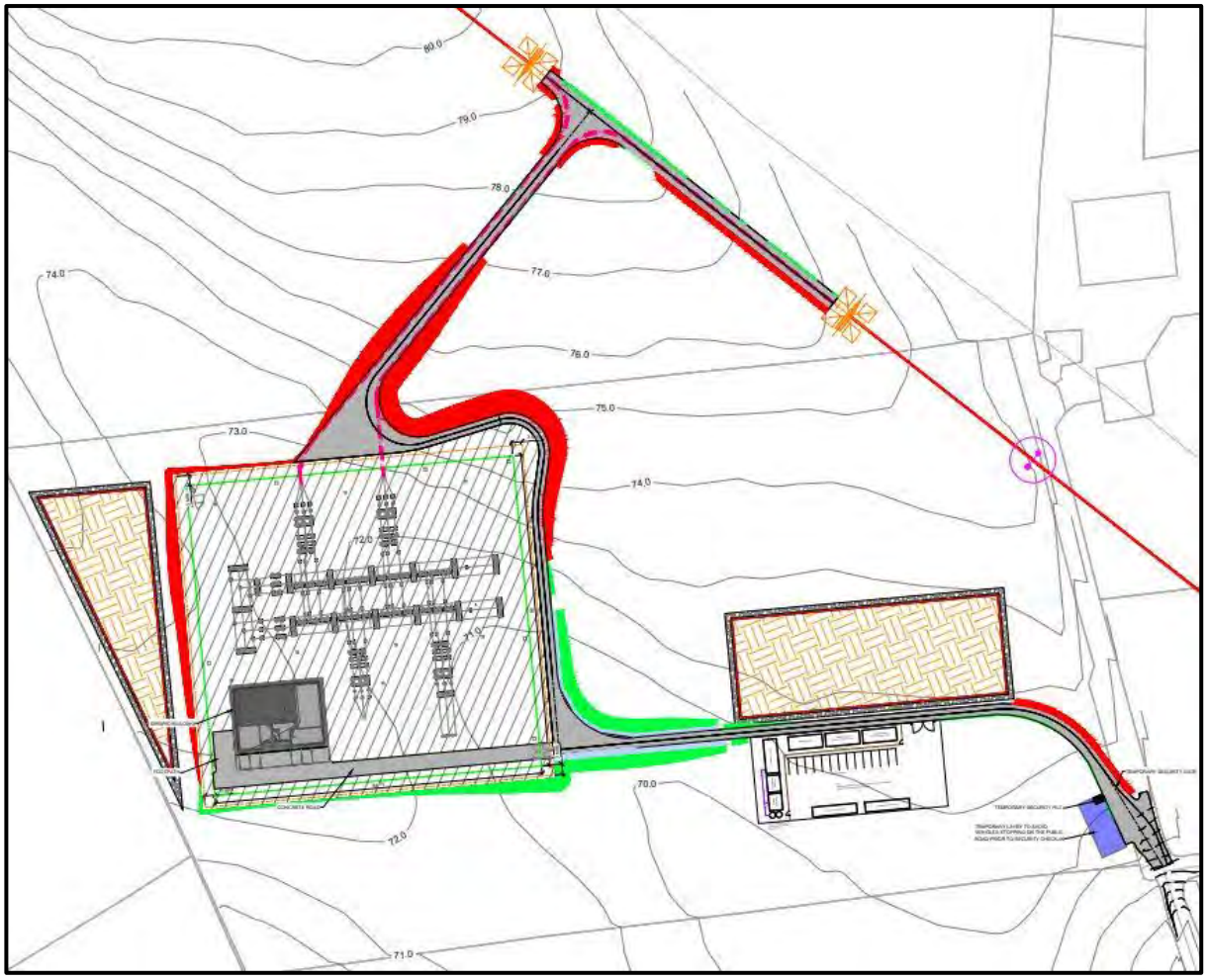


Figure 3: Layout of electricity substation site

3 BASELINE CONDITIONS

3.1 Site-Specific Archaeological Background

There are no Recorded Monuments within the location of the electricity substation.

There are 2 no. Recorded Monuments within 200m of the electricity substation (Figure 4).

RMP RO048-037: standing stone

This monument is the site of a standing stone which no longer survives above-ground, and whose location is therefore not known with certainty. The site of the former monument is recorded (www.archaeology.ie) approximately 150m north of the electricity substation, and approximately 90m north west of a replacement lattice-type interface mast which is required to facilitate connection of the electricity substation to the existing Lanesborough to Athlone overhead line. A standing stone is marked on a Longfield map dated 1825, where it is described

as "*Clognegan*". The site is situated on the summit of a low north/south esker ridge, but no remains of the standing stone are visible at ground level (www.archaeology.ie).

There are 63 standing stones recorded in County Roscommon (www.archaeology.ie). The significance of individual standing stones can be difficult to assess, but it is considered they mark a special place. Some standing stones have been found with associated burials, and the majority are believed to date to the second millennium BC (Waddell 2005, 174). They are also known to mark ancient routeways and fords.

There is an additional 1 no. Recorded Monument within 200m of the electricity substation, although this site is now classified as a redundant record.

RMP RO048-038: redundant record

Annotated on the First Edition Ordnance Survey 1:2,500 map and the Third Edition Ordnance Survey 1:10,560 map, where it is shown as a slight sunken feature measuring approximately 20m in diameter. No evidence of an archaeological monument is visible at ground level, and the site was most likely only ever a quarry (www.archaeology.ie). It is centered on a point approximately 190m north east of the electricity substation, and approximately 120m north of a replacement lattice-type interface mast which is required to facilitate connection of the electricity substation to the existing Lanesborough to Athlone overhead line.

Figure 4: Electricity substation showing location of RMP RO048-037 (standing stone) and RMP RO048-038 (redundant record)

There are an additional 32 no. Recorded Monuments within 1km of the electricity substation.

There are no Recorded Monuments within the electricity line.

There are 14 no. Recorded Monuments within 100m either side of the electricity line. Of these 14 no. Recorded Monuments, 2 no. are classified as redundant records. The remainder include 1 no. bowl-barrow, 2 no. ringforts, 4 no. penitential stations, 1 no. holy well, 1 no. stoup, 1 no. armorial plaque, 1 no. 17th century house and 1 no. building.

3.2 Cartographic Analysis

Ordnance Survey Maps: First Edition 1:10,560 (1838)*; First Edition 1:2,500* (1888 - 1892) and *Third Edition 1:10,560* (1911 - 1913)

A large part of the road along which the electricity line will be located is recorded on the First Edition 1:10,560 Ordnance Survey map. The electricity line route will cross a number of townland boundaries and a parish boundary as shown on the First Edition map. The electricity substation will be located immediately east of a townland boundary. Research suggests that:

> "*hoards and single finds of Bronze Age weapons, shields, horns, cauldrons and gold personal objects can all be shown to occur on boundaries*." (Kelly 2006, 28).

RMP RO048-037 (standing stone) is not recorded on any editions of the Ordnance Survey maps. The location of the electricity substation is partially recorded as rough pasture or furze and whins on historic cartographic sources.

There are no archaeological or architectural features recorded within the land take of the electricity substation on the Ordnance Survey maps.

The historic maps all record the presence of vernacular structures, Ordnance Survey bench marks, wells, gravel pits, *etc*. in the general vicinity of the electricity line.

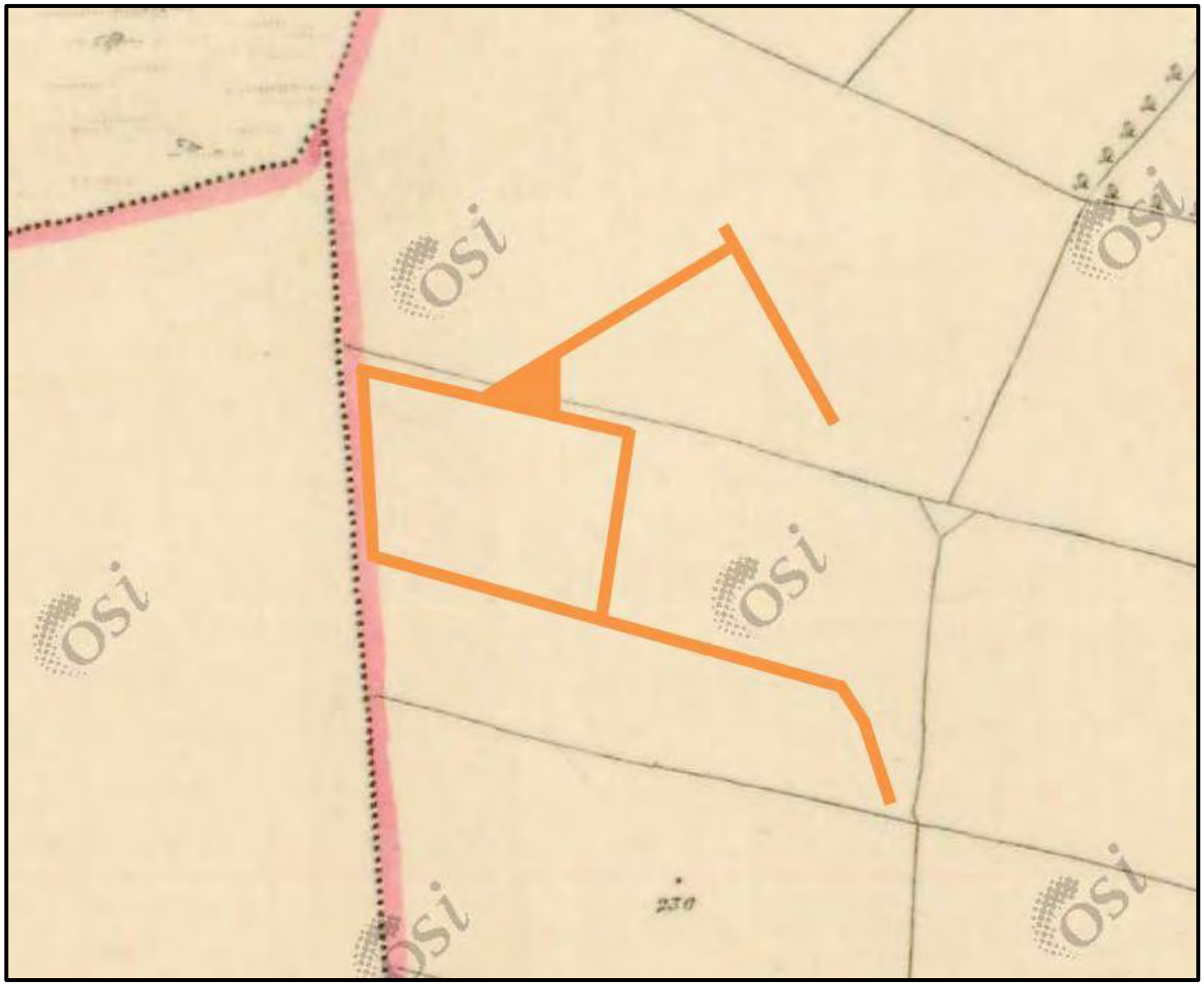


Figure 5: Extract from First Edition Ordnance Survey map 1:10,560, showing the electricity substation, access track and underground electricity line

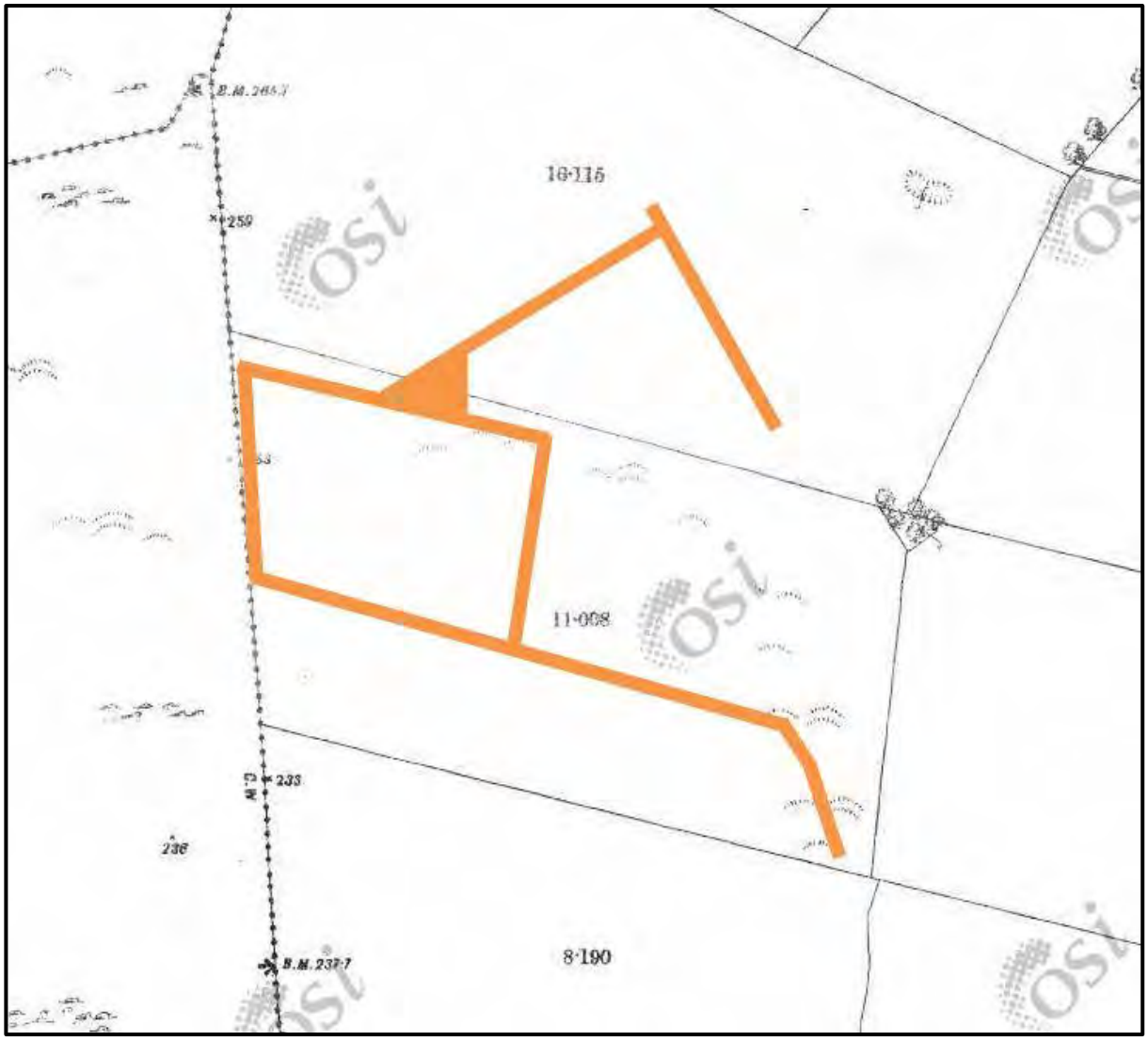


Figure 6: Extract from First Edition Ordnance Survey map 1:2,500, showing the electricity substation, access track and underground electricity line

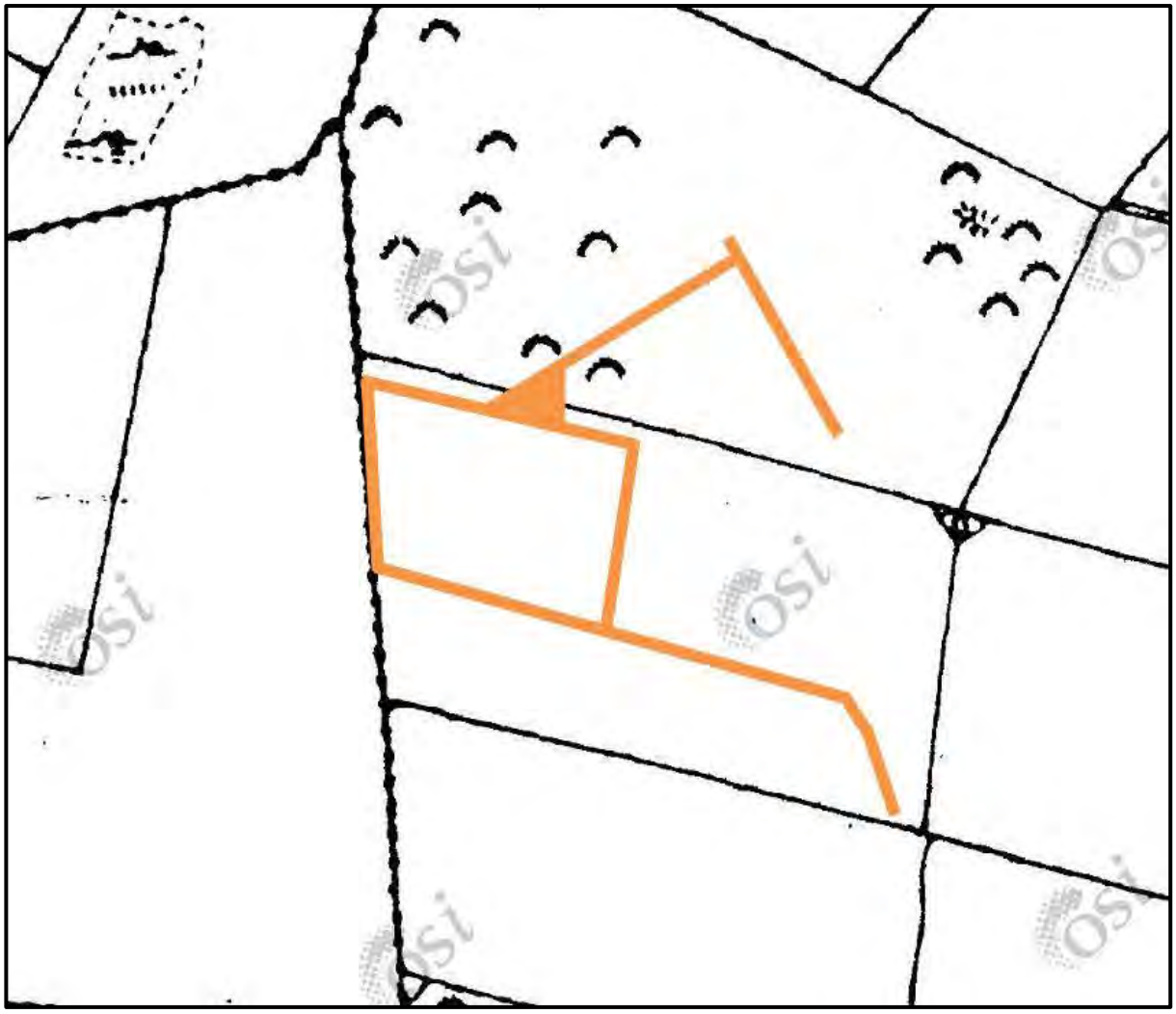


Figure 7: Extract from Third Edition Ordnance Survey map 1:10,560, showing the electricity substation, access track and underground electricity line

3.3 Aerial Photographs

Aerial photographs held by Ordnance Survey Ireland (www.map.geohive.ie) and Bing aerial photography (www.bing.com/maps) were consulted to look for the presence of archaeological or architectural remains within the land take of the project.

There was no evidence of any archaeological or architectural features recorded on aerial photography within any areas of land take required for the project.

3.4 County Development Plan

Roscommon County Development Plan 2022 - 2028

3.4.1 Archaeological Heritage

It is a Policy Objective (BH 9.13) of Roscommon County Council (Roscommon County Development Plan 2022-2028, Volume 1) to:

> "*Secure the preservation (i.e. preservation in situ or, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological interest generally. In securing such preservation Roscommon County Council will have regard to the advice and recommendations of the National Monuments Section of the Department of Housing, Local Government and Heritage*."

The *Roscommon County Development Plan* (2022 – 2028) does not contain any designated lists or sites of archaeological importance or significance.

3.4.2 Architectural Heritage

It is a Policy Objective (BH 9.1) of Roscommon County Council (*ibid*.) to:

> "*Ensure the protection of the architectural heritage of County Roscommon through the compilation of a Record of Protected Structures, the designation of Architectural Conservation Areas, the safeguarding of historic gardens, and the recognition of structures and elements that contribute positively to the vernacular and industrial heritage of the county.*"

It is also a Policy Objective (BH 9.2) of Roscommon County Council (*ibid*.) to:

> "*Protect all structures included on the Record of Protected Structures and their settings, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest*."

The Roscommon County Development Plan (*ibid*.) contains the *Record of Protected Structures* for the county. There are no Protected Structures recorded in the Roscommon County Development Plan within the electricity substation.

There are 4 no. Protected Structures recorded in the Roscommon County Development Plan within 2km of the electricity substation (3 no. of which are recorded on the National Inventory of Architectural Heritage).

There are no Protected Structures recorded in the Roscommon County Development Plan within the electricity line or within 100m either side of the electricity line.

Section 9.3 of the Roscommon County Development Plan (*ibid*.) contains a list of *Architectural Conservation Areas* from within the county. There are no Architectural Conservation Areas recorded in the Roscommon County Development Plan within the electricity substation or within 2km of the electricity substation.

There are no Architectural Conservation Areas recorded in the Roscommon County Development Plan within the electricity line or within 100m either side of the electricity line.

3.4.3 Cultural Heritage

The *Roscommon County Development Plan* (2022 – 2028) does not contain any designated lists or sites of cultural heritage importance or significance.

3.5 National Monuments

The Department of Housing, Local Government and Heritage maintains a database on a county basis of National Monuments in State Care. The term National Monument is defined in Section 2 of the National Monuments Act (1930) as:

> "*a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto.*" (www.archaeology.ie).

There are no National Monuments in State Care within the electricity substation or within 2km of the electricity substation.

There are no National Monuments in State Care within the electricity line or within 100m either side of the electricity line.

The Department of Housing, Local Government and Heritage also maintains a database on a county basis of National Monuments with Preservation Orders or Temporary Preservation Orders.

There are no National Monuments with Preservation Orders or Temporary Preservation Orders within the electricity substation or within 2km of the electricity substation.

There are no National Monuments with Preservation Orders or Temporary Preservation Orders within the electricity line or within 100m either side of the electricity line.

There are no World Heritage Sites or sites included in the Tentative List as consideration for nomination to the World Heritage within the electricity substation or within 2km of the electricity substation.

There are no World Heritage Sites or sites included in the Tentative List as consideration for nomination to the World Heritage List within the electricity line or within 100m either side of the electricity line.

3.6 National Inventory of Architectural Heritage

Building Survey

The National Inventory of Architectural Heritage (NIAH) maintains a non-statutory register of buildings, structures *etc*. recorded on a county basis.

There are no structures recorded on the National Inventory of Architectural Heritage within the electricity substation.

There are 4 no. structures recorded on the National Inventory of Architectural Heritage within 2km of the electricity substation (3 no. of which are recorded as Protected Structures).

There are no structures recorded on the National Inventory of Architectural Heritage within the electricity line or within 100m either side of the electricity line.

Garden Survey

There are no historic gardens or designed landscapes recorded on the National Inventory of Architectural Heritage within the electricity substation.

There are no historic gardens or designed landscapes recorded on the National Inventory of Architectural Heritage within the electricity line.

3.7 Site Visit

The field inspections sought to assess the site, its previous and current land use, the topography and any additional environmental information relevant to the report. The site visits were carried out on 7th November 2023 and 4th September 2024 when weather conditions were

dry and bright, and all areas of land take associated with the electricity substation were walked and visually assessed. A windshield survey of the electricity line route was carried out.

No archaeological features or artefacts were revealed as a result of carrying out the walkover surveys or windshield survey. The location of RMP RO048-037 (standing stone) and RMP RO048-038 (redundant record) were both inspected in detail, and no associated features were recorded.

3.8 Conclusions

There are no Recorded Monuments within the electricity substation. There are 2 no. Recorded Monuments within 200m of the electricity substation, one of which is the site of a standing stone which no longer survives above-ground and whose location is therefore not known with certainty. The other site is now classified as a redundant record. There are an additional 32 no. Recorded Monuments within 1km of the electricity substation.

There are no Recorded Monuments within the electricity line. There are 14 no. Recorded Monuments within 100m either side of the electricity line. Of these 14 no. Recorded Monuments, 2 no. are classified as redundant records. The remainder include 1 no. bowl-barrow, 2 no. ringforts, 4 no. penitential stations, 1 no. holy well, 1 no. stoup, 1 no. armorial plaque, 1 no. 17th century house and 1 no. building.

There are no National Monuments in State Care within the electricity substation or within 2km of the electricity substation. There are no National Monuments in State Care within the electricity line or within 100m of the electricity line. There are no National Monuments with Preservation Orders or Temporary Preservation Orders within the electricity substation or within 2km of the electricity substation. There are no National Monuments with Preservation Orders or Temporary Preservation Orders within the electricity line or within 100m of the electricity line. There are no World Heritage Sites or sites included in the Tentative List as consideration for nomination to the World Heritage within the electricity substation or within 2km of the electricity substation. There are no World Heritage Sites or sites included in the Tentative List as consideration for nomination to the World Heritage List within the electricity line or within 100m of the electricity line.

There are no Protected Structures within the electricity substation. There are 4 no. Protected Structures within 2km of the electricity substation (3 no. of which are recorded on the National

Inventory of Architectural Heritage). There are no Protected Structures within the electricity line or within 100m of the electricity line.

There are no Architectural Conservation Areas within the electricity substation or within 2km of the electricity substation. There are no Architectural Conservation Areas within electricity line or within 100m of the electricity line.

There are no structures recorded on the National Inventory of Architectural Heritage within the electricity substation. There are 4 no. structures recorded on the National Inventory of Architectural Heritage within 2km of the electricity substation (3 no. of which are recorded as Protected Structures). There are no structures recorded on the National Inventory of Architectural Heritage within the electricity line or within 100m of the electricity line.

There are no historic gardens or designed landscapes recorded on the National Inventory of Architectural Heritage within the electricity substation. There are no historic gardens or designed landscapes recorded on the National Inventory of Architectural Heritage within the electricity line.

There are no archaeological or architectural features recorded within the electricity substation on Ordnance Survey maps. The historic maps all record the presence of vernacular structures, Ordnance Survey bench marks, gravel pits, *etc*. in the general vicinity of the electricity line. There was no evidence of any archaeological or architectural features recorded on aerial photography within any areas of land take required for the project. No archaeological features or artefacts were revealed as result of carrying out the walkover surveys or the windshield survey. The location of RMP RO048-037 (standing stone) and RMP RO048-038 (redundant record) were both inspected in detail, and no associated features were recorded.

4 ASSESSMENT OF POTENTIAL CONSTRUCTION IMPACTS

4.1 Potential Construction Impacts

As a result of carrying out this desk-based scoping report, the following potential archaeological, architectural and cultural heritage impacts have been identified and thus require detailed assessment, where relevant:

- There are no Recorded Monuments within the electricity substation.

- There are 2 no. Recorded Monuments within 200m of the electricity substation, one of which is the site of a standing stone which no longer survives above-ground and whose location is therefore not known with certainty. As a result, the project could potentially have a permanent imperceptible direct construction impact on the site of a Recorded Monument.

- There is an additional 1 no. Recorded Monument within 200m of the electricity substation, although this site is now classified as a redundant record. There are an additional 32 no. Recorded Monuments within 1km of the substation. There are no Recorded Monuments within the electricity line. There are 14 no. Recorded Monuments within 100m either side of the electricity line.

- The project could potentially have a permanent imperceptible direct construction impact on any previously unrecorded archaeological remains that may exist within the development area.

- It is considered there could potentially be a visual and noise construction impact on the site of a Recorded Monument (standing stone), although this feature no longer survives above-ground. Further assessment is required.

- It is considered at this stage there is unlikely to be a significant visual or noise construction impact on any additional archaeological remains, however, further assessment is required.

- It is considered at this stage there is unlikely to be a significant visual or noise construction impact on any architectural or cultural heritage remains, however, further assessment is required.

4.2 Potential Cumulative Construction Impacts

- It is considered at this stage there is unlikely to be cumulative construction impacts on any archaeological, architectural or cultural heritage remains.

5 ASSESSMENT OF POTENTIAL OPERATIONAL IMPACTS

5.1 Potential Operational Impacts

- It is considered the electricity substation may have an operational visual impact on the site of a Recorded Monument (standing stone, which no longer survives above-ground),

as well as additional Recorded Monuments within the 1km study area. Further assessment is required.

- It is not known at this stage if there will be an operational visual impact on 4 no. Protected Structures (3 no. of which are recorded on the National Inventory of Architectural Heritage), and 4 no. structures recorded on the National Inventory of Architectural Heritage (3 no. of which are recorded as Protected Structures) located within 2km of the electricity substation. Further assessment is required.

- It is considered that the electricity line, due to its underground nature, does not have the potential to result in operational visual impacts on archaeological, architectural or cultural heritage remains.

5.2 Potential Cumulative Operational Impacts

- It is not known at this stage if there will be any cumulative operational impacts on archaeological, architectural or cultural heritage remains between the electricity substation and any existing, permitted or proposed developments. Further assessment is required.

- It is considered that the electricity line will not have any cumulative operational impacts on archaeological, architectural or cultural heritage remains.

6 PROPOSED ASSESSMENT & MITIGATION MEASURES

- It is recommended that a detailed desktop analysis and appraisal of the existing cultural heritage environment be undertaken as part of the Environmental Impact Assessment Report (EIAR). This appraisal will allow for an evidence-based assessment of likely significant effects which may arise from the construction and operation of the project.

- It is possible that a pre-consent archaeological geophysical survey may be required in all areas of land take associated with the electricity substation.

- It is possible that pre-consent licensed test trenching may be required in all areas of land take associated with the electricity substation.

- It is likely that licensed archaeological monitoring will be recommended for all excavation works associated with construction of the electricity substation.

- It is likely that licensed archaeological monitoring will be recommended for all excavation works associated with construction of the electricity line.

- It is recommended that detailed visual and noise impact assessments be carried out to assess the extent of construction and operational visual impacts which the electricity substation may have on archaeological and architectural remains.

- On the basis of the above scoping assessment, it is assessed that no heritage elements can be "scoped out", and thus a detailed impact assessment of the archaeological, architectural and cultural heritage resource must be provided within the EIAR.

7 MICROSITING

Given its proximity to a Recorded Monument (standing stone, which no longer survives above-ground), it is recommended that micrositing should not be considered at the site of the electricity substation should it result in it moving closer to the site of the Recorded Monument.

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www.map.geohive.ie	Ordnance Survey Ireland aerial photographs
www.roscommoncoco.ie	Roscommon County Council

Annex 6 –

Noise & Vibration Scoping Report

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MOYVANNAN SUBSTATION

SCOPING REPORT: NOISE AND VIBRATION

Technical Report Prepared For

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Our Reference

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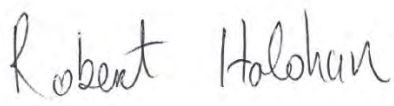
Signature		
Name	Robert Holohan	Mike Simms
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Date	7 May 2024	7 May 2024

EXECUTIVE SUMMARY

This document summarises the scope of the noise and vibration study for EIAR Chapter for the Moyvannan Electricity Substation under the following headings:

- The ***study area*** will be defined;
- the ***description of the existing environment*** will be obtained by the analysis of the measured noise levels, at locations monitored by AWN.
- The ***description of likely effects*** for the construction, operational and demolition phases will be evaluated against the current relevant guidelines for the construction and operational phases, and;
- ***Cumulative environmental noise effects****:* Cumulative noise and vibration effects with the Seven Hills wind farm are screened out of the assessment. The potential for cumulative noise and vibration due to other nearby developments in general can be assessed if required.

Constraints on the proposed development have also been considered. There are noise-sensitive locations (typically residential houses) at intervals all along the route. No schools or places of worship were identified.

CONTENTS

1.0 INTRODUCTION

The noise and vibration chapter of the EIAR will assess the potential impacts of the project to sensitive receptors in the surrounding environment. The principal phase with potential for noise and vibration impacts is the construction phase, given that the underground electricity cables do not generate noise. The only element of the project with the potential for operational noise impacts is the substation.

The principal objectives of the noise and vibration assessment are to specify appropriate limit values and mitigation measures to ensure that the impact on the environment is minimised.

2.0 STUDY AREA

The study area for the operational phase covers the substation area where the noise is predicted to exceed 35dB $L_{Aeq,15min}$. Based on typical noise levels of substations the area will be in the order of 350 m from the substation boundary.

For the construction phase all properties within 250 m of the proposed construction activities or the nearest noise sensitive location (NSL) if greater than 250m were considered in the assessment.

Potential NSLs included residential dwellings, commercial properties, derelict buildings (which may be brought back into use), and pre-planning infrastructure (including that submitted for planning permission associated with houses). All properties were then reviewed by ground-truthing and further desktop assessment to identify potential sensitive receptors in the vicinity of the development.

3.0 DESCRIPTION OF EXISTING ENVIRONMENT

A background noise monitoring survey was completed at several NSLs in the vicinity of the project. All measurements were conducted in accordance with the ISO 1996: 2017*: Acoustics – Description, measurement, and assessment of environmental noise* (ISO, 2017).

The results of the background noise survey will be used to identify appropriate noise criteria for the various phases of the project with reference to the appropriate guidance documents.

3.1 Unattended Noise Survey Location

In order to address the potential impact of the substation noise, an unattended noise monitor was installed over a 7-day period at the location shown in Figure 1. The survey was carried out in calm wind conditions. The findings of the noise survey will be used to develop noise criteria using the methodology in (EPA) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities NG4* (EPA, 2016) and the British Standard BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*.

3.2 Proposed Attended Noise Survey Locations

It is understood that the construction activities will take place during daytime periods (07:00hrs to 19:00 hrs). In order to describe the existing noise environment along the route, noise levels at four locations were monitored. The findings of the noise survey will be used to develop construction noise criteria using the methodology in the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites Part 1: Noise*.

The locations of the completed noise surveys are presented in Figures 1 and 2 below. Coordinates for the locations are provided in Tables 1 and 2.

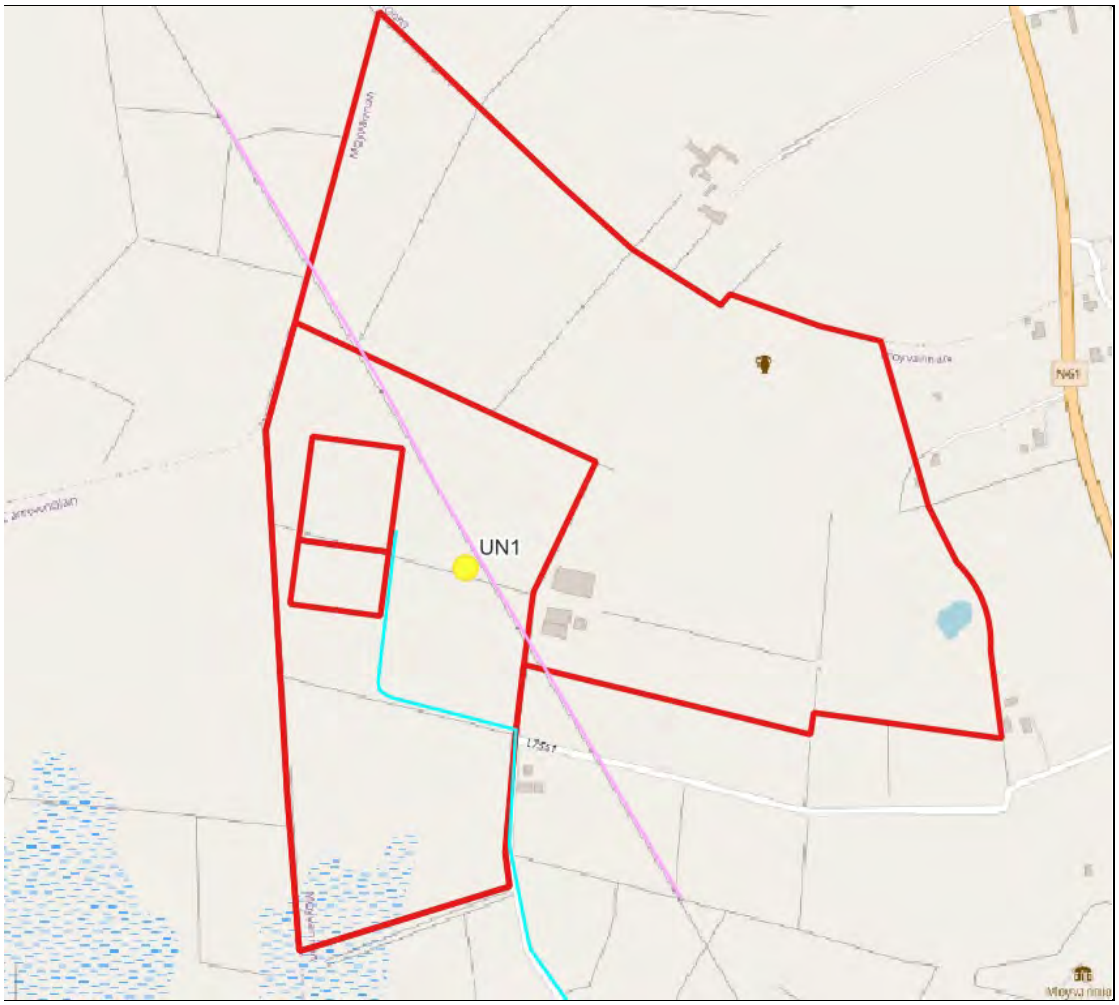

Figure 1 Proposed Unattended Noise Survey Location

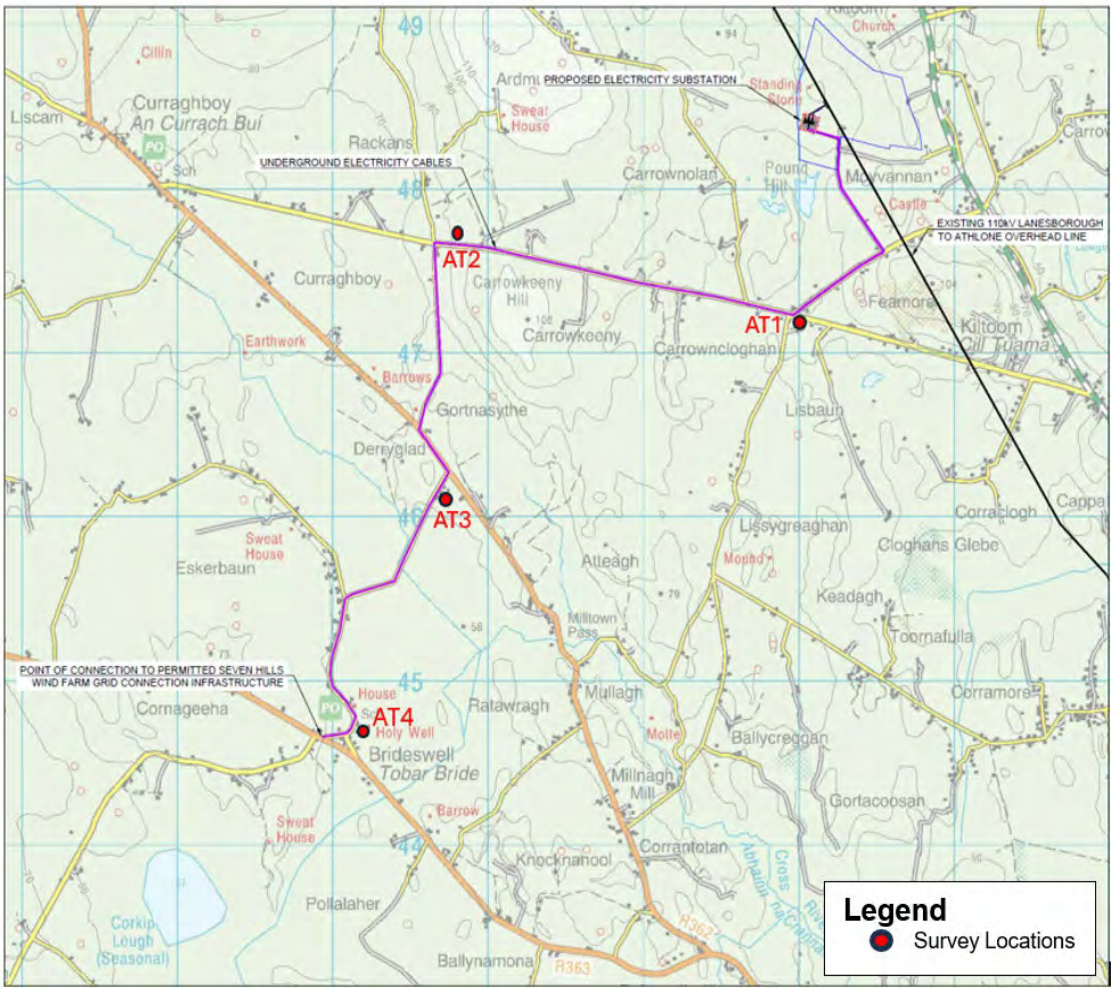

Figure 2 Proposed Attended Noise Survey Locations

Table 1 Coordinates for unattended survey locations

Location Reference	Coordinates (ITM)	
	Easting	Northing
AT1	197188	248426

Table 2 *Coordinates for attended survey locations*

Location Reference	Coordinates (ITM)	
	Easting	Northing
AT1	196947	247218
AT2	194820	247660
AT3	194697	246171
AT4	194087	244633

4.0 DESCRIPTION OF LIKELY EFFECTS

The baseline work characterised the noise climate existing in the area and facilitates the quantification of potential noise impact which may arise from the project. It is envisaged that the main noise and vibration impacts associated with the project will be construction activity. The potential noise and vibration impacts will be considered for the following phases:

- Construction Phase, and;
- Operational Phase.

It is understood that there will be no decommissioning phase in this instance, as the infrastructure will be left *in situ*.

4.1 Construction Phase

Construction noise levels associated with various element of the proposed development will be predicted at the facades of the closest noise-sensitive locations in the vicinity of the development by developing detailed construction calculations. Source noise levels will be obtained from BS 5228 2009 +A1 2014 *Code of practice for noise and vibration control on construction and open sites*. All predictions will be conducted in accordance with the guidance contained also within BS 5228.

Vibration during construction will also be considered regarding the potential impact of residential amenity and structural damage to buildings.

4.2 Operational Phase

We will predict noise levels at all the identified noise sensitive locations in the substation study area using a proprietary noise modelling package. All predictions will be done in accordance with ISO 9613: *Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation*, (ISO, 1996). The use of a computer-based noise model lends itself to ongoing evaluation of design changes and provides output that is detailed and extensive. Noise contour maps can be generated for the site noise models illustrating noise levels in the study area.

The results obtained from the prediction calculations will be used to assess the likely noise impact of the operation of the proposed substation. Where necessary and possible, consider noise control measures will be considered. Discussion of other issues will be included where appropriate, e.g. tonality.

The potential noise impact road traffic movements to and from the substation and any other permanent source of noise will be assessed and included as part of the noise chapter.

5.0 CUMULATIVE EFFECTS

Due to the 8km distance from proposed development to Seven Hills Wind Farm, cumulative assessment considering the wind farm is not included in the scope of the environmental noise assessment.

However, if desired, discussion of cumulative construction noise due to other development, whether they be renewable energy, quarries, infrastructure or

residential, can be included. In this instance, the specific list of developments for consideration will be provided by the client.

6.0 CONSTRAINTS

The main constraint on the project from a noise point of view is the distance to NSLs. in this context, the definition supplied in Environmental Protection Agency (EPA) NG4 Appendix I is adopted:

> *NSL – any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.*

The majority of NSLs at the substation and along the electricity cable route are residential houses. Using information available on-line, no schools or places of worship were identified in the study area.

6.1 Construction Phase

The construction works will necessarily pass along public roads and close to NSLs. This is mitigated by the fact that the construction works will proceed in linear fashion and will not be close to any individual NSL for more than a number of days.

A set of general construction noise and vibration mitigation measures will be included in the EIAR. Construction compounds, of applicable, should not be located with 100 m of an NSL.

6.2 Operational Phase

The operational phase noise of the project is confined to the substation. No sources of vibration are associated with the operational phase of the project. Using data to be provided by the client, the potential for noise impact at the nearest NSL will be assessed against the criteria derived from EPA NG4 / BS 4142:2014+A1:2019 guidance. If required, noise mitigation measures in the form of acoustic screening via berms or solid walls will be proposed.