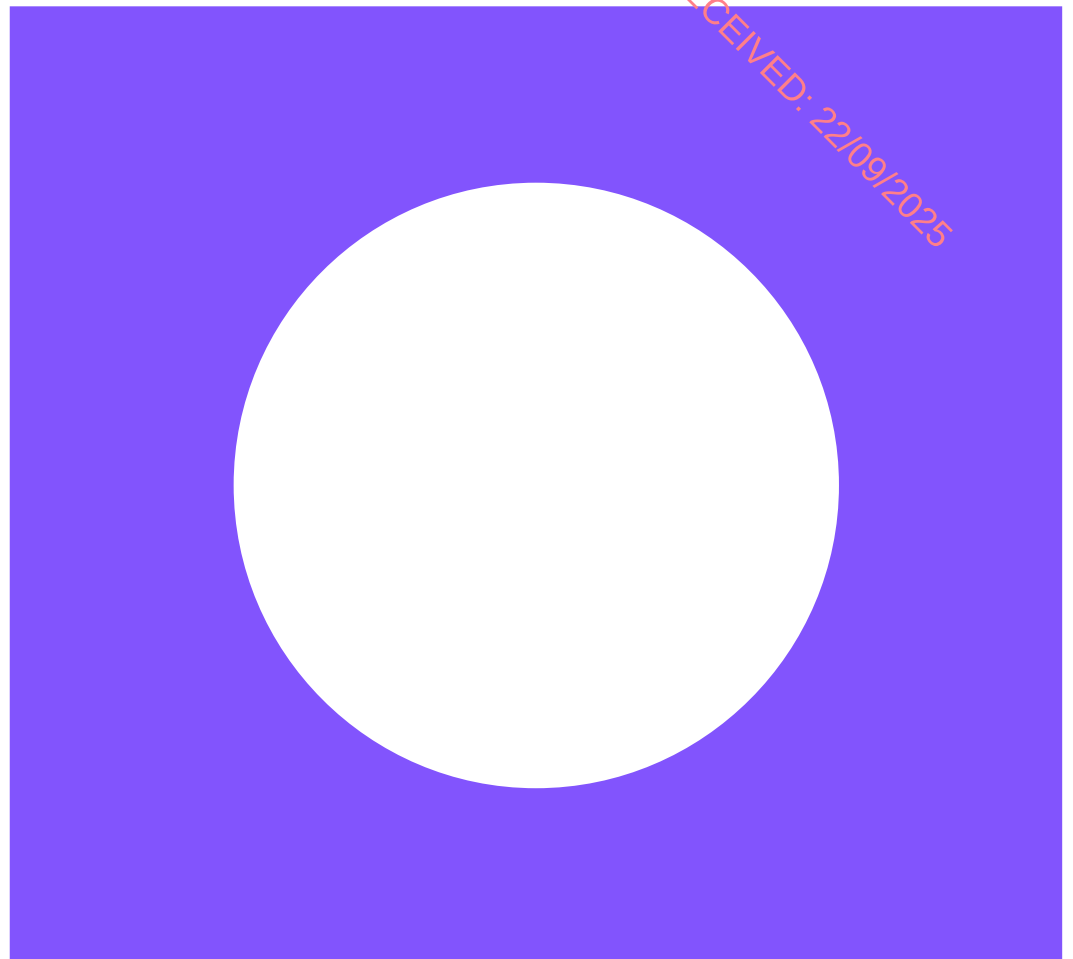


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Shelburne Energy Farm Environmental Impact Assessment Report

September 2025

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Shelburne Energy Farm Environmental Impact Assessment Report

September 2025

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Abbreviations

AA	Appropriate Assessment
AADT	Annual average daily traffic
ABP	An Bord Pleanála
AEP	Annual Exceedance Probability
AFA	Areas for Further Assessment
AGI	Above Ground Installation
AMS	Archaeological Management Solutions
AOD	Above ordnance datum
AQS	Air quality standards
BESS	Battery energy storage system
BPM	Best Practicable Means
BS	British Standard
BSI	British Standard Institution
CBC	Common Bird Census
CBGM	Cement Bound Granular Mixture
CCAC	Climate Change Advisory Council
CCGT	Combined Cycle Gas Turbines
CCRA	Climate change risk assessment
CDP	County Development Plan
CEMP	Construction Environmental Management Plan
CFRAM	National Catchment-based Flood Risk assessment and Management
CIEEM	Chartered Institute of Ecology and Environmental Management
CMIP5	Coupled Model Intercomparison Project Phase 5
COP	Conference of Parties
CPO	Compulsory Purchase Order
CRTN	Calculation of Road Traffic Noise
CRWMP	Construction Resource Waste Management Plan
CSH	Cultural Heritage Site
CSO	Central Statistics Office
CTMP	Construction Traffic Management Plan
DAHGI	Department of Arts, Heritage, Gaeltacht and the Islands
DAHRRGA	Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs
DEHLG	Department of Environment, Heritage and Local Government
DHLGH	Department of Housing, Local Government and Heritage
DIER	Database of Irish Excavation Reports
DSM	Digital Surface Model
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EnCoW	Environmental Clerk of Works
END	Environmental Noise Directive
ENR	Environmental Noise Regulations

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ESAS	European Seabird at Sea
ESB	Electrical Supply Board
ESBN	Electricity Supply Board Networks
ETS	EU Emission Trading System
EU ETS	European Union's Emissions Trading Scheme
Evs	Electric Vehicles
EWC	European Waste Classification
FRA	Flood Risk Assessment
GDSDS	Greater Dublin Strategic Drainage Study
GHG	Greenhouse gas
GIS	Gas-insulated substation
GIS	Geographic Information System
GNI	Gas Networks Ireland
GSI	Geological Survey Ireland
ATC	Automatic Traffic Counts
HDPE	High Density Polyethylene
HDV	Heavy Duty Vehicles
HFCs	Hydrofluorocarbons
HGV	Heavy Goods Vehicles
HMP	Habitat Management Plan
IAI	Institute of Archaeologists of Ireland
IAQM	Institute of air quality management
ICE	Institution of Civil Engineers
IEMA	Institute of Environmental Management and Assessment
IFI	Inland Fisheries Ireland
IRR	an Individual Risk Receptor
ISAP	Irish Stone Axe Project
ITM	Irish Transverse Mercator
KCC	Kerry County Council
KER	Key Ecological Receptors
km	Kilometer
kV	Kilovolt
kWh	kilowatt-hour
LCA	Landscape Character Area
LCIM	Line Cable Interface Mast
LDV	Light Duty Vehicles
LECP	Local Economic and Community Plan
LEVs	Low-Emission Vehicles
LGV	Light Goods Vehicles
LIA	Local Impact Area
LNG	Liquefied Natural Gas
LVIA	Landscape and Visual Impact Assessment
MSW	Municipal solid waste
m	Metre

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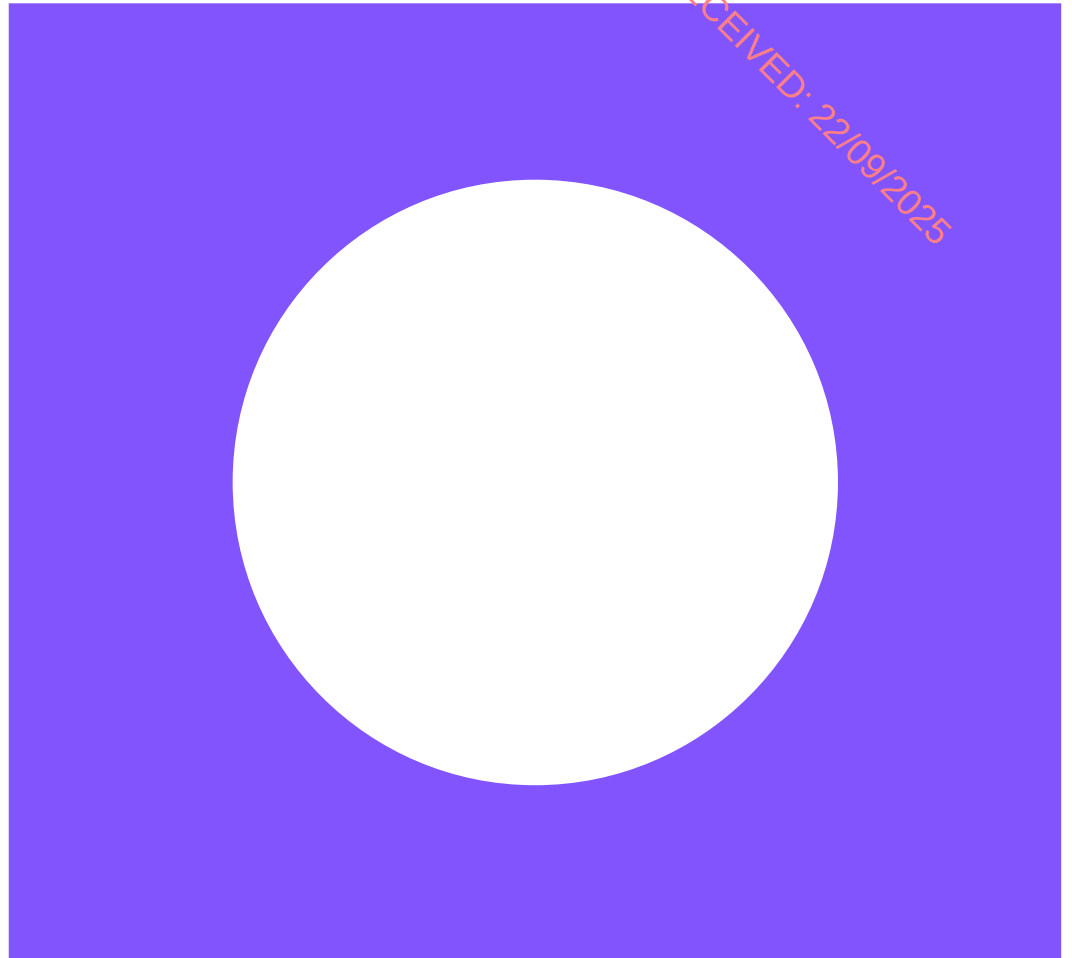
MtCO ₂ e	Million tonnes of CO ₂ equivalent
MW	Mega Watt
m ²	Square metre
TM	Traffic Management
m ³	Cubic metre
PIC	Personal Injury Collisions
KCDP	Kerry County Council Development Plan
RSA	Road Safety Authority
JTC	Junction and Turning Counts
NToM	National Transport Model
NAF	National Adaptation Framework
NBDC	National Biodiversity Data Centre
NDC	National Determined Contribution
NDC	Nationwide Data collection
NDP	National Development Plan
NHA	Natural Heritage Areas
NIAH	National Inventory of Architectural Heritage
NIFM	National Indicative Fluvial Mapping
NLS	National Landscape Strategy
NMI	National Museum of Ireland
NMS	National Monuments Service
NPF	National Planning Framework
NPWS	National Parks and Wildlife Service
NRA	National Road Authority
NMU	Non-motorised User
NSL	Noise Sensitive Locations
NSO	National Strategic Outcomes
OD	Ordnance Datum
OPW	Office of Public Works
OS	Ordnance Survey
PAB	Planning Application Boundary
pcy	Per calendar year
PE	Polyethylene
PFCs	Perfluorocarbons
pNHA	Proposed Natural Heritage Areas
PoMs	Programmes of Measures
PPE	Personal Protective Equipment
ppv	Part Per volume
PSCS	Project Supervisor Construction Stage
PSDP	Project Supervisor for the Design Process
RBD	Irish River Basin District
RBD	River Basin Districts
RBMP	River Basin Management Planning
RBMP	River Basin Management Plan

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RMP	Record of Monuments and Places
RPS	Record of Protected Structures
RSES	Regional Spatial and Economic Strategy
SAC	Special Area of Conservation
SI	Statutory Instrument
SID	Strategic Infrastructure Developments
SMR	Sites and Monuments Record
SPA	Special Protected Area
SPA	Special Protection Area
SPL	Sound Pressure Levels
SRA	Southern Regional Assembly
SRTM	Shuttle Radar Topography Mission
STEP	Shannon Technology and Energy Park
SUDs	Sustainable Urban Drainage Systems
TAO	Transmission Asset Owner
TII	Transport Infrastructure Ireland
TMP	Traffic Management Plan
TSO	Transmission System Operator
UNCBD	United Nations Convention on Biological Diversity
UNFCCC	United Nations Framework Convention on Climate Change
WFD	Water Framework Directive
WIA	Wider Impact Area
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility
TTA	Traffic and Transport Assessment

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 1 Introduction

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1 Introduction

1.1 Project Overview

Mott MacDonald Ireland Limited have been appointed by Gen7 Renewable Energy Limited (Gen7) to prepare this Environmental Impact Assessment Report (EIAR) to accompany planning applications to the relevant planning authorities for a renewable energy development.

Gen7 intend to apply for planning permission to construct a solar farm, battery energy storage system (BESS), which together are referred to as 'Shelburne Energy Farm'. Gen7 will also seek planning permission for a 220kV substation and associated cable connection which will connect Shelburne Energy Farm to the national grid.

This EIAR has been prepared to facilitate Wexford County Council and An Coimisiún Pleanála in undertaking an Environmental Impact Assessment for a solar farm, a battery energy storage system, and the associated 220kV substation and grid connection (hereafter "The Proposed Project").

As the Proposed Project meets a threshold specified within Schedule 5, Part 2, of the Planning and Development Regulations, 2001 (as amended), mandatory EIA is required (refer to Section 1.8 for further details).

This EIAR constitutes an Environmental Impact Assessment Report in accordance with Directive (2011/92/EU) as amended by Directive 2014/52/EU (together, the "EIA Directive") and fully complies with the requirements of the EIA Directive.

1.2 About the Applicant

Gen7 Energy Renewables Limited are an Irish independent renewable energy developer. Gen7 Energy Renewables Limited brings together over one hundred years of expertise in engineering, finance, information technology, new business development and marketing with the core skills to successfully develop and operate the proposed Shelburne Energy Farm.

1.3 Outline of the Project

Shelburne Energy Farm is a solar photovoltaic farm with an accompanying and co-located battery energy storage system. The solar farm will generate up to 92.68 MWp (peak [alternating current] generation under optimal conditions) of electricity while the battery energy storage system will provide 54.8MWac of electricity storage for a two-hour duration. The battery system will store the electricity generated by the solar farm.

Shelburne Energy Farm is located within a circa 121.5 hectare site in the townlands of Ballygarvan, Cloonagh and Nash, Gusserane, County Wexford. The largest solar array area - Area A, measures 65.1 hectares and contains the largest solar array and also the co-located battery energy storage system. The solar farm then extends to a further two parcels of land (Area B – ca. 39.2 hectares and Area C – ca.17.2 hectares).

All utility scale energy generation projects require a connection to the national electricity grid. For Shelburne Energy Farm this will comprise a 220kV substation and an associated 220kV 2.9km cable connection to an existing transmission overhead line (Great Island - Lodgewood 220kV circuit) in the vicinity north of Shelburne Energy Farm.

1.4 The Proposed Project's consenting process

Table 1.1 sets out the planning consent process for the Proposed Project in chronological order in Table 1.1.

A single EIAR and Natura Impact Statement (NIS) will accompany both planning applications.

Table 1.1: Planning Consent routes for the Proposed Project

Planning application type	Proposed Development	Planning authority
Section 34 of the Planning and Development Act, 2000, as amended	Solar Farm and BESS	Wexford County Council
Strategic Infrastructure Development of the Planning and Development Act, 2000, as amended	220kV GIS/AIS substation compound and grid connection	An Coimisiún Pleanála

1.5 References to Proposed Project

The following explanations are detailed herein in relation to the terms and definitions which constitute the Proposed Project in relation to this EIAR.

Shelburne Energy Farm refers to all elements of the solar farm, battery energy storage system and all associated access roads, low and medium voltage cabling, permanent metrological stations, temporary construction compounds, fire water supply, site drainage and perimeter fencing.

The **220kV Grid Connection** refers to the 220kV Gas Insulated Switchgear (GIS) and Air Insulated Switchgear (AIS) substation compound and the associated 220kV underground cable route which connects from the GIS building to the existing Great Island - Lodgewood 220kV transmission circuit, as described in further detail in Chapter 5 *Description of Development*.

The **Proposed Project** as referenced in this EIAR refers to all elements of the Shelburne Energy Farm and the 220kV Grid Connection as described above. The Proposed Project is described in detail in Chapter 5 of this EIAR.

The **Project Site** refers to the planning application boundaries referenced in Table 1.1 above, i.e. Shelburne Energy Farm and the 220kV Grid Connection.

1.6 Project Need

Solar PV technology is one source of electricity generation which is required to help fulfil the national and European targets for increased renewable energy generation within the electricity sector. Solar energy targets have been set within each Climate Action Plan published by the Government since the initial publication in 2019, and in the last three iterations (2023, 2024 and 2025) the national target for solar energy has been set at 8GW by the year to 2030.

Within the National Planning Framework First Revision (April 2025), National Policy Objective 74 sets out regional renewable electricity capacity allocations. The Proposed Project is located in County Wexford and is within the administrative boundary of the Southern Regional Assembly, the applicable regional Solar PV allocations are reproduced below in Figure 1.1.

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Figure 1.1: Regional Solar PV targets

Region	Energised Capacity 2023 (MW)	Additional Renewable Power Capacity Allocations (MW)	Total % of National Share in 2030
Solar PV			
Eastern and Midlands	306	3,294	45%
Northern and Western	0.3	959	12%
Southern	138	3,302	43%
Total	445	7,555	

Source: Extract from the National Planning Framework First Revision (April 2025)

Solar PV is just one form of electricity which will make up the increasing diverse and renewable energy focused electricity generation mix within Ireland. Although in its infancy, solar PV is the fastest growing renewable energy source. It is an indigenous source of energy which support security of supply. Due to the hour-to-hour variability in renewable energy sources, including when irradiation may be lower during peak hours of electricity consumption, the provision of battery energy storage alongside the solar generation helps to offset this variability.

1.7 Project Location

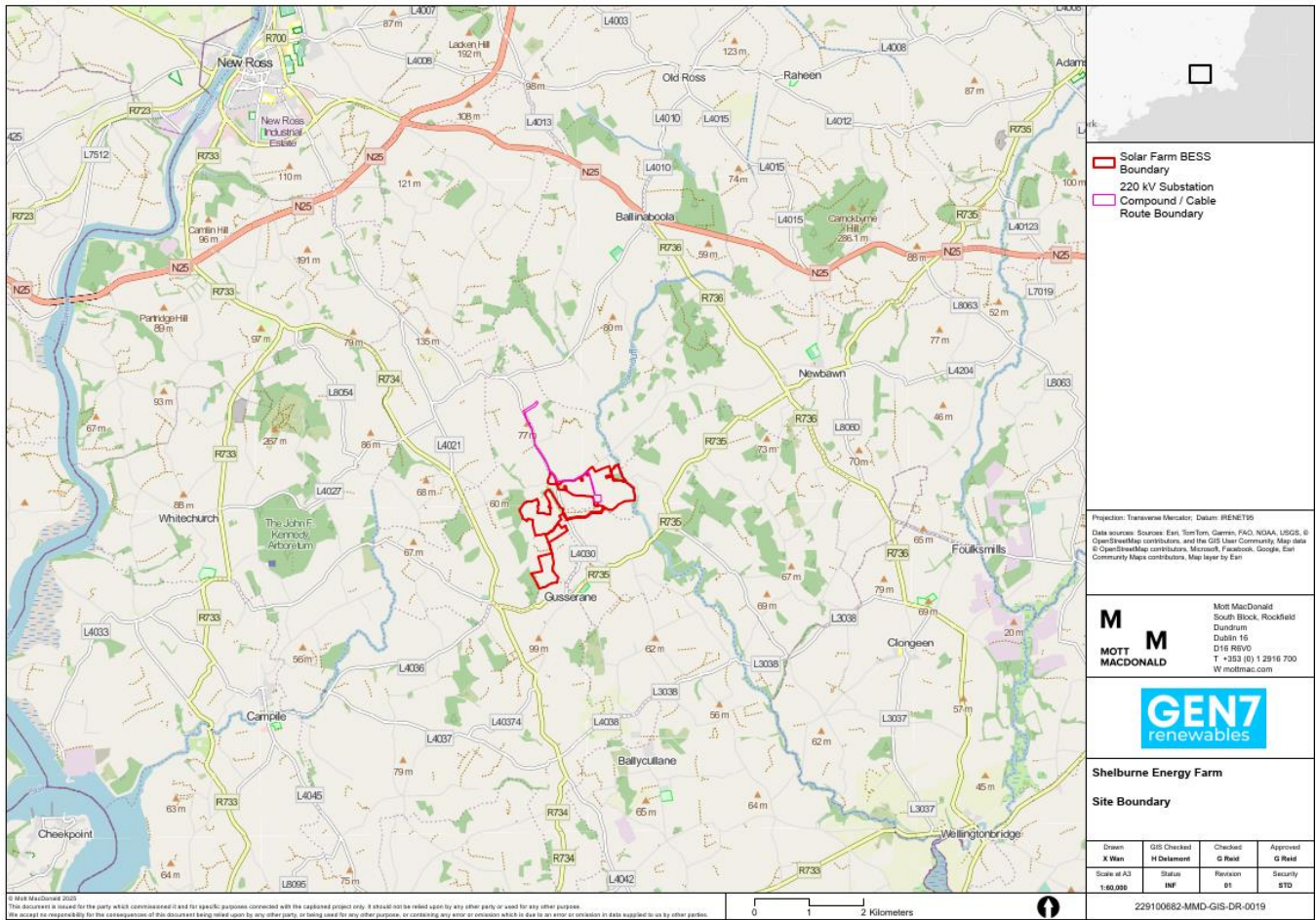
The Proposed Project is located in southwest County Wexford. The closest town is New Ross, located c.6.5km northwest of the Proposed Project; the village of Newbawn is located c.3km north-northeast of the Proposed Project. The Proposed Project occurs across three townlands to the north of the settlement of Gusserane as detailed herein;

- The proposed solar farm is located across three townlands, Ballygarvan, Cloonagh and Nash.
- The proposed BESS is co-located with the solar farm and is located in the townland of Nash.
- The proposed 220kV grid connection is located in the townland of Nash.

The Project site boundary is shown in Figure 1.2 and overlain on aerial imagery in Figure 1.3. Both Figure 1.2 and 1.3 show the respectively planning application boundaries which comprise the Proposed Project, the red boundary represents the application boundary in relation to the planning application Wexford County Council, while the pink boundary represents the application boundary for the planning application to An Coimisiún Pleanála.

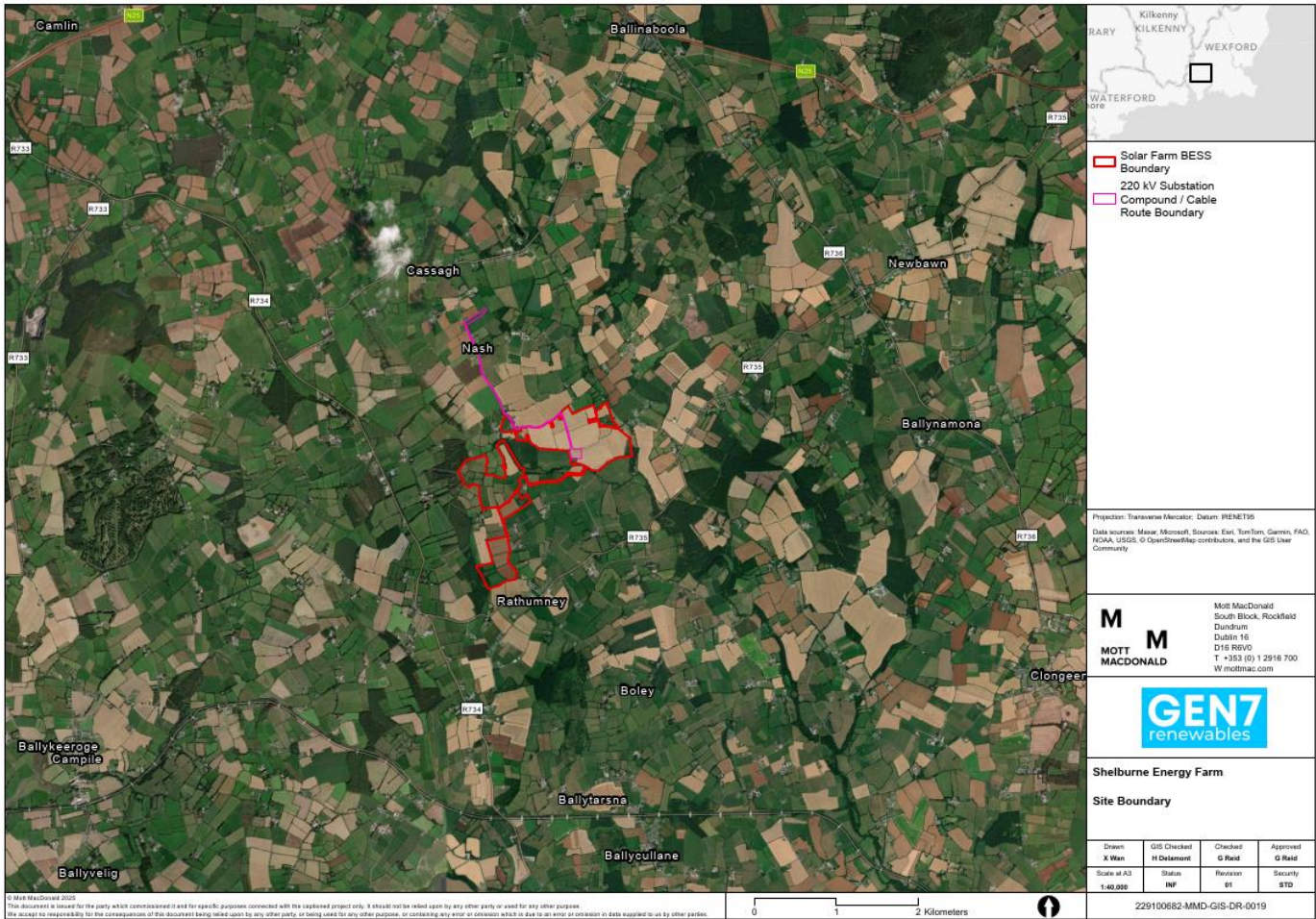
The current land-use within the Project site comprises existing agricultural lands which are predominately used for tillage production, crop production and livestock grazing. Land-use in the wider landscape of the Proposed Project comprises a mix of agriculture, low density residential development (one-off rural dwellings), commercial businesses and commercial forestry. The Proposed Project boundary also comprises the L4030 local road, which the 220kV underground cables will be laid within.

Figure 1.2: Location of Proposed Project



Source: Mott MacDonald Ireland Limited

Figure 1.3: Project Site Boundary (with satellite imagery)



Source: Mott MacDonald Ireland Limited

1.8 Legislative Context of Environmental Impact Assessment

Projects listed in Annex I to the European Union (EU) EIA Directive 2011/92/EU, as amended by EIA Directive 2014/52/EU (together, the 'EIA Directive') requires the mandatory preparation of an EIA for all projects listed therein. Projects listed in Annex II to the EIA Directive are not automatically subjected to EIA. Member States can decide to subject them to an assessment on a case-by-case basis or according to thresholds and/or criteria (for example size), location (sensitive ecological areas and potential impact (surface affected, duration)).

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296/2018) amended the Planning and Development Act 2000 and the Planning and Development Regulations 2001 in order to transpose into Irish Law the provisions of EIA Directive 2014/52/EU.

Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations 2001, as amended, transposes Annex I and Annex II to the amended EIA Directive.

The requirement for an EIAR to be prepared for the Proposed Project relates to the exceedance of the threshold related to the recontouring of rural land holdings.

The Proposed Project requires the creation of level platforms to facilitate the installation of equipment, plant and buildings. As such the cut and fill activities related to the BESS compound and the main temporary construction compound measures an area of 6.2 hectares. Additionally, the substation compound will also be levelled and measures an area of 0.72 hectares.

The combined earthworks activities associated with the Proposed Project total 6.92 hectares, resulting in the exceedance of the 5 hectares threshold prescribed under the Planning and Development Regulations 2001, as amended, Schedule 5, Part 2, Paragraph 1(a) [Agriculture, Silviculture and Aquaculture], reproduced below:

1(a) "Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares".

Where a class set out in Schedule 5, Part 2, exceeds the relevant threshold, a mandatory EIAR is required.

There is no legal definition of what comprises re-contouring for the purposes of this class. However given the extent of excavation and levelling of lands across and area in excess of the 5 hectare threshold specified under Schedule 5, Part 2, Paragraph 1(a) [as stated above] , on a precautionary basis, an EIAR has been prepared and EIA is required.

Article 5 of the EIA Directive provides where an EIA is required, the developer shall prepare and submit an environmental impact assessment report (EIAR). The information to be provided by the developer shall include at least:

- 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 relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

Whilst the relevant Schedule 5, Part 2, Paragraph 1(a) has triggered the requirement for EIA, out of an abundance of caution this EIAR is an assessment of the *whole project* and not of the rural restructuring in combination with the wider elements of the project.

This EIAR describes the receiving environment, assesses the likely significant effects of the Proposed Project on the receiving environment and proposes mitigation measures to avoid or reduce these effects as well as appropriate monitoring to ensure the efficacy of such mitigation measures. The function of the EIAR is to provide information to allow the competent authority to conduct the EIA of the Proposed Project.

1.9 Brief Project Description

The Proposed Project will comprise of the following elements to generate renewable electricity, facilitate electricity storage, control and alter electricity voltages, and connect this electricity to the transmission network. The different elements of the Proposed Project are described herein and further detailed in Chapter 5 –*Description of Development*. The Applicant is seeking planning approval for a 40 year operational life for Shelburne Energy Farm.

The Proposed Project will comprise of the following development;

A solar energy farm consisting of

- Photovoltaic (PV) panels on ground mounted frames, fixed in place using earth screws or driven mini-piles, with a maximum height of 4m above ground level, and a minimum ground clearance of 1.0m above ground level, across three separate land parcels referred to as Array Areas A, B and C providing 92.68 MWp (peak electricity generation under optimal conditions)
- Inverter units incorporated into the PV support structures;
- 17 no. transformer centres each measuring approximately 6.1m L x 2.5m W x 3.1m H;
- Underground electrical cable ducting between solar array areas A, B and C, connecting to the future proposed 220kV substation, including underground connections across local roads and 2no. wooden overhead electric poles, one placed on either side of the Tellarought River to facilitate its crossing;
- 4no. meteorological stations.

A Battery Energy Storage System (BESS) providing 54.8MWac of electricity storage for a two-hour duration, secured with 2.6m high palisade fencing and gates, and containing:

- 79no. of containerised battery storage modules (measuring approximately 6.82m length, 2.44m wide and 2.89m high);
- 19no. of containerised transformer and Power Conditioning Units (measuring approximately 6.82m length, 2.44m wide and 2.89m high) and ancillary equipment;
- 8.5m high acoustic barrier for noise attenuation around the BESS compound;
- Well and pump house to supply 2no. fire fighting tanks for Battery Energy Storage System compound and

- **All associated development** including widening of existing field entrance from local road L - 8059-1 to serve the solar array and BESS in Area A and vegetation clearance at all other existing site entrances to provide sight lines, temporary construction compounds (one in each solar array area), 2m high perimeter fencing fitted with mammal passes and security gates, pole mounted CCTV system, lighting, site drainage, fire water tanks, use of existing field entrances for access for construction and operation, internal access tracks, recontouring of land and landscaping, and all other works required to facilitate the proposed development.

The proposed 220kV substation compound and grid connection will be the subject of a separate planning application to An Coimisiún Pleanála under section 182A of the Planning and Development Act 2000 as amended. This associated development will consist of:

- A substation compound measuring an area of approximately 1.0 hectare which will accommodate the following:
 - 1no. Air Insulated Switchgear (AIS) securely fenced compound, which includes 1no. control building (9m L x 7.5m W x 4m H), 1no. transformers, cable sealing ends and associated AIS equipment;
 - 1no. Gas Insulated Switchgear (GIS) securely fenced compound, which includes a 220kV GIS building (49m L x 18.5m W x 17m H) housing GIS equipment;
- A grid cable connection from the GIS building to the existing 220kV overhead line circuit to Great Island, comprising 2no. 220kV underground cable circuits measuring approximately 2.9km in length;
- 2no. Line Cable Interface Masts (LCIMs) and stringing of new conductor to connect to an existing 220kV overhead line circuit to Great Island; and,
- All associated development including lighting, substation compound site drainage, effluent holding tank, well water supply for substation, internal access circulation area, lightning rods, lighting, dismantling and removal of 1no. existing 220kV overhead line tower and all other works required to facilitate the proposed development.

1.10 Structure of this EIAR

The EIAR for the Proposed Project is presented in five volumes, as follows:

- **Volume 1 – Non-Technical Summary:** This summarises the findings of the EIAR in a clear, accessible format that uses non-technical language and supporting graphics. The Non-Technical Summary describes the Proposed Project, summarises the baseline environment, potential impacts and mitigation measures, and relevant topics of the EIAR in a manner that can be easily understood by the general public;
- **Volume 2 – Main Report:** This includes introductory chapters in addition to ‘assessment’ chapters for each environmental topic in accordance with Annex IV of the EIA Directive. The front-end chapters provide the relevant Proposed Project context while the assessment chapters provide a description of the relevant environmental aspects, and likely significant impacts, with cumulative impacts from other developments in combination with the predicted impacts of the Proposed Project, and summary chapters provided thereafter;
- **Volume 3 – Appendices:** This provides the technical reports and information that support and are cross-referenced within Volume 2; and
- **Volume 4 – Photomontages & Glint and Glare Assessment:** This provides the photomontages that support Chapter 12 The Landscape, within Volume 2.

The overall structure of the EIAR, with a further breakdown of the structure of this Volume (Volume 2) is provided in Table 1.2.

Table 1.2: EIAR Volume 2 Structure

Chapter	Chapter Title	Chapter Description
1	Introduction	Provides an overview of the purpose, structure and scope of the report.
2	Stakeholder Engagement	Details the informal consultation undertaken with stakeholders and their feedback on the proposed project.
3	EIA Methodology	Sets out the methodology undertaken in the EIAR.
4	Reasonable Alternatives Considered	Sets out the need for the Proposed Project. Describes and evaluates the reasonable alternatives studied by the developer. Sets out the justification for the option chosen with consideration of the effects of the Proposed Project on the environment.
5	Description of Development	Describes the design, scale and size of the Proposed Project. Provides an overview of the location and wider setting of the proposed project.
6	Population and Human Health	Provides an assessment of the receiving environment in terms of population and human health and potential impact on humans as a result of the proposed project.
7	Biodiversity	Describes the receiving environment in terms of existing species and habitats. Assesses potential impacts on biodiversity and proposes relevant mitigation measures.
8	Land, Soils & Hydrogeology	Provides a review of the land, soils and hydrogeology receiving environment and assesses potential impacts on soil and hydrogeology and impacts in relation to land take. Recommended mitigation measures are stated.
9	Surface water resources and Flooding	Describes the receiving water environment, the potential impact of the proposed Project on water quality and flooding; and recommends mitigation measures.
10	Air Quality	Provides an overview of the receiving air quality environment, describes the impacts on air quality related to the Proposed Project and recommends appropriate mitigation measures.
11	Noise and Vibration	Provides an assessment of the receiving noise environment and outlines sensitive receptors vulnerable to potential noise or vibration impacts that may arise as a result of the Proposed Project.
12	Landscape	Describes the receiving landscape and visual environment, potential impacts to the landscape character and viewpoints and recommends mitigation measures.
13	Archaeology, Architectural and Cultural Heritage	Provides an assessment of the Proposed Project, considering potential impacts to cultural heritage assets, such as architectural and archaeological heritage, and proposes mitigation measures.
14	Roads, Traffic and Transportation	Outlines the receiving traffic environment and describes potential impacts on local roads that may arise due to construction and operational traffic.
15	Material Assets and Waste Management	Describes existing services, waste and infrastructural service requirements by the Proposed Project. Describes potential impacts to utilities as a result of the Proposed Project.
16	Climate (Carbon and Resilience)	This chapter of the EIAR identifies, describes and presents an assessment of the eventual significant effects of the Proposed Project on climate. This chapter describes the receiving climatic environment, the vulnerability of the Proposed Project to climate change and recommends resilience measures with regard to the Proposed Project.
17	Major Accidents and Disasters	Identifies and assesses the likelihood and potential impacts to the environment and population arising from the vulnerability of the Proposed Project to risks of major accidents and / or natural disasters.

Chapter	Chapter Title	Chapter Description
18	Interactions of Effects	Provides an overview of potential interactions among environmental factors and their cumulative impact as a result of the Proposed Project.
19	Summary of Mitigation and Monitoring	Sets out the mitigation and monitoring measures proposed throughout the various chapters for ease of reference.

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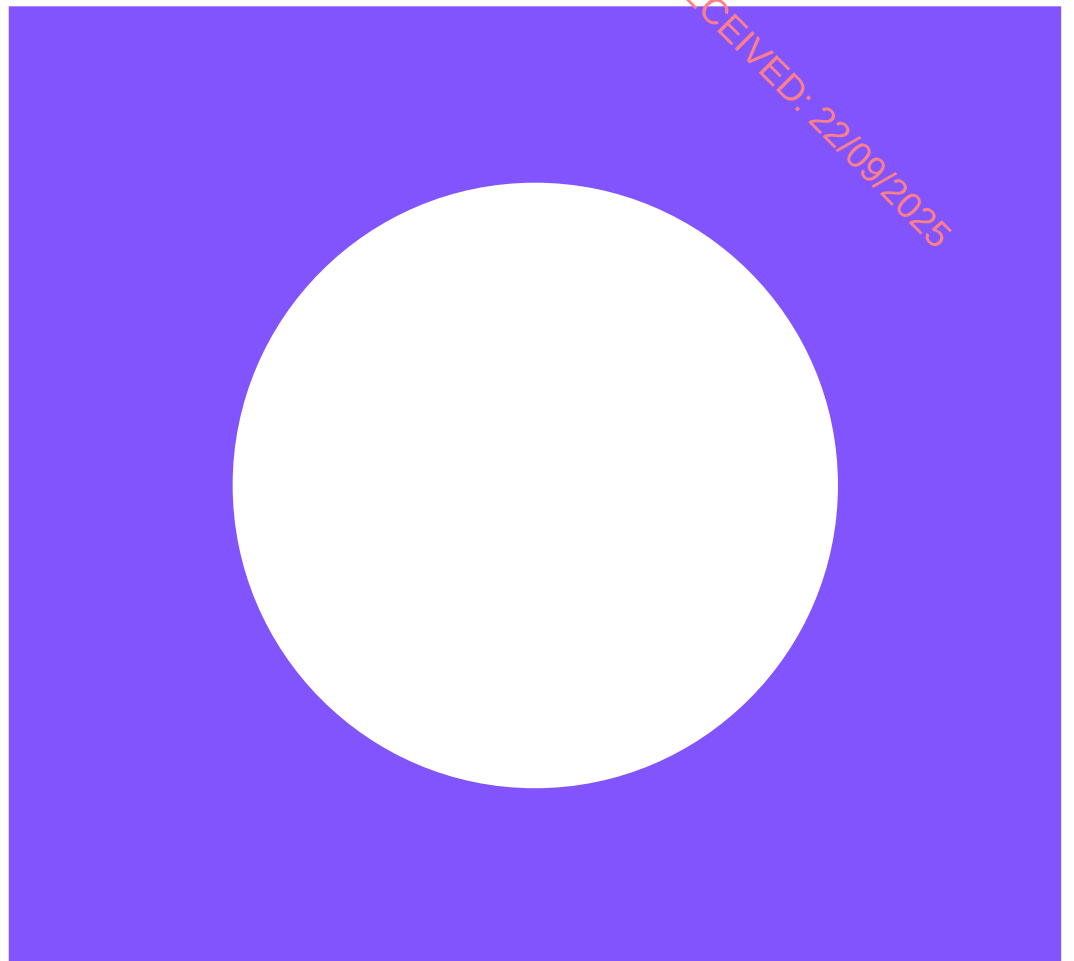
1.11 Competency of EIAR Experts

Mott MacDonald is a multidisciplinary consultancy with over 20 years' experience of undertaking complex and challenging environmental impact assessments and of writing environmental impact assessment reports for a wide range of projects. These include some of the Ireland's largest infrastructure, engineering and development projects. Mott MacDonald maintains high professional standards amongst staff both individually and across technical areas of practice.

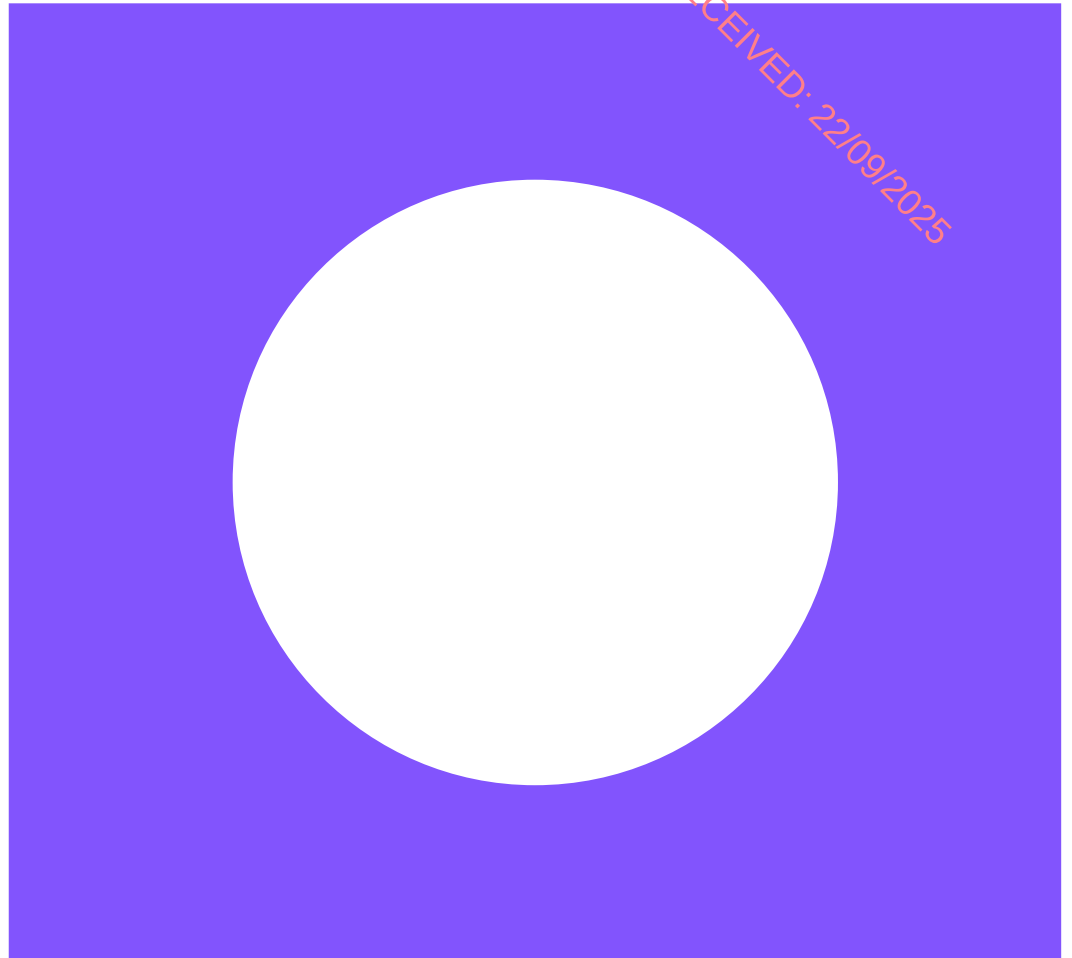
Mott MacDonald is a corporate member of the Institute of Environmental Management and Assessment and holds its EIA Quality Mark. The Quality Mark Scheme allows organisations that lead the co-ordination of statutory EIAs to make a commitment to excellence in their EIA activities and have this commitment independently reviewed. This Quality Mark Scheme is a clear indication that that Mott MacDonald can fully demonstrate the requirements for a 'competent expert' as outlined in the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Report' (2022).

Individually Mott MacDonald's technical staff are subject to annual performance reviews which evaluate their Continued Professional Development. As a business Mott MacDonald maintains technical "Practices" which are internal professional networks that span organisational and geographical boundaries. These help to maintain high professional standards across technical disciplines as well as facilitating contribution to the wider development of the Environmental Consulting industry. Specialist consultants have also been commissioned to provide support in the preparation of the EIAR. The credentials and competencies of all respective EIAR contributors is provided in Appendix 1.1 of this EIAR.

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 2 Stakeholder Development

September 2025

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2 Stakeholder Engagement

2.1 Introduction

Public participation and pre-application engagement with the local community has been an integral to the development of the Proposed Project and the EIA process. This chapter details the statutory and non-statutory stakeholder engagement activities undertaken for the Proposed Project.

2.2 Non-statutory stakeholder engagement

The Applicant conducted a series of community engagement events to collate the views and opinions of the local community.

2.2.1 Local Community Engagement

2.2.1.1 Consultation with Landowners directly affected by the Proposed Development

Consultation with landowners directly affected by the Proposed Development was undertaken between July 2023 and May 2025 following a feasibility study of the proposed solar farm. Discussions were finalised with six landowners who agreed to provide their consent for the purposes of lodging a planning application to Wexford County Council and An Coimisiún Pleanála. Legal consent of the landowners directly affected is a requirement for the planning consent process (pre-application consultation process and application consent process) with Wexford County Council.

2.2.1.2 Notification to Local Community

Engagement with the local community was initiated in June 2025 with a letter drop to households whose properties by reason of topography and orientation would be potentially impacted by the Proposed solar farm and Battery Energy Storage System. This letter drop provided a project information leaflet, detailing the extent of development for which planning permission would be sought from Wexford County Council, as well as details of the overall Project. This information leaflet included an invitation to members of the local community to avail of in-person meetings with the Applicant and members of the planning team between 16 and 25 July 2025 to discuss the Project.

The project information leaflet (contained in Appendix 2.1) included the following information;

- Project Overview
- Location Map / Site Layout Map
- Outline description of the Proposed Project
- Outline of the next steps (planning consent)
- Frequently Asked Questions
- Details of in-person meetings
- Project contact details

2.2.1.3 Non-Statutory Public Consultation Event

In-person meetings were held between 16 July and 25 July 2025 at The Brandon Court Hotel, New Ross, County Wexford. Time slots of 30-minute duration were made available to

individuals to discuss the Proposed Project with the Applicant and their planning team. Amongst the issues discussed were choice of location, impact from glint and glare on individual properties, impact of construction works on local roads, visual impact of the solar array, biodiversity, noise impacts during construction and commissioning, community benefit fund and how funds may be distributed, and potential loss of agricultural farm land.

These concerns were fed back to the design team by the Applicant, and taken into account in the design development and proposed mitigation measures.

Attendees who were interested in further details on the Proposed Project were invited to provide their contact information to allow the design team to answer specific queries, and to inform them of the lodgement of the planning application and details of the EIAR portal.

2.2.1.4 Follow-up Engagement

Further discussions were held in July and August 2025 with those individuals within the local community whose residential properties are located immediately adjoining the Proposed Project site who wished to discuss potential impacts to their property. These meetings focused on issue of relevance to the individual properties and generally related to disturbance during the construction phase or visual impacts and mitigation measures proposed including additional planting of trees and hedgerows to provided screening to properties during the operational and maintenance phase.

2.2.2 Statutory Bodies

Consultation on the Proposed Project with certain prescribed bodies was undertaken.

2.2.2.1 Development Applications Unit

A letter was emailed to the Development Applications Unit within the Department of Housing, Local Government and Heritage on 10 June 2025. A response was received on 01 July 2025. Archaeology related observations were provided in their responses, and are summarised herein:

- Notes existing Recorded Monuments with proximity to the Project site.
- There is potential for previously unidentified archaeological sites/features to survive within this greenfield development area and a fully comprehensive archaeological impact assessment, based on a programme of fieldwork, is recommended to develop an informed archaeological mitigation strategy to ensure the protection of the archaeological heritage.
- The developer should engage the services of a suitably qualified archaeologist to carry out a documentary and field-based archaeological assessment of the development site.
- The archaeologist shall prepare a written report, including an archaeological impact statement, for inclusion in the EIAR.
- The Planning Authority, in consultation with this Department, will advise accordingly following review of the archaeological assessment report.

The above items are addressed in Chapter 13 Archaeology, Architecture and Cultural Heritage.

2.2.2.2 Inland Fisheries Ireland

A letter was emailed to the relevant regional branch of Inland Fisheries Ireland (regional office for the Proposed Project is Clonmel, which covers the South Eastern river basin district) on 10 June 2025. No response was received.

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2.2.2.3 EirGrid

As part of the Proposed Project a GIS/AIS substation compound is required to connect the solar farm/BESS to the national grid. The ownership and operation of the GIS substation will be transferred to EirGrid once commissioned, as such, a discussion was held with EirGrid on 21 March 2023 to discuss the proposed grid connection. During this discussion EirGrid informed the Applicant that there was no capacity on the 110kV electricity transmission system to cater for additional generation (from any generation source). EirGrid thereby advised that the Proposed Project will be required to provide a connection into the local 220kV transmission system.

A pre-application grid connection application was lodged with EirGrid on 15 June 2025. Discussions with EirGrid will recommence subsequent to the lodgement of the Grid Application for the grid connection.

2.3 Statutory Engagement

Pre-application planning consultations have been undertaken for the Proposed Project including the grid connection which is required to connect the Proposed Project to the national grid.

2.3.1 Wexford County Council

A pre-application meeting request to discuss the proposed solar farm was sent on 30 August 2024 to Wexford County Council and a pre-application meeting was held on 12 November 2024 (Pre-application reference: P20240256). It was noted that solar farms are not a type of project listed within the EIA Directive, as such, the planning application would be accompanied by a Planning and Environmental Considerations Report. The following issues were discussed during the pre-application meeting:

- Traffic: requirement for a traffic impact assessment. This has been provided in Chapter 14 Roads, Traffic and Transportation.
- Air: requirement for a construction phase dust plan. This has been provided in Chapter 10 Air Quality.
- Noise: baseline noise survey to accompany the application. A baseline noise survey has been undertaken and is included in Chapter 11 Noise and Vibration.
- Water: construction surface water management to be provided, operational phase drainage to include SuDS based design. The proposed drainage is described in Chapter 5 - Description of Development.
- Biodiversity: Any site fencing must provide access for mammals. Clarification must be provided on why native habitats within the site are not suitable for tree planting and are worth retaining. The proposed perimeter fencing will include mammal passes in each section, while an area of land (measuring approximately 2.31 hectares) has been identified as appropriate for oak and alder tree planting. Justification on the retention of other habitats is discussed with Chapter 5 and 7.
- Agricultural uses: state intention to retain agricultural uses. It is proposed that sheep grazing is utilised throughout the solar farm to manage grass vegetation growth and eliminate or reduce the need for mechanical machinery to undertake this maintenance activity.
- Fire officer noted that the need to address the fire-fighting management approach as fires will not be attended. The proposed fire protection measures are addressed in Chapter 5 Description of Development.
- Battery Storage if being considered there would be a need to ensure that no leakage would enter ground water. The potential effects of the Proposed Project on groundwater are described in Chapter 8 Land, Soils and Hydrogeology.

- The planning authority advised that non statutory local community engagement should be considered. Community engagement as undertaken in described in section 2.2.1.

Following this pre-application planning consultation the Applicant sought to include Battery Energy Storage Systems (BESS) as part of the overall project. Wexford County Council were informed of this change to the Proposed Project to include BESS via email on 03 July 2025. Additionally, it was communicated in the pre-application consultation request documents submitted on 03 July 2025 that the relevant threshold of 5 hectares has been exceeded in relation to recontouring of a rural landholding under Schedule 5, Part 2, Paragraph 1(a) of the Planning and Development Regulations 2001 (as amended), and therefore a mandatory EIA is triggered.

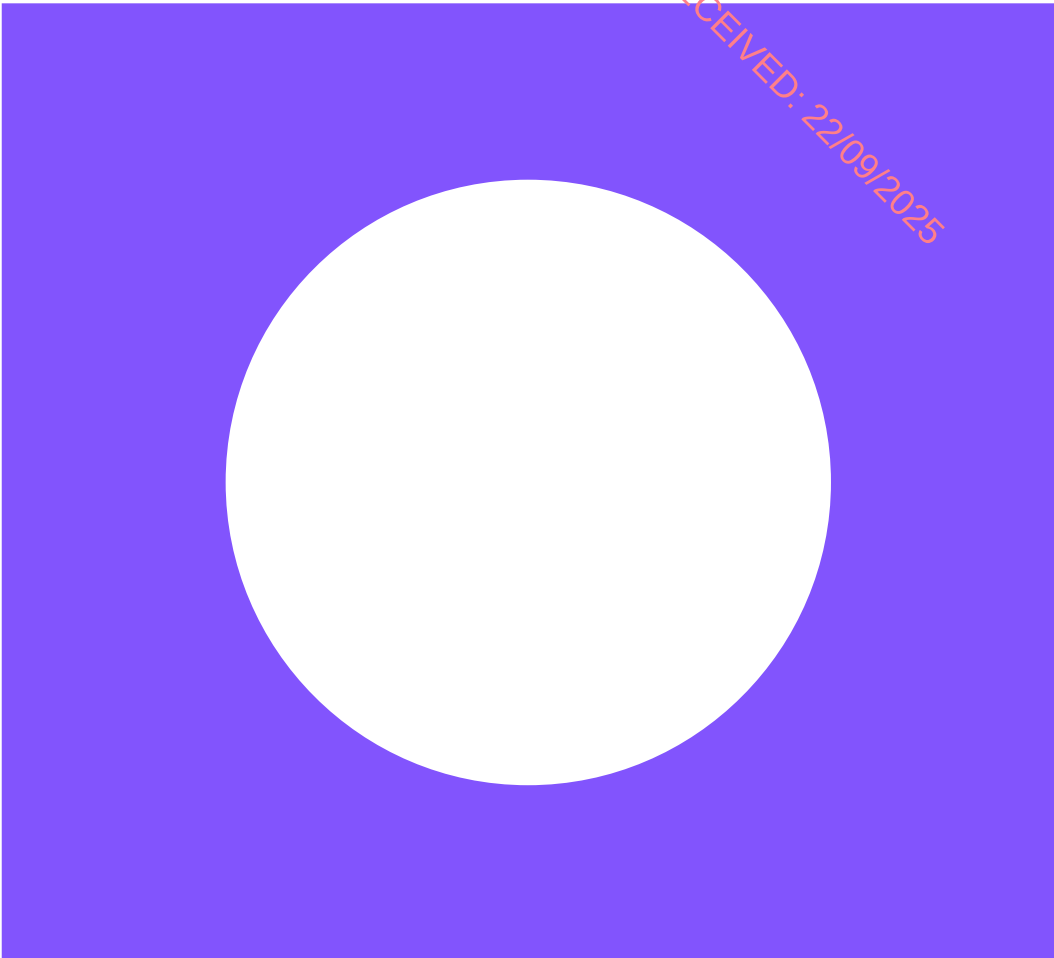
A second pre-application meeting was proposed by the Applicant if it was deemed to be required by Wexford County Council. A second meeting was held on 16 September 2025 in relation to the amended project description to include BESS. Discussions included the application of S.I. No. 274/2025 - European Union (Planning and Development) (Renewable Energy) Regulations 2025 in relation to the lodging of the Section 34 planning application.

2.3.2 An Coimisiún Pleanála

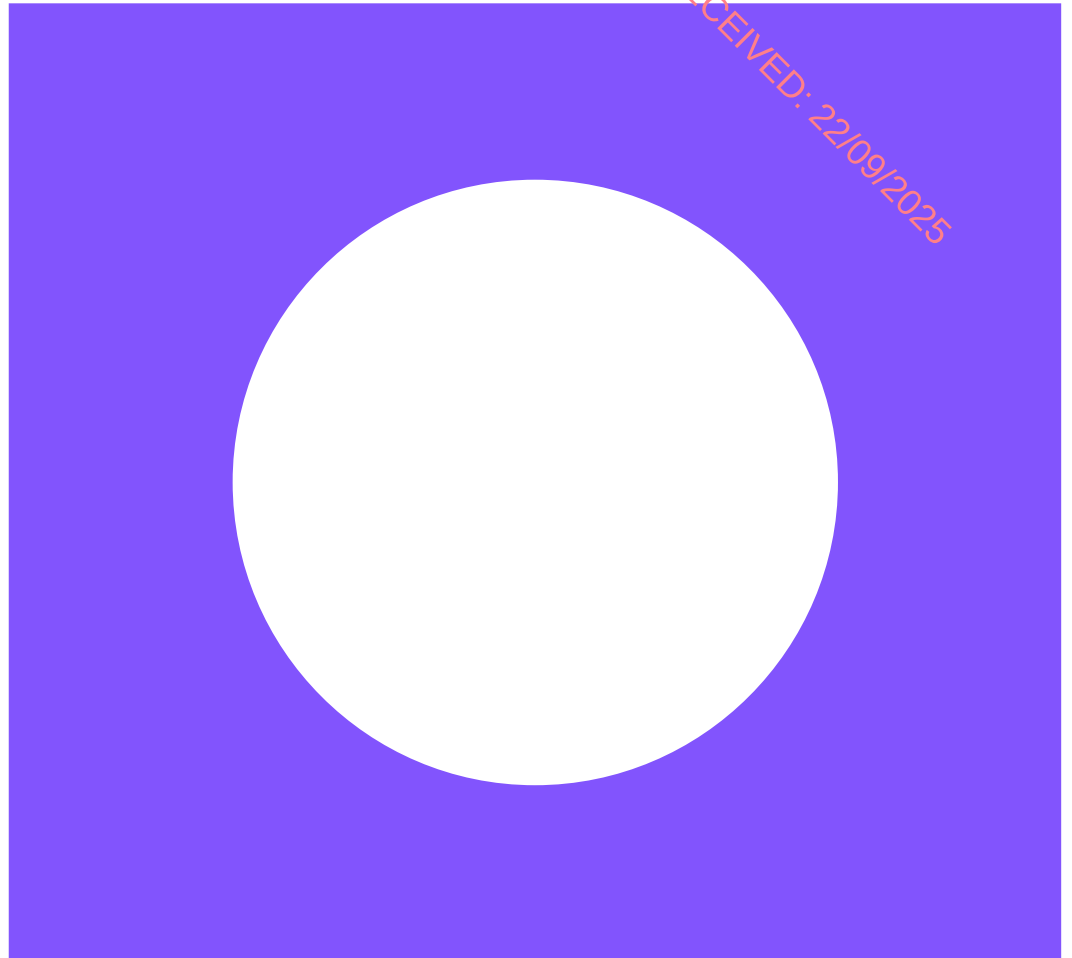
As outlined in Chapter 1, Shelburne Energy Farm will require a grid connection to the 220kV electricity transmission network. As such, the grid connection element of the Proposed Project is considered to comprise Strategic Infrastructure Development (SID) pursuant to Section 182A(1) of the Planning and Development Act 2000, as amended, as such a determination on the SID status of this grid connection was sought (request dated 16 May 2025) and a pre-application meeting was held with An Coimisiún Pleanála on 31 July 2025.

A formal decision on the SID pre-application process will only be issued when the pre-application process is formally closed, which at the time of writing has not yet occurred. As part of the SID closure process, An Coimisiún Pleanála will provide a list of prescribed bodies who will be required to be notified of a SID application.

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Chapter 3 EIA Methodology

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3 EIAR Methodology

3.1 Introduction

Environmental Impact Assessment (EIA) Directive 2011/92/EU on the assessment of the effects of certain public and private projects as amended by Directive 2014/52/EU (together, the “EIA Directive”) defines EIA as a process consisting of:

1. The preparation of an Environmental Impact Assessment Report (EIAR) by the developer;
2. The carrying out of consultations;
3. The examination by the competent authority of the EIAR, any supplementary information provided by the developer (where necessary) and relevant information received through consultations with the public, prescribed bodies and any affected Member States;
4. The reasoned conclusion of the competent authority on the significant effects of the project on the environment; and
5. The integration of the competent authority’s reasoned conclusion into any development consent decision.

This definition provides for a clear distinction between the process of EIA to be carried out by the competent authority and the preparation by the developer of an EIAR.

The Environmental Protection Agency’s (EPA) “Guidelines on the information to be contained in Environmental Impact Assessment Reports Guidelines” (2022) describes the EIAR as follows:

“The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed project on the receiving environment. ...The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign”.

This chapter sets out the approach to this EIAR. For each assessment, a precautionary approach has been applied whereby maximum design parameters based on realistic worst-case dimensions, orientations and components have been assessed. This approach ensures that the assessment will consider the greatest environmental impact (i.e. largest footprint, longest exposure, or highest dimensions depending on the topic). This approach is a resilient method where it may not be possible to identify the exact design parameters at this stage within the final design, thereby accommodating flexibility in design and construction whilst ensuring maximum extents and ranges are assessed in this EIAR.

The technical chapters of this EIAR provide further topic specific details of the methodologies applied in the preparation of this EIAR.

3.2 EIA Directive

The EIA Directive requires that the EIAR provides:

“A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.

Article 3(1) states that the EIA shall:

“Identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the project on the following factors:

- a. Population and human health;
- b. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- c. Land, soil, water, air and climate;
- d. Material assets, cultural heritage and the landscape; and
- e. The interaction between the factors referred to in points (a) to (d)”.

Article 3(2) states the following is also assessed:

The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.

Article 5(1) states that an EIAR shall include at least:

- a. “A description of the project comprising information of 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 (a) to (d); and
- f. Any additional information specified in annex iv relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected”.

Annex IV requires;

“The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium term and long term permanent and temporary, positive and negative effects of the project. The description should take into account the environmental protection objectives established at Union or member State level which are relevant to the project”.

In addition, Annex IV requires:

“A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved”.

3.3 EIA Screening

Screening is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Annex I to the EIA Directive 2014/52/EU requires as mandatory the preparation of an EIA for all projects listed therein. Projects listed in Annex II to the Directive are not automatically subjected to EIA. Member States can decide to subject them to an assessment on a case-by-case basis or according to thresholds and/or criteria (for example size), location (sensitive ecological areas in particular) and potential impact (surface affected, duration).

In Ireland, Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations 2001, as amended, transposes Annex I and Annex II to EIA Directive 2014/52/EU.

The following review seeks to determine whether any part of the Proposed Project constitutes a prescribed class of development listed within Schedule 5, Part 1 or Part 2.

3.3.1 Schedule 5, Part 1

There is no part of the Proposed Project which can be categorised under any class listed in Schedule 5, Part 1.

3.3.2 Schedule 5, Part 2

The requirement for an EIAR to be prepared for the Proposed Project relates to the exceedance of the threshold related to the recontouring of rural land holdings under Schedule 5, Part 2, Paragraph 1(a) [Agriculture, Silviculture and Aquaculture], which is reproduced below:

1(a) "Projects for the restructuring of rural land holdings, undertaken as part of a wider proposed development, and not as an agricultural activity that must comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011, where the length of field boundary to be removed is above 4 kilometres, or where re-contouring is above 5 hectares, or where the area of lands to be restructured by removal of field boundaries is above 50 hectares."

The Proposed Project requires the creation of level platforms to facilitate the installation of equipment, plant and buildings, as such the cut and fill activities related to the BESS compound and the main temporary construction compound measures an area of 6.2 hectares. Additionally, the substation compound which will also be levelled and measures an area of 0.72 hectares.

The combined earthworks activities associated with the Proposed Project total 6.92 hectares, resulting in the exceedance of the 5 hectares threshold prescribed under the Planning and Development Regulations 2001, as amended, Schedule 5, Part 2, Paragraph 1(a) [Agriculture, Silviculture and Aquaculture].

The Proposed Project will also require the removal of hedgerows to provide safe access and egress from the site, and to facilitate cable laying activities. The total length of hedgerow removal is calculated to measure a linear length of ca. 538m, as such, this is significantly below the threshold of 4 kilometres under Schedule 5, Part 2, Paragraph 1(a).

Other potential EIA project classes of relevance to the Proposed Project include:

Paragraph 10(dd) [Infrastructure projects] "All private roads which exceed 2000 metres in length."

The Proposed Project provides internal access tracks to solar farm transformer units and to the substation and BESS compounds, which have a combined total length of 2850m. Notwithstanding, these access tracks cannot be deemed to characterised as roads under the meaning given in to road under Section 2 of the Roads Act 1993 (as amended)¹, these access

¹ Section 2 of the Roads Act 1993 (as amended), provides the following definition and interpretation of a "road" – it includes (a) any street, lane, footpath, square, court, alley or passage,

tracks are not considered to be a road for the purposes of this project class as they are not for the conveyance of people and vehicles per se, except as necessary in connection with the construction, maintenance and decommissioning of the proposed solar farm development, BESS and substation compounds, and are materially different from a 'road' as defined under the Roads Act, 1993. In any event, the EIAR assesses the entirety of the Proposed Project as set out below.

In this respect, the Proposed Project is of a project type listed in Schedule 5, Part 2, Paragraph 1(a) and the relevant threshold has been exceeded thereby requiring it to be subject to the preparation of an Environmental Impact Assessment Report.

Whilst the relevant Schedule 5, Part 2, Paragraph 1(a) has triggered the requirement for EIA, out of an abundance of caution this EIAR is an assessment of the **whole project** and not of the rural restructuring in-combination with the wider elements of the project.

3.4 EIA Scoping

Scoping is the process of identifying the significant issues which should be addressed by a particular impact assessment as well as the means or methods of carrying out the assessment. Scoping of an EIAR is voluntary for a developer. A scoping exercise was not carried out prior to the development of this EIAR.

3.5 EIAR Methodology

3.5.1 Regulations and Guidelines

This EIAR has been prepared in line with the Planning and Development Act, 2000, as amended and the Planning and Development Regulations, 2001, as amended, having regard to the following guidelines.

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission).

Further specific reference documents are cited within the technical chapters of this EIAR, as appropriate.

-
- (b) any bridge, viaduct, underpass, subway, tunnel, overpass, overbridge, flyover, carriageway (whether single or multiple and whether or not designated for a particular class of vehicle), pavement or footway,
 - (c) any weighbridge or other facility for the weighing or inspection of vehicles, toll plaza or other facility for the collection of tolls, service area, emergency telephone, first aid post, culvert, arch, gully, railing, fence, wall, barrier, guardrail, margin, verge, kerb, lay-by, hard shoulder, island, pedestrian refuge, median, central reserve, channelliser, roundabout, gantry, pole, ramp, bollard, pipe, wire, cable, sign, signal or lighting forming part of the road, and
 - (d) any other structure or thing forming part of the road—
 - (i) used, or the use of which is reasonably required, for the safety, convenience or amenity of road users or for the construction, maintenance, operation or management of the road or for the protection of the environment, or
 - (ii) prescribed by the Minister;

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3.5.2 Receiving Environment

The baseline environment describes the current state of environmental characteristics, detailing the condition, sensitivity and significance of relevant environmental factors which are likely to be significantly affected by the proposals.

The EIA Directive also requires consideration of the likely future receiving environment in the absence of the project, refer to Section 3.5.9 *Do Nothing Effects* below.

“A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.

3.5.3 Temporal and Spatial Scope

The duration of effects is described for each technical chapter of this EIAR.

Spatial (or geographical) scope refers to the area over which the EIAR considers effects. The environmental sensitivity of the surrounding geographical areas and the establishment of source-pathway-receptor linkages (i.e. the zones of influence) determine the extent of the area assessed as part of this EIAR. This is defined in each of the technical chapters of the EIAR.

3.5.4 Identification of Potential Receptors

A receptor is defined in the EPA 2022 Guidelines as *“any element in the environment which is subject to impacts”*.

The environmental effect will depend on the spatial relationship between the source and the receptor with some receptors being more sensitive than others to particular environmental effects. Topic specific receptors have been identified in each technical chapter, as appropriate.

3.5.5 Identification of Likely Significant Impacts

Where appropriate and unless otherwise stated, the evaluation of impacts on the environment has been evaluated according to the criteria outlined in Table 3.1 *Description of Effects* and as referenced in the EPA 2022 Guidelines.

The EPA 2022 Guidelines suggest that EIAR should focus on the likely, significant effects. Likely or probable effects are defined as *“those which are planned to take place (e.g. the projected emissions, the proposed earthmoving etc.) and those which can be reasonably foreseen to be inevitable consequences of the normal construction and operation of the project.”* Significance of effects is described as *“the importance of the outcome of the effects (the consequences of the change)”*. Significance is determined by a combination of (objective) scientific and subjective (social) concerns. The professional judgement of competent experts plays an important role in determining likely significant effects.”

Table 3.1: Description of Effects (EPA Guidelines, 2022)

Category	Description of Effects
Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error

Category	Description of Effects
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance below.).	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Profound Effects An effect which obliterates sensitive characteristics
	Extent Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years
	Long-term Effects Effects lasting fifteen to sixty years
	Permanent Effects

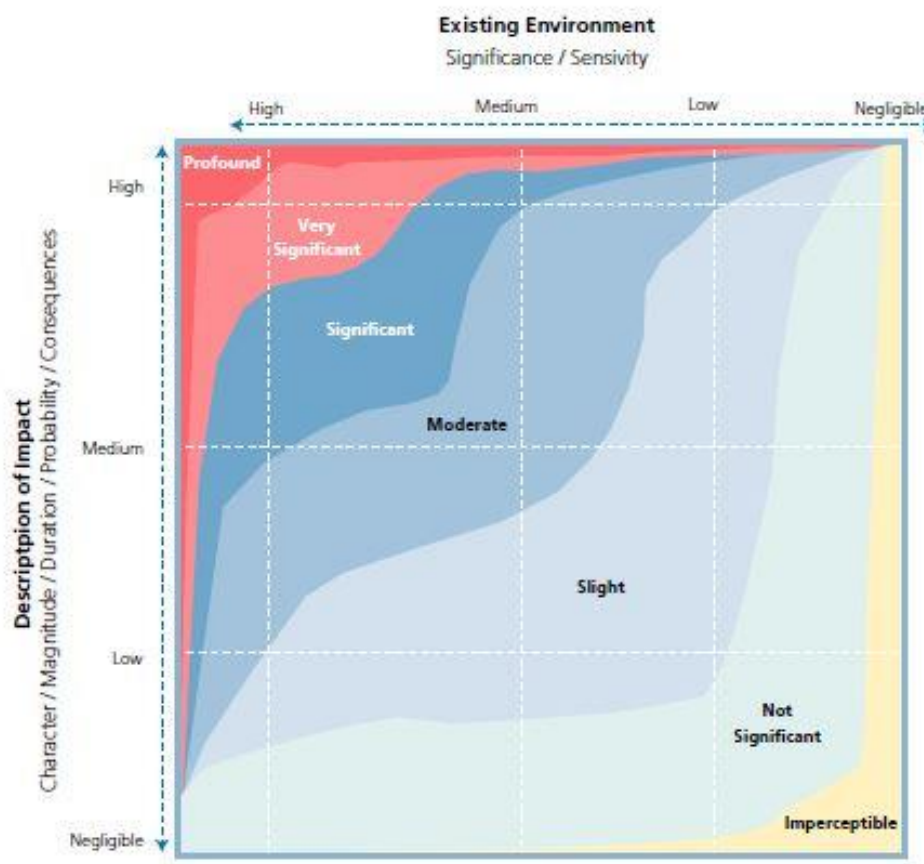
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Category	Description of Effects
Describing the Types of Effects	Effects lasting over sixty years
	Reversible Effects
	Effects that can be undone, for example through remediation or restoration
	Frequency of Effects
	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
	Indirect Effects (a.k.a. Secondary Effects)
	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects
	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	‘Do Nothing Effects’
	The environment as it would be in the future should the subject project not be carried out.
	‘Worst case’ Effects
	The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects
	When the full consequences of a change in the environment cannot be described.
	Irreversible Effects
	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects
	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects
	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SO _x and NO _x to produce smog).

The significance of a potential impact is defined by the sensitivity of the receiving environment and the character of the predicted impact as shown in Figure 3.1. In some cases, magnitude or significance cannot be quantified with certainty, and in these cases professional judgement remains the most effective way to identify the significance of an impact. Where significant adverse effects are likely, mitigation to offset those impacts is required.

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Figure 3.1: Impact Assessment Methodology



Source: EPA 2022 Guidelines

3.5.6 Mitigation and Monitoring

There are four established strategies for the mitigation of effects - avoidance, prevention, reduction and offsetting. The efficacy of each is related to the stage in the design process at which environmental considerations are taken into account. Mitigation measures that have been defined for each environmental topic are set out in the technical chapters comprising this EIAR. These mitigation measures relate to the construction, operation and maintenance phases of the project. Mitigations, as proposed, are representative of best practice guidance in the respective specialist technical fields. The proposed mitigation and monitoring measures will be implemented by means of targeted management plans. A Construction and Environmental Management Plan (including a Construction Traffic Management Plan (CTMP) and Construction Resource Waste Management Plan (CRWMP)) is included as part of this application for consent. These are live documents and will be updated by the developer and any Contractors appointed during the various project phases. Monitoring provides assurance that proposed systems are operating as intended. This allows adjustments of operations to be made to ensure continued compliance with consent conditions.

3.5.7 Residual Impacts

Residual impacts that remain from the predicted impacts once additional mitigation has been implemented are set out in the technical chapters in this EIAR.

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3.5.8 Decommissioning

The operational life of the equipment and apparatus of the Proposed Project is expected to be 40 years. This is based on the project team expert knowledge and Solar Ireland (formerly the Irish Solar Energy Association) statement that solar farms can operate successfully for 40 years (stated within Solar Ireland best practice guidance²). The BESS units begin to operate at a reduced capacity and efficiency overtime due to degradation. A review of the BESS units capacity and efficiency loss will be undertaken within year ten of their operational life under the Long-Term Service Agreement and then periodically thereafter. This review will determine mitigation, such as unit replacement or additional units. The associated activities of the decommissioning phase are similar to those of construction assuming that materials are removed for disposal and the site is restored.

It is not intended to decommission the proposed GIS/AIS substation compound and grid connection as they will form part of the national electricity grid infrastructure; however, over time elements of the Proposed Project, for example, cables, may need to be replaced. The activities associated with the decommissioning phase will be similar to those associated with the construction phase.

Decommissioning effects are assessed in each technical chapter.

3.5.9 Do Nothing Effects

As outlined in the EPA Guidelines 2022, the description of Do-Nothing effects relates to “the environment as it would be in the future should the subject project not be carried out”. The Do Nothing scenario is considered in each technical chapter of this EIAR.

3.5.10 Cumulative Effects

Cumulative effects take account of the addition of many minor or significant effects to create larger, more significant effects. As outlined in the EPA Guidelines 2022, while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant. A single effect which may, on its own, have a significant effect, may also have a reduced and insignificant impact when combined with other effects.

Existing projects have been considered as part of the chapter baselines within this EIAR.

Intra Project Effects

There are no intra-projects effects assessed as part of this EIAR, this is due to the application of an abundance of caution regarding the assessment approach which assesses the entirety of the **whole project**, and not just the EIA class which has triggered the requirements for mandatory EIA, that of the rural restructuring in combination with the wider proposed development.

Other Developments

For each technical topic, the nature and scale of ‘other development’ has been evaluated, and the potential for spatial or temporal overlap within the topic-specific zone of influence (Zoi) has been assessed, having regard to the potential for significant cumulative effects. A desk top study was undertaken to collate publicly available information on granted and proposed plans or projects within the defined Zoi. This search was conducted using planning application databases available on the websites of local planning authorities, namely, Wexford County

² Best Practice Planning Guidance Report for Large Scale Solar Energy Development in Ireland (Irish Solar Energy Association, November 2023) p.54

Council, Waterford County Council, and An Coimisiún Pleanála's website. A search for drainage or flooding works undertaken by the Office of Public Works was also undertaken.

The following development types were excluded from the collated list of 'Other Developments': as these projects would not have the potential for cumulative or significant environmental effects or already form part of the baseline.

- One-off housing and related extensions or renovations
- Agricultural buildings and extensions to farm complexes with agricultural buildings/structures
- Planning applications with a status of 'incomplete', 'withdrawn', 'refused', or refused on appeal
- Planning applications for 'retention' as it is assumed these planned projects are already constructed

The list of proposed or planned development – 'Other Development' is contained in Table 3.2. A ten-year timeframe dating back from September 2025³ is considered appropriate as the typical permission duration granted is five years, thus permission granted more than five years ago is at a minimum likely to be under construction, if not already completed before the Proposed Project commences construction, therefore cumulative effects are unlikely to occur. A radius of 15km was applied to search criteria in the collation of the list of 'Other Developments'.

The environmental assessments presented in this report have had regard to these planned developments in the context of potential for cumulative effects. Each specialist has reviewed the projects in Table 3.2 with regard to their potential for significant effects, relevant to their discipline, and these assessments are presented in each technical chapter. In relation to the potential for cumulative effects, prior to commencement of construction and during the construction phase, engagement with the local communities in the vicinity of the Proposed Project will continue. Where there is potential for works to be carried out at the same time appropriate mitigation measures have been described and will be implemented within the parameters assessed in this EIAR. This includes the scheduling of works and regular liaison meetings to ensure that plans are coordinated, and effects are minimised.

Attention is drawn to the first two listed 'Other Developments' in Table 3.2, which state the potential for one of two options regarding the development of lands immediately north of the proposed BESS compound. These lands have potential for further siting of BESS units or solar panels. At the time of writing, it is not known which option will be progressed.

At the time of preparing this EIAR, it is not known which option may be progressed and there is no interdependence between the Proposed Project and either of these options. They do not form part of the proposed development, the subject of the planning applications to Wexford County Council and An Coimisiún Pleanála, and do not form part of the Proposed Project, which is the subject of this EIAR and EIA to be carried out.

Any such proposal(s) will be subject to and fully assessed as part of a further planning application to the relevant competent authority, including any necessary EIA and AA, which would take into account the effects of any potential future development in-combination with the effects of the Proposed Project if permitted and in light of other developments at that time.

However, the potential for cumulative effects of the Proposed Project in the context of these potential future developments are considered in far as practicable/relevant in each technical chapter.

³ The timeframe applied within the planning application search is 01 August 2019 to 01 August 2025

Table 3.2: Other Development (with potential for cumulative effects)

Planning Authority / Planning reference	Grant/ Approval Date	Location	Brief Development Description	Distance	Construction Schedule
Potential future expansion of the Proposed Project	N/A	Nash, Co. Wexford	Shelburne Energy Farm – Phase 2 BESS within area immediately adjoining the proposed BESS site, and an associated AIS plant/equipment and control building in the undeveloped AIS compound	Within existing project site boundary	Potential for a separate planning application would follow within 3 years of a grant of permission for Shelburne Energy Farm
Potential future expansion of the Proposed Project	N/A	Nash, Co. Wexford	Shelburne Energy Farm – Extension of the solar farm within area immediately adjoining the proposed BESS site,	Within existing project site boundary	Potential for a separate planning application would follow within 3 years of a grant of permission for Shelburne Energy Farm
An Coimisiún Pleanála - Case reference: PL26.318204 Wexford County Council 20230871	15 January 2025	Great Island Power Station, Great Island, Campile, New Ross, Co. Wexford	A 10 year planning permission for the construction of a Grid Stability Service Development and all associated site clearance and site development works. The proposed grid stability service development consists of the provision of a synchronous condenser within a building circa 13 metres in height; elevated modular containers to house electrical and control equipment and all associated plant/apparatus	c. 9.2km (west - southwest)	No information available
Wexford County Council 20231294	21 March 2024	Great Island, Co. Wexford	Construction of an electrical infrastructure installation and associated underground grid connection (UGC) on lands within the townland of Great Island measuring approximately 2.6Ha. in overall area. The installation will consist of a Battery Energy Storage System (BESS) would comprise 16no. individual battery storage units, a 38kV tail-fed substation, underground grid connection (UGC) to connect the proposed substation to an existing ESB substation at Campile and associated ancillary development.	c. 9.2km (west - southwest)	No specific information available – construction is due to last 16 months
Wexford County Council 20240309	15 July 2024	Great Island, Co. Wexford	Permission for development consisting of construction of a Battery Energy Storage System (BESS), landscaping works and all other associated ancillary infrastructure on lands measuring approximately 1.34Ha. The BESS would comprise 44no. individual battery storage units and 22no. inverter units.	c. 9.2km (west - southwest)	No information available

Planning Authority / Planning reference	Grant/ Approval Date	Location	Brief Development Description	Distance	Construction Schedule
Wexford County Council 20240650	23 October 2024	Knockmullen, New Ross, Co. Wexford	A ten year planning permission is being sought for the proposed development which will consist of the following elements: the installation and operation of 1 no. battery energy storage system compound containing battery energy storage containers, 1 no. electrical substation and compound connected to the national grid system via 300m of underground cable to the ESB Knockmullen 38kV substation, electrical transformers and inverter units, underground cabling and ducting, boundary fencing, security entrance gates, CCTV, internal access road and all associated ancillary site development, landscaping and reinstatement works.	c. 7.82km (north- northwest)	No specific information available – construction is due to last 6-12 months
Wexford County Council 20241230	24 March 2025	Nash, Tellarought, Carnagh (numerous other townlands) Co. Wexford	The proposed development within Co. Wexford will comprise: - the replacement (restringing) of the existing overhead line circuit conductor wires with a new higher capacity conductor; - the strengthening of foundations at 6 no. locations; - shear block remedial works at 55 no. locations; - the strengthening of towers (i.e. member replacement) at 20 no locations; - the painting of all structures; - the replacement of insulating and ancillary hardware at structures; - all associated works within the existing Great Island 220kV substation to accommodate the uprated 220kV OHL including uprating of the Kellis bay in the Great Island 220kV substation	c. 1.8km (west)	No information available
Wexford County Council 20250414	02 July 2025	Rosspile, Clongeen, Co. Wexford	Permission for development which will consist of a 10 year permission for the construction of an energy storage facility within a total site area of up to 3hA, to include an IPP compound with one single storey substation building, transformer and ancillary electrical equipment, containerised battery storage modules and inverter/transformer station modules	c. 7.4km (east- southeast)	No information available
Wexford County Council 20220900	28 September 2022	Ballygowny, Killesk, Co. Wexford	Permission for a 10-Permission for a 10-year planning permission for development which will consist of the construction of a solar PV farm with an operational life of 35 years consisting of ca. 79,450m2 of solar photovoltaic panels on ground mounted frames within a	c.5.1km (south)	No specific dates available – The entire construction phase is expected to last 20 weeks.

Planning Authority / Planning reference	Grant/ Approval Date	Location	Brief Development Description	Distance	Construction Schedule
			site area of 12.6 hectares and associated ancillary development including 2 no. inverter / transformer stations, 1 no. ESB delivery substation, 1 no. MV switch room module, 1 no. spare parts storage container		
An Coimisiún Pleanála - Case reference: VA26.318914	05 June 2024	Great Island, Kilmokea, County Wexford.	110kV substation and 110kV underground grid connection	c. 9.2km (west - southwest)	No information available
Wexford County Council 20220900	26 August 2022	Ballygowry, Killesk	Permission for a 10-year planning permission for development which will consist of the construction of a solar PV farm with an operational life of 35 years on a site of 12.6 hectares.	c. 4.5km (south)	No information available
Wexford County Council 20230651	08 December 2023	Marshmeadows, County Wexford	The project passes under the River Barrow across the county boundaries of Wexford and Kilkenny. The development consists of (1) Medium Voltage (MV) electricity system improvement by the installation of a new 20kV electricity underground cable (UGC) by means horizontal directional drilling (HDD) under the River Barrow to connect the Lake Region circuit at Marshmeadows, County Wexford to the Beechgrove circuit at Raheen, Rosbercon, County Kilkenny. From end to end the UGC measures approximately 580m. The majority of the circuit, approximately 365m will be installed by HDD under the River Barrow. The remainder of the circuit, approximately 215m will be a UGC installed by traditional trenching and ducting means. Approximately 355m of this UGC will be installed within County Wexford and the remaining 225m will be installed within County Kilkenny. (2) A second 'spare' duct will be installed within the HDD to enable a second circuit to be installed at a future date to further enhance and future proof the network. (3) Permission is sought for all associated works including temporary works required.	7.5km (northwest)	No information available
Wexford County Council 20221633	13 November 2024	New Ross, Co. Wexford	Development of a new electricity circuit	9.0km (south-southwest)	No information available

Planning Authority / Planning reference	Grant/ Approval Date	Location	Brief Development Description	Distance	Construction Schedule
An Coimisiún Pleanála ABP-318103-23					
Kilkenny County Council 20200588	04 February 2021	Grange (ED Fethard), Fethard, Co. Wexford.	Construction of an 18 metre high free standing communications structure.	13.7km (north)	No information available
An Coimisiún Pleanála ABP-307962-20					
Kilkenny County Council 2288	26 March 2024	Drumdowney Upper Townland, Murtaghstown, Co. Kilkenny	The development consists of an existing 25 metre high telecommunications support structure and associated works as previously granted under local authority reference 13/30	10.8km (northwest)	No information available
An Coimisiún Pleanála ABP-315856-23					
Wexford County Council 20160717	21 December 2016	Tomfarney, Clonroche, Co. Wexford	A 10 year permission for the construction of a solar PV energy development within a total site area of up to 12.7 hectares with all associated site works.	13.6km (northwest)	No information available
An Comision Pleanála PL 26.247179					
Wexford County Council 20210807	06 May 2022	Rochestown, Harperstown, Co. Wexford	Permission for development consisting of a ten year permission for a solar farm on a site of approximately 86.6 hectares consisting of the following: solar photovoltaic panels on ground mounted steel frames; IPP electrical control building and associated compound; inverter/transformer stations; battery storage units and associated hard standings; storage containers for spare parts; underground power and communication cables and ducts; boundary security fencing; upgraded internal access tracks; new internal access tracks and associated drainage infrastructure; CCTV cameras and all associated site services and works. A Natura impact statement accompanies this application.	14.5km (southeast)	No information available
An Comision Pleanála ABP-312674-22					

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3.5.11 Transboundary Effects

Certain environmental effects of a Proposed Project have the potential to cross state boundaries and have a 'transboundary effect'. The need to consider transboundary impacts has been enshrined in the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context, adopted in 1991 (the Espoo Convention). The Espoo Convention has been ratified by the European Union, Ireland and the United Kingdom of Great Britain and Northern Ireland. Under the amended EIA Directive, the likely significant transboundary effects of a proposed Project must be described. All activities associated with the construction, operation and decommissioning of the Proposed Project are wholly within Ireland and there is no potential for transboundary effects and as such are not considered further in this EIAR.

3.5.12 Interactions between Environmental Factors

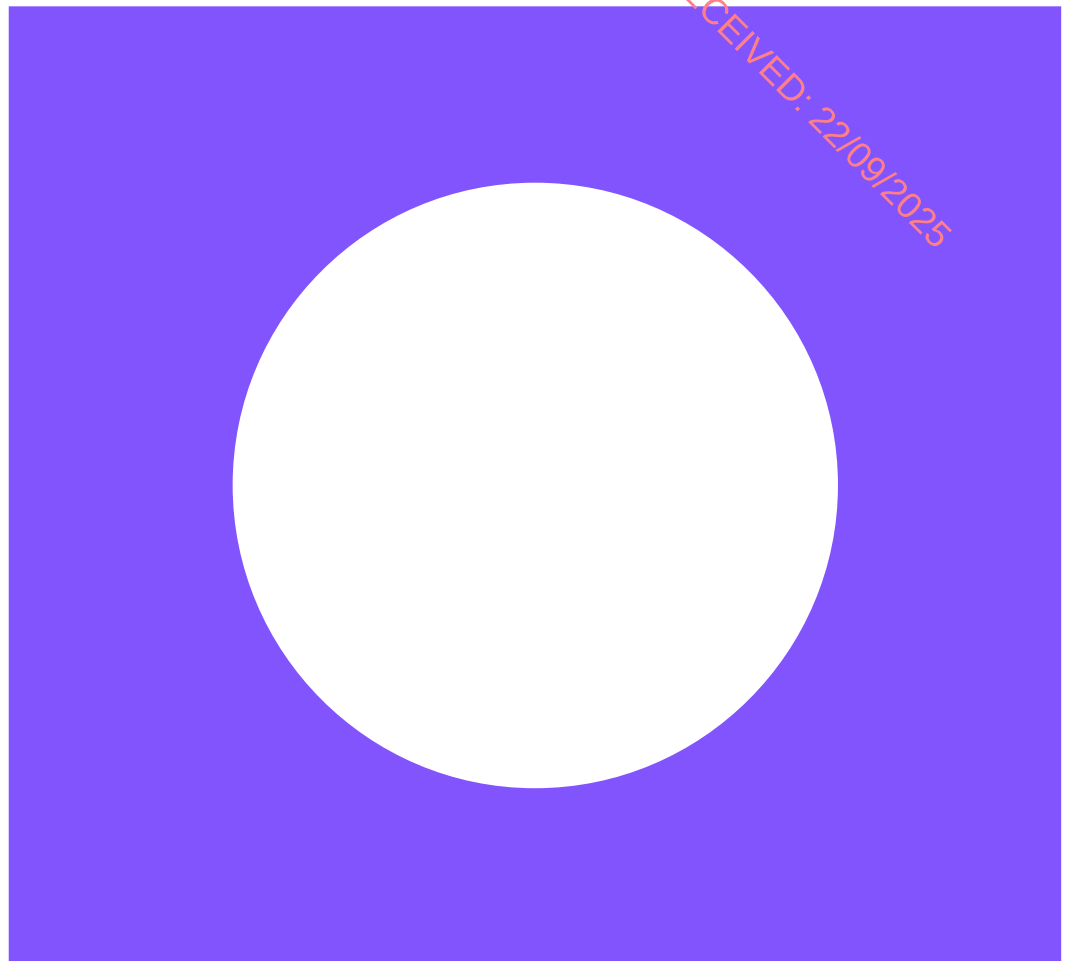
Interactions between effects may arise from the reaction between effects of the Proposed Project on different aspects of the environment which may exacerbate the magnitude of those effects. These are presented in Chapter 18.

3.6 References

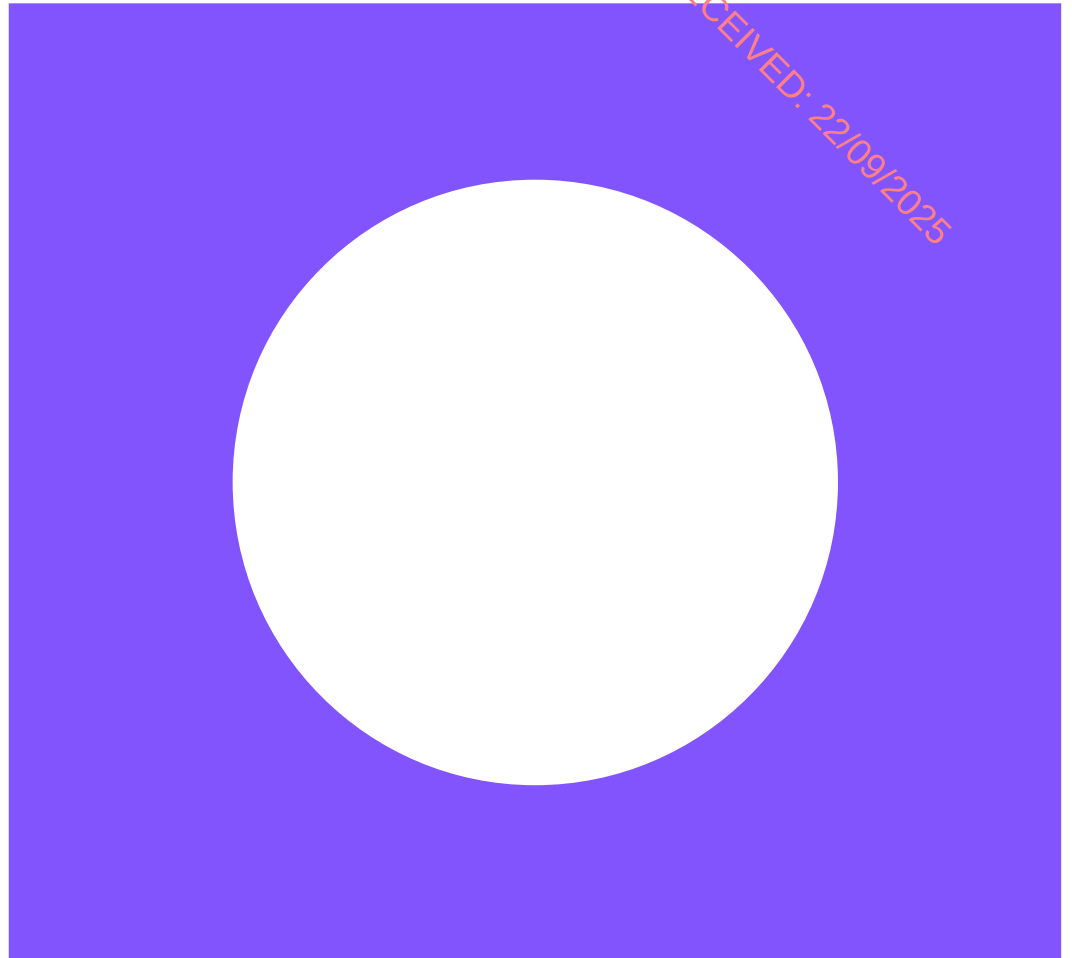
Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

Advice Notes for Preparing Environmental Impact Statements (EPA, Draft September 2015)

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 4 Reasonable Alternatives Considered

September 2025

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4 Reasonable Alternatives Considered

4.1 Introduction

This chapter outlines the Reasonable Alternatives considered in relation to the Proposed Project, which is a mandatory process under the EIA Directive. Article 5(1)(d) of Directive 2014/52/EU requires an EIA to contain “A description of the reasonable alternative (in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

4.1.1 Guidance

Within the Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017) it states that “Alternatives have to be ‘reasonable’, meaning that feasible Project options meet the Project’s objectives” (p.55) and also clarifies “that reasonable alternatives “must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives” (p.52). However, there is limited European guidance on what constitutes a ‘reasonable alternative’.

The EPA Guidelines state that “It is generally sufficient to provide a broad description of each main alternative, and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or ‘mini-EIA’) of each alternative is not required” (p.33 EPA, 2022).

The EPA 2022 guidance also states that analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR.

This chapter presents the alternatives that were considered by the Applicant during the design process.

4.2 Do Nothing Scenario

The “Do-Nothing” (or ‘no-Project’) alternative will mean that the status quo is retained in terms of the local environment of the Project site, thereby the continuation of the existing land use of managed agricultural farmland is likely to occur in perpetuity, with gradually evolving farming practices employed over time. From an environmental effects perspective, this means no change.

Under a ‘Do-Nothing’ scenario there will be no contribution to the regional and national targets for renewable energy from solar energy. This would then be contrary to Ireland’s Climate Action Plan target of delivering up to 8 GW of electricity generated from solar energy by 2030 and reduce reliance on fossil fuels within the State’s energy supply mix.

4.3 Alternative Sites

4.3.1 Solar Farm

The Applicant was aware of the potential of lands suitable for solar generation development within the townlands of Ballygarvan, Cloonagh and Nash in County Wexford, due to the townlands being located in an area identified as having high solar generation potential based on

the Sustainable Energy Authority Ireland's (SEAI) digital mapping, which provides detailed information on solar irradiation and possible grid connection points.

The suitability of these lands, and other surrounding lands, were assessed for their potential as a site for solar generation development and this is summarised in Table 4.1.

There are several influencing factors related to site selection for solar farms, these are outlined within The Best Practice Guidance Report on Solar Energy Development for Applications and Planning Authorities¹ (Irish Solar Energy Association, 2023) and were considered during the feasibility phase. Project responses for the eight criteria are detailed in Table 4.1 below.

Table 4.1: Stage 1 Solar PV Site Selection Screening Assessment

Selection Criteria	Project response
Grid Connection	A fundamental consideration in the siting of solar farms is on the basis of the proximity to the existing transmission network, therefore the required grid connection is a key selection criterion, as the distance to existing transmission infrastructure is preferable and more advantageous in relation to reducing the distance of a required connection to the grid. An existing 110kV overhead transmission circuit runs within the Project site in the townland of Nash. An existing 220kV overhead transmission circuit runs along the north of the Project site. Options for the grid connection were considered and are discussed in more detail in section 4.3.3. below.
Land orientation and siting	Contours reviewed using OSI Discovery mapping range between 40m to 60m (Malin Head Ordnance datum) and were later confirmed with a topographical survey to be ranging between 32m and 63m. Variations in topography can reduce the usable land area and cause shading on solar panels, however, the gently undulating lands of the Project site are suitable for solar development.
Planning Policy	The Project Site is located within an area designated as "Open for Consideration for Solar Farms, (Wexford County Development Plan 2022-2028, Volume 10, Energy Strategy, Map No.6 (Wexford County Council).
Adjacent Road Network / Site Access	There is a local public road network surrounding the site with direct access to the public road, with existing field entrances present and utilisable.
Landscape / Visual impact	The Wexford County Development Plan identifies the site as being located in the Lowlands Landscape Character Area which is noted as being categorised as Low to Moderate sensitivity landscapes. "Low sensitivity landscapes are more robust landscapes which are tolerant to change and have the ability to accommodate development without significant adverse impacts on the character of the landscape. These landscapes comprise the majority of the Lowlands." The areas of moderate sensitivity in the Lowlands are where it borders other landscape character units. It is noted that the Project site does not border any other landscape character units.
Conservation designations	Conservation sites refer to Special Protection Area, Special Area of Conservation, Natural Heritage Area, or proposed Natural Heritage Area (pNHA). There is one conservation designation within a 5km radius, Boley Fen pNHA (site code: 000699) is located ca. 1.0 km to the southwest and comprises intermediate fen with wet grassland and tall sedge (<i>Carex</i> spp.) communities with encroaching scrub, mainly willows (<i>Salix</i> spp.). It is noted as nationally important for the following rare species of Diptera (flies): <i>Anasimyia lunulata</i>, <i>Psacadina zernyi</i>, <i>Parhelophilus consimilis</i>, <i>Pteromicra angustipennis</i> and <i>Tetanocera punctifrons</i>. The development of the proposed solar farm would not impact this habitat or the species which inhabit the fen.
Flood risk	The SEAI Guidelines state that "Flooding is not seen as a hard constraint as solar farms can be built in areas of flood risk". Flood risk was identified in areas of land considered for solar development. It was a committed objective for the Project that only fencing or underground cabling would be located in Flood Zones A (high probability) and B (moderate probability) to

¹ <https://www.seai.ie/documents/research-projects/RDD00651.pdf>

Selection Criteria	Project response
	ensure that the site would be future proofed against the potential effects of climate change, over the duration of its 40 year operational lifespan.
Potential Yield	The location of a solar farm is primarily based on areas known to achieve high solar irradiation. The Proposed Project is located in an area identified as an area within the State as having one of the greatest Annual Global Horizontal Radiation (measured as kWh/sqm). The Solar Atlas ² states that the Proposed Project is located in an area which can obtain irradiation levels of 978 – 992 kWh/sqm (this is the third highest irradiation, the highest achievable is 1027 – 1078 kWh/sqm).

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A Stage 2 Constraints Mapping exercise was conducted to rationalise the selected lands and refine the boundary for the proposed solar energy development, refer to Figure 4.1.

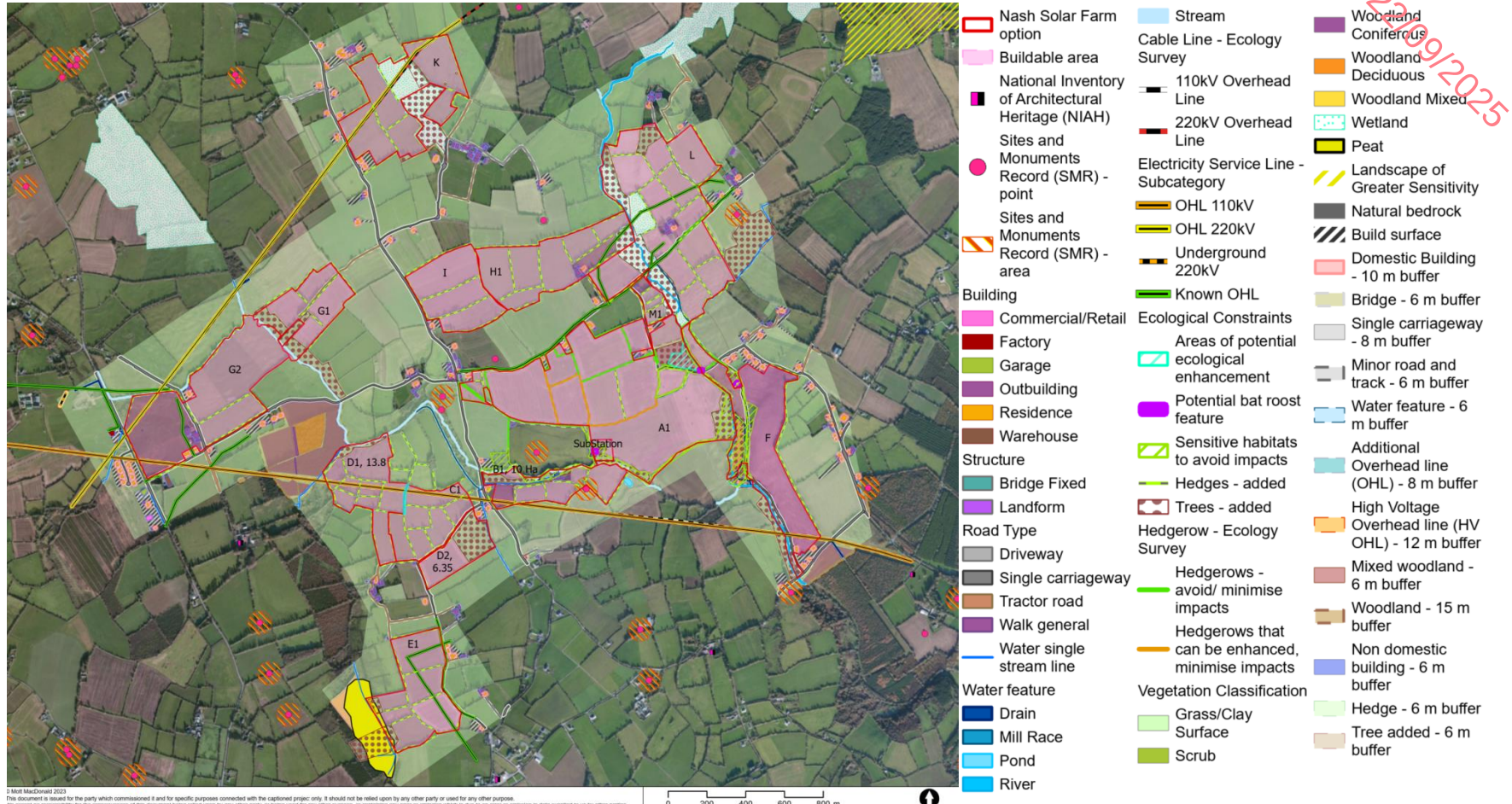
The study area in Figure 4.1 is defined by the areas in light green shading, covering an area of approximately 250 hectares. Within the study area are parcels of land (pink shading) which were identified as having potential to form part of the solar farm, referred to as 'buildable areas'. Environmental, ecology and cultural heritage constraints were identified and mapped (refer to legend within Figure 4.1). It was recognised during the selection of the buildable areas that certain criterion would not result in discounting parcels of lands, as specific design criteria could be set to ensure that potential impacts to receptors could be avoided, reduced or mitigated through the design process. Such examples include;

- Proximity to residential properties - buffer separation distances and landscaping will be provided
- Hedgerows and trees - due to its rural setting these are present throughout the study area and will be protected through the application of buffer separation distances
- Watercourses – setback distances from the riparian corridor/floodplain will be applied

This constraints mapping process resulted in the exclusion of parcels of land in conjunction with the ability to deliver the Project objectives, the 250 hectares area initially considered was reduced to an area of 121.5 hectares which now comprises the solar array areas A, B and C within the Proposed Project.

² <https://maps.seai.ie/apps/solarAtlas/>

Figure 4.1: Constraints Mapping



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4.3.2 Battery Energy Storage System

The selection of alternative sites for a BESS compound was not considered, this is due to the availability of the lands within the spatial extent of the proposed solar farm which are sizeable enough to accommodate the co-locating of a BESS compound. The siting of a BESS compound in lands outside of the solar farm was not considered a reasonable alternative as co-locating the BESS within the solar farm eliminates the need to provide further cabling within public roads to connect to the solar farm and subsequently a grid connection point. In addition, co-locating BESS with a renewable energy source increases the efficiency with which renewable energy can be transferred to the grid.

The favourability of local topography was used to inform the decision for the siting of the BESS compound, which occurs at a low point in the local topography to provide natural screening and maximisation of the separation distance to residential receptors.

Irrespective of the site chosen, recontouring of the land is required to ensure a level platform for the BESS and also to ensure appropriate mitigation measures in the event of fire.

4.3.3 Grid Connection

As previously stated, a viable grid connection point is a vital consideration in the siting of a solar farm.

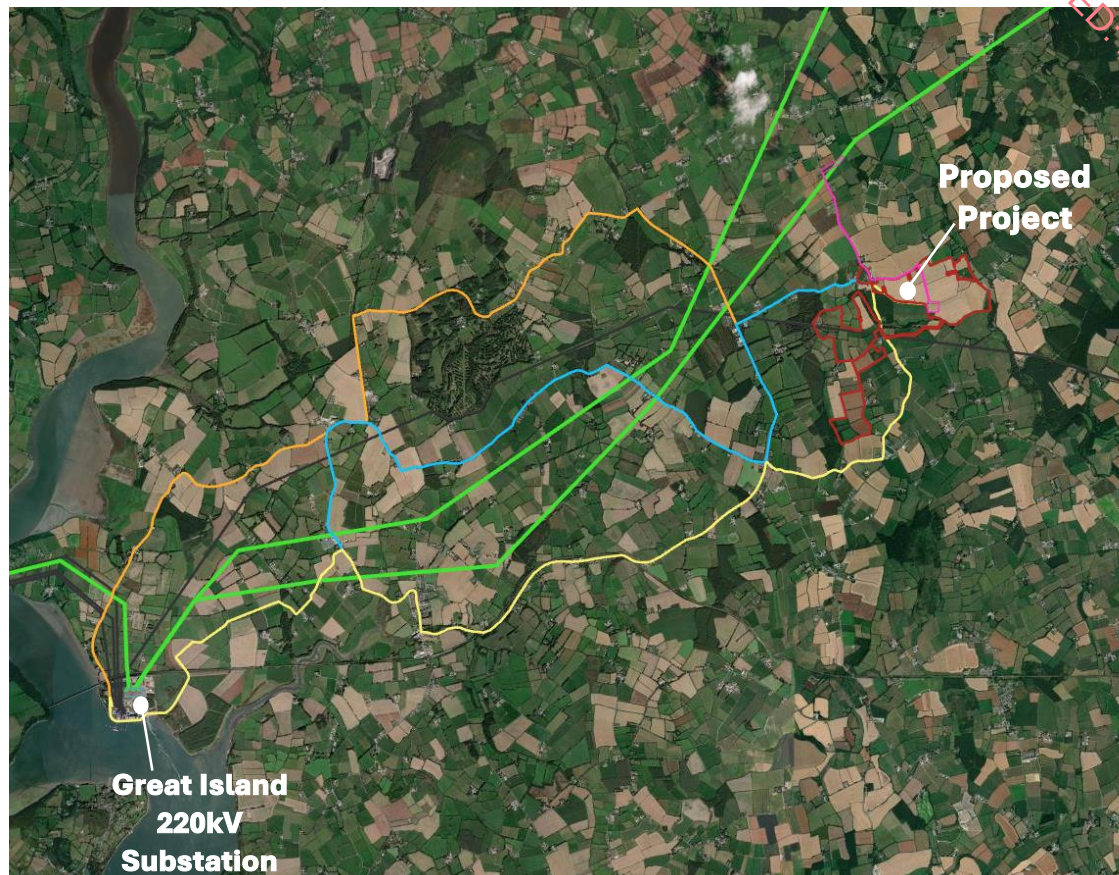
A connection to the existing 38kV network was not a feasible option due to the predicted capacity which the proposed solar farm would be able to generate, which is above that suitable for a 38kV connection.

Due to the location of the existing 110kV overhead line, refer to Figure 4.2, (110 kV overhead transmission line illustrated as a black line) within lands under consideration it was initially considered that the 110kV line offered a suitable connection source. However, during discussions with EirGrid plc the Applicant was informed that the existing 110kV transmission circuit could not accommodate any additional generation capacity. EirGrid plc stated that a connection to the existing 220kV transmission circuit was the only feasible alternative for the Proposed Project to connection to the national grid. Following the submission of this consent application, a Grid Connection Application will be submitted to EirGrid following which a finalised Grid Connection Offer will be provided. This planning application for Solar and BESS is submitted on the basis of a 220kV Grid Connection.

A route optioneering process was initiated to determine the grid connection point for the solar farm. An assessment for a new underground cable connection direct to the existing 220kV Great Island substation was undertaken, which resulted in three potential route options (blue, yellow and orange, the existing 220kV overhead line is shaded green) as illustrated in Figure 4.2. All routes were discarded through the assessment due to the length of the routes, the constraints within the public roads (including road width, co-location with existing utilities, etc.). In addition, the approach to Great Island substation is heavily congested, and there is no certainty as to the availability and allocation of a spare bay within the substation to facilitate the connection.

The co-location of a 220kV grid connection substation within the solar farm was then identified as the appropriate option. This comprises a loop-in connection to the existing 220kV Great Island - Lodgewood overhead transmission circuit and the construction of an 8-bay 220kV Gas Insulated Switchgear (GIS) EirGrid operated substation. This avoids a direct connection to the Great Island 220kV substation, and therefore avoids the congestion identified above.

Figure 4.2: Potential grid connection routes to Great Island 220kV Substation



Source: Mott MacDonald Ireland Limited

4.4 Alternative Layouts

Solar farms by virtue of their nature utilise all available lands suitable for development (those under the ownership of the applicant or where necessary landowner consent has been obtained) to maximise the solar energy generated. In this regard, only localised changes occur due to environmental factors, for example proximity to habitats, environmental features such as rivers or rock outcrops, recorded archaeology or properties.

The layout of the solar farm was designed cognisant of environmental factors and refined to ensure the minimisation of potential impacts to sensitive receptors. Solar panels are the main infrastructural component of a solar farm, and thus all available land is used to ensure maximisation of solar generation, and as per standard practice panels positioned at an angle of between 25 - 30 degrees from the ground facing southwards (in the northern hemisphere) to capture the most sunlight possible.

The substation compound is of a standard configuration as dictated by EirGrid technical specifications ³.

The configuration of the BESS compound is a typical standard arrangement.

³ Technical Standards for Customer Connections - <https://www.eirgrid.ie/grid/transmission-policies-and-standards>

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4.5 Alternative Technologies

The objective of the Project is to provide a renewable energy development accompanied by battery storage to ensure that the maximum utilisation of the solar energy development is provided in line with the national renewable energy targets.

4.5.1 Renewable Technology Types

The site of the Proposed Project is not deemed suitable for any other renewable technology, i.e. onshore wind development, as the guidelines⁴ for onshore wind recommend that a setback distance from occupied dwellings of four times the tip height from a turbine. This recommended setback distance would not facilitate the development of any wind turbines within the boundary of the Project site. Thus, solar technology is considered the appropriate renewable technology to be used.

Solar equipment technologies, sizes and materials are continually evolving, and the specific type and configuration to be installed will be determined during the detailed design phase, based on the latest technology available.

4.5.2 Battery Energy Storage System Types

The use of storage co-located with a renewable energy source ensures that the maximum utilisation of the renewable energy development is provided in line with the national renewable energy targets and decarbonisation goals. Containerised modular battery energy storage is considered the appropriate technology as compared to other storage options due to the modular nature and its ease of installation, scalable design, and flexible connection to the grid. The modular nature allows for correct-sizing of the compound based on the anticipated energy yield of the co-located renewable energy source, and BESS technologies also allow for additional support to grid stability and more predictable energy flows, contributing to lower curtailment rates.

4.5.3 Substation and Grid Connection Types

GIS technology has been chosen over Air Insulated Switchgear (AIS) for the 220kV EirGrid operated substation due to the reduced space requirements for GIS substation. The substation footprint has been based on the existing EirGrid standards and technical specification drawings which are publicly available on the EirGrid website⁵.

The customer operated 220kV substation will be AIS as only a single bay is required for connection and the only switchgear within the substation will be cable sealing ends, current and voltage transformers, and an AIS disconnector. There will also be a power transformer and 33kV switchgear housed within a control building. The outdoor 220kV disconnector is required in line with EirGrid busbar policy⁶ and connection requirements.

The loop-in connection to the existing 220kV Great Island – Lodgewood will be realised through underground cable. The use of overhead line for the connection is a technology option which was discounted at an early stage due to the increased visual and amenity impact that such a connection would incur. It was also discounted due to the wayleave requirements, exclusion zones for building other infrastructure, and also the potential for shading of the solar panels and

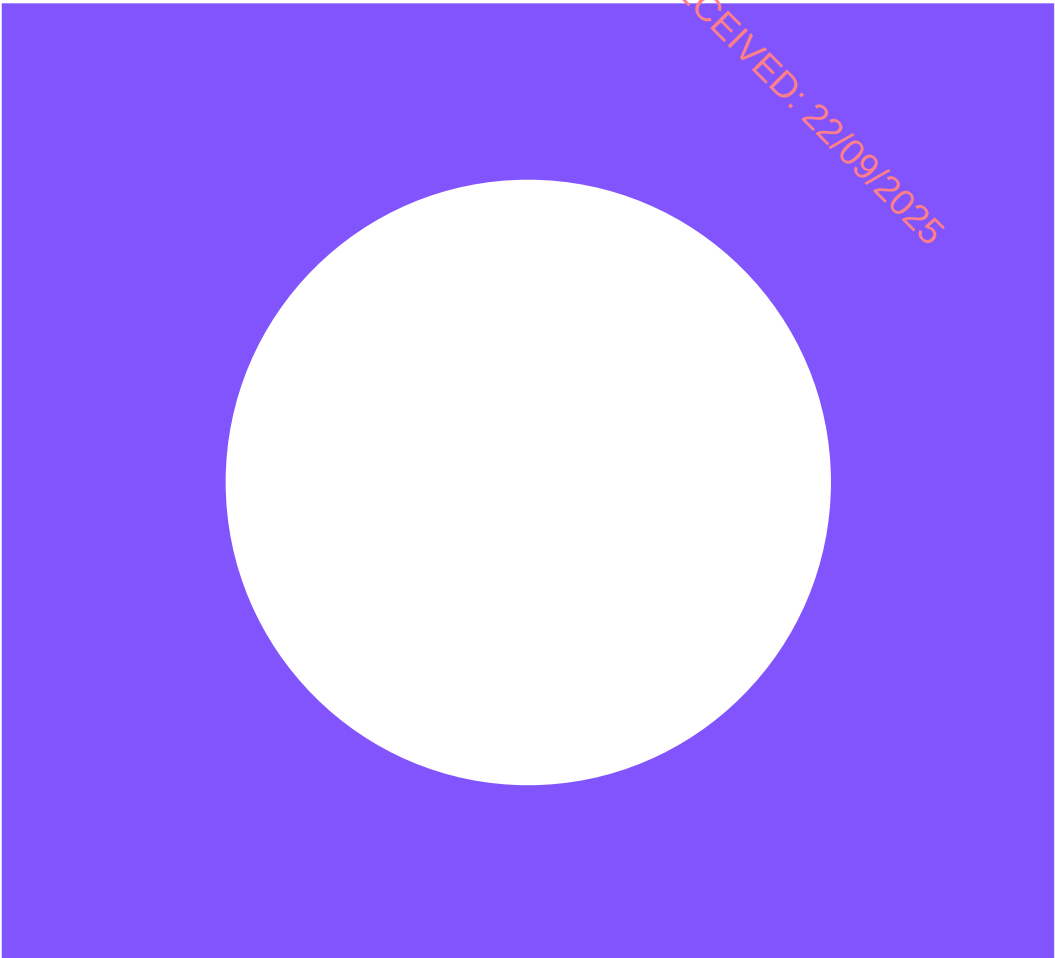
⁴ Draft Guidelines and the 'Best Practice Guidelines for the Irish Wind Energy Industry (Department of Housing Environment, Local Government, 2019)

⁵ Technical Standards for Customer Connections - <https://www.eirgrid.ie/grid/transmission-policies-and-standards>

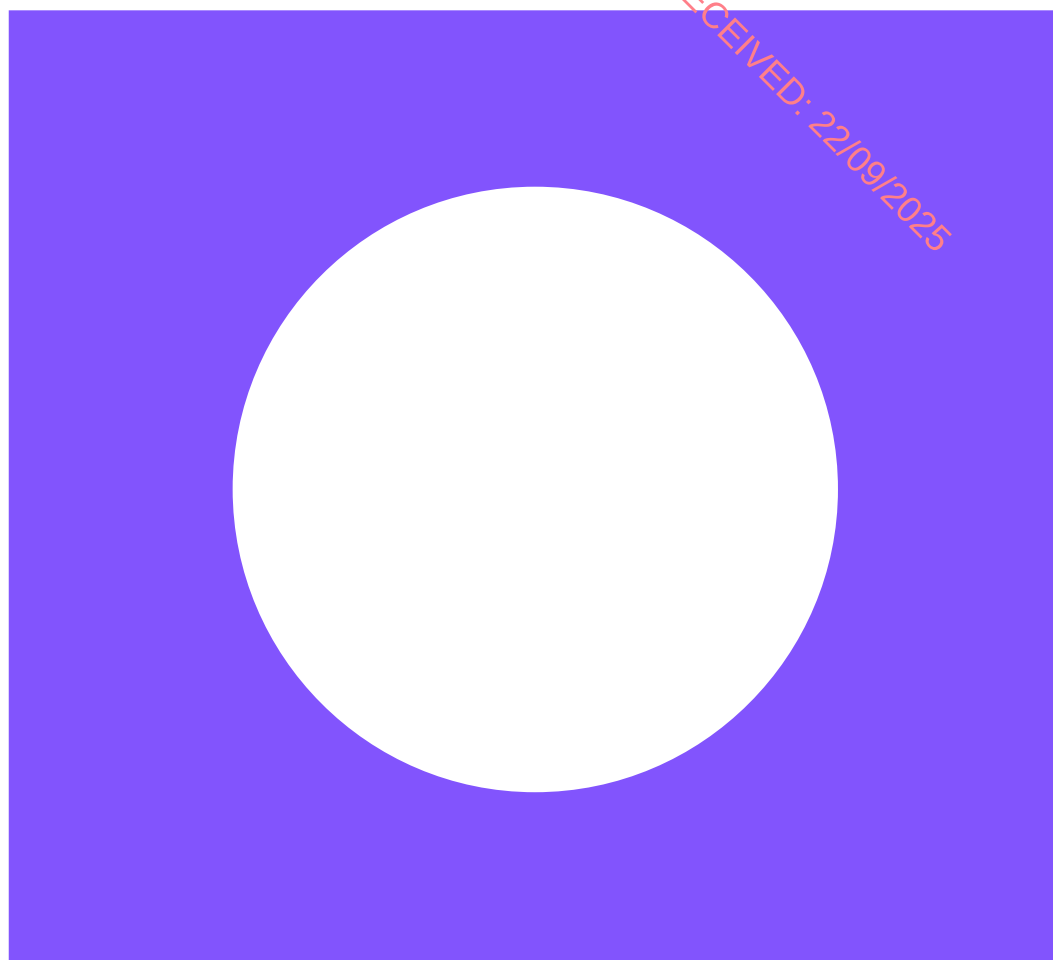
⁶ https://cms.eirgrid.ie/sites/default/files/publications/Policy_Statement_3_Busbar_Configuration_v4.pdf

therefore reducing the energy yield. The substation and grid connection will be the subject of a future planning application to An Coimisiún Pleanála.

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 5 Description of Development

September 2025

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5 Description of Development

5.1 Introduction

The Proposed Project comprises a photovoltaic (PV) solar energy farm which is split into three distinct solar array areas - A, B and C, and a co-located Battery Energy Storage System (BESS), collectively referred to as Shelburne Energy Farm, and together occupying a total area of approximately 121.5 hectares. A grid connection is required to connect Shelburne Energy Farm to the national electricity grid, with a co-located 220kV substation compound within the energy farm, measuring approximately 0.72 hectares, with an associated underground cable connection which will connect to an existing overhead transmission circuit.

This chapter contains information on the site, design, size and other relevant features in accordance with the requirements of the EIA Directive. It describes the main components of the Proposed Project, including details of construction activities, the operational phase and decommissioning. This chapter provides the basis for the assessments in the subsequent chapters of this EIAR.

5.2 Location of the Proposed Project

The Proposed Project is located in the townlands of Ballygarvan, Cloonagh and Nash, Gusserane, County Wexford, as illustrated in Figure 5.1. The local area in which the Proposed Project will be situated is characterised as predominantly rural agricultural lands with low density residential properties occurring throughout the locality.

The closest settlements include the town of New Ross located approximately 6.5km northwest, and the villages of Ballynaboola approximately 4.5km to the north, Newbawn 3.4km to the northeast and Ballycullane 3.5km to the south.

The Proposed Project is predominantly within agricultural lands with field boundaries delineated by mature hedgerows, with some limited areas of semi-natural woodland in the east of the project site. The solar energy farm is divided into three distinct array areas, occurring on either side of the local public road - L4030, while the L40232 bounds solar array Area A to the north. The Owenduff River (EPA code: 13O01) bounds areas of the Project site to the east of solar array Area A, while the Tellarought river (EPA code: 13T14) is crossed by the inter-array cables connecting solar array Area B and C to solar array Area A and onwards to the proposed 220kV substation.

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Solar Farm BESS
boundary

20 kV Substation
Compound / Cable
Route Boundary



The layout of the Proposed Project is illustrated in Figure 5.2. A summary of the Proposed Project is outlined below and described in further detail throughout this chapter.

- Photovoltaic (PV) panels on ground mounted frames, fixed in place using earth screws or driven mini-piles, with a maximum height of 4m above ground level, and a minimum ground clearance of 1.0m above ground level, across three separate land parcels referred to as Array Areas A, B and C providing 92.68 MWp (peak electricity generation under optimal conditions)
- Inverter units incorporated into the PV support structures;
- 17 no. transformer centres each measuring approximately 6.1m L x 2.5m W x 3.1m H;
- Underground electrical cable ducting between solar array areas A, B and C, connecting to the future proposed 220kV substation, including underground connections across local roads and 2no. wooden overhead electric poles, one placed on either side of the Tellarought River to facilitate its crossing;
- 4no. meteorological stations.

A Battery Energy Storage System (BESS) providing 54.8MWac of electricity storage for a two-hour duration, secured with 2.6m high palisade fencing and gates, and containing:

- 79no. of containerised battery storage modules (measuring approximately 6.82m length, 2.44m wide and 2.89m high);
- 19no. of containerised transformer and Power Conditioning Units (measuring approximately 6.82m length, 2.44m wide and 2.89m high) and ancillary equipment;
- 8.5m high acoustic barrier for noise attenuation around the BESS compound;
- Well and pump house to supply 2no. fire fighting tanks for Battery Energy Storage System compound and
- **All associated development** including widening of existing field entrance from local road L - 8059-1 to serve the solar array and BESS in Area A and vegetation clearance at all other existing site entrances to provide sight lines, temporary construction compounds (one in each solar array area), 2m high perimeter fencing fitted with mammal passes and security gates, pole mounted CCTV system, lighting, site drainage, fire water tanks, use of existing field entrances for access for construction and operation, internal access tracks, recontouring of land and landscaping, and all other works required to facilitate the proposed development.

The proposed 220kV substation compound and grid connection will be the subject of a separate planning application to An Coimisiún Pleanála under section 182A of the Planning and Development Act 2000 as amended. This associated development will consist of:

- A substation compound measuring an area of approximately 1.0 hectare which will accommodate the following:
 - 1no. Air Insulated Switchgear (AIS) securely fenced compound, which includes 1no. control building (9m L x 7.5m W x 4m H), 1no. transformers, cable sealing ends and associated AIS equipment;
 - 1no. Gas Insulated Switchgear (GIS) securely fenced compound, which includes a 220kV GIS building (49m L x 18.5m W x 17m H) housing GIS equipment;
- A grid cable connection from the GIS building to the existing 220kV overhead line circuit to Great Island, comprising 2no. 220kV underground cable circuits measuring approximately 2.9km in length;
- 2no. Line Cable Interface Masts (LCIMs) and stringing of new conductor to connect to an existing 220kV overhead line circuit to Great Island; and,
- All associated development including lighting, substation compound site drainage, effluent holding tank, well water supply for substation, internal access circulation area, lightning rods, lighting, dismantling and removal of 1no. existing 220kV overhead line tower and all other works required to facilitate the proposed development.

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Figure 5.2: Proposed Project Layout



Source: Mott MacDonald Ireland Limited

5.4 Solar PV Infrastructure Description

5.4.1 Solar Arrays

The individual solar panels measure 1.3m wide by 2.58m long, and will be positioned in rows of three (overall length of PV rows varies based on their location) which will be erected on pre-erected galvanised steel mounting frames set at a height of 1m above ground level at the lowest point increasing to a maximum height above ground level of 4m, and tilted at 20 degrees to the horizontal. The solar panels will be positioned with appropriate gaps between modules implemented as to minimise the number of tables required and to reduce inter-row shading.

It is proposed that the solar panels will be fixed in place using earth screw/ pile driven steel framing. A cross section of a three-row solar panel is provided in the accompanying Planning Drawing Ref: 229101268-MMD-00-XX-DR-E-0301.

5.4.2 Inverter Units and Transformers Centres

The inverter unit collects direct current (DC) and converts it into grid-compliant alternating current (AC), which is then fed to the transformer centres via underground electrical cabling (refer to Section 5.4.3). These inverter units are positioned on the support structures under the end of each row of solar panels. It is proposed to construct string inverters across the solar farm

which will be mounted on brackets within the profile of the PV panel mounting structure. The dimensions for the proposed inverter units are approximately 1.15m L x 0.87m W x 0.36m H.

The transformers centres are integral to the solar farm, collecting the AC electricity from the inverters and increasing the voltage to 33kV before transferring this current to the proposed 220 kV substation. The units enclose the transformer, medium voltage switchboard and low voltage switchboard. The transformers are equipped with a weather station, ventilation vent and security light. The transformer units (including associated ancillary equipment) will be constructed as modular containerised units to facilitate efficient transport and installation. It is proposed to construct 17no. transformer and MV switchgear units across the solar farm, which will be modular containerised units to be placed on plinths suitably bunded. The dimensions for the proposed units are approximately 6.1m L x 2.4m W x 3m H.

A total of 17no. of transformers centres are proposed across the entire solar farm. The number of transformers in each solar array area is directly related to the AC electricity generated within each array area as such the number of transformers per solar array area is as follows;

- Area A: 9no.
- Area B: 5no.
- Area C: 3no.

The proposed transformers will be oil-filled transformers, which are the most commonly occurring type used in outdoor high voltage installations. Each transformer will include built-in leak containment to prevent leaks and protect the environment.

5.4.3 Array Cabling

An estimated total linear length of 9,700m of low voltage (LV) underground electrical cable trenching is required to connect the solar panels to the invertors, and from the invertors to the transformer centres. These cables will operate at a voltage below 1kV.

The medium voltage (MV) underground array cables from the transformer centres to the proposed substation will operate at 33kV and be directly buried except where crossing roads or other services in which case the cable will be installed in ducts covered in concrete. An estimated total of 5,400m linear metres of MV cable trench is required.

There are two parcels of land which comprise part of the overall Array Area A, but which are divided from the main Array Area A by public roads, namely the north-westerly parcel, referred to as parcel 1 in planning drawing titled Overall Site Location Map (drawing number 229101268-MMD-00-XX-DR-E-0100) is separated by the L4030. Parcel 10, to the northeast, is separated from the main Array Area A by the L80591.

The 33kV cabling for Array Area B and C will be required to be constructed within the public road, L-81411-1 and L4030, on its route to the proposed 220kV substation compound, the final section of the route will be off-road as it traverses through agricultural fields. A crossing of the Tellarought River, via an overhead section of cabling which will be strung between two wooden polesets on either side of the river (which can be seen in Planning Drawing 229101268-MMD-00-XX-DR-E-0205), when it reaches Array Area A the MV cabling will be once again undergrounded and will connect to the AIS compound.

5.4.4 Access Tracks

The Proposed Project includes the construction of internal access tracks (total length measures approximately 2860m) to facilitate the movement of construction, operational, and maintenance vehicles throughout the solar farm. These tracks will be constructed using a compacted gravel

surface, with a width of 3.8m, and will be adjusted to suit site-specific conditions and tie in levels with the existing ground.

One internal access track provides shared access for the solar farm, the BESS compound and proposed substation compound, this track is 6m wide and has been developed to EirGrid Technical Standards for Customer Connections (this track runs from Site Access 4 as illustrated in Planning Drawing 229101268-MMD-00-XX-DR-E-0101 to the proposed substation compound).

5.4.5 Surface Water Drainage

The Proposed Project comprises three distinct solar array areas - A, B and C. All the elements of the drainage design have been developed in accordance with CIRIA Sustainable Drainage Systems (SuDS) Manual 2015. To ensure effective surface water management along the proposed access tracks within the solar farm, the project includes the construction of two dedicated drainage systems, namely the access tracks drainage and the perimeter drainage system.

Surface water drainage is required along the proposed access tracks to ensure effective control of runoff rates from these areas. Due to the reduced permeability of the compacted gravel surface compared to natural ground conditions, a mitigation strategy has been developed. This includes the installation of filter drains positioned alongside the access tracks, designed to collect and convey surface runoff to soakaways, facilitating gradual infiltration into the subsoil. The proposed system helps prevent washouts, minimise erosion, and mitigates long-term deterioration of the track infrastructure. The performance of infiltration-based systems is influenced by the geotechnical characteristics of the underlying soil.

The proposed perimeter drainage system is designed to manage flows from the identified grassed areas allocated for solar panels, which naturally slope towards the adjacent access tracks. The design varies across Array Areas A to C and comprises a combination of solutions that facilitate both infiltration and conveyance of surface water flows. In Lot A and Lot C, the system facilitates the discharge of surface water into downstream receiving waterbodies.

The solar farm is primarily situated on agricultural land with filed parcels defined by mature hedgerows that are to be retained and, if required, bolstered. The parcels generally slope towards the vegetated strips, which based on site topography, function as natural conveyance features that discharge surface water into more pronounced downstream waterbodies. The hedgerows are anticipated to provide a high degree of natural infiltration.

The layout of solar panels has been designed to provide optimal separation distances between the solar panel array rows to avoid blanket coverage of the site and to allow for vegetation growth between them. The panels are designed with moderate slopes, and the installation frames are elevated at a height of 1.0 metre above ground level. This configuration offers dual benefits: it reduces the potential for elevated rainwater runoff rates and provides space for vegetation growth and maintenance beneath the panels.

As part of the overall drainage strategy, gravel-filled filter drains are proposed between the rows of solar panels. These are intended to intercept and manage surface water runoff, promote infiltration and to mitigate the risk of erosion and waterlogging.

The operation and maintenance of the solar farm will include regular monitoring of the vegetation beneath the panels. Where soil compaction is observed during operation of the site, the ground will be reinstated.

The topographical characteristics relative to respective solar energy farm Array Areas A to C are outlined below.

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Array Area A

The overall landscape of Array Area A is relatively uniform, with gradients ranging between 1:20 and 1:30. These consistent slopes allow natural surface water conveyance across the site. Based on the topographical survey and site walkover a drainage ditch is noted to run parallel along the hedgerow conveying flows downstream and discharging to a more pronounced drainage ditch at the southeast of the site. This ultimately connects to the Owenduff River.

This area of the solar farm is characterised by moderate sloping topography with two primary drainage directions. The western portion of the site slopes predominantly from north to south, directing surface water towards existing matured hedgerow strip. The eastern portion slopes towards the southeast and east, discharging naturally towards the adjacent Owenduff River. This watercourse, along with its associated floodplain, defines the eastern boundary of the development area.

It was noted during the site walkover that there is an absence of formal land drainage along the hedgerow strip at the south, although it is evident that the surface runoff follows the existing topography of the land. The design includes a range of mitigation measures aimed at maintaining pre-development hydrological conditions to effectively manage surface water across the solar farm. These are included in the first part of this section.

To ensure effective surface water management along the proposed access tracks within the solar farm, the project includes the construction of two dedicated drainage systems, namely the access tracks drainage and the perimeter drainage system.

The main access track is proposed to connect the proposed substation compound and BESS compound to the local public road L-40232, which defines the northern boundary of Array Area A. In addition, a network of secondary access tracks is proposed to provide operational access throughout the solar farm.

The proposed perimeter drainage system is designed to intercept, infiltrate and convey surface water flows from the identified grassed areas, which naturally slope towards the adjacent access tracks. The system comprises French drains, filter drains and carrier drains. The flows follow the existing topography of the land and discharge through a headwall into the nearest existing drainage ditch located at the southeast. The system includes a flow control chamber to ensure that discharged does not exceed greenfield runoff rates, therefore protecting the capacity of the downstream network.

The proposed surface water drainage layout is shown on Drawing No. 229101268-MMD-00-XX-DR-C-0101 to 0105.

Array Area B

Area B generally features gently sloping topography, with the gradients falling towards existing waterbodies. The Owenduff River, its floodplain and associated streams bound the Proposed Project to the north, northeast and the northwest. The natural ground slope directs surface water toward existing hedgerows, which serve as informal vegetated conveyance features and ultimately discharge into the downstream watercourses.

The majority of the site has a relatively uniform landscape, with average ground gradients of 1:50. The narrow section at the northeastern area is an exception and the slopes are steeper here with average slope of 1:20. The surface runoff discharges naturally to the adjacent river.

This area of the solar farm is situated on agricultural land bordered by mature hedgerows that aid natural infiltration and convey surface water downslope into larger waterbodies. The design includes a range of mitigation measures aimed at maintaining pre-development hydrological

conditions to effectively manage surface water across the solar farm. These are included in the first part of this section.

To ensure effective surface water management along the proposed access tracks within the solar farm, the project includes the construction of a dedicated access tracks drainage system. This includes the installation of filter drains positioned alongside the access tracks, designed to collect and convey surface runoff to soakaways, facilitating gradual infiltration into the subsoil. The main access track is proposed to connect to the local public road located to the south of the site. As outlined in the design principles, a perimeter drainage system and access track drainage have been integrated into the overall drainage strategy to ensure effective surface water management.

The proposed surface water drainage layout is shown on Drawing No. 229101268-MMD-00-XX-DR-C-0106 to 0108.

Array Area C

Area C is characterised by gently sloping topography with the primary gradient falling westward. This directs surface water toward existing hedgerows, which serve as informal vegetated conveyance features and ultimately discharge into the adjacent stream. This stream defines the western boundary of the development area. The overall landscape is relatively uniform, with gradients ranging between 1:30 and 1:40. These consistent slopes allow natural surface water conveyance across the site.

This area of solar farm is situated on agricultural land bordered by mature hedgerows that aid natural infiltration and convey surface water downslope into larger waterbodies. The design includes a range of mitigation measures aimed at maintaining pre-development hydrological conditions to effectively manage surface water across the solar farm. These are included in the first part of this section.

To ensure effective surface water management along the proposed access tracks within the solar farm, the project includes the construction of a dedicated access tracks drainage system. This includes the installation of filter drains positioned alongside the access tracks, designed to collect and convey surface runoff to soakaways, facilitating gradual infiltration into the subsoil. The main access track is proposed to run centrally through the site, connecting to the local public road that runs parallel to the eastern boundary of Area C.

The proposed surface water drainage layout is shown on Drawing No. 229101268-MMD-00-XX-DR-C-0109 and 0110.

5.4.6 Water and Waste Water

There is no requirement for water or wastewater drainage infrastructure as neither are required for the operation of the solar energy farm.

5.4.7 Security Infrastructure

The perimeter of the overall project site will be required to be secured from unauthorised access to ensure protection of the solar equipment. The proposed perimeter fencing is typical deer fencing, structured of galvanised wire steel mesh fencing, measuring 2m high with 15cm wide apertures. The security fencing will have mammal access points to ensure species such as foxes, badgers, rabbits, hares etc. have unfettered movement throughout the solar farm. Fencing will also have the added benefit of ensuring sheep, which will be used to graze throughout the solar farm, will be contained within the solar farm site. Each site entrance will have a 2.0m high double leaf high chain link gate (moss green colour, RAL 6005) installed.

A closed-circuit television camera (CCTV) system will be provided from various locations in each array area and will be erected on dedicated pole mounted stands at a height of 4.0m above ground level as detailed within planning drawing 229101268-MMD-00-XX-DR-E-0305. The CCTV be angled to record within the array areas only and will not capture any adjacent residential properties or roads. The CCTV system will be monitored remotely on a continual basis using infrared lighting as the solar facility will be unlit at night-time.

There is no lighting infrastructure required or proposed for the operational phase of the solar farm.

5.4.8 Landscaping

As an outcome of the landscape and visual impact assessment, mitigation in the form of additional hedgerow planting was proposed. This will bolster existing hedgerows within and on the boundaries of the Project site to provided further screening. The proposed landscaping is illustrated in the accompanying landscape drawing (refer to drawing 25WX01-DR-0101 to 0103 in Appendix 5.3, Volume 3 of this EIAR).

5.4.9 Landuse/Grazing Arrangements

At present the Project site comprises improved and wet agricultural grassland and is used for tillage production and animal grazing. It is proposed that all solar farm array areas (A, B and C) will continue to retain agricultural practices through the application of sheep grazing. Sheep grazing is a common agricultural practice at established solar energy farm locations for the maintenance of grassed areas. Sheep grazing has a mutual benefit of retaining agricultural practices and is a sustainable farming practice ensuring vegetation growth does not interfere with solar panels, while also improving biodiversity through the creation of conditions for the (re)establishment of native wildflower/meadow species.

5.4.10 Biodiversity Enhancement Measures

The biodiversity enhancements are based on the preservation of existing local habitats which support flora and fauna of local, regional or national importance. In this regard, areas of recovering remanent fen/ wet woodland habitats have been left undeveloped. Any retained habitats are best managed via low maintenance methods, i.e. reduced grazing or self-regeneration, while no pesticides or herbicide usage will be employed within the Project site.

As discussed in Section 5.4.9 above, sheep grazing will be used to provide a natural form of grass management throughout the solar farm, this has biodiversity benefits to maintain meadow areas and prevent scrub encroachment.

The predominate enhancements are focused on bolstering existing hedgerows throughout the Project site, where current agricultural practices have resulted in rigorous management of hedgerows. Hedgerows will be bolstered with the planting of native hedgerow species, such as hawthorn, sloe, hazel, holly, spindle and guelder rose. Where trees will be planted within hedgerows these species include a mix of oak, crab apple, wild cherry, scots pine.

A 2.31 hectare field at the northeast corner of the site has been identified for specific biodiversity enhancement. This field comprises a river floodplain with remnant fen and wet woodland habitat. The planting of alder and oak has been identified as appropriate within areas of the Project site (refer to drawing 25WX01-DR-0120 in Appendix 5.3, Volume 3 of this EIAR).

The proposed biodiversity enhancement measures are listed below.

- 2.01 hectares of existing wet grassland and scrub mix to be conserved and managed to protect existing habitats.

- 2.64 hectares of existing marsh and scrub mix to be conserved and managed to protect existing habitats.
- 5.33 hectares of existing marsh, wet grassland, and scrub mix to be conserved and managed to protect existing habitats.
- Retention of 0.73 hectares including an existing building and bat roost to be left undisturbed.
- Retention of 1.45 hectares of mixed woodland.
- 3.21 hectares of former agricultural pasture and tillage land is to be planted with native woodland; Alder and Oak on lower lying ground adjacent streams and flood prone areas and Hazel and Oak woodland on drier ground.
- Additional mitigation planting adjoining dwellings will consist of dense native woodland and shrub planting and provides a cumulative area of 1.03 hectares.
- Replanting of degraded hedgerows over and a cumulative area of 1.35 hectares.

Tree planting will be conducted by hand under the supervision of an ecologist to ensure that tree planting is located outside remanent fen/ wet woodland, which will be retained. This will enhance biodiversity within the floodplain of the Owenduff River which forms a boundary of the Project site.

The perimeter fencing for the Proposed Project will have mammal gates installed at regular intervals (small mammal gates at every panel (between posts) and large mammal passes every tenth panel) to allow the mammal access points to ensure species such as foxes, badgers, rabbits, hares etc. have unfettered movement throughout the solar farm.

5.5 Battery Energy Storage System Description

5.5.1 BESS Units

The purpose of the BESS units is to store surplus energy generated during low demand periods and release this when demand is greater. Additionally, the stored energy is used to provide fast acting DS3 system¹ services which contribute to the stability of the system as the penetration of renewable generation on the system increases.

The BESS units are modular and will be arrayed within the site along with associated transformers and inverters. An example of a typical BESS unit is shown in Figure 5.3. The BESS unit incorporates a concrete base, battery modules, associated plant and equipment including transformers and inverters.

A BESS operates in either a charging mode or a discharging mode. During discharging mode power from the batteries is converted from direct current to alternating current by an inverter. Power from all the batteries is stepped up through a transformer to a 33 kV busbar which then connects to a main transformer and from there an underground cable connects the facility to the grid. During charging mode, the process is reversed and electricity is fed into the batteries and the energy is stored. For this development, energy for charging of the batteries will only be sourced from the co-located solar development.

The design adopted allows for minimising on-site construction as each modular component is manufactured off-site and transported to site for final assembly. Each BESS unit will be transported to site already built, the site works will include installation, connection via cables and commissioning. Inverters and transformers will also be transported to site as complete functional units ready for installation and connection on site.

¹ DS3 is about operating the power system securely, while meeting renewable targets.

5.5.2 Site Layout and Processes

The precise BESS arrangement, consisting of the containerised battery storage modules, the transformer and Power Conversion Systems (PCSs), to be used at the site will be finalised prior to construction and will be dependent on commercial and technical considerations at the time of procurement. Dimensions of containerised modules produced by different manufacturers vary; however, designs have been over specified, and therefore, the total structure height and boundaries will not exceed that indicated in the accompanying planning drawings.

These containers will house the batteries, fire suppression equipment and associated electrical components. The cable routing between containers would be above ground.

Each battery module will be monitored and controlled through a Battery Power Facility Management System. The site will be monitored and controlled remotely and will be visited regularly for routine maintenance and security checks.

An example of a typical containerised battery storage module and associated transformer and PCU is provided in Figure 5.3 and Figure 5.4.

Figure 5.3: Image of a typical container housing the battery storage modules



Source: Mott MacDonald

Figure 5.4: Image of a typical container housing the PCU



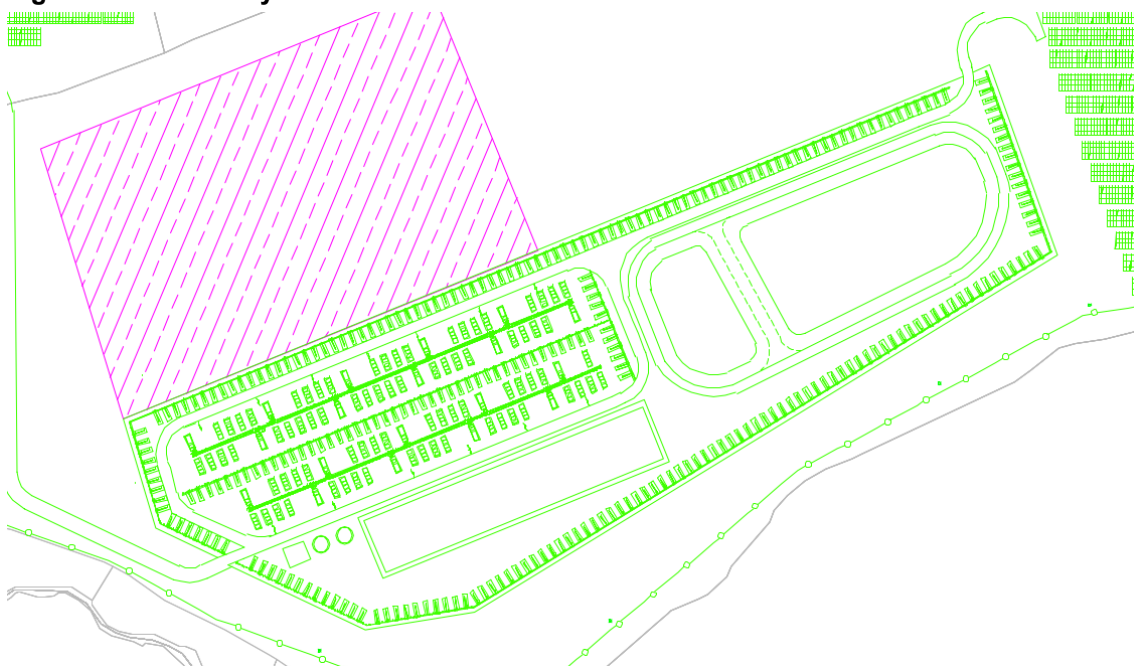
Source: Power Electronics

A certain number of the BESS containers may include 3m lightning finials, if required, as per the site lightning risk assessment. For the purpose of the planning application and associated drawings, it has been assumed that lightning finials will be provided on each BESS container. Details have been provided for standard approach for a BESS container in planning application drawing 229101268-MMD-00-XX-DR-E-0308.

A 8.5m high acoustic barrier surrounding the BESS compound is proposed to mitigate noise impacts to local residents.

The proposed BESS layout is shown in Figure 5.5. For more details on the proposed location and layout of the BESS units, refer to planning application drawings 229101268-MMD-00-XX-DR-E-0200, 229101268-MMD-00-XX-DR-E-0203, 0205 and 0206.

Figure 5.5: BESS Layout



Source: Mott MacDonald

5.5.3 Internal circulation tracks

Internal access is required throughout the BESS compound to allow safe vehicular access and movements to areas of the array for maintenance purposes throughout its operational lifespan. The access tracks will be 4.5m wide and will be excavated to a depth of 450mm. This will then be replaced with an aggregate base layer of soil that will be topped with a surface layer of gravel. The main access road leading to the proposed substation compound and BESS compound will be topped with tarmac.

The BESS compound will include for two access points (one to the west and one to the east) to ensure redundancy in the event of an obstruction and emergency [fire] services to attend in the event of a fire.

5.5.4 Water Supply

An on-site fire water supply will be provided due to distance from any Uisce Éireann water supply infrastructure. The water supply will be capable of supplying a minimum of 1900 litres /

minute for at least two hours in accordance with National Fire Chiefs Council publication 'Grid Scale Battery Energy Storage System Planning – Guidance for FRS'². Firefighting water is to be supplied from a bored well (the location of which will be subject to site investigation results) that will be located a minimum of 50m from any watercourse and 30m from the GIS building's foul holding tank. Two fire water supply tanks are proposed, each measuring a height of 4.2m and with a tank diameter of 6.1m, each providing a volume of 124m³. The tanks will be equipped with level monitoring and overflow protection. A dedicated pump house will be constructed to accommodate a fire pump capable of maintaining the required pressure and flow during emergency conditions, with backup power provision for grid outages.

There is no requirement for a potable water supply for the operation of the BESS.

Refer to Section 5.5.6 below for details of the proposed firefighting water discharge containment.

5.5.5 Wastewater Drainage

No permanent welfare facilities are proposed for the BESS plant. As a result, there is no requirement for wastewater treatment or drainage infrastructure to be installed to facilitate the operation of the BESS plant.

5.5.6 Surface Water Drainage

To comply with established best practice, a surface water drainage system incorporating Sustainable Drainage System (SuDS) features will be constructed to manage the quantity and quality of runoff during rainfall events. The proposed drainage strategy will comply with the recommendations as outlined in the Wexford County Development Plan 2022-2028 (Volume 2, Chapter 9) that include reference to the CIRIA SuDS Manual 2015.

Surface runoff from the narrow area along the north boundary of the BESS compound will naturally flow in a northwestern direction towards the proposed solar energy farm (Array Area A) access track drainage, following the geomorphology of the site.

The surface water runoff generated by the BESS facility will be collected via a gravity drainage system and managed using a dry detention basin. The proposed future substation will also be connected to main gravity drainage system serving the BESS compound. The basin will be unlined allowing for infiltration and it will be sized to ensure no flooding of the proposed site occurs for the critical storm with a 1 in 100-year return period, including a 30% allowance for climate change. The operational efficiency of infiltration systems is dependent on the geotechnical properties of underlying soil at the proposed location and should be confirmed through ground investigation. The dry detention basin will include a sediment forebay at the inlet of the basin that will provide sediment treatment by allowing particulates to settle out and preventing their resuspension within the main detention area. Furthermore, a permanently wet volume will be provided to enhance the treatment of surface water runoff by encouraging the adhesion of entrained contaminants to vegetation planted within the pond. The outfall from the basin will be discharged via a headwall into the existing drainage ditch located to the southeast. The headwall is positioned approximately 5 metres from the perimeter fencing of the BESS compound. Based on site walkover, the ditch maintains hydrological connectivity with the Owenduff River, which flows in a south-westerly direction, running parallel to the site's boundary. The discharge to a watercourse is to be restricted in accordance with sustainable drainage principles and limited to the greenfield runoff rate.

² <https://nfcc.org.uk/wp-content/uploads/2023/10/Grid-Scale-Battery-Energy-Storage-System-planning-Guidance-for-FRS.pdf>

In case of a fire event, surface water from the hardstanding BESS area will be automatically redirected to a firewater storage tank via an automated penstock. The tank will be sized to accommodate flows during a critical storm event with a 1 in 10-year return period, including a 30% allowance for climate change.

A perimeter drainage system, comprising a filter drains and soakaways system, will be installed to collect and infiltrate surface water runoff from the access track located in the western section of the Project Site, as well as from the adjacent unpaved area between the BESS compound and the substation compound. In the southwestern area, the surfacing surrounding the fire tank will be served by the filter drains running parallel to the acoustic wall that connect to main gravity drainage system of the BESS compound.

The proposed surface water drainage system will incorporate the following features to reduce the risk of pollution and improve the quality of surface water which will be discharged from the site:

- Silt trap chamber and oil/fuel interceptor located upstream of the dry detention basin to help remove pollutants which may have become entrained in runoff from any hardstanding areas that may be at risk of contamination from oil or fuel spills associated with vehicles;
- Flow control chamber downstream of the dry detention basin regulates the flow at the discharge point from the basin;
- Forebay within the dry detention basin to promote treatment and settlement; and,
- Emergency shut-off valve chambers located upstream of the dry detention basin to prevent discharge from the drainage network in an emergency event and during periodic maintenance.

The proposed surface water drainage layout is shown on Drawing No. 229101268-MMD-00-XX-DR-C-0100. The proposed firewater storage tank plan and sections are included on Drawing No. 229101268-MMD-00-XX-DR-C-0017 and the proposed pumphouse plan and sections are on Drawing No. 229101268-MMD-00-XX-DR-C-0018.

5.5.7 Lighting

Internal site lighting is proposed within the centre of the BESS compound, there will be no perimeter lighting. A total of 14 no. double head lamp post positions are indicated on the proposed site layout plans. Lighting will be sensor activated. The lamp posts will be inward facing and approximately 6.0m in height, the details of which are shown in the planning application drawing 229101268-MMD-00-XX-DR-C-0100.

5.5.8 Acoustic barrier

An acoustic barrier is required around the BESS compound and a further section will extend internally. The acoustic barrier will measure a height of 8.5m and will have full absorptive noise capacity to ensure there is no exceedance of background noise levels at the closest residential receptors.

5.5.9 Embedded Fire Protection

There are a number of levels of fire protection built into the BESS units. The BESS plants are comprised of a number of individual battery container units called 'cubes', each cube has racks, each rack contains a number of battery modules and each module is comprised of a number of battery cells.

At a module and cell level, the battery temperature and voltage are constantly monitored. If these parameters are measured outside the safe operating range, the module is automatically disconnected from the system in order to prevent any further issues.

Should the module level protections fail to prevent a fire each cube contains gas, temperature and smoke detection sensors. If smoke or oxidation gases are detected within the cube, all cubes linked in the same string are disconnected from the system and a solid aerosol fire suppressant is automatically released within the cube.

As a final layer of protection the battery modules are designed to so that in the event the first two layers of fire protection do not prevent a fire igniting, any fire will remain contained within that module and will not spread to other modules within the container and thereby will not spread to adjacent containers.

In line with best practice guidance, a water-based fire suppression system is proposed to provide defensive cooling. This involves the strategic application of water to adjacent units and surrounding infrastructure to prevent fire spread and reduce thermal escalation. Direct application of water onto burning battery modules is to be avoided due to electrical hazards. Firewater containment measures are incorporated into the site design to manage runoff and prevent contamination.

Refer to Section 5.5.4 above for details of the fire water supply.

5.5.10 Security Infrastructure

The BESS compound will be required to be secured from unauthorised access to ensure protection of the BESS units. The proposed fencing comprises 2.6m high steel palisade fencing (moss green colour, RAL 6005).

The closed circuit television cameras (CCTV) system will be provided around the perimeter of the solar farm from various locations in each array area and will be erected on dedicated pole mounted stands at a height of 3.5m above ground level as detailed within planning drawing titled Ancillary Details (Drawing number 229101268-MMD-00-XX-DR-E-0305). The CCTV cameras will be angled to record within the array areas only and will not capture any adjacent residential properties. The CCTV system will be monitored remotely on a continual basis using infrared lighting as the facility will be unlit at night-time.

5.6 Grid Connection Description

Shelburne Energy Farm as an electricity generation and storage project, requires a connection to the national grid to enable the export of the electricity generated or stored. The connection to the national grid will comprise a 220kV Gas Insulated Switchgear substation compound with two transformers, one for the BESS storing electricity generated by the solar energy farm and a second for the BESS storing electricity from the national grid.

5.6.1 220kV Substation Compound

The substation compound will house two separately fenced compounds, to the west the GIS compound (EirGrid operated compound) and to the east the AIS compound (customer operated compound). Both compounds have been designed to EirGrid technical specifications and are further detailed herein.

5.6.1.1 GIS Compound

The GIS compound which will be securely fencing with palisade fencing, with an independent and separate gated compound entrance. The 220kV GIS Building housing all associated GIS equipment will be the solitary above ground structure within the GIS compound. The 220kV GIS building will comprise a two-storey over partial basement structure. It will house the new gas insulated switchgear, comprising Sulphur Hexafluoride (SF6) insulated circuit breakers, disconnectors and other high voltage equipment. Auxiliary services equipment, such as control

and telecoms equipment, low voltage switchgear, an emergency diesel generator, and batteries. Welfare facilities (i.e. toilets, sinks, messroom, workshop.) will also be located within the GIS substation building in line with EirGrid Functional Specifications. The underground cables will connect with the substation via the partial basement, which will be designed to prevent any water ingress.

A below ground earth grid will be installed in a grid arrangement approximately 600-750 mm below the finished surface. The earth grid will consist of bare stranded copper conductor with an outside diameter of approximately 95mm². The purpose of the earth grid is to ensure personnel and public safety during electrical faults that may occur on the transmission grid.

Fencing around the entire EirGrid substation compound, with the exception of the site entrances/gates, will comprise 2.6m high galvanised steel palisade security fencing, with black powder coat.

The building will comprise a typical industrial form, with a structural steel frame clad with profiled metallic sheet wall and roof cladding. Internal walling of masonry will be adopted, except where specific load carrying requirements necessitate the use of reinforced concrete walls.

Industrial claddings will be factory finished according to EirGrid specification. The roof will be shallow pitched and constructed of profiled metal decking on purlins spanning between rafters. The buildings will have access gantries and walkways for access to equipment. These will be constructed of stainless/galvanised steel open grating type flooring supported on steel beams and columns.

External doors and escape doors will generally comprise metal flush doors and mild steel frames. Fire doors will comply with BS 476-22:1987 - Fire tests on building materials and structures.

The ultimate choice of finish and colour of the metal cladding coating will be made considering the specified service life, resistance to degradation under long term exposure to climatic conditions and will comply with the requirements of the statutory approval, if granted. A typical 220kV GIS Substation Building is shown in Figure 5.6.

Figure 5.6: Typical 220kV GIS Substation Building



Directional light fittings have been incorporated within the plan in order to minimise light pollution in the surrounding area. External light fittings will be mounted to the cladding of the GIS building facing downwards to minimise impacts to areas outside the substation compound. A total of 20no. external lights will be mounted to the GIS building, six lights will be positioned on each long edge of the building, and two lights on each short edge.

5.6.1.2 AIS Compound

The AIS Compound contains two individually fenced compounds, the southern compound will contain the AIS structures and equipment which related to the transfer of electricity from the solar farm and BESS. The northern compound will be left unoccupied (i.e. no AIS equipment/control building will be installed) and may be utilised in the future should any future expansion of the facility be developed, subject to all necessary development consents and assessments. The dimensions of the AIS structures are detailed in Table 5.1.

The AIS compound will contain a single control building which will contain a switchgear room that houses the 33kV switchgear and a transformer. The security and control room will house the cabinets used for SCADA, telecommunications, security and fire, CCTV and LV distribution. A storage room will also be provided within the control building. A total of four lighting poles will be provided in the AIS compound.

Table 5.1: Approximate Dimensions of AIS structures

Structure	Number of Structures	Length (m)	Width (m)	Height (m)
Transformers	1	10.8	6.9	5.72
Lightning monopoles	2	n/a	n/a	18.5
Cable Sealing Ends (with associated steelwork)	3	n/a	n/a	4.1
Voltage Transformers	3	n/a	n/a	4.1
Current transformers	3	n/a	n/a	4.1
Disconnectors	3	2.8	n/a	4.1
Post insulators	6	n/a	n/a	4.1
Control Building	1	9	7.5	4
Lightning Rods (mounted to the roof of the control building)	4	n/a	n/a	2
Palisade Fence	1	n/a	n/a	2.6

5.6.1.3 Surface Water Drainage

The proposed substation compound will include a range of hardstanding surfaces, comprising building roofs, vehicle access tracks, parking areas and compacted granular zones within the compound. These surfaces will generate stormwater runoff, which will be intercepted and managed through a gravity-fed drainage system designed to collect and convey flows efficiently across the site. The drainage will consist of a combination of filter drains used to capture and promote infiltration of surface water from permeable areas and carrier pipes that will convey collected runoff. The proposed substation drainage system is designed to discharge into the main BESS drainage network. This integrated approach ensures that surface water flows generated within the substation compound are effectively managed within the overall site-wide drainage strategy. The BESS drainage system has been sized to accommodate the additional runoff from the substation, as detailed in Section 5.5.6. This allows for consolidated flow conveyance, attenuation, and controlled discharge in accordance with sustainable drainage principles and regulatory requirements.

Additionally, measures to protect water quality will have to be considered within the design of the substation compound drainage. In accordance with standards practice, drainage from oil filled bunds will require an oil-sensitive bund pump. As a backup measure to ensure no oil can escape it is proposed that all storm water generated on the site will gravity flow to the outfall via a full retention petrol / oil interceptor.

A perimeter drainage comprising a French drain will be constructed parallel to the western and southern site boundary to intercept and infiltrate surface water runoff to prevent surface water from descending from the adjacent areas towards the site. The proposed surface water drainage layout is shown on Drawing No. 229101268-MMD-00-XX-DR-C-0100.

5.6.2 Water and Wastewater

A new potable water connection is required for welfare facilities within the proposed GIS substation. Due to the distance from existing potable water infrastructure the proposed water supply will be taken from the bored well that is designed to supply also the firefighting water for the BESS compound. This is included in Section 5.5.4.

This borehole will be constructed with regard to the Environmental Protection Agency Drinking Water Advice Note No.14, Borehole Construction and Wellhead Protection (Version 1, 2013)³⁷. The volumes required from the well during the operational phase will be limited, as staff visiting for operational and maintenance purposes are likely to not exceed five persons twice per month.

The only sources of wastewater on site will be the basic welfare facilities located in the GIS building. There is an absence of existing wastewater infrastructure in the locality of the substation. Therefore, an underground foul holding tank is proposed to collect wastewater. This is a standard solution that require regular scheduled emptying. Appropriate separation distance to be provided to comply with the EPA's Code of Practice for Domestic Waste Water Treatment Systems (Population Equivalent ≤ 10) (2021).

5.6.3 220kV Cable Connection

The proposed underground cable development will comprise two 220kV electricity cables and fibre optic cables to facilitate the connection of electricity generated at the solar and battery plant to the national grid.

The grid connection is proposed via two 220kV underground cables (UGC) approximately 2850m in length, the initial section will extend from the GIS building and along access tracks within the Project site until it reaches the L40232, turning westwards until it reaches the junction with the L4030 where it will continue northwards before once again travelling off-road, as it passes through agricultural land to connect to the existing Great Island-Lodgewood 220kV overhead transmission circuit. Each 220kV circuit will have a total of four joint bays and accompanying each joint bay will be a communication chamber and a link box.

The underground section of the cable will have a trefoil formation. The assessment included in this EIAR is based on a trefoil formation which has a standard width.

The final section of each 220kV cable will be above ground, as each cable will connect to a proposed Line Cable Interface Mast, which allows each circuit to connect to the existing Great Island-Lodgewood 220kV overhead transmission circuit providing a "looped-in connection".

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5.7 Construction Phase Activities

5.7.1 Solar Farm

5.7.1.1 Site Preparation

Vegetation removal will be required, and any removal of hedgerow, trees or scrub will take place outside of the bird nesting season (01 March - 31 August). There is no requirement for site levelling to be undertaken for the proposed solar farm with the exception of minor re-structuring to provide a flat platform for the containerised transformer systems.

5.7.1.2 Solar PV Civil Works

Access Tracks

The construction methodology will include the following materials and steps:

- Topsoil stripping along the route of the proposed track, with the excavated soil stored on-site for later reinstatement or landscaping.
- Installation of a permeable geotextile membrane (e.g., Terram 1000 or equivalent) to allow water infiltration while preventing the upward migration of fines from the subgrade.
- In areas with weaker subsoil, a soil-reinforcing geogrid (e.g., Tensar TX160 or similar) or high-strength geotextile will be installed to enhance load-bearing capacity and reduce the required thickness of aggregate layers.
- Placement of a minimum 200 mm thick Clause 804 sub-base (a well-graded granular material composed of crushed rock, gravel, or recycled concrete), compacted in layers to provide structural support and durability.
- Application of a surface layer of crushed stone (typically 6F2 or similar), compacted in layers to form a durable, low-dust running surface suitable for regular vehicle use.
- The access tracks are designed to be semi-permeable and semi-permanent, supporting sustainable drainage and minimising surface runoff. Surface water drainage will be installed alongside the tracks to manage surface water and prevent erosion. Tracks are typically aligned along field boundaries or existing farm routes to minimise land take and ecological disturbance.

To further reduce environmental impact:

- Access to the majority of most solar panels will not require access tracks and will use tractors or 4 wheel drive vehicles as the vast majority of the site is well drained with low risk of soil rutting etc.
- Tracks are allowed to grass over post-construction to blend with the surrounding landscape and reduce visual impact.
- No concrete is used in the track construction unless required for specific load-bearing areas such as crane pads or substation access points.
- Construction is staged to minimise soil disturbance and protect biodiversity, particularly during sensitive ecological periods.

At the end of the solar farm's operational life, the access tracks will be decommissioned, with all materials removed and the land restored to its original agricultural condition, including the reinstatement of topsoil and reseeded where appropriate.

Drainage Pipework

The construction methodology will include the following materials and steps:

- No drainage works are proposed in the vicinity of wet grassland and marsh habitats which are generally down slope of proposed works areas
- Ensure safe excavation practices, including shoring or benching as required. Where dewatering is required, water will be treated and appropriately attenuated, before being discharged to vegetation or surface water drainage feature
- Conduct geotechnical surveys to assess soil type, soil permeability, bearing capacity, groundwater levels and contamination risk through site investigation.
- Surface water carrier pipes. Excavate pipe trenches to the specified depth, ensuring a minimum cover. Ensure trench base is flat and follows the designed slope. Fill the trench with bedding material below, around and above the pipe. Pipes shall be laid at specified design grade using approved methods. Ensure proper joint assembly. Backfill trenches in layers using suitable materials.
- Install inspection chambers at appropriate intervals for maintenance access. Regular inspection and maintenance are essential to prevent clogging and ensure long-term performance.
- Assess ground conditions to determine the feasibility of implementing an infiltration system

French drains and filter drains

- Excavate the trenches to the specified depth, ensure trench base is flat and follows the designed slope.
- Use a geotextile membrane to separate the trench from surrounding soil and prevent migration of fines. For non-infiltrating designs, use an impermeable liner to contain flow and direct it to downstream SuDS components.
- Install a perforated carrier pipe at the base of the filter drain trench.
- Backfill the trench/ French drain with clean, angular stone (Clause 505 Type B coarse and light weight aggregate to Table 5/5 MCDRW Series 500). Fill to within 150 mm of the surface.
- Top with crushed stone or gravel to match levels of adjacent surfacing.

Soakaway

- Excavate to the required dimensions based on design calculations. Provide a level bedding layer of compacted granular material.
- Wrap the stone fill in a geotextile membrane to prevent soil ingress while allowing water to pass through.
- Fill the soakaway pit with clean, angular stone (Clause 505 Type B) to the specified depth. Ensure uniform distribution and compaction of the stone to prevent settlement.
- Connect the inlet pipe to the soakaway, ensuring it discharges above the stone layer.
- Install a perforated vertical observation tube for monitoring water levels.
- Maintain a minimum cover depth for the soakaways. Backfill the top layer with permeable material or topsoil, depending on surface finish requirements.

Restore the surface above the soakaway.

- Headwall and dispersion outlet installation. Evaluate existing waterbody/ditch location, direction of flow and soil conditions in advance of works. Use shoring or trench boxes if required to prevent collapse and protect the ditch. Ensure the base is level and compacted to prevent settlement. Place a layer of compacted granular material or lean concrete to form a stable base. Install any required anti-scour measures to protect the ditch banks. Position the headwall to required depth and dimensions, ensuring a level base and to provide alignment with the existing ditch to guide interrupted water flow. Backfill around the headwall with suitable material, compacted in layers. Restore the ditch profile and surrounding area.

- It is required that all grassed areas will be reinstated by either seeding or by replacing with grass turves.

To further reduce environmental impact:

- Weather conditions are to be considered when planning construction activities to minimise risk of run off from site.
- The contractor will carry out visual examinations of local watercourses during the construction phase. In the unlikely event of water quality concerns, the Environmental Manager will be consulted.
- Materials storage and storage tanks etc, shall not be located near any surface water features and will be located beyond the 50m exclusion zone.
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off site. Use spill kits and follow pollution prevention protocols.
- Welfare facilities will be provided within the designated construction compound for duration of works. All generated effluent will be contained in a sealed holding tank, which will be emptied and disposed of off-site by a licenced contractor. Water will be supplied to the site via tanker as required. No impacts on existing site conditions are anticipated.
- Temporary works will be designed to avoid increasing flood risk from overland flow by limiting excavation lengths and providing suitable drainage provision.
- Silt control measures, including silt traps and fences, will be implemented to prevent construction site-generated sediment from entering surface drainage and nearby waterbodies.

Solar panel installation

- The metal support structure which the PV panels will be bear the PV panels will be secured in-situ with piles will be driven into the ground and no additional foundation will be required. However, this aspect should be confirmed once the geotechnical studies are completed, and the structure is selected.
- The installation of the piles is carried out using specialised machinery that will drive them into the ground. The length of embedding (depth into the ground) may vary depending on the ground characteristics.
- PV modules are often attached to mounting rails using module clamps or directly bolted. The mounting rails provide a stable base, while the clamps or the bolts secure the modules in place.
- String inverters can be mounted on piles driven into the ground or integrated into the PV panel support structures. For this project, it is proposed that they be located along the roads.

LV/MV cabling

Civil works for trenching within the solar plant will be required to accommodate all necessary cabling and ducting between the string inverters, transformer containers, and associated electrical infrastructure.

- Trenches will typically range in depth and width according to cable specification and installation standards, and will be excavated to ensure sufficient separation between circuits as required by design codes and cable section calculations.
- All trenches will be lined with sand bedding, with marker tape installed above the cables prior to backfilling.
- Backfilling materials will be free of rocks, roots, vegetation or any element that could damage the cables or create cavities after compaction or during project lifetime.
- The alignment of the trenches will be coordinated with the overall site layout to minimise crossings and maintain clear access routes for installation and operational activities.

- Upon completion of cable installation, trenches will be reinstated to match the finished surface levels.

38kV poleset

- Transport 2 no. wooden poles, crossarm, insulators, and fittings to the area immediately adjacent to the intended location. The wooden poles are between 16m - 23m in length and weigh ca. 2.0 - 2.5 tonnes.
- Excavate for each pole using a tracked excavator. The topsoil layer will be excavated first and placed at a location adjacent to the construction area. The soil below will be stockpiled separately.
- Line up the 2 no. poles with the excavated holes. Attach the new crossarm to 1 no. pole. The machine operator will then drive forward pushing each pole up until the pole is in an almost vertical position. The pole will be supported at all times while the excavation is backfilled to a minimum depth by using a smaller tracked excavator.
- Insert each new wooden pole in the ground at a depth of 2.3m bgl.
- After erection of the poleset, excavate a further 0.8m bgl in between the poles. This is a small linear excavation necessary to install wooden sleepers. These sleepers add additional stability to the new poleset and are attached to the poleset using a U-bolt.
- Attach the crossarm to the second pole.
- Backfill the soil arisings (spoil) with the turf layer placed on top.

Transformer centres

The modular containerised transformer centres will be placed on suitably bunded concrete plinths. Soil will be excavated and stored on-site for later reinstatement or landscaping, following which, the bund will be poured.

5.7.2 Battery Energy Storage System

5.7.2.1 BESS Civil Works

The BESS site will be required to be levelled. The existing site slopes southwards from a high level of +43.4 OD to a low point of +34.7m OD to the south East of the site. It is proposed that the development site is set at a gradual slope of 1:150 from +39.495m OD to +36.800m OD. The proposed site will follow the natural slope southwards to facilitate the drainage design intent to follow the natural drainage south-westwards. A cut & fill analysis estimates a cut quantity of 23,540m³ (accounting for a bulk factor of 1.15) and a fill quantity of 17,810m³. As much of the cut quantity as practicable will be used for fill,. The need for a level platform for the BESS is the trigger for the need for an EIAR in conjunction with the levelling required for the substation.

A minimum 300mm concrete platform will be constructed under each of the BESS and PCS containers, and this will support the BESS containers and equipment. An access track is proposed to the east and west of the BESS compound to access track which will have a tarmac finish, while the areas between containers will be hardstanding concrete.

An absorptive acoustic barrier will be installed at the BESS location to reduce noise impacts to local receptors. The barrier will be formed by a set of 4m wide panels each with its own foundation and support designed for the appropriate design loads. Foundation construction will commence after the completion of BESS site clearance and grading. The foundation installation will involve excavation, form work, steel reinforcement, and concrete placement. Foundations will be designed in accordance with the appropriate design loads and specifications. After curing of the concrete, Steel columns will be fixed to the anchor bolts via baseplates, spaced at 4100 mm centres. The steelwork erection will follow a sequence agreed with the contractor to ensure temporary stability of all members during installation. All baseplates will be grouted using a high-

strength, non-shrink grout to ensure proper load transfer and long-term durability. Temporary bracing or propping may be used during this phase to maintain alignment and safety.

Once the steel frame is securely in place, acoustic panels will be fixed to the structure using specified fasteners. Care will be taken to ensure accurate alignment and effective sealing to meet acoustic performance requirements. Upon completion of panel installation, a thorough inspection of all components will be conducted to verify compliance with design specifications and quality standards.

Civil works for trenching within the BESS compound will be required to accommodate all necessary cabling and ducting between the DC containers, PCSs, and associated electrical infrastructure. Trenches will typically range in depth and width according to cable specification and installation standards, and will be excavated to ensure sufficient separation between circuits as required by design codes and cable section calculations. All trenches will be lined with sand bedding, with marker tape installed above the cables prior to backfilling. Backfilling materials will be free of rocks, roots, vegetation or any element that could damage the cables or create cavities after compaction or during project lifetime. The alignment of the trenches will be coordinated with the overall site layout to minimise crossings and maintain clear access routes for installation and operational activities. Upon completion of cable installation, trenches will be reinstated to match the finished surface levels.

The BESS units will be delivered to site, pre-integrated with internal components such as battery racks, HVAC systems, fire suppression, and Battery Management Systems (BMS). Using cranes or other lifting equipment, the BESS units are carefully placed onto their designated foundations and anchored securely. Mechanical connections, such as HVAC ducting and fire system interfaces, is also done afterwards.

5.7.2.2 Drainage

The construction methodology will include the following materials and steps:

Drainage pipework

- Ensure safe excavation practices, including shoring or benching as required. Where dewatering is required, water will be treated and appropriately attenuated, before being discharged to vegetation or surface water drainage feature
- Conduct geotechnical surveys to assess soil type, soil permeability, bearing capacity, groundwater levels and contamination risk through site investigation.
- Surface water carrier pipes. Excavate pipe trenches to the specified depth, ensuring a minimum cover. Ensure trench base is flat and follows the designed slope. Fill the trench with bedding material below, around and above the pipe. Pipes shall be laid at specified design grade using approved methods. Ensure proper joint assembly. Backfill trenches in layers using suitable materials.
- Install inspection chambers at appropriate intervals for maintenance access. Regular inspection and maintenance is essential to prevent clogging and ensure long-term performance.
- Assess ground conditions to determine the feasibility of implementing an infiltration system
- French drains and filter drains. Excavate the trenches to the specified depth, ensure trench base is flat and follows the designed slope. Use a geotextile membrane to separate the trench from surrounding soil and prevent migration of fines. For non-infiltrating designs, use an impermeable liner to contain flow and direct it to downstream SuDS components. Install a perforated carrier pipe at the base of the filter drain trench. Backfill the trench/ French drain with clean, angular stone (Clause 505 Type B coarse and light weight aggregate to Table 5/5 MCDRW Series 500). Fill to within 150 mm of the surface. Top with crushed stone or gravel to match levels of adjacent surfacing.

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Soakaway

- Excavate to the required dimensions based on design calculations.
- Provide a level bedding layer of compacted granular material.
- Wrap the stone fill in a geotextile membrane to prevent soil ingress while allowing water to pass through.
- Fill the soakaway pit with clean, angular stone (Clause 505 Type B) to the specified depth.
- Ensure uniform distribution and compaction of the stone to prevent settlement. Connect the inlet pipe to the soakaway, ensuring it discharges above the stone layer.
- Install a perforated vertical observation tube for monitoring water levels. Maintain a minimum cover depth for the soakaways.
- Backfill the top layer with permeable material or topsoil, depending on surface finish requirements.
- Restore the surface above the soakaway.

Attenuation basin

- Clear vegetation, debris, and obstructions from the site. Set out pond boundaries and access routes in accordance with approved drawings.
- Excavate to the required depth and shape. Dewater the excavation if groundwater is encountered.
- Grade and compact the base to design levels. Use a geotextile permeable membrane to separate the base from surrounding soil and prevent migration of fines.
- Construct headwall inlet and outlet structures and forebay berm to manage flows.
- Install flow control chamber at the outlet to regulate discharge rates.
- Fit overflow to manage exceedance flows safely.
- Plant native vegetation to enhance biodiversity and aid water quality.
- Install fencing and access paths if required.
- Inspect inlet/outlet structures and liner integrity. Confirm pond capacity and flow control performance.

Headwall installation

- Evaluate existing waterbody/ditch location and direction of flow, soil conditions, and environmental constraints in advance of works.
- Use shoring or trench boxes if required to prevent collapse and protect the ditch. Ensure the base is level and compacted to prevent settlement.
- Place a layer of compacted granular material or lean concrete to form a stable base. Install any required anti-scour measures to protect the ditch banks.
- Position the headwall to required depth and dimensions, ensuring a level base and to provide alignment with the existing ditch to guide interrupted water flow.
- Backfill around the headwall with suitable material, compacted in layers.
- Restore the ditch profile and surrounding area.
- Access ground conditions to determine measures for the underground structures including oil / fuel interceptor, fire water storage tank, foul water holding tank to withstand earth pressure, hydrostatic pressure, and uplift forces.

Underground structures including oil / fuel interceptor, fire water storage tank, foul water holding tank

- Excavate to the required depth, allowing for base slab thickness and working space. Ensure safe excavation practices, including shoring or benching as required. Dewater the excavation if groundwater is present. Install anti-floatation measures in high groundwater areas. Install

formwork and reinforcement of the underground tank as per structural design. Install inlet/outlet pipework, access covers, and ventilation systems. Fit internal components such as baffles or pump chambers if specified. Perform water tightness testing to confirm integrity. Inspect structural elements, pipe connections, and access fittings. Backfill around the tank with suitable material in compacted layers. Restore surface finishes and ensure proper drainage away from the tank.

Firefighting water supply tanks

- Conduct a site survey to confirm location, access, and ground stability. Clear vegetation and debris, and level the area.
- Construct a reinforced concrete or compacted gravel base, ensuring it is level and sized to support the tank footprint.
- Install foundation, anchor bolts or base plates as per tank design. Assemble the tank according to manufacturer specifications. Install inlet, outlet, overflow, and drain connections as per design.
- Fit access ladders, inspection hatches and safety railings if required.
- Conduct hydrostatic testing to confirm structural integrity.
- Inspect all fittings and connections for proper function.

Water supply system

- Conduct hydrogeological surveys to support selection of appropriate bored well location. The well to be installed with third party contractor. Use submersible or jet pumps to be installed depending on the well depth and yield. Conduct test pumping to evaluate performance.

Watermain pipe

- Excavate pipe trenches to the specified depth, ensuring a minimum cover. Ensure trench base is flat and follows the designed slope.
- Fill the trench with bedding material below, around and above the pipe. Pipes shall be laid at specified design grade using approved methods.
- Ensure proper joint assembly. Install thrust blocks or mechanical joint restraints at bends, joints and valves. Install service connections, scour and air release valves as per design.
- Backfill trenches in layers using suitable materials.

Pump house

- Excavate for foundations, sump pits, and pipelines as per design drawings.
- Construct the foundation using reinforced concrete, ensuring proper waterproofing. Build the superstructure with associated utilities.
- Install pumps, base frames, and connect raising mains and discharge pipelines as per design specifications.
- Complete electrical works including control panels, cable laying, earthing, and safety systems.
- Conduct thorough testing and commissioning of mechanical and electrical systems.

To further reduce environmental impact:

- Weather conditions are to be considered when planning construction activities to minimise risk of run off from site.
- The contractor will carry out visual examinations of local watercourses during the construction phase. In the unlikely event of water quality concerns, the Environmental Manager will be consulted.
- Materials storage and storage tanks etc, shall not be located near any surface water features and will be located beyond the 50m exclusion zone.

- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off site. Use spill kits and follow pollution prevention protocols.
- Concrete or concrete contaminated water run-off will not be allowed to enter any watercourses, drainage channels and other surface water features.
- Welfare facilities will be provided within the designated construction compound for duration of works. All generated effluent will be contained in a sealed holding tank, which will be emptied and disposed of off-site by a licenced contractor. Water will be supplied to the site via tanker as required. No impacts on existing site conditions are anticipated.
- Temporary works will be designed to avoid increasing flood risk from overland flow by limiting excavation lengths and providing suitable drainage provision.
- Silt control measures, including silt traps and fences, will be implemented to prevent construction site-generated sediment from entering surface drainage and nearby waterbodies.

5.7.2.3 BESS electrical works

Following the placement of the BESS units on their foundations, electrical installation begins. Internally, battery strings are connected and routed to the PCS, which converts DC power from the batteries to AC for grid export. AC cabling is then installed to connect PCS units to medium-voltage transformers and onward to the MV switchgears in the substation throughout the MV circuits. Control and communication cabling is laid to integrate the BMS, PCS, and SCADA systems. Auxiliary systems such as lighting, security, and emergency shutdown circuits are wired and tested. All electrical works are carried out in accordance with local electrical codes and standards.

5.7.2.4 BESS Commissioning

Prior to shipment and installation, Factory Acceptance Tests (FAT) are conducted at manufacturer's facility, verifying that the system meets all technical specifications, safety standards, and performance requirements outlined during the design phase. FAT typically includes visual inspections, functional tests of components like battery modules, power conversion systems (PCS), and battery management systems (BMS), as well as validation of thermal management and fire safety systems. Once equipment is fully installed on site the commissioning phase begins with pre-functional checks, including visual inspections, insulation resistance testing, and validation of protection settings. Once systems are energized, functional testing is conducted on the BMS, PCS, HVAC, fire suppression, and SCADA interfaces. Site Acceptance Tests (SAT) include verifying system performance under various operating conditions such as charge/discharge cycles, grid response tests (e.g., frequency regulation, reactive power support), and fault simulations. Communication protocols are tested to ensure reliable data exchange between site equipment and remote monitoring centres. Final SAT documentation is compiled, including test reports, calibration certificates, and compliance records. Upon successful completion, the system is handed over to operations.

5.7.3 Substation Compound

General construction phase activities associated with the substation are set out below.

5.7.3.1 Civil works

- Demarcation of construction works areas, clearance, and site levelling to prepare the works area. As the substation is to be located on an area set aside within the Shelburne Energy Farm project area, the site levelling works will be completed as part of the site groundworks.

- Topsoil will be stripped using excavators. The topsoil will be stockpiled within the demarcated boundary. The grounds will be built up to a finished ground level of 37.3 to 39.4 metres above ordnance datum.
- Stone for compound surfacing will be graded into place using excavator.

The main civil works for constructing the new GIS building will include:

- Foundations works
- Structural steelwork erection
- Cladding and building finishing works
- Permanent water supply and drainage works
- Miscellaneous civil works: paving, landscaping, permanent fencing and completion of works.

5.7.3.2 Foundation Works

Foundation construction will commence after the completion of Shelburne Energy Farm site clearance and grading. The foundation installation will involve excavation, form work, steel reinforcement, and concrete placement. Foundations will be designed in accordance with the appropriate and relevant EirGrid Technical Specifications. Excavated material will either be reused on-site or disposed of off-site in accordance with applicable requirements under the Waste Management Act 1996, as amended and associated regulations.

When the foundations have been set, the copper earth mat will be installed into the soil in and around the foundation and will cover the entire substation compound. The earth mat installation and permitted operating limits will be designed in accordance with the appropriate and relevant EirGrid Technical Specifications.

5.7.3.3 Structural Steelwork Erection

Following the installation of the foundation and earth mat, construction activities will shift to the erection of structural steelwork. The GIS Building will be a steel portal two storey building over partial basement constructed in accordance with EirGrid technical specification. The ground floor level will include service rooms, loading bay, generator room, relay room, battery room and access to the cable basement area. The first-floor area of the building will be constructed to accommodate the 220kV switchgear assembly and a storeroom.

5.7.3.4 Cladding and Building Finishing Works

Cladding and building finishing works and the installation of building services, e.g. drainage, internal circulation road, will be undertaken once the structural frame and steel support structures are completed.

A fire detection and alarm system will be specified during the detail design of the substation in compliance with EirGrid requirements. A Fire Safety certificate application to Wexford County Council will be made in advance of construction in accordance with the standard approach for the construction of substations.

5.7.3.5 Miscellaneous Civil Works: Permanent Fencing and Completion of Works

Fencing around the entire substation compound, except for the site entrances, will comprise a 2.6m high palisade security fencing. The installation of this fencing will comprise root mounted posts (posts driven into ground). There will be negligible ground borne vibration due to relatively small diameter of these posts. This would negate the requirement for pad footings below each post.

Electrical Installation of GIS plant will be delivered to the substation compound and unloaded within the GIS building loading bay. The gantry crane located within the hoisting area will lift the GIS plant to the first storey of the building and position it appropriately within the GIS Equipment Room. The plant will then be bolted together in place. Following the installation of plant within the GIS building, wiring and cabling of GIS plant and associated protection and control cabinets will be undertaken to the specifications and standards set out by the manufacturer.

5.7.3.6 Drainage

The construction methodology will include the following materials and steps:

- Ensure safe excavation practices, including shoring or benching as required. Where dewatering is required, water will be treated and appropriately attenuated, before being discharged to vegetation or surface water drainage feature
- Conduct geotechnical surveys to assess soil type, soil permeability, bearing capacity, groundwater levels and contamination risk through site investigation.
- Surface water carrier pipes. Excavate pipe trenches to the specified depth, ensuring a minimum cover. Ensure trench base is flat and follows the designed slope. Fill the trench with bedding material below, around and above the pipe. Pipes shall be laid at specified design grade using approved methods. Ensure proper joint assembly. Backfill trenches in layers using suitable materials.
- Install inspection chambers at appropriate intervals for maintenance access. Regular inspection and maintenance is essential to prevent clogging and ensure long-term performance.
- Access ground conditions to determine the feasibility of implementing an infiltration system
- French drains. Excavate the trenches to the specified depth, ensure trench base is flat and follows the designed slope. Use a geotextile membrane to separate the trench from surrounding soil and prevent migration of fines. For non-infiltrating designs, use an impermeable liner to contain flow and direct it to downstream SuDS components. Install a perforated carrier pipe at the base of the filter drain trench. Backfill the trench/ French drain with clean, angular stone (Clause 505 Type B coarse and light weight aggregate to Table 5/5 MCDRW Series 500). Fill to within 150 mm of the surface. Top with crushed stone or gravel to match levels of adjacent surfacing.
- Access ground conditions to determine measures for the underground structures including oil / fuel interceptor, foul water holding tank to withstand earth pressure, hydrostatic pressure, and uplift forces. Excavate to the required depth, allowing for base slab thickness and working space. Ensure safe excavation practices, including shoring or benching as required. Dewater the excavation if groundwater is present. Install anti-floatation measures in high groundwater areas. Install formwork and reinforcement of the underground tank as per structural design. Install inlet/outlet pipework, access covers, and ventilation systems. Fit internal components such as baffles or pump chambers if specified. Perform water tightness testing to confirm integrity. Inspect structural elements, pipe connections, and access fittings. Backfill around the tank with suitable material in compacted layers. Restore surface finishes and ensure proper drainage away from the tank.
- Watermain pipe. Excavate pipe trenches to the specified depth, ensuring a minimum cover. Ensure trench base is flat and follows the designed slope. Fill the trench with bedding material below, around and above the pipe. Pipes shall be laid at specified design grade using approved methods. Ensure proper joint assembly. Install thrust blocks or mechanical joint restraints at bends, joints and valves. Install service connections, scour and air release valves as per design. Backfill trenches in layers using suitable materials.

To further reduce environmental impact:

- Weather conditions are to be considered when planning construction activities to minimise risk of run off from site.
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off site. Use spill kits and follow pollution prevention protocols.
- Concrete or concrete contaminated water run-off will not be allowed to enter any watercourses, drainage channels and other surface water features.
- Welfare facilities will be provided within the designated construction compound for duration of works. All generated effluent will be contained in a sealed holding tank, which will be emptied and disposed of off-site by a licenced contractor. Water will be supplied to the site via tanker as required. No impacts on existing site conditions are anticipated.

5.7.4 220kV Cable Connection

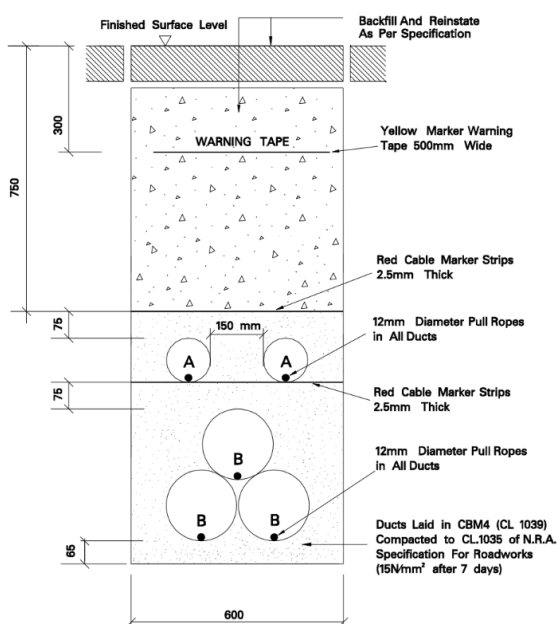
This section describes the proposed construction phase activities associated with the installation of the two proposed underground cables.

Subject to any grant of planning approval of the Grid Connection by An Coimisiún Pleanála there will be a process of pre-construction detailed design and micro-siting of the grid infrastructure. This will occur within the parameters and assessments of the approved development; any micro-siting which extends outside such parameters, for example outside the red line application area, will be subject to post-consent modification in accordance with the provisions of statutory legislation, as required. Throughout the design and assessment process, all reasonable and practically achievable measures have been taken to minimise and avoid impacts.

5.7.4.1 Trenching and Ducting

The standard trench dimensions for a single 220kV cable circuit in trefoil formation installed within an existing road is a width of 0.6m and a minimum depth of 1.45m. These cable trenches are to be installed on sections of the L40232 and L4030 on both sides of the road. Refer to Figure 5.7.

Figure 5.7: Standard Trefoil Arrangement Cross Section



Source: EirGrid PE424-D7001-019-001-000

The standard trench dimensions for a single 220kV cable circuit in trefoil formation installed on agricultural land is a width of 0.7m and a minimum depth of 1.75m, as per EirGrid technical requirement drawings (not publicly available XDC-CBL-STND-F-016). These cable trenches are to be installed on the final section between the L4030 and the LCIM's.

Following excavation of the trench and bedding material, Cement Bound Granular Material (CBGM) will be laid, the ducts put in place, protection strips laid on top and the trench will be backfilled.

The duct installation will progress sequentially starting at one joint bay and moving towards the next joint bay along the route. The construction area will move in tandem with the progress of the duct installation, with only the relevant portion of the section cordoned off while under construction.

If there are excavations required where there are existing utilities, hand digging and the use of smaller excavators may also be required.

For cross-country sections, a temporary working strip of approximately 37m in width is proposed. The working strip is required for the following reasons:

- To facilitate the storage of topsoil which must be removed from:
 - The footprint of the temporary construction access track (typically up to 5m in width).
 - The footprint of the cable trench.
 - A buffer strip between the temporary access track and the trench (for safety).
 - Subsoil storage area.
 - Materials storage areas.
- To facilitate the laying of the temporary construction access track alongside the cable trench to allow for the movement of construction equipment and materials along the section of the route on the farmland.
- To facilitate the excavation of the cable trench and the installation of the cable ducting.
- To facilitate the storage of distinct layers of subsoils excavated from the cable trench in segregated piles for later reinstatement to the original soil profile.

Approximately 30-50 m of trenching and ducting is completed in a day, dependent on conditions and location. Figure 5.6 illustrates a trench within agricultural lands.

5.7.4.2 Cable Installation and Jointing

The cables will be brought to site on cable drums which will then be placed into position. Once the drum is set up, a winch system at the remote joint bay location(s), including pulling cable, will be attached to the nose of the cable and rollers will be used to guide the cable end towards the duct. The cables will then be pulled into the duct with lubrication being applied to the cable and duct throughout the process in order to control pulling tensions.

A bend radius of typically 20m or greater is used to navigate changes in direction for the cable route. The bend radius can be reduced to 6m to navigate very tight corners however as this introduces increased pulling tensions when installing the cable, it is used sparingly and only where required.

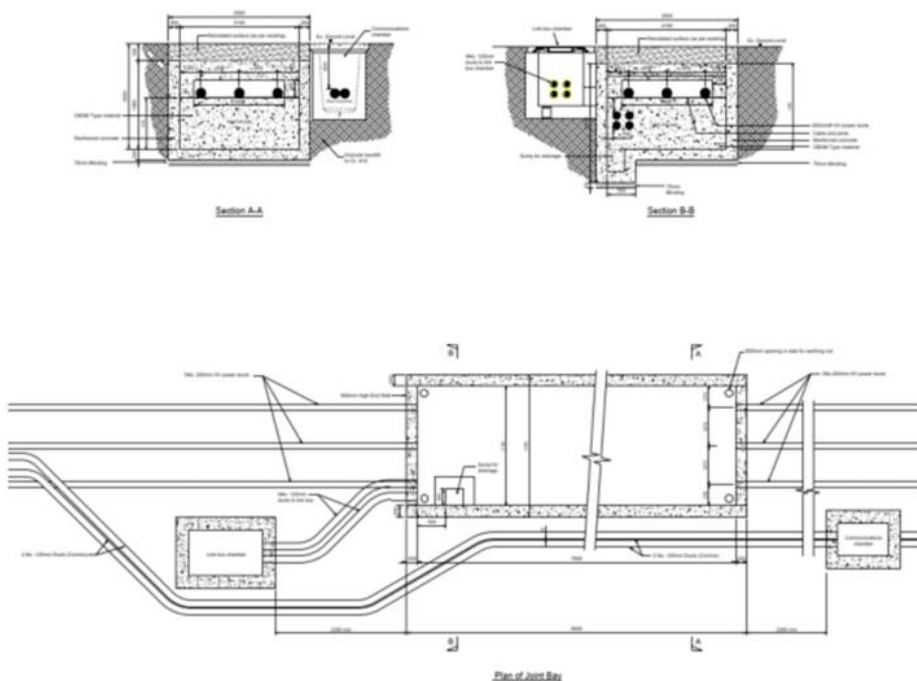
As detailed previously, joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling.

The width of the joint bays and the nature of the road network in the area means that partial road closures and diversions may be required in some areas along the route during cable installation. However, all reasonable and practically achievable measures, such as moving of

equipment and placing temporary covers over the joint bays to allow essential access for vehicles, will be implemented to facilitate local access requirements for emergency services, residential and commercial purposes. Chapter 14 Roads and Traffic details proposed traffic management measures. Specific traffic management requirements and localised arrangements will be developed by the appointed contractor(s) and will be agreed in advance of implementation with the appropriate local authority.

Joint bays generally consist of precast concrete walls and base located below ground with typical approximate dimensions of 8m length x 2.5m width x 2.3m depth for 220kV joint bays. The length of the joint bays may be longer subject to the requirements of the cable manufacturer. Sand or lean mix concrete will be used as required as a blinding layer to the underside of the chamber. The ducts will be installed to each end of the chamber, then proven, cleaned and sealed. Figure 5.8 illustrates an indicative joint bay; Figure 5.9 illustrates a pre-cast joint bay and Figure 5.10 illustrates the cable pulling set up.

Figure 5.8: Indicative Joint Bay

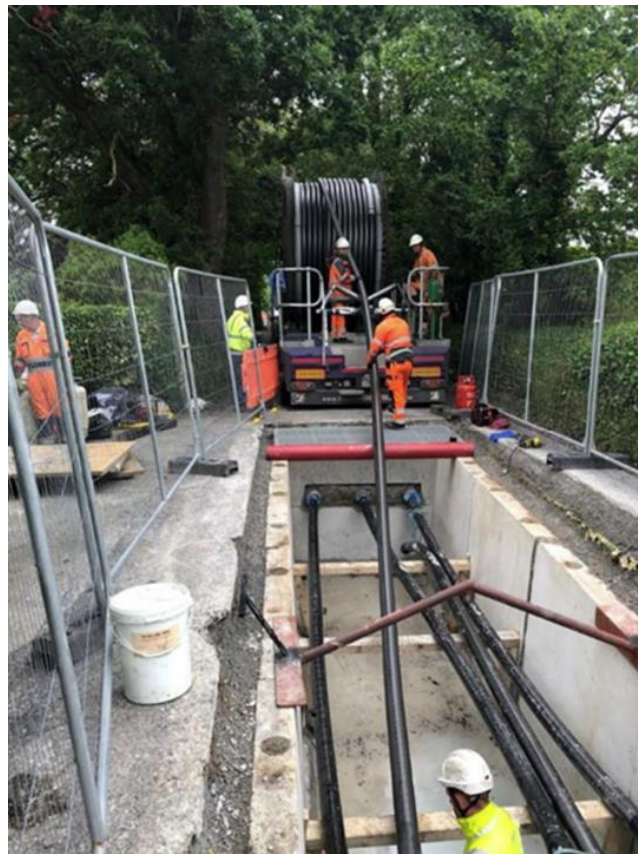


Source: Mott MacDonald

Figure 5.9: Pre-cast Joint Bay prior to Cable Installation



Figure 5.10: Typical Set-Up of HV Cable Pulling Procedure



5.7.4.3 High Voltage transmission crossings

Crossing underneath overhead power lines will require mitigation during the construction phase ensuring that a suitable distance from the cabling is maintained by construction equipment and staff, and staff welfare and safety is maintained.

5.7.4.4 Connection to Great Island - Lodgewood 220kV circuit

The two underground cables will connect to the national transmission network via two separate LCIM connections. An example of an LCIM is shown in Figure 5.11.

Figure 5.11: Line Cable Interface Mast (LCIM)



Both underground cables will be joined to a conductor on a newly constructed LCIM from which they will connect to the Great Island and Lodgewood substations via an existing overhead line.

From the Great Island and Lodgewood substations there will be connection to the wider existing grid network.

The installation of the underground cable is expected to take approximately 14-16 months.

5.7.4.5 Dismantling of existing 220kV tower

A single existing 220kV steel tower carrying the conductor for the Great Island – Lodgewood transmission circuit in the townland of Nash, will be required to be dismantled as part of the Proposed Project. The following details the construction methodology for its removal.

- Set up of temporary working area with fencing installed around the tower location.
- Removal of overhead line conductors – This involves releasing the line tension and winching of conductors onto drums.
- Removal of hardware and insulators – Using Mobile Elevating Work Platforms the fittings and hardware such as spacers, dampers and insulators will be removed from the towers.
- The towers will be dismantled and lowered in sections using a suitably sized crane and removed from site to an approved recycling facility.

- Using an excavator and a rock breaker if required, the tower will be dismantled to shear block level, the concrete base will be left in-situ.
- Material from the dismantled overhead line infrastructure will be removed from the site for recycling to a licensed recycling facility.

5.7.5 Construction Schedule

Construction of the Proposed Project is expected to take ca. 21-23 months, and is anticipated to commence in 2027, subject to grant of planning permission. An indicative schedule for each element is set out in Table 5.2.

Table 5.2: Project Construction Schedule

Construction Activity	Approximate Duration (weeks or months as appropriate)
GIS Substation Compound	
Site Preparation	3-4 months
Civil Works	5 months
Electrical works	4-5 months
Energisation	2 months
Total	14-16 months
220kV Cable Connection	
Pre-construction	2 months
Civil Works	5-6 months
Electrical works	5-6 months
Commissioning	1 month
Joint Bay re-instatement	1 month
Total	14-16 months
Solar PV farm	
Civil works	6 months
Mechanical works	6 months
Electrical works	6 months
Commissioning	3 months
Total	12-18 months
BESS	
Site Clearance and enabling works	2-3 months
Civil works	3-4 months
Electrical Installation	3 months
BESS container installation	2 months
Commissioning and testing	2 months
Total	12-14 months
Overall Construction Phase Timeframe	21-23 months

Table 5.3: Construction Timeline

Construction Programme	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Substation compound								
220kV Cable connection								
Solar farm								
BESS								

5.7.6 Construction Personnel

The total number of construction staff on-site will vary during the construction phase of the works but are expected to reach a peak of 213 persons. It has been assumed that construction personnel will travel to site using private passenger vehicles (in some cases accommodating more than one occupant).

5.7.7 Hours of Work

Construction activities will be undertaken during 07:00 – 19:00 Monday to Friday and 08:00 – 14:00 on Saturday, subject to agreement with Wexford County Council and An Coimisiún Pleanála respectively.

No construction works will take place outside these hours, unless such work:

- is required under exceptional circumstances; or
- is carried out with the prior written approval of the planning authority.

5.7.8 Construction Access

All construction traffic will arrive via the regional roads R735 and R754 and the local tertiary roads to the north (L4030 and L40232), east, (L4030) and south (L-8141-1 and L-8141-2).

The main construction access for the Proposed Project to the main temporary construction compound is via site access number 3 providing access to Array Area A via the L40232. Construction site access will not be undertaken to the east of site access no.3 to ensure that construction traffic does not utilise the L-80591-1. In order to access field 9 located in the north eastern corner of the Project site a temporary construction access will be provided in parcel 8 to provide direct access to site.

The local tertiary road network will then be used to access Array Area B and C.

5.7.9 Construction Traffic

It is conservatively assumed that the average vehicle occupancy for construction personnel travelling to/from the study area (i.e. to/from a home location) will be 1.25 persons. A vehicle occupancy rate of 1.25 is assumed and in the robust-case scenario this would equate to a peak daily number of 171 vehicles (342 two-way movements per day) for the construction phase.

It is anticipated that the peak daily number of HGVs required to facilitate construction activity will be 76 (two-way movements, as a worst-case scenario).

It is understood that there will be a requirement for the movement of abnormal loads (for the proposed GIS/AIS substation equipment) during the construction phase of Proposed Project. The assessment of abnormal loads is presented in Chapter 14 Roads, Traffic and Transportation.

5.7.10 Temporary Construction Compounds/Laydown Areas

A temporary construction compound is proposed in each Array Area – A, B and C. The main temporary construction compound and laydown area will be located in Array Area A, and will include the construction staff parking area. This temporary construction compound will be utilised during all stages of the construction programme for the Proposed Project.

The location of the temporary compound/laydown areas is indicated on the site layout drawings contained in Appendix 5.1, Volume 3 of this EIAR.

The appointed contractor(s) will be responsible for organising site compounds in consultation with the Environmental Manager or Environmental Clerk of Works (EnCoW).

In areas where the potential temporary construction compounds are not currently hardstanding, the ground will be stripped and levelled and replaced with hardstanding. The ground will be reinstated to its original condition following the proposed works.

The Contractor's Environmental Manager will be responsible for the management of the site compounds in accordance with the CEMP. The contractor's compounds will be used for storage of construction materials, as well as construction equipment and machinery.

The contractor will ensure that the proposed compound is secured, either with existing hedgerows/treelines, or new palisade fencing.

5.7.11 Construction Environmental Management Plan (CEMP)

A CEMP has been prepared and submitted as part of this planning application. The CEMP will be implemented during the construction phase in consultation with Wexford County Council. The CEMP will remain a 'live' document which will be reviewed regularly and revised as necessary in consultation and agreement with the local authority to ensure that the measures implemented are effective.

The CEMP will be a key contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment are implemented. The primary objective of the CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a project framework to ensure that key mitigation measures and conditions set out as part of the planning consent process are translated into measurable actions and are appropriately implemented during the construction phase of the Proposed Project. As part of this framework, transparent and effective monitoring of the receiving environment during construction will be used to inform and manage on-going activities on site and to demonstrate effectiveness of the measures outlined therein.

5.7.11.1 Resource and Waste Management Plan (RWMP)

Prior to commencement of the development, the appointed Contractor will implement the construction phase Resource and Waste Management Plan (RWMP) (included as Appendix A to the CEMP) which will ensure that optimum levels of waste prevention, reduction, reuse, recycling, and recovery are achieved throughout the duration of the Proposed Project. As with

the CEMP, the RWMP will remain a 'live' document and will be reviewed regularly and revised as necessary in consultation and agreement with Wexford County Council to ensure that the measures implemented are effective.

The plan has been prepared in accordance with waste management guidance and principles as outlined in *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects* (EPA, 2021) and *Design Out Waste: A design team guide to waste reduction in construction and demolition projects* (EPA, 2015). All operations at the site will be managed and programmed in such a manner as to prevent/minimise waste production and maximise upper tier waste management (i.e. reuse, recycle, and recovery) in line with the Waste Hierarchy where technically and economically feasible.

The requirement to develop, maintain and operate the construction phase RWMP will form part of the contract documents for the Proposed Project and will be updated by the appointed Contractor in advance of the commencement of construction activities on site. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the Proposed Project site to an authorised site of recovery/disposal in a manner which will not adversely affect the environment. All employees will be required to comply with the obligations under this RWMP.

5.7.11.2 Traffic Management Plan (TMP)

The appointed Contractor will implement and develop the Traffic Management Plan (TMP) during construction phase, in ongoing consultation with Wexford County Council. A TMP is included as Appendix B to the Construction Environmental Management Plan (CEMP) submitted as part of the planning application. The TMP will remain a 'live' document and will be reviewed regularly and revised as necessary in consultation and agreement with Wexford County Council to ensure that the measures implemented are effective.

The implementation of the TMP will mitigate potential construction traffic impacts on the public road network. All construction activities, including construction traffic, will be managed through the CEMP.

5.7.12 Environmental Supervision and Monitoring

An Environmental Manager will be employed by the Contractor to oversee implementation of mitigation. The Environmental Manager will be a suitably qualified, competent and experienced professional to perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. For further detail on the role and responsibilities of the Environmental Manager, refer to the CEMP (submitted as part of this planning application).

An Ecological Clerk of Works (ECoW) will be employed by the Contractor to oversee implementation of mitigation measures. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) and have demonstrable experience in ecological supervision.

The Contractor's ECoW will also ensure any disturbance licenses, if required are arranged based on relevant details outlined in the EIAR. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular

liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised. For further detail on the role and responsibilities of the ECoW, refer to the CEMP.

All monitoring reports will be provided to the Employer's Representative team, and to the local authorities or other parties where required by condition.

An independent ECoW will be employed on behalf of the Employer's Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

An Environmental Clerk of Works (EnCoW) will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The Contractor's Environmental Clerk of Works (EnCoW) will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The EnCoW will be delegated sufficient powers under the construction contract so that she / he will be permitted to instruct the Contractor to stop works and apply emergency response mitigation should an environmental incident occur.

The EnCoW will also manage consultation with environmental bodies including the NPWS and IFI. The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

An independent EnCoW will be retained on behalf of the Employers Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's EnCoW. The independent EnCoW will have the necessary experience and knowledge appropriate to the role and will be a member of a relevant professional body, such as the Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as IEMA).

In addition to the above, the CEMP includes an Emergency Incident Response Plan. In the unlikely event of an incident, the Emergency Incident Response Plan will ensure that any incident is dealt with effectively, and that the response is timely and appropriate. This plan will be further developed by the appointed Contractor, in line with the mitigation measures detailed in the CEMP, to describe the procedures, lines of authority and processes that will be followed to ensure that all incident response efforts are prompt, efficient and appropriate to the particular incident. Inland Fisheries Ireland and the EPA will be notified in the event of an incident or accident.

5.8 Operation and Maintenance

5.8.1 Solar Farm

During operations, the proposed solar farm will be monitored and operated remotely by a management team and will be visited regularly by security and/or maintenance personnel.

Maintenance activities associated with the solar farm will comprise the following:

- Supplementary grass cutting (only in identified areas where sheep grazing has not ensured that vegetation growth has been maintained)
- Preventative inspections and maintenance inspections (i.e identification of damage, where identified further visits will be undertaken, cleaning of panels as when required)
- Electricity meter readings
- Maintenance of drains, attenuation pond and security fencing

- Maintenance of access tracks, including grading, weed control, and surface repairs to maintain safe vehicle access
- Maintenance of hedgerows (where there is an obstruction of solar panels)

There is no waste generation or wastewater (foul) generation during the operational phase, as such there is no waste/wastewater collection required for the solar farm.

This will typically result on average of two visits every six months.

5.8.2 Battery Energy Storage System

During operations, maintenance of BESS follows a similar approach, but oriented to the particularities of BESS equipment, comprising mainly the following activities;

- Preventative inspections and maintenance checks (e.g. visual inspection of battery containers, PCS units, HVAC systems, and fire suppression equipment; follow-up visits for cleaning filters or replacing worn components as needed). Particularly, regular checks for corrosion, structural damage, door seals, and ventilation grilles to ensure weatherproofing and thermal performance.
- Energy meter readings and system performance logging (including verification of state-of-charge, round-trip efficiency, capacity and degradation, and inverter output)
- Clearing of vegetation or debris near air intakes, exhausts, and cooling units (to maintain thermal performance and prevent overheating risks)
- Grounding and earthing system verification: Periodic testing of grounding connections for all containers to maintain electrical safety and reduce fault risks.
- Maintenance of drains, attenuation pond and security fencing
- Maintenance of access tracks, including grading, weed control, and surface repairs to maintain safe vehicle access

5.8.3 Grid Connection

The GIS substation compound is expected to be operated remotely by EirGrid and maintained by ESB. Welfare facilities will be provided in the GIS substation for ESB personnel attending the site. Monthly attendance by a team of ESB technicians is anticipated. The GIS substation will require the maintenance of the foul holding tank.

The AIS substation compound will also be operated remotely and will require infrequent visits, which will be conducted on average once every six months.

There is no required maintenance activities related to the 220kV cable connection.

5.9 Decommissioning

5.9.1 Solar Farm

The decommissioning of the solar array areas involves ceasing all electrical output. All electrical works will be disconnected before the removal of any site equipment.

The site decommissioning and restoration plan will be executed in line with the environmental conditions of the Planning Permission.

Given the nature of the solar farm development and the small amount of infrastructure required, it is considered highly unlikely that any adverse effects would occur as a result of decommissioning works.

Following the decommissioning of the site the agricultural land will be restored to its original state. Should the access tracks be removed, the affected areas will be regraded, covered with topsoil, and seeded with an appropriate grass mixture.

5.9.2 Battery Energy Storage System

The decommissioning of the BESS site involves the safe cessation of all electrical output and the isolation of both AC and DC systems. All electrical works, including disconnection of grid interfaces, battery modules, and power conversion systems, will be completed prior to the removal of any equipment. A comprehensive lockout-tagout (LOTO) procedure will be followed to ensure safety during dismantling.

The site decommissioning and restoration plan will be carried out in accordance with the environmental conditions set out in the Planning Permission and relevant regulations in place at the time. Given the modular and containerised nature of BESS infrastructure, and the controlled handling of hazardous components such as lithium-ion batteries and fire suppression systems, no environmental impacts are expected to result from decommissioning activities.

Following the removal of all containers, cabling, and ancillary infrastructure, the site will be restored to its original condition. Where access tracks are removed, the affected areas will be regraded, covered with topsoil, and seeded with an appropriate grass mixture.

All battery modules will be transported to licensed recycling or treatment facilities, with documentation retained to demonstrate compliance with end-of-life obligations.

5.9.3 Grid Connection

The design life of the GIS substation is approximately 40 years. It is expected that the substation site will remain a permanent part of the national electricity transmission network and will be refurbished and / or redeveloped as required rather than be decommissioned.

The AIS substation is expected to have a design life of 40 years. Where decommissioning takes place, all above-ground components associated with the substation will be disassembled and removed from the site and effects are likely to be similar or of a lesser magnitude than the construction effects.

5.10 Health and Safety Considerations

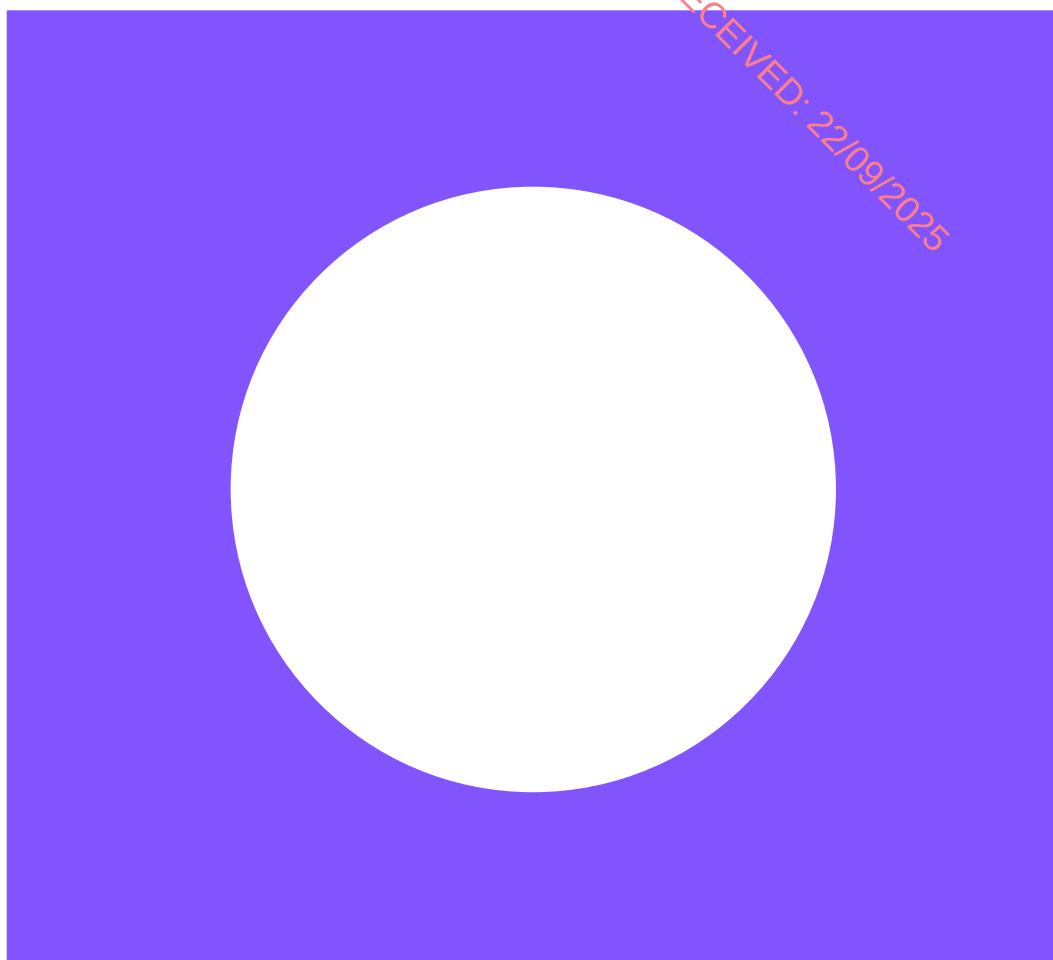
5.10.1 Project Supervisor for Design Phase

A Project Supervisor for the Design Phase (PSDP) will be appointed. The PSDP ensures co-ordination of the work of designers throughout the Proposed Project. This is to ensure effectiveness in addressing and co-ordinating safety and health matters from the very early stages of the Proposed Project.

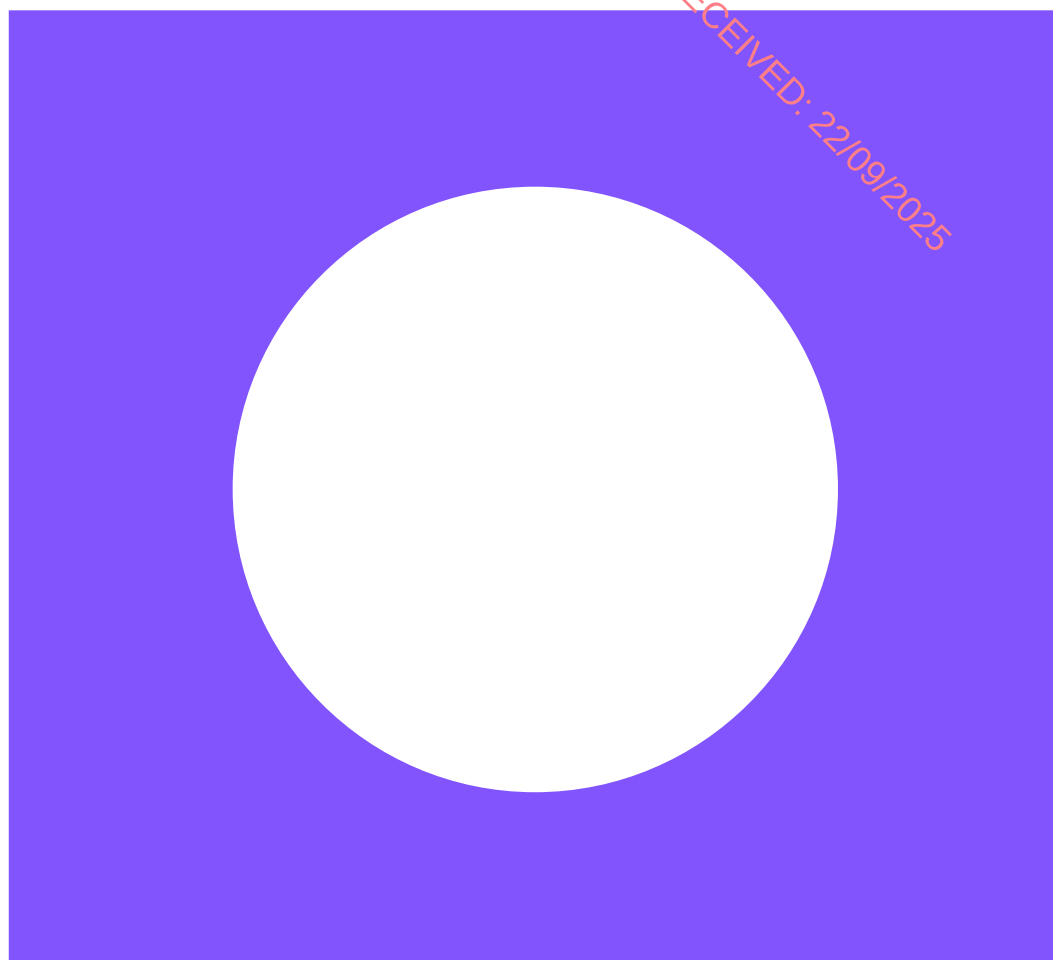
5.10.2 Project Supervisor for the Construction Stage

A Project Supervisor for the Construction Stage (PSCS) will be appointed. The PSCS will be responsible for developing the construction stage Safety and Health Plan, co-ordinating the work of Contractors and providing PSDP with information required in the Safety File.

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 6 Population and Human Health

September 2025

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6 Population and Human Health

6.1 Introduction

This chapter considers the likely significant effects of the Proposed Project on population and human health. This includes consideration of the potential for both adverse and beneficial effects, during construction and operation, with regards to residential properties, community resources, local businesses, employment, tourism, and human health. The assessment is based on the Proposed Project as described in Chapter 5 of this EIAR.

The Environmental Protection Agency (EPA) Guidelines 2022 state that:

‘...in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc’

The analysis of human health consequently considers those impacts associated with relevant environmental disciplines which have been comprehensively addressed elsewhere in this report including:

- Land, Soils and Hydrogeology (Chapter 8)
- Surface Water Resources and Flooding (Chapter 9)
- Air Quality (Chapter 10)
- Noise and Vibration (Chapter 11)
- The Landscape (Chapter 12)
- Architecture, Archaeology and Cultural Heritage (Chapter 13)
- Roads, Traffic and Transportation (Chapter 14)
- Material Assets and Waste Management (Chapter 15)
- Climate (Chapter 16)
- Major Accidents and/or Disasters (Chapter 17)

Mitigation and monitoring measures, residual impacts and cumulative impacts are also discussed where appropriate.

6.2 Policy and guidance

Policies and guidance documents of potential relevance to the population and human health topic are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

6.2.1 Legislation

Under the EU's Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by 2014/52/EU), development projects in the EU must be assessed for their impact on the environment. The Directive states that EIA must assess the direct and indirect significant impact of a project based on a range of environmental factors, including population and human health.

6.2.2 Policies

The following national, regional, and local equality, planning policy and strategy documents have a bearing on this assessment.

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6.2.2.1 National policies

Project Ireland 2040

Project Ireland 2040 comprises two key documents: the First Revision to the National Planning Framework¹ (NPF) and the National Development Plan² (NDP). The NPF sets out the Government's economic, environmental, and social planning policies for Ireland. It provides a framework detailing how key national priorities will be addressed through the planning system, including sustaining and developing vibrant, climate resilient communities. The NDP sets out the Government's investment strategy to achieve Project Ireland 2040's objectives.

Section 1.3 of the NPF sets out Ireland's National Strategic Outcomes (NSOs). NSOs relevant to the Proposed Project and the population and human health assessment include:

- NSO 3: Strengthened Rural Economies and Communities
- NSO 6: A Strong Economy supported by Enterprise, Innovation and Skills
- NSO 8: Transition to a Carbon Neutral and Climate Resilient Society
- NSO 9: Sustainable Management of Environmental Resources

Section 3.4 of the NPF sets out core planning and place-making principles for the Southern Region, including integrating the planning, management, and development of rural and local communities for regional benefit, as well as harnessing the potential of the region in renewable energy terms across the technological spectrum.

Rural Ireland contributes significantly to the country's energy needs, however there is a need to plan for the transition to low carbon economy. Section 9 of the NPF highlights Ireland's environmental and sustainability goals, which includes resource efficiency and transition to a low carbon energy future. In this section, it is noted that renewable energy projects have often been delivered in rural areas, and that this can include co-location with agricultural activities.

Policies relevant to the Proposed Project and the population and human health assessment include:

- National Policy Objective 30: "Facilitate the development of the rural economy, in a manner consistent with the national climate objective, through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting biodiversity and the natural landscape and built heritage which are vital to rural tourism".
- National Policy Objective 36: "Support the objectives of public health policy including the Healthy Ireland Framework and the National Physical Activity Plan, though integrating such policies, where appropriate and at the applicable scale, with planning policy".
- National Policy Objective 66: "The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the medium and longer-term requirements of all relevant environmental and climate legislation and the sustainable management of our natural capital".

¹ Government of Ireland (2019): 'Project Ireland 2040 - National Planning Framework'. Available at: [National Planning Framework First Revision – April 2025 - The National Planning Framework](#)

² Government of Ireland (2021): 'Project Ireland 2040 – National Development Plan 2021-2030'. Available at: [gov.ie - Government launches the renewed National Development Plan 2021-2030 \(www.gov.ie\)](#)

Our Rural Future, Rural Development Policy 2021-2025³

Our Rural Future provides a framework for the development of rural Ireland over the 2021-2025 period. The Government's vision is for a thriving rural Ireland, and Our Rural Future aims to 'enhance the wellbeing and quality of life of people living in rural areas and build resilient and sustainable rural communities and economies through integrated investment, support and services'. Key deliverables noted in the document include to: 'support health and wellbeing of rural communities' and 'supporting a Just Transition to a climate neutral economy'.

Healthy Ireland, A Framework for Improved Health and Wellbeing 2019-2025⁴

Healthy Ireland is a broad framework of actions being undertaken by government departments, public sector organisations, businesses and communities to improve health and wellbeing and reduce the risks posed to future generations. The vision for Healthy Ireland is 'a healthy Ireland, where everyone can enjoy physical and mental health to their full potential, where wellbeing is valued and supported at every level of society and is everyone's responsibility'.

Healthy Ireland's central goals are to:

- increase the proportion of people who are healthy at all stages of life;
- reduce health inequalities;
- protect the public from threats to health and wellbeing; and
- create an environment where every individual and sector can play their part in achieving a healthy Ireland.

Tourism Development & Innovation: A Strategy for Investment 2016-2022⁵

This strategy outlines a national investment framework to enhance Ireland's tourism sector, aiming to:

- Deliver world-class visitor experiences
- Support sustainable tourism growth
- Increase employment and economic contribution
- Strengthen Ireland's international tourism appeal

The strategy emphasises innovation, community involvement, and sustainability, using the VICE model (Visitors, Industry, Community, Environment). Health and wellbeing of rural communities are core themes in this strategy, with a vision to foster environments that encourage physical activity, social connection, and economic vitality.

Investments in outdoor infrastructure such as walking trails and access to natural landscapes, the strategy promotes active lifestyles and mental wellness. These developments should not only attract tourists but also provide local residents with improved recreational spaces, contributing to healthier daily routines and stronger connections to nature.

³ Government of Ireland (2021): Our Rural Future: Rural Development Policy 2021-2025'. Available at: gov.ie - [Our Rural Future: Rural Development Policy 2021-2025 \(www.gov.ie\)](http://www.gov.ie)

⁴ Government of Ireland (2019): Healthy Ireland Framework 2019-2026. Available at: gov.ie - [Healthy Ireland Framework 2019-2025 \(www.gov.ie\)](http://www.gov.ie)

⁵ Government of Ireland (2016): Tourism Development & Innovation. Available at: [Fáilte Ireland - Tourism Development & Innovation - A Strategy for Investment 2016-2022](http://faileireland.ie)

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6.2.2.2 Regional policies

Regional Spatial and Economic Strategy (RSES) 2020-2032⁶

The RSES sets out a strategic development framework to address challenges and opportunities facing the Southern Regional Assembly (SRA) area over the 2020 to 2032 period. It provides a high-level development framework for the region that supports the implementation of the NPF and other Government economic policies and aspirations.

Well-being and improving quality of life are core themes in the RSES. This is set to be delivered through transformative change, ensuring sustainable, planned and infrastructure-led development is adopted. (Regional Policy Objective (RPO) 175).

6.2.2.3 Local policy

Wexford County Development Plan 2022-2028⁷

The Wexford County Development Plan sets out a comprehensive vision for the county's growth, focusing on sustainable development, climate action, economic resilience, and community wellbeing. Its primary aim is to guide land use and infrastructure planning in a way that supports balanced regional development, protects the environment, and enhances quality of life for all residents. The plan integrates strategies across housing, transportation, tourism, green infrastructure, and social services to ensure that development is inclusive, future-proofed, and environmentally responsible.

The County Development Plan places strong emphasis on sustainable infrastructure, such as active travel networks, green spaces, recreational amenities, and accessible public transport. These elements are designed to encourage physical activity, reduce car dependency, and improve air quality. The plan also supports the development of sustainable communities by promoting compact growth, mixed-use development, and access to healthcare, education, and social services. By embedding health-promoting principles into the fabric of planning and infrastructure, the strategy aims to create healthier, more connected, and more resilient communities across Wexford.

6.2.3 Guidance

- European Commission – Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report⁸ (EU guidance)
- EPA – Guidelines on the information to be contained in Environmental Impact Assessment Reports⁹ (Irish guidance)
- Institute of Public Health in Ireland (IPH) – Health Impact Assessment Guidance: Manual and Technical Guidance¹⁰

⁶ Government of Ireland (2021): Southern Regional Assembly. Available at: [Southern Regional Assembly \(southernassembly.ie\)](https://southernassembly.ie)

⁷ Wexford County Council (2022): Development Plan 2022-2028. Available at: [Wexford County Development Plan 2022-2028 | Wexford County Council](#)

⁸ European Commission (2017): 'Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report'. Available at: [Circabc \(europa.eu\)](https://circabc.europa.eu)

⁹ Environmental Protection Agency (2022): 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'. Available at: [Guidelines on the information to be contained in Environmental Impact Assessment Reports \(EIAR\) \(epa.ie\)](#)

¹⁰ Institute of Public Health in Ireland (2021): Health Impact Assessment Guidance: Manual and Technical Guidance. Available at: [Health Impact Assessment | Institute of Public Health](#)

- Government of Ireland – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment¹¹ (Irish guidance)
- Institution of Environmental Management and Assessment (IEMA) – Health in Environmental Impact Assessment: A primer for a proportionate approach¹²
- IEMA – Determining Significance for Human Health in Environmental Impact Assessment¹³

It should be noted that, with the exception of EPA guidelines, standards set out in other guidance / methodologies have been used to guide the assessment, rather than being used as standards to follow.

6.3 Methodology

6.3.1 Approach to data collection

The following information and data sources (Table 6.1) have been considered during the production of this EIAR.

Table 6.1: Data sources

Data Source	Date	Data Contents
Central Statistics Office (CSO) www.cso.ie	Census 2022	Demographics Settlements Labour Force Survey
Geodirectory Data	Various	Settlements Land use
Ordnance Survey Ireland (OSI) Mapping and aerial photography (www.osi.ie)	Various	Settlements Land use
Corine land cover data (www.epa.ie)	2018	Land use
Open Street Mapping (www.openstreetmap.org)	Various	Land use
Google Street Mapping	Various	Land use

6.3.2 Approach to impact assessment

There are no published standards or technical guidelines in Ireland that set out preferred methodology for assessing the likely population and human health effects of a development. However, there are a series of commonly used, best-practice methodologies for assigning the significance of population and human health effects during the construction and operation of a development. This section describes the approached used to conduct this assessment.

The assessment methodology proceeds by determining the sensitivity of receptors that have the potential to be affected by the construction or operation of the Proposed Project. The magnitude of impacts experienced by those receptors is then determined. A combination of the sensitivity of receptor and the magnitude of impact in relation to the receptor has been used to assess the significance of potential effects.

¹¹ Government of Ireland (2018): 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment'. Available at: gov.ie - Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018) (www.gov.ie)

¹² Institution of Environmental Management and Assessment (2017): Health in Environmental Impact Assessment: A primer for a proportionate approach. Available at: [Health in impact assessment](#)

¹³ Institution of Environmental Management and Assessment (2022): Determining Significance for Human Health in Environmental Impact Assessment. Available at: [iema-eia-guide-to-determining-significance-for-human-health-nov-2022.pdf](#)

The outcome has been used to aid the development of appropriate mitigation measures in order to avoid or reduce potential adverse effects.

The steps undertaken for the assessment are as follows:

1. Identifying receptors in the study area and determining their sensitivity to potential changes in accordance with best practice guidance listed in 6.2.3 above.
2. Identifying activities and components of the Proposed Project that could have an impact on population and human health receptors.
3. Determining the magnitude of the impacts these receptors will experience.
4. Assessing the significance of effects that arise as a result of the impacts on the receptors, incorporating any mitigation measures included within the Proposed Project, and assessing any residual effects.

This chapter utilises good practice, informed guidance as set out in section 6.2.3 above.

6.3.2.1 Technical scope

In accordance with the EPA guidelines¹⁴, this assessment has considered effects on community receptors arising as a result of the construction, operation and maintenance and decommissioning of the Proposed Project. The assessment considers both direct and indirect effects on receptors arising as a result of the Proposed Project, in particular, effects on:

- **Land use and social considerations**, including effects on land requirements (both temporary and permanent) and accessibility to community receptors (namely, residential properties (and gardens); community facilities, businesses and public open spaces (such as parks and play areas));
- **Economic activity** including employment and tourism; and
- **Human health**, including environmental effects on human health contained in corresponding chapters (such as air quality, noise, landscape and traffic), and general neighbourhood quality (the interactions between these environmental effects).

Neighbourhood quality effects occur if there are two significant adverse effects occurring at the same location at the same time – impacting the amenity of a neighbourhood, street, community facility or open space. These potential effects are noise and vibration, air, the landscape and road and traffic effects.

6.3.2.2 Assessment criteria

Sensitivity of receptors

The sensitivity of receptors is determined by their capacity to absorb proposed changes. It reflects their vulnerability to change, resilience to change, and in some cases the availability of alternative resources of a similar value.

Table 6.2 below sets out criteria that have been used to describe and assess the sensitivity of receptors.

Table 6.2: Sensitivity criteria for receptors

Sensitivity	Criteria
Very High	• A vulnerable receptor with no means to absorb changes. • A receptor accessed on a daily basis.

¹⁴ Environmental Protection Agency (2022): 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'. Available at: [Guidelines on the information to be contained in Environmental Impact Assessment Reports \(EIAR\) \(epa.ie\)](https://www.epa.ie/publications/consultation_documents/Documents/ELAR/ELAR_guidelines.pdf)

Sensitivity	Criteria
	- No alternative facilities, access arrangements or opportunities are available within an easily accessible distance. - Daily activities prevented. - Population with a very poor health status
High	- A vulnerable receptor with very little capacity and means to absorb changes. - No alternative facilities, access arrangements or opportunities are available within an easily accessible distance. - A frequently accessed resource. - High level of deprivation - Daily activities limited a lot. - Population with a poor health status
Medium	- A receptor with limited capacity and means to absorb changes. - A limited range of alternative facilities, access arrangements or opportunities are available within an easily accessible distance. - A moderately, or-semi-frequently accessed resource. - Moderate level of deprivation - Daily activities moderately limited - Population with a health status in line with regional/national average
Low	- A non-vulnerable receptor with sufficient capacity and means to absorb changes. - A wide range of alternative facilities, access arrangements or opportunities are available within an easily accessible distance. - An infrequently accessed resource. - Low level of deprivation - Daily activities limited a little. - Population with a good health status
Negligible	- A receptor that is currently not in use - Very low levels of deprivation / an affluent area - Daily activities not limited at all.

Source: Mott MacDonald, 2024 (adapted from EPA, 2022; IEMA, 2022; IPH, 2021)

Magnitude of impact

To evaluate the magnitude of impact, each impact has been assessed in terms of the following indicators:

- Spatial scope – whether impacts are likely to be felt within the study area or more widely
- Extent – how many community resources are likely to experience impacts and the extent of these impacts.
- Duration – whether the impacts would be short or long-term (as defined by EPA guidelines).
- Reversibility – whether the impact is permanent or temporary (as defined by EPA guidelines).

The criteria for defining magnitude for the assessment of impacts are defined in the table below.

Table 6.3: Impact magnitude criteria

Magnitude	Criteria
Major	- A large proportion of the study area is impacted - The impact is permanent (lasting over 60 years) or long-term (lasting 15 to 60 years) - Demolition / total loss of a resource - Partial loss of resource and/or quality and integrity of the receptor - Unable to or requires extreme intervention to return to the baseline

Magnitude	Criteria
Moderate	● A moderate proportion of the study area is impacted. ● The duration over which the impact is experienced is medium-term (lasting seven to 15 years). ● Impacts a moderate number of receptors ● Partial loss of/damage to key characteristics, features or elements of the receptor ● Requires considerable intervention to return to the baseline
Minor	● A small proportion of the study area is impacted ● The duration over which the impact is experienced is short-term (lasting one to seven years) ● Affects a small number of receptors ● Minor loss of, or alteration to, key characteristics, features or elements of the receptor ● Baseline returns without intervention or with only limited intervention
Negligible	● A very small proportion of the study area is impacted ● Impact is very short-term (lasting less than a year) ● Impacts a very few number of receptors ● Very minor loss or detrimental alteration to characteristics, features or elements of the receptor ● Baseline remains consistent
Indiscernible	● A few receptors affected ● Impact is momentary / brief (lasting less than a day) ● No loss or detrimental alteration to the receptor ● No change to baseline

Source: Mott MacDonald, 2024 (adapted from EPA, 2022; IEMA, 2022; IPH, 2021).

For impacts which do not fall entirely into the assessment criteria for sensitivity and magnitude, professional judgement and justifications have been provided for assigning sensitivity and magnitude categories to each impact.

Significance of effect

Effect significance is a product of the sensitivity of receptors and the magnitude of effects. In line with EPA guidance, effects can be:

- Positive – a change which improves the quality of the environment.
- Neutral – no effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
- Negative – a change which reduces the quality of the environment.
- Likely – the effects that can reasonably be expected to occur because of the planned project if all mitigation measures and properly implemented.
- Unlikely – the effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

In line with EPA guidance, the significance of effects have been determined as imperceptible, not significant, slight, moderate, significant, very significant and profound. These are described in Table 6.4 below.

Table 6.4: Description of significance of effects

Significance	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

Significance	Description
Moderate effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very significant	An effect which, by character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound effects	An effect which obliterates sensitive characteristics

Source: EPA (2022)

Effects that are assessed as moderate to profound are considered to be significant, and would require mitigation. Table 6.5 sets out the relationship between magnitude, sensitivity, and significance.

Table 6.5: Significance of effect

		Magnitude			
		Indiscernible	Negligible	Minor	Moderate
Sensitivity	Very High	Slight / Not Significant	Moderate / Slight	Significant / Moderate	Very Significant / Significant
	High	Not Significant	Slight	Moderate	Significant
	Medium	Not Significant / Imperceptible	Slight / Not Significant	Slight	Moderate
	Low	Imperceptible	Not Significant	Slight / Not Significant	Slight
	Negligible	Imperceptible	Imperceptible	Not Significant / Imperceptible	Not Significant

Source: Mott MacDonald, 2024 (created using EPA Guidelines, 2022)

6.3.3 Study area

The study area for population and human health assessment is typically defined by the Electoral Division (ED) in which the Proposed Project site is located. ED is the smallest legally defined administrative area in the State for which Small Area Population Statistics (SAPS) are published from the Census.

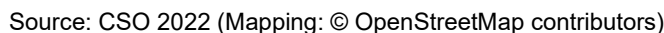
The Proposed Project is located within the EDs of Dunmain and Inch. The study area for residential properties, community facilities, businesses and agricultural landholdings is 500m from the boundary of the Proposed Project. This is due to receptors within 500m of the Proposed Project being more likely to experience potential effects throughout both construction and operation. The study area is shown in Figure 6.1 below. The nearest settlement is the village of Gusserane approximately 170m to the south of the Project site boundary. The study area is extended to include this village. The population and human health conditions are also considered according to the following spatial areas:

- Local Impact Area (LIA): defined as the EDs of Dunmain and Inch
- Wider Impact Area (WIA) – defined as County Wexford

Regional (South East Ireland) and national (Ireland) data has been used as comparator areas.

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Map showing the location of the Solar Farm/BESS site in County Wick, Ireland. The map includes labels for Kilkenny, WEXFORD, and WATERFORD. A legend indicates the Solar Farm/BESS Boundary, 220kV Substation, Compound / Cable Route Boundary, and Route Boundary.



The following assumptions have been identified for the assessment:

- ## 6.4 Receiving Environment

The structure of the receiving environment is as follows:

- Section 6.4.1 provides an overarching demographic summary of the local population
- Section 6.4.2 provides baseline data in relation to land uses and social considerations
- Section 6.4.3 provides baseline data in relation to economic activity
- Section 6.4.4 provides baseline data in relation to human health.

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6.4.1 Population

6.4.1.1 Demographic profile

The table below shows the demographic structure of the LIA, County Wexford, South East Ireland, and Ireland. 2022 Census data indicates that 931 people live in the LIA – an increase of 5% since the previous Census in 2016. This is slightly less so than in wider areas, with County Wexford, South East Ireland, and Ireland each experiencing a higher rise in population (of 9%, 8%, and 8% respectively) over the same period.

Table 6.6: Demographic structure of the LIA

	Total population	Children (<15 years)	Young people (15-24 years)	Working age (15-64 years)	Older people (65+ years)
LIA	931	23%	12%	62%	15%
County Wexford	163,919	20%	12%	63%	17%
South East	457,410	20%	12%	64%	16%
Ireland	5,149,139	20%	13%	65%	15%

Source: CSO Census, 2022

The data suggests that the demographic composition of the LIA is in line with County Wexford, regional, and national proportions:

- 23% of the LIA population are children, compared to 20% in County Wexford, South East Ireland, and Ireland
- Young people represent 12% of the LIA population, this is in line with all wider areas
- 62% of the LIA population are of working age, in line with the wider areas (63%, 64%, and 65% respectively)
- Older people represent 15% of the population in the LIA, this is in line with proportions in the wider areas (17%, 16%, and 15% respectively).

6.4.1.2 Levels of deprivation

Pobal data provides a measurement and comparison of relative levels of deprivation. The Pobal HP Deprivation Index¹⁵ sets out eight levels of deprivation, ranging from 'extremely disadvantaged' to 'extremely affluent' as set out in in Table 6.7 below.

Table 6.7: Pobal HP Deprivation Index

Level	Description
1 (most deprived)	Extremely disadvantaged
2	Very disadvantaged
3	Disadvantaged
4	Marginally below average
5	Marginally above average
6	Affluent
7	Very affluent
8 (least deprived)	Extremely affluent

Source: Pobal, 2022

¹⁵ Pobal: HP Deprivation Indices, 2022. Available at: [Pobal HP Deprivation Index Launched - Pobal](#)

According to the Index, the electoral divisions of Dunmain and Inch, which make up the LIA, are respectively marginally above and below average levels of deprivation. The overall level of deprivation across County Wexford is also marginally below average, which indicates that the LIA performs similarly to County Wexford and wider areas in terms of deprivation.

6.4.2 Land uses and social considerations

As per the Wexford County Development Plan 2022-2028, the Project site is located within rural area type 'Stronger Rural Areas'.

The Proposed Project site is a greenfield agricultural site, surrounded by agricultural land in its immediate vicinity. The nearest settlement is the village of Gusserane approximately 170m to the south of the Project site boundary. Other CSO settlements close to the Proposed Project are Newbawn (approximately 3km east of the Proposed Project) and Ballycullane (approximately 3km south of the Proposed Project).

The Wexford County Development Plan¹⁶ (WCDP) identifies Newbawn as 'Level 5 Small Villages Category 1', Ballycullane as 'Level 4 Large Villages', and Gusserane as 'Level 5 Small Villages Category 2'. The WCDP Settlement Hierarchy is developed around seven levels, each serving a different strategic role to support the urban and rural development strategy objectives. Settlements have been allocated a different level based on a range of factors, including the Core Strategy's guiding principles; population scale; regional and sub-regional influence; and infrastructure capacities. Definitions for each of these categories can be found in Table 6.8, and a map of County Wexford's settlements in these seven categories can be found on Figure 6.1 below. New Ross is the nearest town to the Proposed Project, approximately 6.4km to the northwest of the Proposed Project.

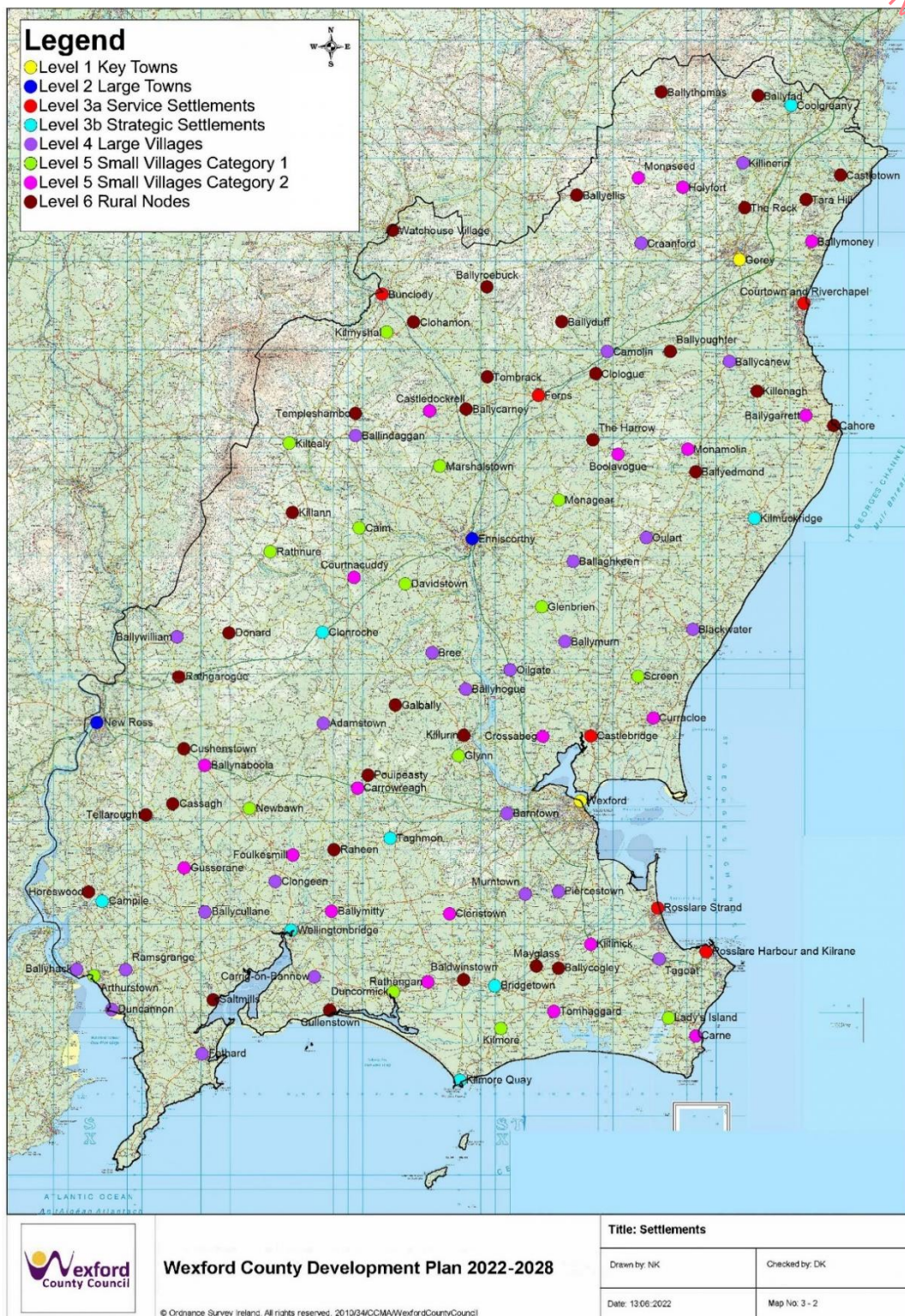
Table 6.8: WCDP Settlement Hierarchy category definitions

Settlement type	Definition
Level 1 Key Town	Self-sustaining regional driver which has a comparable structure to the five centres designated in the National Planning Framework (NPF)
Level 2 Large Town	Towns with a population of >10,000 in 2016
Level 3a Service Settlements	Settlements of varied sizes which share a common characteristic of being important service settlements for their local communities and wider rural hinterlands
Level 3b Strategic Settlements	Settlements of important contributors to economic activity at sub-county level with existing large employers; potential to be regenerated through tourism; and performing important functions including retail, commercial, education, residential, service and amenity functions for wide sub-county hinterlands
Level 4 Large Villages	Settlements of varied sizes and scale which share common characteristics of providing important local level services. Villages with identifiable settlement structures and established populations with potential to support additional growth
Level 5 Small Villages Category 1	Villages with identifiable settlement structures, established populations, with potential to support a small quantum of additional growth
Level 5 Small Villages Category 2	Similar to Category 1 villages, with the exception that they are generally smaller in scale, with more limited infrastructure and as such can accommodate lesser levels of growth than Category 1 villages
Open Countryside	Comprises those parts of the county outside of settlements in Level 1 to 6

Source: Wexford County Council (2022): WCDP

¹⁶ Wexford County Development Plan 2022-2028 (2022): Chapter 3: Core Strategy.

Figure 6.2: County Wexford Settlement Hierarchy



Source: Wexford County Council (2022) WCDP

6.4.2.1 Residential properties

There are 348 residential properties in the LIA¹⁷, which makes up 0.5% of the housing stock in County Wexford. There are 131 residential properties located within 500 meters of the Proposed Project.

A review of planning applications and publicly available mapping in the area show that there are currently no planned residential developments within 500m of the Proposed Project boundary.

6.4.2.2 Community facilities

There are several community facilities located within 500 meters of the Proposed Project. This includes schools, places of worship, and sports centres, the majority of which are located in Gusserane, to the south of the Proposed Project. They are listed below:

- Saint Colman's Well (59m from Area B)
- Owenduff Burial Ground (65m from Area B)
- Gusserane Community Hall (150m from Area C)
- Gusserane National School (206m from Area C)
- Gusserane Handball Club (290m from Area C)
- Gusserane Church – St John the Baptist Church (324m from area C)
- Gusserane Cemetery (376m from area C)
- Gusserane O'Rahilly's Gaelic Athletic Association club (445m from Area C)

6.4.2.3 Businesses

There are a number of businesses located within 500 meters of the Proposed Project. The table below lists all of these by sector -based on the European NACE¹⁸ classification system.

Table 6.9: Businesses within 500m of the Proposed Project by economic sector

Economic sector	Business name
Construction Of Buildings	W. & M. Construction
	Fca Developments (New Ross) Limited
	Patrick John Construction Limited
	Bws Construction Services Limited
	Chameleon Properties Limited
Joinery Installation	Michael Hanton
Sale of Cars and Light Motor Vehicles	Murphy Cars
Maintenance and Repair of Motor Vehicles	Dms Garage Ltd.
Renting and Leasing of Other Machinery, Equipment and Tangible Goods	Econ Plant Hire
	P. Whitty
Other Personal Services	K9 Klippers

¹⁷ Central Statistics Office (2022): Housing Stock and Vacancy Rate. Available at: [F2095 - Housing Stock and Vacancy Rate \(cso.ie\)](https://www.cso.ie/en/tables/F2095-Housing-Stock-and-Vacancy-Rate/)

¹⁸ The N.A.C.E. is the 'Statistical Classification of Economic Activities in the European Community'. It allows to classify all companies in the European Union according to their activities.

6.4.2.4 Agricultural land

The site of the Proposed Project comprises improved and wet agricultural grassland and is used for tillage production and animal grazing. It is proposed that all solar farm array areas (A, B and C) will continue to retain agricultural practices through the application of sheep grazing. This is a common agricultural practice at established solar energy farm locations for the maintenance of grassed areas, this has a mutual benefit of both retaining agricultural practices and being a sustainable farming practice which protects solar panels from vegetation growth. There are 55 agricultural land holdings with a combined 3,007 hectares of farmland within the LIA¹⁹. There are 17 farm holdings located within 500 meters of the Proposed Project.

6.4.2.5 Transport network

Transport facilities are important community infrastructure. Six bus services utilise sections of the road network in the study area. Table 6.10 summarises the local services and their associated frequencies.

Table 6.10: Local Bus Routes

Route No.	Operator	Route	Weekday Frequency	Weekend Frequency
370	Bus Eireann	Waterford – Rosslare via New Ross & Wellington Bridge	Four services per day in both directions	Four services per day in both directions
371	Bus Eireann	New Ross to Wexford via Adamstown	One loop service on a Friday afternoon.	None
373	Bus Eireann	New Ros to Wexford via Fethard	One service on a Tuesday morning and afternoon.	None
388	TFI Local Link	Duncormick to Wexford	Ten-eleven services per day in both directions	Same as weekday
392	TFI Local Link	Wellington Bridge to New Ross	Six services per day in either direction. Additional evening service on Friday.	Six services per day in either direction. Additional evening service on Saturday.
399	TFI Local Link	Hook Head – New Ross	Four-Five services per day in either direction. Additional two evening services on Friday	Four-Five services per day in either direction. Additional two evening services on Saturday

Source: bustimes.org, transportforireland.ie, busireann.ie, locallinkwexford.ie

There is no rail provision within the LIA. The closest railway station to the Proposed Project is Waterford (Plunkett) Station, located 28km away.

6.4.3 Economic Activity

6.4.3.1 Employment

The table below shows key employment indicators. The proportion of the employed working age population in the LIA (69%) is in line with that of County Wexford (67%), South East Ireland, and Ireland as a whole (both 69%). At 6%, the LIA has a lower proportion of unemployed people compared to County Wexford (10%), however it is largely in line with the regional (9%) and national (8%) proportions.

¹⁹ Central Statistics Office (2025). Census of Agriculture 2020. Available at: [Agricultural Statistics by Electoral Division Census of Agriculture 2020 Detailed Results - Central Statistics Office](#)

Table 6.11: Employment indicators

	Working age population	Employed (%)	Unemployed (%)
LIA	578	69%	6%
County Wexford	104,034	67%	10%
South East Ireland	292,264	69%	9%
Ireland	3,360,537	69%	8%

Source: CSO Census, 2022

6.4.3.2 Employment sectors

The table below shows the key employment sectors in the LIA as well as wider comparison areas.

- The share of people working in agriculture, forestry and fishing is significantly higher in the LIA (9%) compared with the national average (4%), however it is in line with that of County Wexford (6%) and the South East region (7%).
- The proportion of people within the LIA working in 'Other' sectors (24%) is slightly lower in comparison to the Wexford (16%), regional (15%), and national (16%) shares. This suggests there is a lower availability of employment in sectors such as hospitality, education, the arts, and non-profits in the LIA when compared to wider areas.
- For all other sectors, the share of people working within all other sectors in the LIA is in line with proportions across the county, the region, and the country.

Table 6.12: Employment sectors

Sectors	LIA		County Wexford		South East Ireland		Ireland	
	No.	%	No.	%	No.	%	No.	%
Agriculture, forestry and fishing	38	9%	4,217	6%	18,332	7%	82,228	4%
Building and construction	34	8%	5,282	8%	17,709	7%	134,482	6%
Manufacturing industries	49	12%	8,361	12%	38,524	14%	273,102	12%
Commerce and trade	86	21%	16,150	23%	58,752	22%	552,642	24%
Transport and communications	25	6%	4,513	6%	15,947	6%	212,383	9%
Public administration	19	5%	3,936	6%	15,104	6%	131,639	6%
Professional services	98	24%	15,816	23%	65,924	24%	568,105	24%
Other	52	13%	11,210	16%	40,718	15%	365,716	16%

Source: CSO Census, 2022

6.4.4 Tourism and Recreation

There is one potential tourist attraction located within 500 meters of the Proposed Project, which are the ruins of a church by Saint Colman's Well, situated 67m from the Area A red line boundary and 80m from the Area B red line boundary.

Slightly further from the LIA, there are further tourist attractions:

- Carnagh burial ground, located 780m north-east of the cable route boundary;
- The John F. Kennedy Memorial Park, located 4.1km west of the Proposed Project.

6.4.5 Human Health

6.4.5.1 Health indicators

Table 6.13: Share of population with a disability

Persons with a disability	LIA		County Wexford		South East Ireland		Ireland	
	No.	%	No.	%	No.	%	No.	%
	221	24%	39507	24%	144085	32%	1109557	22%

Source: CSO Census, 2022

Census 2022 data suggests that almost a quarter (24%) of the LIA population is disabled, which is in line with the proportions for County Wexford (24%) and Ireland as a whole (22%). The share of people with a disability represents almost a third (32%) of the population in the South East region, which is significantly higher than that of other comparison areas.

Table 6.14: General health of population

	LIA	County Wexford	South East Ireland	Ireland
Very good	57%	53%	53%	53%
Good	29%	30%	30%	30%
Fair	8%	10%	9%	9%
Bad	1%	2%	2%	1%
Very Bad	1%	0%	0%	0%
Not stated	4%	5%	6%	7%

Source: CSO Census, 2022

In terms of general health, 86% of the LIA population reported having 'good' or 'very good' health in the 2022 Census. This is higher than the proportions across County Wexford, South East Ireland, and Ireland which are all 83%.

6.4.5.2 Air quality management

As outlined in Chapter 10 (Air Quality), there are no localised air quality issues in the area. Overall, the annual mean concentrations measured at monitoring sites in proximity to the Proposed Project indicate a decrease of all relevant pollutants between 2019 and 2023.

6.4.5.3 Noise environment

As set out in Chapter 11 (Noise and Vibration), a total of six noise sensitive locations have been identified in proximity to the Proposed Project. These locations include residential receptors.

6.4.5.4 Landscape amenity

As set out in Chapter 12 (Landscape), the local area in which the Proposed Project is located is described as 'gently undulating lands' with agricultural lands that 'tend to be characterised by views across larger fields as a result of the generally low well-trimmed hedges.' The overarching landscape unit hosts principal towns (except where transected by River Valleys) and major infrastructure such as the main roads and railways.

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6.5 Likely Significant Effects

In accordance with the EPA Guidelines and methodology as described in Section 6.3, the following sections provide an overview of the likely significant effects, within the LIA, on:

- Population demographics and settlement patterns;
- Land use and social considerations, including effects on land requirements, accessibility, and general amenity;
- Economic activity e.g. employment, tourism;
- Community facilities and amenities, including cultural and recreational receptors;
- Human health, considered with reference to, and interactions with, other environmental receptors contained in corresponding chapters such as air quality, noise, and traffic.

6.5.1 Do nothing

In the event that the Proposed Project does not proceed, the 'do nothing' effect would be that effects on the local population and LIA would not occur. The positive benefits of generating renewable energy solar will not be realised if the Proposed Project is not developed.

6.5.2 Construction Phase

This section describes and assesses the potential construction phase population and human health effects of the Proposed Project.

Table 6.15: Effects during the construction phase

Source	Sensitivity of receptor	Description of impact	Magnitude of impact	Significance of effect
Population				
Changes in resident population	Due to the nature of the project, the Proposed Project will not lead to an increase in the resident population of the area.			
Land use and social considerations				
The Proposed Project will not require land from community facilities, non-agricultural businesses, tourist attractions of public open spaces during the construction period				
Permanent land requirements	Low – All land for the Proposed Project requires buy-in and consent for a 40-year lease in line with the operational lifespan of the Proposed Project.	The Proposed Project will permanently require approximately 121.5 hectares of agricultural land across the LIA.	Negligible – The land required permanently represents a small proportion of the land in the LIA.	Not significant
Economic activity				
Temporary changes in employment	Low - The construction workforce is likely to be sourced from across the County. In County Wexford the proportion of the working age population which is unemployed is slightly lower than national proportions. The sensitivity of the receptor (unemployment) is therefore considered to be low.	During construction of the Proposed Project, there will be a beneficial impact on the economy through the provision of employment opportunities – via both new and existing construction contracts. This is likely to be beneficial in terms of local employment opportunities associated with direct employment from construction activities, as well as for local businesses through indirect and induced expenditure.. It is expected that the number of construction workers required will vary throughout the duration of the construction phase, but will peak at approximately 130 persons. A number of these jobs could be expected to be filled by residents of County Wexford. However, it is assumed that the majority of construction jobs would be accessed by people (i.e. both	Negligible - The proportion of construction workers and/ or contracts that would be sourced locally is currently unknown. However, if it assumed that all jobs are new and sourced from the pool of County Wexford residents who are unemployed, the change in unemployment would equate to approximately 1% for a period of up to 26 months. The magnitude of impact is minor as only a small proportion of the population will be impacted.	Not Significant

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Source	Sensitivity of receptor	Description of impact	Magnitude of impact	Significance of effect
		employed as well as unemployed) from across the wider South East region.		
Human health				
Temporary changes in health and wellbeing due to changes in the local environment / neighbourhood quality	The construction of the Proposed Project may result in temporary environmental changes (such as noise and dust) for communities in proximity to construction activities – resulting in an overall change in neighbourhood quality for these communities. Changes in neighbourhood quality result from a combination of significant residual (post-mitigation) effects reported by other assessment topics – specifically noise and vibration, air, landscape and road and traffic effects. For a neighbourhood effect to be identified, at least two significant residual effects must combine in the same location. No significant residual effects have been reported in relevant environmental chapters, therefore there is no effect on health and wellbeing anticipated during the construction phase of the Proposed Project.			
Electromagnetic Fields (EMF)	EMF is produced whenever electricity is present. Electromagnetic interference (EMI) is disturbance that affects an electrical system due to magnetic and electric fields, electromagnetic induction, conduction or electromagnetic radiation emitted from an external source. High voltage electrical equipment creates EMF, which can potentially have implications for human health and may cause EMI to other electrical/electronic equipment (e.g., communications) or infrastructure (e.g. power lines). The Proposed Project includes new electrical equipment. EMF limits are specified in the EU Directive 2013/35/EU Electromagnetic Fields (EMF) limits, published in 2013 and enforced in the Ireland by the Department of Environment, Climate and Communications, EPA and the Health & Safety Authority – all of which reference the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines. Equipment used during construction of the Proposed Project will also comply with applicable health and safety standards for EMF. As this equipment will be installed, operated and maintained correctly, levels of electromagnetic emissions are unlikely to exceed the acceptable limits for workers or the public, or to cause EMI. Power supplies used for construction are generally insufficient to cause any significant EMI. Consequently, there will be no significant health effects associated with the construction of the Proposed Project.			
Temporary changes in social cohesion	Low – Welfare facilities will be provided onsite for construction workers. As such, the presence of the construction workforce is unlikely to put considerable pressure on resources within nearby settlements. Daily activities of residents within the LIA will therefore be limited a little.	During the day, the workforce will be present on construction sites and compounds. The construction workforce will peak at approximately 130 persons. The presence of construction workers is likely to be noticeable for those living in the area.	Minor - Construction workers are likely to congregate in places of social cohesion that are local to the LIA. The severity predominantly relates to a minor change in the make up of the LIA, and the impact will be rapidly reversed.	Not significant
Temporary disruption to community receptors as a result of road closures	High - The sensitivity of community receptors within the study area is considered to be high as they are accessed frequently by users.	The local community may experience temporary disruption in access to community receptors during construction of the Proposed Project due to road closures. In Chapter 14 (Traffic and Transport) it is assessed that, at worst, any closures would typically add a maximum of thirteen minutes onto journeys.	Moderate - While the duration of impact is very short-term (maximum of seven weeks for the longest road closure) and will remain open for local and emergency access, community disruption for a moderate number of receptors is anticipated. As	Moderate adverse, significant

Source	Sensitivity of receptor	Description of impact	Magnitude of impact	Significance of effect
		The following roads have been identified as being impacted by closures: - L4030 between the L40232 and the L4023; - L40232 between the L4030 and Array Area A access; - L80591; - L4030 - Array A Link; and - L4030 - Array A to Array B Link.	such, the magnitude of impact is therefore assessed as moderate.	
Temporary changes in NMU amenity due to increased HGV traffic	High – The sensitivity of NMUs is considered to be high as pedestrians are a vulnerable receptor.	As highlighted in Chapter 14 (Traffic and Transport), the amenity of a pedestrian's journey may be impacted due to an increase in HGV traffic on local roads. For example, the Proposed Project is predicted to generate an increase of up to 16800% of HGVs on the Unclassified Road between L4030 Rathumney to L4030 Nash in year 2027. Such increases are likely to impact the 'relative pleasantness of a journey' for NMUs during this time.	Major – As the presence of HGV traffic throughout the construction period impacts the quality and integrity of the receptor due to its impact on NMU amenity, the magnitude has been assessed as major.	Major adverse, significant

6.5.3 Operation and Maintenance Phase

This section describes and assesses the potential population and human health effects of the Proposed Project during the operation and maintenance phase.

Table 6.16: Effects during the Operation and Maintenance Phase

Source	Sensitivity of receptor	Description of impact	Magnitude of impact	Significance of effect
Population				
Due to the nature of the project, the Proposed Project will not lead to an increase in the resident population of the area.				
Land use and social considerations				
The permanent requirement for land will take place during the construction phase. As such, these have been identified and assessed in Table 6.15 above. No further impacts to land use and social considerations have been identified during the operation and maintenance phase.				
Economic activity				

Source	Sensitivity of receptor	Description of impact	Magnitude of impact	Significance of effect
Permanent employment	Low - The sensitivity of the LIA is low due to the proportion of the working age population which is unemployed being slightly lower than national proportions.	Throughout operation, the Proposed Project is likely to generate a small amount of employment. However, both the Solar Farm and GIS and AIS substations are expected to be operated remotely. Visits to the sites by security and maintenance personnel are anticipated to occur on average once or twice every six months.	Indiscernible – As it is currently unknown if employment will be sourced locally, the magnitude of impact is assessed as negligible and indiscernible at the County level.	Not significant
Human health				
Electromagnetic Fields (EMF)	There will be no significant health effects associated with EMF in the operation and maintenance of the Proposed Project. The Proposed Project will operate in accordance with EMF health and safety standards.			

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6.5.4 Decommissioning Phase

Subject to the granting of statutory approval, the Nash PV Solar Farm, BESS and grid connections will form part of the national electrical grid infrastructure. The design life of the PV Solar Farm and BESS is 30 years and 20 years respectively, where the planning permission for the operational life span of the Proposed Project overall is 40 years.

It is expected that the Proposed Project will remain a permanent part of the national electricity transmission network and will be refurbished and / or redeveloped as required rather than be decommissioned.

6.6 Cumulative Effects

Cumulative effects consider the potential effects of the Proposed Project in combination with the potential effects of other existing or approved developments within the surrounding area.

In addition to the Proposed Project, Chapter 3 of this EIAR provides other developments in the vicinity of the Proposed Project which have the potential to result in cumulative impacts.

6.6.1 Land Uses and Social Considerations

The Proposed Project will permanently require approximately 121.5 hectares of agricultural land across the LIA, however this has not been deemed as significant. The nearest other approved or existing developments are 5km away from the Proposed Project, meaning cumulative land take effects are unlikely to arise.

6.6.2 Economic Activity

The construction and operation of the Proposed Project is expected to generate employment. It is not possible to estimate the employment impacts of each cumulative scheme due to a lack of accessible information on employment required for the delivery of other projects. However, it is likely that there would be a beneficial temporary effect on the construction employment sector due to a cumulation of construction works. Longer term beneficial effects may also arise throughout operation.

6.6.3 Human Health

6.6.3.1 Neighbourhood quality

Whilst Chapter 11 (Noise and vibration) has highlighted that the potential extension of the BESS battery storage may have a cumulative noise impact on the receptors nearest to the compound, no cumulative effects have been identified in the Air Quality or Landscape (Chapters 10 and 12). As such, no cumulative neighbourhood quality effects are anticipated as a result of other developments.

6.6.3.2 Electromagnetic Fields

The proposed development and cumulative schemes will operate in accordance with limits set by the EU Directive 2013/35/EU Electromagnetic Fields (EMF) and International Commission on Non-Ionising Radiation Protection (ICNIRP). As such, it is assumed that there will be no significant cumulative health effects associated with EMF during the construction and operation of the proposed and cumulative schemes.

6.6.3.3 Traffic disruption

According to Chapter 14 (Traffic and Transport), if the construction traffic generated by Proposed Project coincides with the construction phases of other developments and remains

unmitigated, there will at worst be a major effect upon community receptors, resulting in a significant cumulative effect. Similarly, if road closures associated with the Proposed Project and other developments remain unmitigated, at worst there would be a moderate adverse effect, which would be significant to local community receptors.

6.7 Mitigation and Monitoring Measures

The Proposed Project has been designed, as far as possible, to minimise effects on population and human health. Appropriate mitigation options have been identified.

6.7.1 Construction phase

The following mitigations relevant to the population and human health assessment are proposed during the construction phase:

- To manage changes in access in the construction phase, a Construction Environmental Management Plan (CEMP) has been developed to communicate planned activities and minimise disruption to stakeholders that may be affected by construction activities. This is included in the application documentation.
- A Construction Traffic Management Plan (CTMP) has been developed as part of the CEMP, to optimise the efficiency and safety of all traffic activities generated by the Proposed Project.
- Construction phase works will take place between the hours of 07:00-19:00 Monday to Friday and 08:00-14:00 Saturday, subject to agreement with Wexford County Council and An Coimisiún Pleanála respectively.
- To address risks of exposure to radon, workplace radon tests will be carried out in areas. Water quality testing will be undertaken pre-construction, during construction and post-construction for any identified drinking water abstraction sources which may be impacted by construction activities.
- The CEMP includes best practice mitigation to minimise air quality and noise impacts associated with construction vehicles and the construction and operation of the Proposed Project.
- Vegetation removal required as part of site preparation, and any removal of hedgerow, trees or scrub will take place outside of the bird nesting season so as to minimise disruption to local biodiversity, and ensuing effects on population and human health.
- Land clearance works will take place on a phased basis and with consideration of seasonal restrictions e.g. lambing season, harvest seasons, etc., if applicable.
- Where land is used temporarily, it will be reinstated to its previous state after construction.

6.7.2 Operation and maintenance phase

No specific mitigations relevant to the population and human health assessment are proposed during the operation and maintenance phase. In accordance with best practice (as set out in Chapter 10 (Air Quality)) emissions will be minimised at source to reduce exposure of effects of operations on receptors.

6.8 Residual Effects

There are no significant residual population and human health effects predicted during the construction and operational phases. It is acknowledged that inconvenience will be caused in some areas due to road closures and the presence of HGV traffic, however, effects will be temporary and appropriately mitigated.

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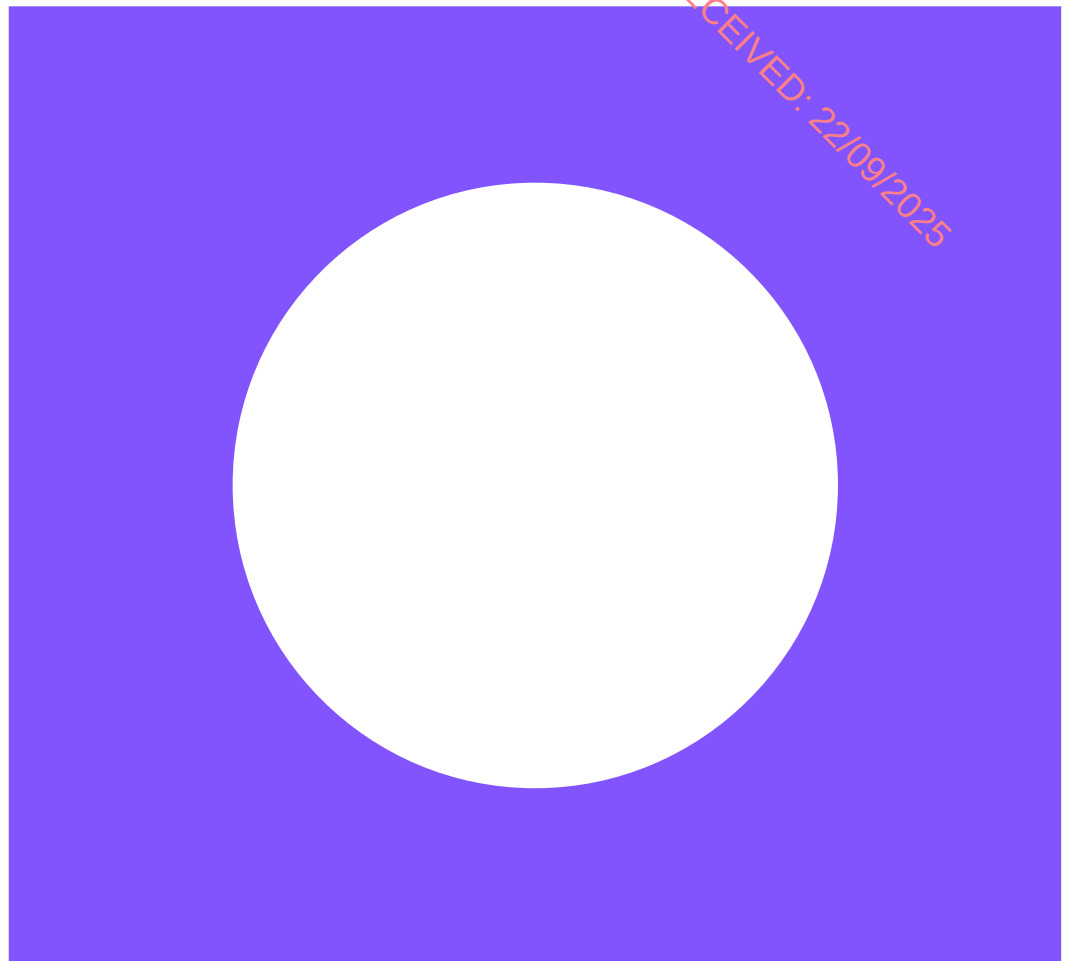
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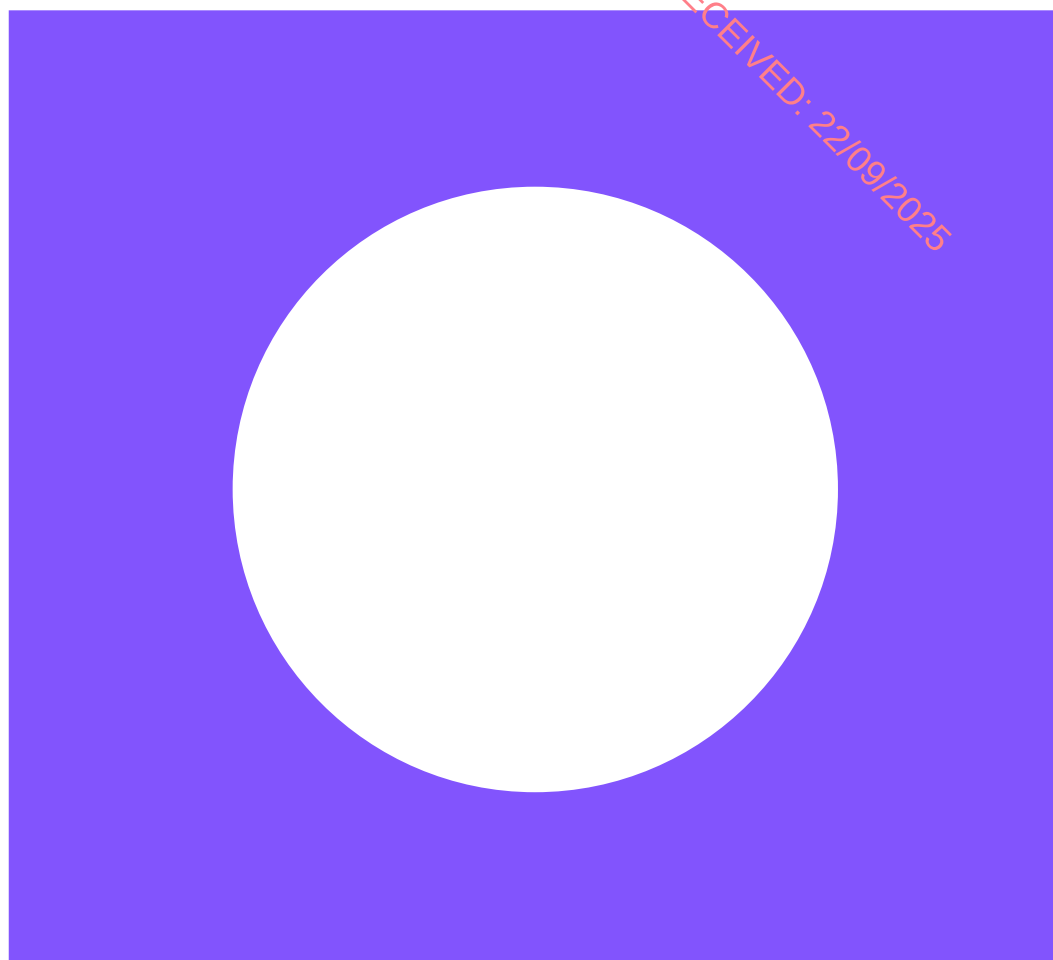
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 7 Biodiversity

September 2025

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7 Biodiversity

7.1 Introduction

This chapter assesses the likely significant effects from the Proposed Project on biodiversity. Biodiversity (or “biological diversity”), as defined at the United Nations Convention on Biological Diversity (CBD)¹, is ‘*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes genetic diversity within species, between species and of ecosystems*’.

This EIAR chapter was prepared by Mott MacDonald with specialist inputs as required. The details regarding the specialist inputs are provided below in the relevant sections which describe the surveys undertaken to inform this assessment.

The assessment is based on the development as described in Chapter 3.

7.1.1 Constraints and Design approach

This EIAR Chapter follows, and was informed by, a series of biodiversity studies carried out on the site for the Proposed Project.

As outlined previously in Chapter 5, the design of the Proposed Project has been an iterative process. In the early stages of the project, ecological sensitivities formed part of the consideration of alternatives, for example sensitive habitats were outlined to the designers to avoid. This has continued into the design of the Proposed Project for consent, in that, where Important Ecological Features (IEFs) have been identified, the design has been amended to avoid / minimise risk of effects in the first instance. Biodiversity assessments provided a comprehensive consideration of the biodiversity identified and communicated constraints at the earliest opportunity to the design team.

A preliminary Ecological Assessment including a site visit and desk study was conducted at the commencement of the project programme to inform the proposed design and identify sensitive ecological receptors within the site for avoidance of infrastructure as far as possible.

The key general design approaches to avoid / minimise effects on IEFs included;

- Avoiding conservation sites including European sites that form part of the Natura 2000 network. European sites comprise:
 - Special Areas of Conservation (SACs) (and candidate SACs) designated under the Habitats Directive (92/43/EEC) due to their significant ecological importance for species and habitats protected under Annexes I and II respectively of the Habitats Directive; and,
 - Special Protection Areas (SPAs), designated for the protection of populations and habitats of
- Avoiding National and proposed National Heritage Areas.
- Avoiding known areas used by bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC).
- Avoid rivers and riparian areas and ensure buffers are maintained between the development and water courses

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<https://www.cbd.int/>

- The proposed surface water retention pond will incorporate ecological design to allow a wetland and semi natural grassland develop.
- Minimise tree and bush clearance where feasible.
- Avoidance of sensitive semi natural woodland and wetland habitats where possible.
- Avoid developing infrastructure in unimproved wet grassland and marsh habitat identified within the site.

Potential effects of the Proposed Project on European sites are presented in this EIAR Chapter, within the EIA framework. Within the framework of Article 6(3) of the Habitats Directive, an assessment of likely significant effects from the Proposed Project on European sites, in combination with other plans or projects is presented, along with an assessment of adverse effects on European site integrity from the Proposed Project in combination with other plans or projects, in the 'Screening for Appropriate assessment and Natura Impact Statement', in ++.

7.1.2 Policy

The following plan has been the primary policy used to inform this chapter:

- Wexford County Development Plan 2022 – 2028 (WCDP)

The WCDP takes account of the overall objectives of the National Biodiversity Action Plan and translates them into a local County Wexford context. The plan has 28 natural heritage objectives with the overall goal being to 'protect, conserve and where appropriate enhance the natural, built and cultural heritage of the county.'

7.1.3 Legislation

The assessment of likely significant effects on biodiversity arising from the Proposed Project, has been carried out in accordance with relevant legislation, including the following:

- EIA Directive (2014/52/EU);
- Planning and Development Acts 2000, as amended and the Planning and Development Regulations 2001, as amended;
- Wildlife Act 1976, as amended;
- EU Habitats Directive (92/43/EEC)
- EU Birds Directive 2009/147/EEC
- Flora (Protection) Order 2022;
- EU Water Framework Directive 2000/60/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);
- Ireland's 4th National Biodiversity Action Plan 2023–2030.

7.1.4 Guidance

In surveying, valuing and describing the ecological receptors and the potential impacts on biodiversity arising from construction and operation of the Proposed Project, the following guidance was considered including;

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2024)²
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).

² CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009).
- Ecological Surveying Techniques for Protected Flora and Fauna during the planning of National Road Schemes (National Roads Authority, 2009).
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005).
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008).
- A Guide to Habitats in Ireland (Fossitt, 2000)³
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011)⁴
- Guidelines for the Treatment of Bats During the Construction of National Road Schemes (National Roads Authority, 2005).
- Countryside Bird Survey (2012) CBS Manual Guidelines for Countryside Bird Survey participants.
- Bat Surveys for Professional Ecologists: Good Practice Guidelines, 4th Edition (Bat Conservation Trust, 2023).
- Kilroy G, Dunne F, Ryan J, O'Connor A, Daly D, Craig M, Coxon C, Johnston P and Henning M (2008). A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive. Environmental Research Centre Report. Environmental Protection Agency Ireland.
- Department of Arts, Heritage and the Gaeltacht – National Parks and Wildlife Service (DAHG NPWS) (2012) Marine Natura Impact Statements in Ireland Special Areas of Conservation, A Working Document.

7.2 Methodology

The approach to this impact assessment comprises analysis of data from a desktop study and ecological field data. Conclusions are then drawn as to whether (and to what extent) baseline conditions are likely to change as a result of the Proposed Project, and whether these changes represent likely significant ecological effects.

7.2.1.1 Zone of Influence

In the context of an ecological impact assessment generally (CIEEM, 2018)⁵ the Zone of Influence (Zol) to potential impacts from a proposed development is defined as:

“the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries” and that “the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change.”

The Zol varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

The Zol identified for various ecological receptors, having regard to the potential for impact as outlined previously are as detailed below:

- Footprint of the Proposed Project for direct damage to habitats.

³ Fossitt, J.A. (2000). A Guide to Habitats in Ireland.

⁴ Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) Best Practice Guidance for Habitat Survey and Mapping.

- Localised dust deposition may occur during construction. Dust effects to ecological receptors was identified as 50m based on scale of works proposed and also considering construction traffic. As such, the maximum Zol is taken as 100m for dust effects within this EIAR.
- 34m for high noise effects⁶ to wetland bird species, based on noise modelling carried out which indicates that the noise levels drop to below 72dB within 32m of the Proposed Project. Noise levels will be below 55dBA (imperceptible levels) within 185m of the Proposed Project.
- 150m for breeding otter holts⁷
- 8km for marsh fritillary (*Euphydryas aurinia*)
- 1km for breeding raptors
- Catchment wide Zol for surface waterbodies
- 250m for groundwater dependant terrestrial ecosystems (GWDTEs)⁸

7.2.2 Desktop Study

7.2.2.1 Overview

A desk study was undertaken in August Month 2025 to review existing ecological baseline information available in the public domain, investigate the potential for connectivity to designated and ecological sensitive areas to obtain relevant information held by third parties. Table 7.1 presents an overview of ecological receptors and data sources reviewed/consulted during the desk study.

Table 7.1: Overview of desk study

Category	Ecological Receptor	Data Source
International and European Designated Sites including:	Ramsar Site	Irish Ramsar Wetland Committee
	Special Area of Conservation (SAC) and candidate SAC (cSAC)	Conservation Objectives reports, Site Synopses, Natura 2000 Data forms, Backing Documents and Maps prepared by the NPWS; NPWS Designations Viewer
	Special Protection Area (SPA)	• Conservation Objectives reports, Site Synopses, Natura 2000 Data forms, Backing Documents and Maps prepared by the NPWS; • NPWS Designations Viewer
Statutory Designated Sites	Natural Heritage areas (NHA)	NPWS Designations Viewer
	Proposed Natural Heritage Areas (pNHA)	NPWS Designations Viewer
Species and Habitat	Habitats	• the Environmental Protection Agency (EPA) (https://gis.epa.ie/),
	Mammals	• the National Biodiversity Data Centre (NBDC) (https://maps.biodiversityireland.ie/Map)
	Birds	• National Parks and Wildlife Services (NPWS) (https://www.npws.ie/maps-and-data);
	Herpetofauna	
	Fish	• Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manuals and associated reports
	Terrestrial Invertebrates	• Maps of landscape favourability for each Irish bat species at a 5km resolution as per the NBDC mapping website;
	Flora	• Article 17 reporting data on Qualifying Interests (QI) (NPWS, 2019a, NPWS, 2019b, NPWS, 2019c); • Article 12 reporting data on Special Conservation Interests (SCI); and

Category	Ecological Receptor	Data Source
		- Habitats within and/ or immediately adjacent to the proposed development areas which might be affected by the Proposed Project were identified and their suitability to support sensitive, rare and/or protected species was assessed (having regard to the typical ranges of species known to occur in the locality and the Zone of Impact (Zoi) of the works). - Consultation with NPWS on sensitive data - NPWS FPO Map Viewer – Bryophytes and Vascular Plants

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In addition to the sources noted above, the desk study made use of free online resources to assess the context of the land associated with the Project as well as to assess habitat suitability for species within the Study Area (accessed January 2024 – March 2025):

- Bing maps (<https://www.bing.com/maps/>);
- Google Earth;
- EPA maps (<https://gis.epa.ie/EPAMaps/>);
- Flood maps (<https://floodinfo.ie/>);
- National Biodiversity Data Centre (NBDC) Biodiversity Maps (<https://maps.biodiversityireland.ie/Map/>); and
- Review of any other relevant ecological reports and literature – cited as necessary.

7.2.2.2 Designated Site Data

The latest site boundary data was interrogated to identify designated sites within the Zoi of the Proposed Project. Designated sites included:

Sites of International Importance:

- Special Protection Areas (SPA) and Special Areas of Conservation (SAC):** The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of the highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are selected for the conservation of Annex I habitats (including priority types marked by * which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats.
- Ramsar Sites:** Ramsar are wetland sites designated to be of international importance under the Ramsar Convention. The Ramsar Convention is an intergovernmental environmental treaty which was established in 1971 by UNESCO and came into force in 1975.

Sites of National Importance:

- National Heritage Areas (NHA):** The basic designation for areas of ecological importance in Ireland is the Natural Heritage Area (NHA). These sites comprise areas which are considered important for the habitats, or species of plants and animals whose habitat needs protection. Under the Wildlife Acts, NHAs are legally protected from damage from the date they are formally proposed for designation.
- Proposed NHAs (pNHA):** are sites which were published on a non-statutory basis in 1995 (and again in the 2010s) but have not since been statutorily designated. These sites are of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of: Agri-environmental farm planning schemes which support the objective of maintaining and enhancing the conservation status of pNHAs. There is a

requirement for the Forest Service to gain NPWS approval before they will pay afforestation grants on pNHA lands; and a recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

- Other Nature Conservation sites include features such as:
 - Nature Reserves,
 - Biosphere Reserves, and
 - Wildfowl Sanctuaries.

7.2.3 Field Surveys

7.2.3.1 Overview

Ecological field surveys were carried out by suitably experienced Mott MacDonald ecologists as outlined in Table 7.2.

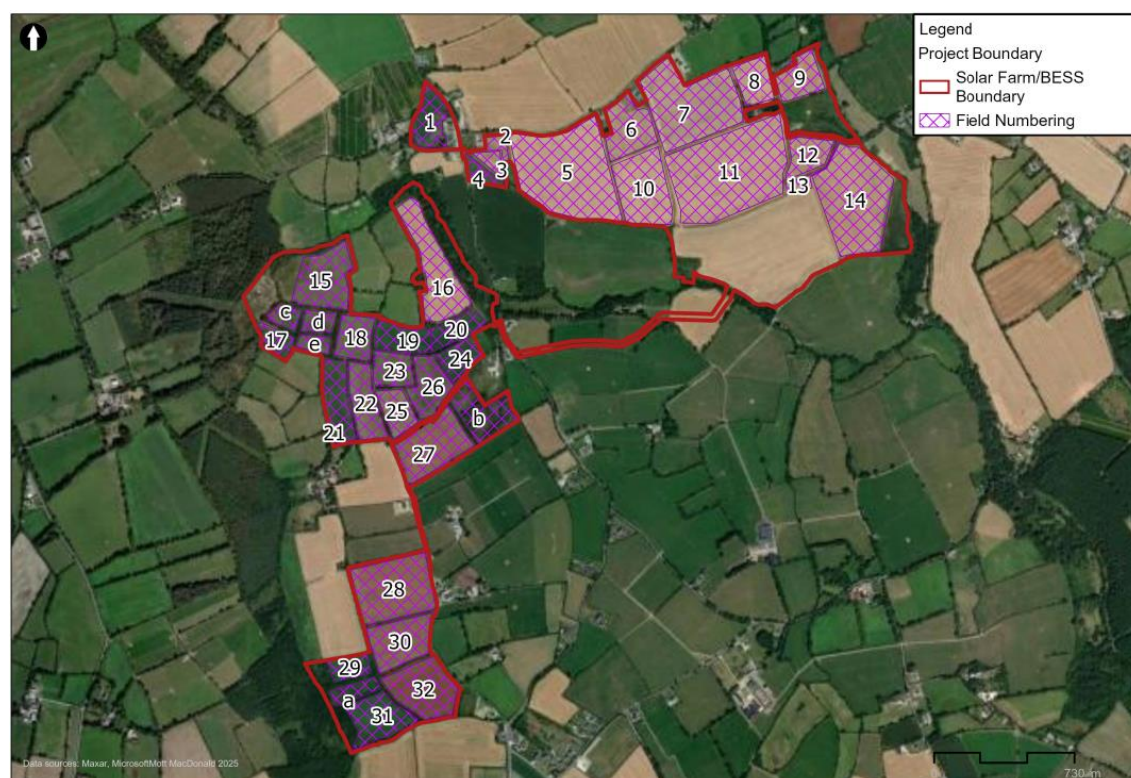
Surveys and locations outlined in Table 7.2 are indicated in Figure 7.1 below.

Table 7.2: Overview of Ecological Field Surveys

Survey Type	Date	Survey Area (refer to Figure 7.1)
Ecological walkover	15 February 2023 10 March 2023 7 May 2024 08 May 2024 09 May 2024 29 May 2024	All numbered fields including fields not numbered within planning boundary,
Bat night time walkovers	Survey 1: 12 June 2024 Survey 2: 13 June 2024 Survey 3: 13 June 2024 Survey 4: 13 June 2024	Four transects conducted across the site including arable farmland (Filed 14 west to 3) woodland / hedgerow (Field 17, 18, 19, 23, 25 and 27, 16, 28, 30, 32, 29 and 31) edge and riparian areas (Field 9, 14 and south of substation site)
Bat static surveys	D4: 30 May – 13 June 2024 D5: 29 May – 13 June 2024 D6: 30 May – 13 June 2024 D7: 29 May – 13 June 2024 D8: 29 May – 13 June 2024 D2: 26 May - 31 May 2025 D6: 26 May - 31 May 2025 D7: 26 May - 31 May 2025 D8: 26 May - 31 May 2025	Field 17, e Field 14 (south substation site) Field 16 Field 26 Filed 5 Field 29 Field 10 Field 31 Field 11
Bat roost emergence/activity survey	16 and 17 July 2024 24 July 2025	Field 3 and 4. An emergent roost at a derelict farmyard with dilapidated buildings, overgrown with scrub (. Field 9. An activity survey at a revegetating field with scrub, wet grassland, treeline and drainage ditch habitats, adjacent to the River Owenduff (centred at 52.326320, - 6.845439).
Breeding bird survey	April 2025: 02/04/2025, 03/04/2025 May 2025: 14 May 2025, 15 May 2025	Surveys conducted throughout field, riparian and woodland edges of the site

Survey Type	Date	Survey Area (refer to Figure 7.1)
	June 2025: 03 June 2025, 04 June 2025	
Wintering bird survey	February and March 2023 January, February, and March 2025.	Surveys conducted throughout field, riparian and woodland edges of the site
Woodcock survey	7-8 May 2024	Location 1: Woodland edge west Field 17C Location 2 : Woodland edge west Fields 29 and 31.
Marsh fritillary survey	16 August 2024	Fields 15c, 15d, 15E, 17 and 27b.
Detailed botanical surveys	28-30 May 2024 17-18 July 2024 16 August 2024	Field 15, 17c, 17d, 17e, 18, 27b, 29, Field 27B, woodland east Field 16
Aquatic Survey	03 May 2025	Two locations on Owenduff River. One upstream (ITM 678761, 620033) and one downstream (678960, 619791) of Kilbrawey Bridge. One location on Tellarought stream (ITM 645801, 5798919)

Figure 7.1: Field Numbering within the Proposed Project Site



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7.2.3.2 Walkover Survey

Preliminary Ecological assessment

A preliminary ecological appraisal (PEA) was conducted during the February 2023. The PEA was carried out to provide:

- A broad overview on biodiversity features and potential ecological constraints for the Proposed Project within the landholding,
- Outline initial areas that provide ecological enhancement opportunities; and
- Recommend potential further surveys that may be required to inform on the potential impacts to biodiversity.

The key findings of the PEA are incorporated into this chapter where relevant and informed the design approach detailed in Chapter 4.

Habitat

A habitat survey was carried out with regard to 'Best Practice Guidance for Habitat Survey and Mapping' (Heritage Council, 2011).

Habitats were classified to Fossitt level three in accordance with 'A Guide to Habitats in Ireland' (Fossitt, 2000). Fossitt habitat classifications are not directly comparable to the descriptions of Annex I habitats, e.g., CW2 - Tidal Rivers under Fossitt are linked to Estuaries (1130) under the EU Interpretation Manual for EU Habitats. Thus, as relevant, the habitat classification system and the corresponding European Annex I habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) having regard to the Irish Vegetation Classification where relevant. The habitat survey had regard for habitats which may offer supporting habitat for QI and SCI associated with European Sites.

Particular attention was paid to the possible occurrence of:

- Annex 1 (including priority Annex 1⁵) habitats designated under the EU Habitats Directive 92/43/EEC
- Protected plant species listed in the 2022 Flora Protection Order S.I. No. 235/2022; European Communities (Birds and Natural Habitats) Regulations 2011
- Flowering plants of conservation concern in the Ireland Red List (No. 10): Vascular Plants (Wyse Jackson *et al.*, 2016)
- Invasive plant species scheduled to the Birds and Habitats Regulations
- Species and habitats of special conservation significance identified within relevant Biodiversity Action Plans
- Rivers and streams that may support aquatic species and habitats including Lamprey species, Freshwater Crayfish, Atlantic salmon, Fresh water Pearl Mussel and floating river vegetation
- Sensitive wetlands and peat habitats including; unimproved wet grassland and marsh which are rare habitats in Co Wexford.
- Semi natural woodland habitats including scrub, wet willow/ alder dominated woodland, bog woodland and oak woodland
- Springs and localised flushes (adjacent to rivers, below hills and edge bogs)

Badger

Survey for evidence of badger (*Meles meles*) was carried out during the walkover surveys in particular where hedgerows/ wooded areas are crossed and adjacent roadside hedgerows.

⁵ Priority Annex 1 habitats are those in danger of disappearance.

These surveys followed Surveying Badgers (Harris et al, 1989). The extent of survey area was defined with regard to Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2006) as 150m beyond the proposed works where access was available from landowners on affected lands.

Otter

A survey for evidence of otter (*Lutra lutra*) was carried out along water courses encountered within the survey area and where vegetation may be disturbed adjacent to drains and streams. These surveys followed Monitoring the Otter *Lutra lutra* (Chanin, 2003). The extent of survey area was defined with regard to 'Guidelines for the Treatment of Otters during the Construction of National Road Schemes' (NRA, 2008).

Bat Surveys

A daytime bat survey of the site was carried out in accordance with "Bat Surveys for Professional Ecologists: Good Practice Guidelines" (4th edn) (Collins, 2023). The visual assessment was carried out in line with Bat Tree Habitat Key (Andrews, H et al., 2013) to determine potential roost features. Trees which might be affected by the works were examined for potential roost features.

The suitability of habitat features for bats, within the survey area, were assessed in accordance with Collins (2023) as described in Table 7.3 below.

Table 7.3: Guidelines for Assessing Potential Bat Roosts in Structures

Suitability	Description/Roosting Habitats	Commuting and Foraging Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice/suitable shelter at all ground/underground levels)	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight lines or generate/shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious features on site likely to be used as flight paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flightpaths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for flight paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	A structure with one or more potential roost sites that could be used that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight paths such as river valleys, streams,

Suitability	Description/Roosting Habitats	Commuting and Foraging Habitats
	to their size, shelter, protection, conditions, and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.	hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses, and grazed parkland. Site is close to and connected to known roosts.

Source: Collins 2023

Trees and buildings / structures were assessed as having a Moderate or High suitability for bats (structures) and potential roost features (PRF-I or PRF-M as outlined in **Table 7.4**) were examined further for evidence of bat activity using an endoscope.

Table 7.4: Guidelines for Categorising the Potential Suitability of Potential Roost Features on a Proposed Project Site for Bats, to be Applied Using Professional Judgement

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Source: Collins 2023

7.2.3.3 Bat Activity Surveys

An array of night-time bat surveys were completed in 2024 and 2025 by two experienced surveyors as detailed earlier within Table 7.2 The methodology for each of these bat surveys is presented below.

Emergence Bat Surveys

Emergence surveys started 15 minutes prior to sunset and were undertaken for a minimum of 2 hours of surveying. Surveys were completed during mild and dry weather conditions. Handheld bat detectors, Anabat Walkabout Full Spectrum bat detectors, were used by both survey

Preparation for dusk survey started approximately 60 minutes prior to sunset and the following actions were undertaken:

- - Re-inspection of building to be surveyed to determine surveyor and filming locations (external and internal (where possible) inspections).
- - Internal inspection of building (applicable only to derelict structures and agricultural buildings) to document any visible bats or audible noises (bats are more audible prior to dusk activity).
- - Positioning of filming equipment and surveyors.
- - Completion of dusk survey.
- - Post surveys, a repeat internal inspection of the surveyed building was undertaken (only applicable to derelict structures and agricultural buildings) to document any visible bats within the structure.

Walking Transects

Walking transects involved surveyors walking accessible sections of the Proposed Project site (i.e. where landowner permission was provided) and adjacent local roads using Anabat Walkabout Full Spectrum bat detectors.

Walking transect surveys were completed from 20 minutes after sunset with the surveyors following transects within the Proposed Project site.

All walking transects were completed during weather conditions suitable for bat activity and walking transects tended to be at least 90 minutes long and varied in length depending on accessibility.

Static Detector Deployments

Four Anabat Express static detectors (Titley Scientific Inc.) fitted with omni-directional microphones were deployed at various locations across the Site between May and June in 2024 (5 detectors) and 2025 (4 detectors) to provide information on baseline bat activity on the site. These were set out on site for 6 nights (2024) and 15 nights (2025)

Average night length was 7.5 hours during the sampling period, so this gives a total survey effort of 180 sampling hours. We consider this to provide a good representation of bat activity during the peak period of bat activity (typically between May and September).

Weather conditions were relatively warm and calm during the survey period, with air temperatures of between 12 and 20 °C, no rain and light winds. This provides a sample of bat activity in ideal weather conditions.

Sound Analysis

Sonograms from automated bat detectors were obtained in the ‘zero-crossing’ format and viewed using Anabat Insight software (Titley Scientific). Species were identified with reference to *British Bat Calls: A Guide to Species Identification* (Russ 2012), based primarily on frequency and call shape. Filters were initially used to provide an indicative classification, and then all sonograms were verified visually by the author. An automated bat classifier was not used.

Calculation and comparison of bat activity indices

At present there is no standardised system to categorise bat activity as low, moderate or high, because activity levels vary depending on the species involved and the surrounding landscape. In some parts of the British Isles the Ecobat tool (managed by the Mammal Society, Lintott et al. 2018) can be used to benchmark activity levels based on other data collected in the region, but at the time of writing the tool is offline for maintenance purposes.

Therefore, for the purposes of this report we use a bespoke system to discuss and compare levels of bat activity at the Site, as outlined in Table 7.8. For ease of comparison, bat activity levels are classified into four categories - negligible, low, moderate, high - based on the total number of bat passes recorded per night. In some tables we highlight these categories using shades of blue for ease of reference; this colour scheme is shown in Table 7.8.

Table 7.5: Terminology and colour-scheme used to categorise bat activity levels

Category	Number of bat passes
Negligible	≤9
Low	10 - 49
Moderate	50 - 99
High	≥100

For the avoidance of doubt, the number of bat passes recorded on a static detector does not accurately represent the number of bats present at a site. 100 bat passes may represent single passes from 100 different bats, but it may also represent a single bat that flew back and forth past the detector 100 times. In this context, bat activity data should be considered a proxy for the suitability of a habitat for bats, rather than an accurate count of the number of bats present in an area.

Potential Bat Roosts Activity Surveys

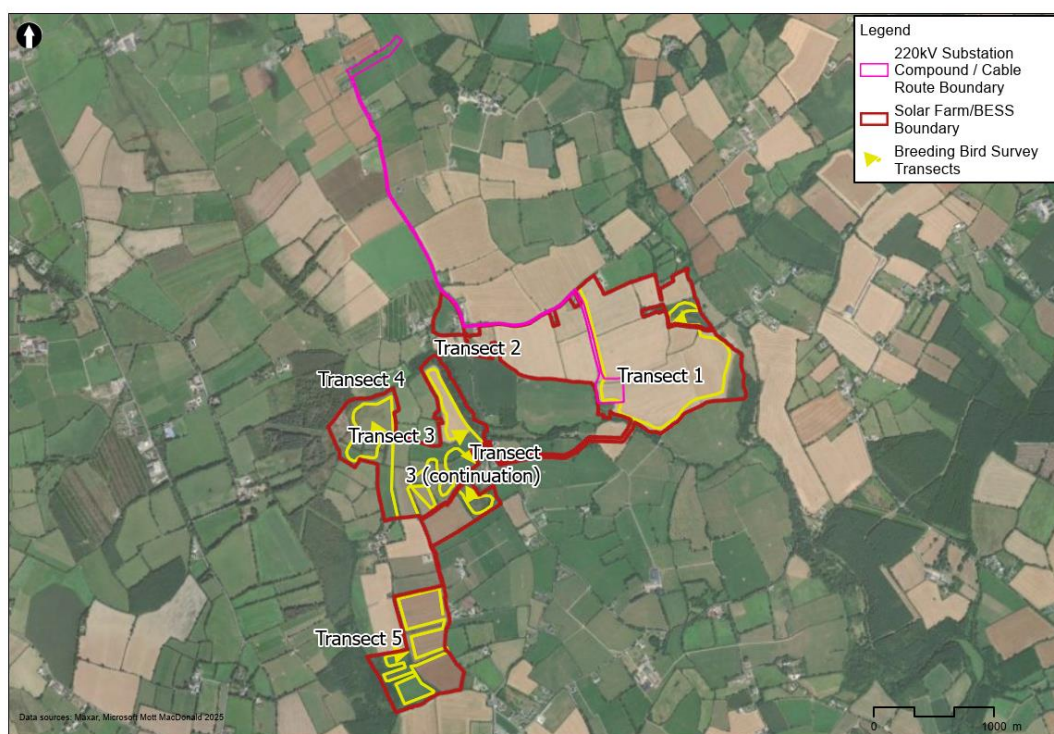
Potential bat roosts identified were subject to dusk surveys during summer 16th and 17th July 2024 and July 24th 2025 at two locations; an emergent roost and activity survey at a derelict farmyard with dilapidated buildings, overgrown with scrub. Equipment used include Anabat detectors and a night vision infrared camera.

7.2.3.4 Bird

Breeding Bird Surveys

Breeding Bird Surveys were carried out within the Proposed Project site and wider Zol. A combination of transect line and vantage point surveys were used to record breeding birds in the study area, in accordance with Gilbert et al. (1998), Bibby et al. 1992 and Bird Survey & Assessment Steering Group (2022). Survey transects are indicated in Figure 7.2.

Figure 7.2: Breeding Bird Survey Transects



Source: Mott MacDonald

Birds of moderate (amber) and high (red) Conservation Concern in Ireland (BoCCI)⁶ and those listed under Annex 1 (Birds Directive) were recorded. A list of target species was formed based

⁶ Gilbert, G., Stanbury, A., and Lewis, L. 2021. Birds of Conservation Concern in Ireland 4: 2020–2026.

on the habitats present within the site and National Biodiversity Data Centre records in the area (Table 7.6). Almost all farmland birds and open habitat breeding bird species are of some conservation concern (amber and red listed) in Ireland. Commoner birds (green listed) while not specifically are generally associated with hedgerows and woody habitats on the site. All birds are considered regarding mitigation for potential disturbance to breeding habitat in Section 7.5.

Table 7.6: Target Species for Breeding Bird Surveys

Species	BOCCI Status
Farmland	
Yellowhammer	Red
Tree sparrow	Amber
Stock dove	Red
Skylark	Amber
Meadow pipit	Red
Barn owl	Red
Kestrel	Red
Snipe	Red
Swallow	Amber
Swift	Red
House martin	Amber
Starling	Amber
House sparrow	Amber
Green finch	Amber
Linnet	Amber
Riparian	
Grey wagtail	Red
Dipper	Green
Kingfisher	Amber
Mallard	Amber
Woodland	
Woodcock	Red
Goldcrest	Amber

Optical equipment used during all surveys included 8x42 Opticron binoculars and a Hawke Nature-Trek 80mm scope.

Woodcock Survey

Dedicated woodcock surveys were carried out within the Proposed Project site and wider Zol. Surveys were carried out in line with British Trust for Ornithology 'Woodcock Annual Monitoring Survey Instructions'.

Woodcock breed in both deciduous and coniferous woodland and commence their unique roding behaviour soon after sunset and shortly before dawn. Roding flights of individual birds can last 5-45 minutes with the bird flying in circuits 3-30m above the woodland canopy.

Woodcock surveys took place woodland sites which were assessed to have potential for woodcock, over the course of two nights in May 2024.

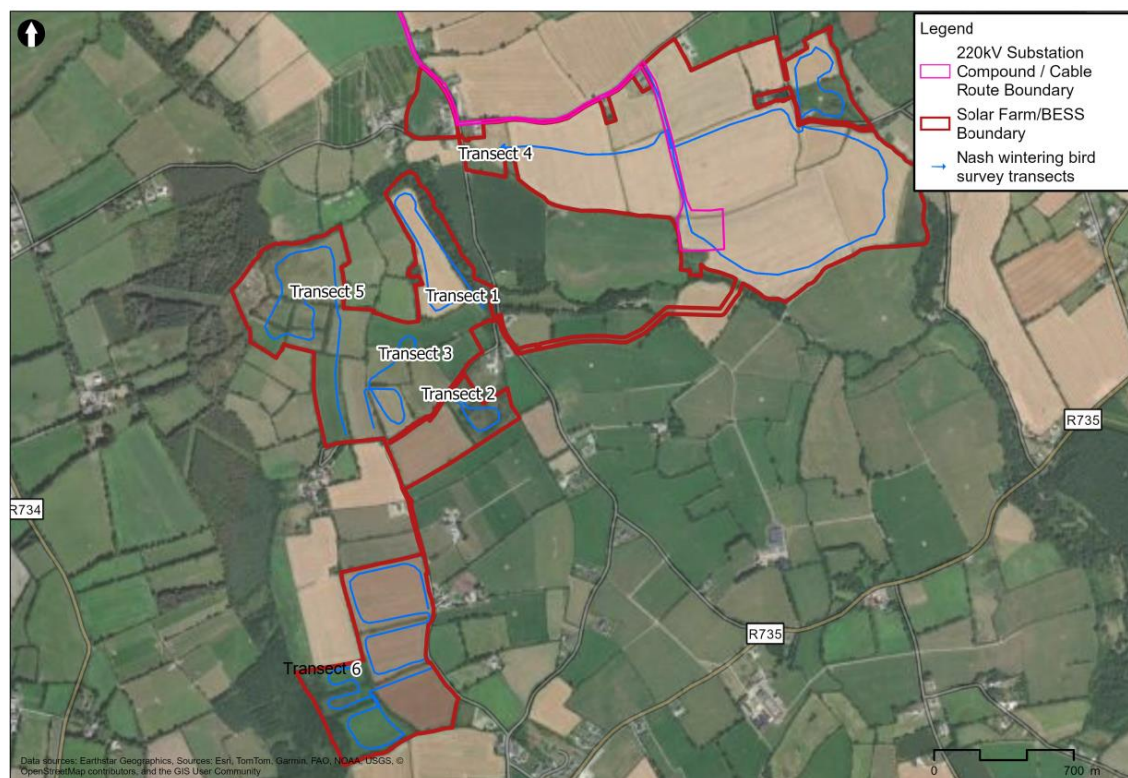
Surveys began 15 minutes before sunset and lasted for a total duration of 75 minutes

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Wintering Bird Surveys

In line with survey methodologies recommended by the British Trust for Ornithology 'Winter farmland bird survey', (based on Bibby, 2000), survey transects were defined to cover all the land parcels within the proposed project red line boundaries, ensuring that all habitat types and the specific target species potentially present, were comprehensively considered. Figure 7.3 illustrates the transects utilised.

Figure 7.3: Wintering Bird Survey Transects



Source: Mott MacDonald

Survey transects were walked at a slow amble pace, stopping periodically to scan priority habitat and features at a distance, to ensure all birds were captured in the data including species more susceptible to disturbance. In the context of this proposed project, priority habitats to survey for ex situ waterfowl of European sites (in the wider region) included open fields with potential for ground foraging species. Also surveyed were dense hedgerows particularly those laden with berries, wet habitats such as rivers and riparian zones and ephemeral water accumulations in fields.

All transect walks attempted to ensure full visual coverage of the entirety of each of the land holding. Some consideration was also given to habitats beyond the red line boundary, particularly those that could be considered potentially impacted upon for wintering birds. Of consideration was the presence of semi natural woodlands and riverine habitats adjacent to the red line boundaries at several locations. Although weather conditions are typically less restrictive during winter bird surveys, than during breeding bird surveys, all surveys avoided inclement weather conditions that could reduce bird detection. All field surveys were conducted by the experienced Senior Ecologist, Fintan Damer.

The nature of the dominant habitats present on the Proposed Project site (primarily open arable fields and pastoral field) and the generally low suitability for wetland birds (such as waders, ducks, geese and swans), was significant in determining the number of visits required to fully

comprehend the usage of and numbers of species likely to occur on the Proposed Project site. Three site visits, once per month, were carried out between the hours of 8am and 4pm (or otherwise according to daylight changes). This included the mid-winter period when numbers of wintering birds are generally accepted to be at their most significant.

All bird species were recorded but particular attention was placed on waterfowl species that may potentially be associated with European sites in the wider region in particular Bannow Bay SPA. These included:

- Species present in internationally important numbers (>1% of the national threshold figure of significance for waterbirds) (Burke et al., 2018).
- Red or amber listed species as Birds of conservation concern in Ireland (BOCCI) (Gilbert et al. 2021).
- Annex I species listed in the EU Bird Directive.

Surveys were carried out in February and March 2023, and January, February, and March 2025 as detailed within Table 7.2.

7.2.3.5 Marsh Fritillary Surveys

Targeted field surveys were conducted in August 2024 for Marsh fritillary *Euphydryas aurinia*, within areas where larval foodplant *Succisa pratensis* were recorded in unimproved wet grassland fields at the northwestern landholding. Areas of wet grassland with potential for Marsh Fritillary were identified as being of high ecological value and not included in the project design.

7.2.3.6 Aquatic Surveys

Baseline aquatic surveys were conducted to provide up to date information on ecological water quality and fisheries value in the Owenduff River (EPA Code: 13O01) - two locations, and Tellarought (EPA Code: 13T14) – 1 location. The methodology included EPA protocol (Toner et al 2005)⁷ and the Small Stream Score Assessment methodology⁸. Suitability and evidence of salmonids (*Salmo trutta*) and other fish species were also noted. In addition, a dry field ditch where a proposed surface water headwall is proposed was confirmed as unsuitable for fisheries and not a significant aquatic habitat on the southern boundary of Field 13 and 14. This drainage ditch links into the Owenduff River. These surveys were conducted by an experienced aquatic ecologist from Mott MacDonald ecology team.

7.2.3.7 Other Protected Species

During walkover surveys of the Proposed Project site, the potential was also noted for habitats of other protected species, including: common lizard (*Zootoca vivipara*), common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*), marsh fritillary (*Euphydryas aurinia*), pine marten (*Martes martes*), and hedgehog (*Erinaceus europaeus*).

In the case of the marsh fritillary butterfly, searches were made for suitable habitats (degraded bog and less managed wet grassland) for the larval food plants of marsh fritillary, devil's-bit scabious (*Succisa pratensis*).

⁷ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., ... & MacGarthaigh, M. 2005. "Water Quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland."

⁸ SSRS-in-Enforcement-of-UWWDA.pdf

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7.2.4 Approach to Impact Assessment

7.2.4.1 Ecological Valuation

The *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) were adopted as part of this methodology for the purpose of evaluating the importance of ecological features within the survey area. The site evaluation criteria from this assessment methodology are reproduced in Table 7.7.

In accordance with NRA guidelines (2009) and CIEEM (2018), impact assessment is only undertaken of Important Ecological Features (IEFs). These are features within the zone of influence of the proposed scheme which are “both of sufficient value to be material in decision making and likely to be affected significantly”. According to NRA guidelines (NRA, 2009), IEFs are of local importance (higher value) or higher as per NRA value criteria. Features of local importance (lower value) are not considered in the guidance to be IEFs and are therefore excluded from impact assessment.

Table 7.7: Site Evaluation Criteria (NRA, 2009)

Ecological Value	Description
Internationally Important	Sites designated (or qualifying for designation) as a SAC or SPA under the EU Habitats or Birds Directives Undesignated sites that fulfil criteria for designation as a European Site Features essential to maintaining the coherence of the Natura 2000 network Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive Ramsar Sites World Heritage Sites Biosphere Reserves Sites hosting significant species populations under the Bonn Convention Sites hosting significant populations under the Berne Convention Biogenetic Reserves European Diploma Sites Salmonid waters
Nationally Important	Sites or waters designated or proposed as an NHA Statutory Nature Reserves Refuge for fauna and flora protected under the Wildlife Acts National Parks Undesignated sites fulfilling criteria for designation as a NHA; Statutory Nature Reserves; Refuge for Fauna and Flora protected under the Wildlife Act and/or a National Park; Resident or regularly occurring populations (assessed to be important at the national level) of species protected under the Wildlife Acts and/or species listed on the relevant Red Data list) Sites containing viable areas of the habitat types listed in Annex I of the Habitats Directive
County Importance	Areas of Special Amenity Areas subject to a Tree Preservation Order Areas of High Amenity, or equivalent, designated under the County Development Plan Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance

Ecological Value	Description
	County important populations of species, or viable area of semi-natural habitats or natural heritage features identified in the National or local Biodiversity Action Plan Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Local Importance (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife Sites of features containing non-native species that are of some importance in maintaining habitat links

Source: NRA 2009

7.2.4.2 Assessment of Likely Impacts

Impacts were assessed and characterised in accordance with the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' EPA (2022) as reproduced in Table 7.8. Important Ecological Features impacts are assessed.

Table 7.8: Impact Magnitude and Duration Criteria (EPA, 2022)

Impact Magnitude	Definition
Quality of Effects	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effects	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.

Impact Magnitude	Definition
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Duration and Frequency of Effects	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

Source: EPA, 2022

7.2.5 Limitations

Every effort has been made to provide comprehensive descriptions of the baseline conditions. No significant limitations were identified.

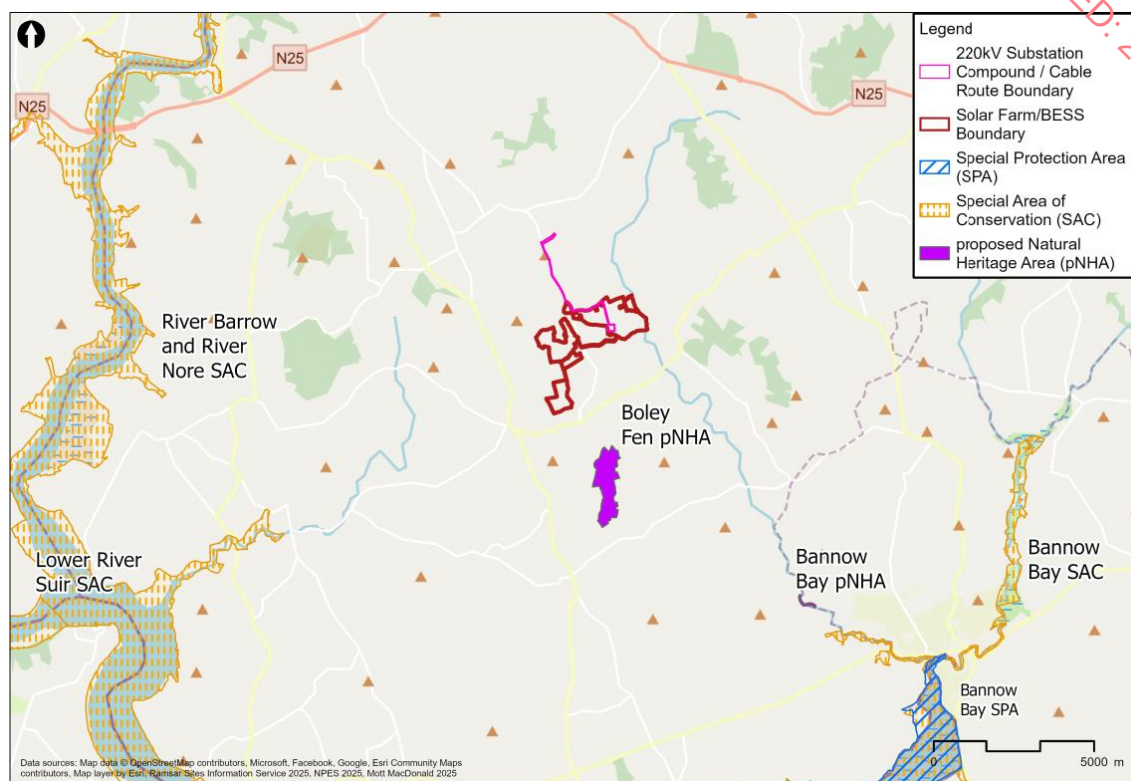
7.3 Receiving Environment

7.3.1 Desktop Study

7.3.1.1 European and Nationally Designated Sites

The location of International and Nationally designated sites in relation to the Proposed Project is presented in Figure 7.4.

Figure 7.4: European and Nationally Designated Sites in the vicinity of the Proposed Project.



Source: Mott MacDonald

RAMSAR

Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention. The Ramsar Convention is an intergovernmental environmental treaty established in 1971 by UNESCO and that came into force in 1975.

There is one Ramsar site. Bannow Bay [840] identified within the Zol of the Proposed Project as outlined in Table 7.9.

Table 7.9: Ramsar Site with Connectivity to the Proposed Project

Site Name	Distance (Km) straight line	Links to other sites	QI
Bannow Bay [840]	15.9	Bannow Bay SAC [000697] Bannow Bay SPA [004033] Bannow Bay Wildfowl Sanctuary	Ecological communities Saltmarsh community <i>Zostera noltii</i> community 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* Species Otter (<i>Lutra lutra</i>) Harbour seal (<i>Phoca vitulina</i>) Eurasian teal (<i>Anas crecca</i>) Eurasian wigeon (<i>Anas Penelope</i>) Light-bellied brent goose (<i>Branta bernicla hrota</i>) Goldeneye (<i>Bucephala clangula</i>) Dunlin (<i>Calidris alpina</i>) Red knot (<i>Calidris canutus</i>) Little egret (<i>Egretta garzetta</i>) Great northern diver (<i>Gavia immer</i>) Red-throated diver (<i>Gavia stellata</i>) Eurasian oystercatcher (<i>Haematopus ostralegus</i>) Bar-tailed godwit (<i>Limosa lapponica</i>) Black-tailed godwit (<i>Limosa limosa</i>) Eurasian curlew (<i>Numenius Arquata</i>) Cormorant (<i>Phalacrocorax carbo</i>) Golden plover (<i>Pluvialis apricaria</i>)

Site Name	Distance (Km) straight line	Links to other sites	QI
			Great-crested grebe (<i>Podiceps cristatus</i>)
			Little grebe (<i>Tachybaptus ruficollis</i>)
			Shelduck (<i>Tadorna tadorna</i>)
			Redshank (<i>Tringa tetanus</i>)
			Lapwing (<i>Vanellus vanellus</i>)

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European Sites

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of the highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises SACs and SPAs. SACs are selected for the conservation of Annex I habitats (including priority types marked by *) which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. These are collectively referred to as “European sites”.

European sites identified as present in the study area and potentially within the ZoI of the Proposed Project are outlined below in Table 7.10.

Table 7.10: European Sites with Connectivity to the Proposed Project

Site Name	Distance between the Proposed Project and European Sites (straight line) at closest point (km)	QI / SCI
Special Protected Areas (SPAs)		
Bannow Bay SPA (004033) ⁹	13.7	Birds A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) A048 Shelduck (<i>Tadorna tadorna</i>) A054 Pintail (<i>Anas acuta</i>) A130 Oystercatcher (<i>Haematopus ostralegus</i>) A140 Golden Plover (<i>Pluvialis apricaria</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) A142 Lapwing (<i>Vanellus vanellus</i>) A143 Knot (<i>Calidris canutus</i>) A149 Dunlin (<i>Calidris alpina</i>) A156 Black-tailed Godwit (<i>Limosa limosa</i>) A157 Bar-tailed Godwit (<i>Limosa lapponica</i>) A160 Curlew (<i>Numenius arquata</i>) A162 Redshank (<i>Tringa totanus</i>) Habitats Wetlands
Special Areas of Conservation (SACs)		
Bannow Bay SAC (000697) ¹⁰	10.6	Habitats 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*

⁹ NPWS (2012) Conservation Objectives: Bannow Bay SPA 004033. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

¹⁰ NPWS (2012). Conservation Objectives: Bannow Bay SAC 000697. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

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7.3.1.2 Sites of National Importance

Natural Heritage Areas

Natural Heritage Areas (NHA) are the basic wildlife designation in Ireland. These areas are considered nationally important for the habitats present, or which that holds species of plants and animals whose habitats needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation (source: www.npws.ie).

No Natural Heritage Areas were identified as present in the study area.

The closest NHA to the Proposed Project is the Slievenamon Bog NHA (002388), located approximately 46.5km west of the Proposed Project, which is assessed as outside the ZoI¹¹.

Proposed Natural Heritage Areas

Proposed NHAs, (pNHAs), are sites which were published on a non-statutory basis in 1995 (and again in the 2010s) but that have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of:

- Agri-environmental farm planning schemes support the objective of maintaining and enhancing the conservation status of pNHAs;
- There is a requirement for the Forest Service to gain NPWS approval before they will pay afforestation grants on pNHA lands; and,
- A recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

Proposed Natural Heritage Areas identified as present in the study area and potentially within the Zone of Influence of the Proposed Project are outlined below in Table 7.11.

¹¹ NPWS 2004, Slievenamon Bog NHA (002388), Site Synopsis

Table 7.11: Proposed Natural Heritage Areas with Connectivity to the Proposed Project

Site Name	Distance between the Proposed Project and Proposed Natural Heritage Areas (straight line) at closest point (km)	Corresponding European Sites	QI
Boley Fen (000699) ¹²	1.0	No	Intermediate fen with wet grassland and tall sedge (<i>Carex</i> spp.) communities. Of interest due to its location, fens are uncommon in the south-east of Ireland. Nationally important for rare species of <i>Diptora</i> (flies): • Anasimyia lunulate, • Psacadina zernyi, • Parhelophilus consimilis, • Pteromicra angustipennis, • Tetanocera puntifrons
Bannow Bay (000697) ¹³		Bannow Bay SAC Bannow Bay SPA Bannow Bay Ramsar Site	See Table 7.10

¹² NPWS (1995), Boley Fen (000699), Site Synopsis

¹³ No specific synopsis available as the site corresponds to European sites. Specific features of interest for these sites are as per Tables 5.6 and 5.7

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7.3.2 Records of Protected/Rare Species and Habitats of Note

7.3.2.1 Mammals

The NBDC compiles records of species across Ireland. Within the database they collect records of protected mammals, both marine and terrestrial.

Records from the NBDC were interrogated for records of protected mammals within the 10km grid squares where the Proposed Project is located, S71 and S72. Additionally, records of rare and protected species received from the NPWS were also consulted. These compiled records are presented within Table 7.12.

Table 7.12: Terrestrial Mammal Species Recorded in the Vicinity of the Proposed Project

Species Name	Protection Level	Grid Squares In Which Recorded
Brown long-eared bat (<i>Plecotus auratus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S72
Daubenton's bat (<i>Myotis daubentonii</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Eurasian badger (<i>Meles meles</i>)	Protected Species: Wildlife Acts	S71, S72
Eurasian pygmy shrew (<i>Sorex minutus</i>)	Protected Species: Wildlife Acts	S71, S72
Eurasian red squirrel (<i>Sciurus vulgaris</i>)	Protected Species: Wildlife Acts	S71, S72
European otter (<i>Lutra lutra</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex II, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Leisler's bat (<i>Nyctalus leisleri</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Pine marten (<i>Martes martes</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex V, Protected Species: Wildlife Acts	S71, S72
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
West European hedgehog (<i>Erinaceus europaeus</i>)	Protected Species: Wildlife Acts	S71, S72
Common dolphin (<i>Delphinus delphis</i>)	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive Annex IV Protected Species: Wildlife Acts	S71

Species Name	Protection Level	Grid Squares In Which Recorded
Common porpoise (<i>Phocoena phocoena</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex II, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts, Threatened Species: OSPAR Convention	S71, S72
Common pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Irish hare (<i>Lepus timidus subsp.</i>)	Protected under the Wildlife Acts	S71, S72
Irish stoat (<i>Mustela erminea subsp.</i>)	Protected under the Wildlife Acts	S71, S72
Natterer's bat (<i>Myotis nattereri</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Whiskered bat (<i>Myotis mystacinus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71

7.3.2.2 Birds

SCIs for relevant European Sites are outlined in Section 7.3.1.1. As described above, a Screening Statement for AA and NIS has been prepared for the Proposed Project, to consider potential adverse effects on SCIs of relevant European sites.

Annex I of the Birds Directive lists species which are:

- In danger of extinction;
- Vulnerable to change in their habitat;
- Considered rare due to small population sizes or a restricted local distribution; and,
- Require attention due to the nature of their habitat.

The National Biodiversity Data Centre (NBDC) contains records of bird species recorded in the 10km grid squares (S71 and S72) within which the Proposed Project is located. Records of bird species of potential conservation interest are provided in Table 7.13.

Table 7.13: Annex I Bird Species Recorded in 10km Grid Squares Overlapping the Proposed Project (S71 and S72)

Species Name	Reasons for Protection / Inclusion of the Species	BOCCI Status	Grid Squares Recorded In
Barn Owl (<i>Tyto alba</i>)	The widespread loss of breeding habitats and some nests are robbed by egg-collectors and to supply a clandestine trade for falconry	Red	S71, S72
Bar-tailed Godwit (<i>Limosa lapponica</i>)	The species is vulnerable due its concentration at a few suitable coastal wetlands outside the breeding season.	Amber	S71
Common Kingfisher (<i>Alcedo atthis</i>)	Its range has expanded this century, but populations have recently fallen in several countries.	Amber	S71, S72
Corn Crake (<i>Crex crex</i>)	Habitat loss and high mortality caused by the intensification and mechanization of hay and silage making	Red	S71, S72
Dunlin (<i>Calidris alpina</i>)	None given.	Red	S72
European Golden Plover (<i>Pluvialis apricaria</i>)	The main threats for the species are the loss and deterioration of habitat and disturbances at the breeding period.	Red	S71
Hen Harrier (<i>Circus cyaneus</i>)	The widespread loss of breeding habitats and the occurrence of localized persecution and destruction of nests.	Amber	S71, S72
Little Egret (<i>Egretta garzetta</i>)	The loss and deterioration of habitats due to drainage and to agricultural and development projects are the major threats that the species is now facing. Extreme weather and predation by Corvids have also been identified as notable threats to the species (Fennelly & Cannon 2015).	Green	S71, S72
Merlin (<i>Falco columbarius</i>)	The main threats to this species are loss of habitats, contamination of birds with organochlorines from agriculture, human disturbance and nest-robbing by falconers.	Amber	S71
Peregrine Falcon (<i>Falco peregrinus</i>)	The widespread post-1960 decline in Peregrine numbers were caused by food-chain contamination with persistent toxic chemical residues, mainly of agricultural organochlorines insecticides. The restrictions and later bans on the majority of persistent organochlorines over most of Europe were followed by the general recovery in Peregrine numbers. Today, some nests are robbed by egg-collectors and to supply a clandestine trade for falconry.	Green	S72
Short-eared Owl (<i>Asio flammeus</i>)	The widespread loss of breeding habitats and increase in predator densities causing an increase in nest predation.	Amber	S72
Mediterranean Gull (<i>Larus melanocephalus</i>)	Loss of habitat, disturbance and tourism development on coastal areas are the major threats for the species. In winter and during migration, Mediterranean Gulls are threatened by illegal hunting, oil pollution and changes in fishing practices.	Amber	S71

In summary, based on the desk study alone the following specific bird species/ groups were considered relevant to the project based on the desk assessment as they may occur within the ZOI of the Proposed Project.

- Barn owl (farmland and old buildings)
- Common kingfisher (riparian areas)
- Waterfowl and gulls (within wider ZOI)

The field surveys focused on these species while recording other potential Target Species that may not be recorded by the NBDC that are known generally to occur in farmland and woodland in Wexford, refer to Table 7.20.

7.3.2.3 Other Species of Note

NBDC records of rare and protected amphibians, reptiles, fish and invertebrates identified within the 10km grid squares the Proposed Project located in is presented in Table 7.14.

Table 7.14: Other Species of Note

Species Name	Conservation Status/Protection Level	Grid Squares in Which Recorded
Common Frog (<i>Rana temporaria</i>)	Protected species: Habitats Directive, Wildlife Acts	S71, S72
Smooth newt (<i>Lissotriton vulgaris</i>)	Protected species: Wildlife Acts	S72
Atlantic Cod (<i>Gadus morhua</i>)	Threatened species: OSPAR Convention	S71
Gatekeeper (<i>Pyronia tithonus</i>)	Threatened species: Near Threatened	S71
Grayling (<i>Hipparchia semele</i>)	Threatened species: Near Threatened	S71
Wall (<i>Lasiommata megera</i>)	Threatened species: Endangered	S71
Hairy Yellow-face (<i>Hylaeus hyalinatus</i>)	Threatened species: Vulnerable	S71
Northern Colletes (<i>Colletes floralis</i>)	Threatened species: Vulnerable	S71
Bronze Furrow Bee (<i>Halictus tumulorum</i>)	Threatened Species: Near threatened	S72
Buffish Mining Bee (<i>Andrena nigroaenea</i>)	Threatened Species: Near threatened	S72
Furry-claspered Furrow Bee (<i>Lasioglossum lativentre</i>)	Threatened Species: Critically Endangered	S72
Groove-faced Mining Bee (<i>Andrena angustior</i>)	Threatened Species: Vulnerable	S72
Painted Mining Bee (<i>Andrena fucata</i>)	Threatened Species: Near threatened	S72
Panzer's Nomad Bee (<i>Nomada panzeri sensu lato</i>)	Threatened Species: Near threatened	S72
Red-tailed Bumblebee (<i>Bombus lapidarius</i>)	Threatened species: Near threatened	S71, S72

Tufted Furrow Bee (<i>Lasioglossum nitidiusculum</i>)	Threatened species: Vulnerable	S71, S72
Shiny-margined Mini-miner (<i>Andrena semilaevis</i>)	Threatened Species: Vulnerable	S72
Shrill Carder Bee (<i>Bombus sylvarum</i>)	Threatened Species: Endangered	S72
Tufted Furrow Bee (<i>Lasioglossum nitidiusculum</i>)	Threatened Species: Vulnerable	S72
Yellow Shell (<i>Campogramma bilineata</i>)	Threatened species: near threatened	S71
Common Lizard (<i>Zootoca vivipara</i>)	Protected species: Wildlife Act	S71, S72

7.3.2.4 Rare and Protected Flora

Records from the NBDC were interrogated for records of rare and protected flora species within the 10km grid squares the Proposed Project is located in; S71 and S72. The species recorded within the last 50 years are presented below in Table 7.15 along with rare/protected flora records received from NPWS, but excluding extinct, and so-called 'Waiting List' species.

Table 7.15: Protected and Rare Flora Records

Species Name	Conservation Status	Protection	Grid Squares Recorded In
Betony (<i>Stachys officinalis</i>)	Threatened Species: Near threatened	Flora Protection Order S.I. No. 235/2022	S71, S72
Borrer's Saltmarsh-grass (<i>Puccinellia fasciculata</i>)	Threatened Species: Vulnerable	Flora Protection Order S.I. No. 235/2022	S71
Chives (<i>Allium schoenoprasum</i>)	Threatened Species: Vulnerable	Flora Protection Order S.I. No. 235/2022	S71
Clustered clover (<i>Trifolium glomeratum</i>)	Threatened Species: Endangered	Flora Protection Order S.I. No. 235/2022	S71
Divided sedge (<i>Carex divisa</i>)	Threatened Species: Regionally Extinct	Flora Protection Order S.I. No. 235/2022	S71
Meadow barley (<i>Hordeum secalinum</i>)	Threatened Species: Endangered	Flora Protection Order S.I. No. 235/2022	S71, S72
Meadow saffron (<i>Colchicum autumnale</i>)	Threatened Species: Critically Endangered	Flora Protection Order S.I. No. 235/2022	S72

7.3.2.5 Invasive Species

Records of invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 were interrogated from the NBDC within 10km grid squares in which the proposed project is located;

Table 7.16: Invasive Species Records

Species Name	Grid Square
Canadian waterweed (<i>Elodea canadensis</i>)	S71
Common cord-grass (<i>Spartina anglica</i>)	S71
Himalayan balsam (<i>Impatiens glandulifera</i>)	S71, S72

Species Name	Grid Square
Japanese knotweed (<i>Fallopia japonica</i>)	S71, S72
Rhododendron (<i>Rhododendron ponticum</i>)	S71, S72
Spanish bluebell (<i>Hyacinthoides hispanica</i>)	S71
Three-cornered leek (<i>Allium triquetrum</i>)	S71, S72
American mink (<i>Mustela vison</i>)	S71, S72
Brown rat (<i>Rattus norvegicus</i>)	S72
Eastern grey squirrel (<i>Sciurus carolinensis</i>)	S72
Giant-rhubarb (<i>Gunnera tinctoria</i>)	S71
Salmonberry (<i>Rubus spectabilis</i>)	S71
Sea-buckthorn (<i>Hippophae rhamnoides</i>)	S71
Harlequin ladybird (<i>Harmonia axyridis</i>)	S71
Dace (<i>Leuciscus leuciscus</i>)	S72
Muntjac deer (<i>Muntiacus reevesi</i>)	S72

These species in particular terrestrial plants were checked for during surveys in areas of potential impact

7.3.3 Field Survey Results

The following summarises results from surveys carried out on site for the Proposed Project. Results are presented in full in the Appendix section.

Figure 7.1 indicates fields where surveys were conducted

7.3.3.1 Habitat Overview

A description of the habitats located within the Proposed Project site is presented hereunder. Habitats were described in accordance with Fossitt (2000). An assessment of the habitats was undertaken in accordance with the NRA Guidance (2009) and CIEEM Guidelines (2018).

A habitat map of the proposed development and surrounding areas is provided in Appendix 7.1. The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009). It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape.

- Habitats that are considered to be good examples of Annex I and Priority habitats are classes as being of International or National Importance.
- Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance.
- Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value).
- Sites containing small areas of semi-natural habitat, or which maintain connectivity between habitats are considered to be of Local Importance (lower value).

A general description of the habitats encountered within the Red Line Boundary is presented Table 7.17 along with their ecological valuation.

Areas which were subject to detailed botanical survey are outlined in Section 7.3.4.2. These surveys informed the design with habitats of high ecological value avoided or impacts minimised

Table 7.17: Description of Habitats Recorded within the Proposed Project Site

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Improved Agricultural Grassland (GA1)	Species recorded included typical common species such as broad leaved dock (<i>Rumex obtusifolius</i>), common chickweed (<i>Stellaria media</i>), clovers (<i>Trifolium spp.</i>), creeping buttercup (<i>Ranunculus repens</i>), creeping thistle (<i>Cirsium arvense</i>), daffodil (<i>Narcissus pseudonarcissus</i>), daisy (<i>Bellis perennis</i>), dandelion (<i>Taraxacum spp.</i>), hairy mouse-ear (<i>Cerastium sp.</i>), hawksbit (<i>Hedypnois spp.</i>), meadow buttercup (<i>Ranunculus acris</i>), mouse ear hawkweed (<i>Pilosella officinarum</i>), common nettle (<i>Urtica dioica</i>), plantain (<i>Plantago spp.</i>), rye grass (<i>Lolium spp.</i>), selfheal (<i>Prunella vulgaris</i>), sheep's sorrel (<i>Rumex acetosella</i>), spear thistle (<i>Cirsium vulgare</i>), and white clover (<i>Trifolium repens</i>). These areas of low ecological value are the focus of the proposed development.	Improved agricultural grassland within the footprint of the Proposed Project is assessed as being of Local Importance (Lower Value) .	 Photo 7.1: Improved Agricultural Grassland (GA1)
Arable crop (BC1)	Arable crop was noted as a commonly occurring habitat within the study area (Photo 7.2). This habitat typically comprises large, open fields of crop, bordered by hedgerows and treelines. This habitat is managed for agricultural land use. These areas of low ecological value are the focus of the proposed development.	This habitat is evaluated as Local Importance (Lower Value) .	 Photo 7.2: Arable crop habitat (BC1)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Tilled land (BC3)	Similar to arable crop tilled land is commonly occurring habitat within the study area (Figure 7.2). This habitat was comprised of tilled fields which had not yet been reseeded for arable crop. These areas of low ecological value are the focus of the proposed development.	This habitat is evaluated as Local Importance (Lower Value) .	 Photo 7.3: Tilled Land (BC2)
Wet Grassland (GS4)	Wet grassland was recorded locally on the site including east Field 14 and Fields a, c, b, 17 and 15. Species recorded within this habitat included rush (<i>Juncus sp.</i>), blue sedge (<i>Carex flacca</i>), wood sedge (<i>Carex sylvatica</i>), dandelion (<i>Taraxacum vulgaria</i>), cuckooflower (<i>Cardamine pratensis</i>), lesser spearwort (<i>Ranunculus flammula</i>), meadowsweet (<i>Filipendula ulmaria</i>), meadow buttercup (<i>Ranunculus acris</i>), silverweed (<i>Potentilla anserina</i>). These areas were identified at an early stage and are largely avoided.	This habitat is evaluated for specific locations in Table 7.18.	 Photo 7.4: Wet Grassland (GS4)
Marsh (GM1)	Marsh was recorded east of Field 14 and west of Fields 15, c and 17. This habitat was recorded grading into wet grassland (GS4) and scrub (WS1). Species recorded within this habitat included rushes (<i>Juncus spp.</i>) purple loosestrife (<i>Lythrum salicaria</i>), meadowsweet (<i>Filipendula ulmaria</i>), flag iris (<i>Iris pseudacorus</i>), great willowherb (<i>Epilobium hirsutum</i>), pondweed (<i>Potamogeton spp</i>), water dropwort (<i>Oenanthe lachenalii</i>), reed canary grass (<i>Phalaris arundinacea</i>), bindweed	This habitat is evaluated for specific locations in Table 7.18.	No image available

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
	(<i>Convolvulus arvensis</i>), greater tussock sedge (<i>Carex paniculata</i>), wild Angelica (<i>Angelica sylvestris</i>). These areas were identified at an early stage and are avoided.		
Treeline (WL2)	Treelines were recorded throughout the red line boundary for the proposed development (Figure 5.1). Species recorded within the treelines included silver birch (<i>Betula pendula</i>), downy birch (<i>Betula pubescens</i>), willow (<i>Salix spp.</i>), holly (<i>Ilex aquifolium</i>), gorse (<i>Ulex europaeus</i>), beech (<i>Fagus sylvatica</i>), blackthorn (<i>Prunus spinosa</i>), brambles (<i>Rubus fruticosus</i>), ivy (<i>Hedera helix</i>), bird cherry (<i>Prunus padus</i>), ash (<i>Fraxinus excelsior</i>), sycamore (<i>Acer pseudoplatanus</i>), hawthorn (<i>Crataegus monogyna</i>), and elder (<i>Sambucus nigra</i>). This habitat is avoided.	Treelines are assessed as being of Local Importance (Higher Value).	 Photo 7.5: Treeline (WL2) Source: Mott MacDonald 2023
Hedgerow (WL1)	Hedgerows were recorded throughout the red line boundary for the proposed development (Figure 5.2). In the northern sections of the Proposed Development the hedgerows were highly managed, with those recorded further south generally less managed examples. Species recorded within this habitat included ash (<i>Fraxinus excelsior</i>), hawthorn (<i>Crataegus monogyna</i>), gorse (<i>Ulex europaeus</i>), blackthorn (<i>Prunus spinosa</i>), brambles (<i>Rubus fruticosus</i>), honeysuckle (<i>Lonicera periclymenum</i>), elder (<i>Sambucus nigra</i>), and sycamore (<i>Acer pseudoplatanus</i>). Except for localised works at some access road crossings this habitat is largely avoided.	Hedgerows are assessed as being of Local Importance (Higher Value).	 Photo 7.6: Hedgerow (WL1) Source: Mott MacDonald (2024)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Earth Banks (BL2) / Stone Walls (BL1)	Earth banks were recorded in on the boundaries of Fields 5, 7, 10 and 11, as field boundaries in a number of locations these earth banks had developed over old stone walls. These earth banks were vegetated typically with species including Yorkshire fog (<i>Holcus lanatus</i>), brambles (<i>Rubus fruticosus</i>), ivy (<i>Hedera helix</i>), and bracken (<i>Pteridium aquilinum</i>). This habitat is largely avoided and some areas are proposed for biodiversity enhancement with additional tree planting..	Earth bank/Stone walls are assessed as being of Local Importance (Lower Value) .	 Photo 7.7: Earth Bank (BL2) Source: Mott MacDonald (2024)
Drainage ditches	Drainage ditches were generally recorded in association with treelines and hedgerows as part of field boundaries (Figure 7.8). Except for localised works on the boundary of the proposed BESS and locally at some access road crossings this habitat is largely avoided.	This habitat is evaluated as being of local importance (Lower value)	 Photo 7.8: Drainage Ditch alongside a treeline Source: mott MacDonald (2023)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Wet Willow Alder Ash woodland (WN6)	This habitat was recorded in riparian areas along the Owenduff River and eastern boundary of Field 16. It was also recored west of Firds a, 29 and 31. Ash (<i>Fraxinus excelsior</i>), elm (<i>Ulmus glabra</i>), sycamore (<i>Acer pseudoplatanus</i>), elm (<i>Ulmus glabra</i>), willow (<i>Salix spp.</i>), poplar (<i>Populus spp.</i>), hawthorn (<i>Crataegus monogyna</i>), alder (<i>Alnus glutinosa</i>), blackthorn (<i>Prunus spinosa</i>), elder (<i>Sambucus nigra</i>), holly (<i>Ilex aquifolium</i>), water dropwort (<i>Oenanthe crocata</i>), flag iris (<i>Iris pseudacorus</i>), golden saxifrage (<i>Chrysosplenium oppositifolium</i>), remote sedge (<i>Carex remota</i>), hogweed (<i>Heracleum sphondylium</i>), wild Angelica (<i>Angelica sylvestris</i>), nettles (<i>Urtica dioica</i>), lesser celandine (<i>Ficaria verna</i>), broad buckler fern (<i>Drioptries dilatata</i>), lady's fern (<i>Athyrium filix-femina</i>), harts tongue fern (<i>Asplenium scolopendrium</i>). This habitat is avoided by the proposed development.	Wet willow alder ash woodland habitat is assessed as being of County Importance .	 Photo 7.9: Wet willow ash woodland Source: Mott MacDonald (2024)
Scrub (WS1)	This woodland is dominated by willow, bramble and marsh species locally within the site and is largely avoided. It forms mosaic habitat with marsh and wet grassland.	Scrub is is assessed as being of Local Importance (higher value) .	No image

7.3.3.2 Detailed Botanical Surveys

Detailed botanical surveys were carried out in semi natural habitats, including GS4, GM1, WN4 and WN6, previously identified during walkover surveys. Surveys were carried out in Fields 15, 17, 29 and 31 as well as fields c, d, w, b and a, refer to Figure 7.1.

Survey results are described within Table 7.18 with the ecological valuation concluded for each field. Species lists for each field, including habitat mosaics, are provided in Appendix 7.2.

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Table 7.18: Results of detailed botanic survey

Field Number	Habitat Type	Habitat Description	Value
Field a	Wet grassland, scrub, marsh, dense bracken and elements of wet heath – GS4 / WS1 / GM1 / HD1 / HH3.	Overall, this field is very species rich and is of high ecological value. This field is adjacent to wet willow woodland. This field can be split roughly into thirds in terms of habitat types. The eastern third (entrance to the field) is cut regularly similar to the adjacent fields to the north and south, access to these fields is also through this part of the field. This part of the field is made up entirely of wet grassland, it is also more species rich than adjacent fields. The middle third is mostly unmanaged wet grassland and scrub/ heath species mosaic, abundant with <i>Molinia</i> and immature willow. Moss cover on the ground increases here and heather (<i>Calluna vulgaris</i>) becomes rare to occasional. There is a notable patch of dense bracken on the south side of this section. The western, wettest and most species diverse portion of the field, is unmanaged marsh and wet grassland mosaic with elements of wet heath.	This field is of County Importance .
Field b	Wet Grassland, Marsh and Scrub mosaic – GS4 / GM1 / WS1	This northern half of this field is a mosaic of wet grassland and scrub. The southern half of the field is very wet with pools forming in areas and is a mosaic of marsh, wet grassland and scrub.	This field is of Local (higher) Importance .
Field c	Wet Grassland – GS4	Similar to field 1 but drier and more birch and gorse regeneration. This field is slightly less species rich than the adjacent field with more scattered devil's bit scabious. This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Fillipendula ulmaria</i> marsh-grassland. Other habitats include Wet grassland GS4, Marsh GM1 and to an extent EU Annex I habitat 6410 <i>Molinia</i> meadow. Given it has a frequent component of Devils bit scabious, it is also likely to be an important site for Annex II species Marsh Fritillary. Both IVC habitat types are almost completely absent from Co. Wexford (O'Neill 2013) with just one known site at Ballynamona Co. Wexford. These IVC habitats otherwise largely only occur in the midlands and northwest.	This field is assessed as being of County Importance .
Field d	Dry Calcareous and Neutral Grassland, with some Wet Grassland – GS1 / GS4.	This field is managed (cut frequently) and drier than the immediately adjacent fields (field c and e) but wetter towards the west end. It was freshly cut during botanical surveys but nevertheless is relatively species poor and has been reseeded in past.	This field is of Local (lower) importance .
Field e	Wet Grassland - GS4	This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Fillipendula ulmaria</i> marsh-grassland. Other habitat classifications it shows an	This field is of County Importance .

Field Number	Habitat Type	Habitat Description	Value
		affinity towards include Wet grassland GS4, Marsh GM1 and to an extent EU Annex I habitat 6410 Mollinia meadow. Given it has an abundant component of Devils bit scabious, it is also very likely to be an important site for Annex II species Marsh Fritillary. Both IVC habitat types are almost completely absent from Co. Wexford (O'Neill 2013) with just one known site at Ballynamona Co. Wexford. These IVC habitats otherwise largely only occur in the midlands and northwest.	
Field 17	Wet Grassland with elements of heath – GS4.	This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Fillipendula ulmaria</i> marsh-grassland. Other habitat classifications it shows an affinity towards include Wet grassland GS4, Marsh GM1 and to an extent EU Annex I habitat 6410 Mollinia meadow. Given it has an abundant component of devils bit scabious, it is also very likely to be an important site for Annex II species Marsh Fritillary. Both IVC habitat types are almost completely absent from Co. Wexford (O'Neill 2013) with just one known site at Ballynamona Co. Wexford. These IVC habitats otherwise largely only occur in the midlands and northwest.	This field is of County Importance .
Field 29	Dry meadow and wet grassland – GS2 / GS4.	This northern field is mostly dry meadow which is more managed, cut more regularly, than the adjacent field to the south. Although, there are patches of wet grassland on the north side of this field.	This field is of Local (higher value) importance .
Field 31	Dry meadow, wet grassland and marsh – GS2 / GS4 / GM1	This field is similar to field 29 in that it is cut quite regularly, and as a result is not as species rich as field a situated between 29 and 31.	This field is assessed as being of Local Importance (Higher Value) importance.

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7.3.3.3 Aquatic Survey

The aquatic surveys provided up to date information on the baseline ecological quality of the Owenduff and Tellarought River.

Owenduff River

Brown trout are present in the Owenduff River (2025 observation). Other fish species may include Salmon, Lamprey Species and Eels as habitat is suitable and water quality (Q3-4) is relatively good, albeit not currently of high quality.

The May 2025 SSSRS assessment determined a score of >7.25 i.e. the river is “probably not at Risk”.

The Q value (Toner et al 2005) assessment determined Q3-4 (Moderate) which is similar to the most recent EPA data (2022) at the closest monitoring point¹⁴ to the site

The River has floating river vegetation consistent with the Annex 1 habitat watercourses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation (3260).

Figure 7.5: River Owenduff with mats of floating river vegetation and glides with abundant trout (*Salmo trutta*)



Tellarought River

This river is a tributary of the Owenduff river.

It has similar water quality to the Owenduff and is likely an important salmonid (sp.) spawning stream.

The SSSRS assessment determined a score of >7.25 i.e. the river is “probably not at Risk”.

The Q value (Toner et al 2005) assessment determined Q3-4 (Moderate).

¹⁴[EPA Maps](#) Station Code: RS13O010100

Evaluation

The Owenduff and Tellarought River are very important aquatic ecology features in the wider Wexford region and are evaluated as **County Importance**.

7.3.3.4 Non Volant Mammals

Badgers

Evidence of badger activity was noted throughout the Proposed Project site and is described within Table 7.19. A total of four active badger setts were identified within the Proposed Project site boundary.

Location information is detailed within a separate confidential report and the design and mitigation will rule out a disturbance risk.

Table 7.19: Badger Signs Recorded During Field Surveys

Feature ID	Feature Recorded	Location Relative to the Proposed Project	Notes
1	Sett (Sett 1)	Located along a southern field boundary, 30m from the Proposed Project layout.	Active badger sett identified within a hedgerow field boundary above a drainage ditch. A total of four sett entrances were recorded at this sett with well-worn paths observed leading to and from the sett entrances along the field boundary and drainage ditch. The sett exhibited evidence of recent activity with fresh spoil and bedding piled up outside of entrances.
2	Sett (Sett 2)	Located within a woodland area, 30m from the Proposed Project layout.	Active badger sett identified within the undergrowth of the woodland corridor habitat with some sett entrances located beneath root systems. A total of seven sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
3	Sett (Sett 3)	Located approximately 65m outside the Proposed Project layout.	Active badger sett identified within the undergrowth of the woodland corridor habitat with some sett entrances located beneath root systems. A total of six sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
4	Sett (Sett 4)	Located within woodland area approximately 30m from the Proposed Project layout.	Active badger sett identified within the undergrowth of the wet woodland habitat with some sett entrances located beneath root systems. A total of twelve sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
5	Snuffle holes	Located within a woodland area approximately 58m west of the Proposed Project site boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area.
6	Snuffle holes	Located within a woodland corridor area approximately 100m north of the Proposed Project boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area.
7	Snuffle holes	Located within a treeline field boundary approximately 17m east of a proposed access.	Snuffle hole located suggesting recent foraging activity has occurred in the area.

Feature ID	Feature Recorded	Location Relative to the Proposed Project	Notes
		track within the Proposed Project layout.	
8	Snuffle holes	Located within the south west corner of a field approximately 20m west of a proposed access track within the Proposed Project layout and inside the Proposed Projectred line boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area,
9	Snuffle holes	Located within a field approximately 4m north of the Proposed Project site's easement, outside of the Proposed Project red line boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area
10	Dung	Located within the western boundary of a field 50m south of the Proposed Project laout within the red line boundary of the Proposed Project.	Dung was identified along a field boundary, not within a latrine
11	Tracks	Fresh tracks were identified within the southern area of the proposed development site located within land parcel UID-004, IGR (S 77667 19063)	

The site supports at least four active badger sett complexes. These setts are located in woodland areas where impacts will be avoided. This small local badger population is evaluated as **Local Importance (Higher)** value. The population using the area around and within the site is likely to be of Local Importance (Higher) value relative to the Wexford County population i.e. less than 1% of the county population.

Otter

No otter holts were identified within the proposed development site. Riparian and river corridors including the Owenduff are used by otters and will be avoided.

The Owenduff River is likely to be an important habitat in the region for otter with connected habitat that runs to Bannow Bay. The otter population using the area around the site is likely to be of Local Importance (Higher) value relative to the Wexford County population i.e. less than 1% of the county population.

7.3.3.5 Volant Mammals - Bats

The key summary findings of the bat survey methods are as follows

Bat Roost sites

Two separate bat roosts were recorded in 2024 within a cluster of old derelict farm buildings at a location adjacent and offsite of the proposed substation. One roost included a single *Myotis* sp, and a separate roost included three Common pipistrelle. A survey conducted again in 2025 here did not record a roost. This roost will not be disturbed by the proposed development and surrounding habitats including woodland and treelines will be retained.

No tree or structure features with potential as bat roosts will be impacted by the proposed development.

Bat activity on the site

2024 Static Detector Data

The most abundant species was common pipistrelle, followed by soprano pipistrelle, Leisler's bat and *Myotis* species. This is a typical species assemblage for lowland farmland.

The majority of activity was recorded was in the mature hedgerows, with high levels of common pipistrelle activity every night, moderate activity by soprano pipistrelles on a regular basis, and occasional nights of moderate activity by Leisler's bat and *Myotis* spp. Field e and Field 26 also had some nights of moderate activity by common pipistrelles and soprano pipistrelles, but Fields 16 and 5 had negligible or low activity by all species.

2025 Static detector Data

Similar to 2024 data the most abundant species was common pipistrelle, followed by soprano pipistrelle. Leisler's bat and *Myotis* species were recorded in low numbers. This is a typical species assemblage for lowland farmland.

The majority of activity was recorded was from the static Detector in Field 16, with high levels of common pipistrelle activity every night, and several nights with high activity of soprano pipistrelle. Low to moderate activity of common pipistrelles and soprano pipistrelles was recorded at all other sampling sites.

Summary

In summary based on 2024 and 2025 data the most important areas for foraging and commuting bats, as expected, were the boundaries of the site near woodland and riparian areas. The smaller fields with higher hedgerow levels at the western part of the site had moderate levels of activity.

In the context of the wider area the bat population in the site is evaluated as being of **Local Importance (Higher Value)**

The extensive open areas of arable and improved farmland had negligible or low bat activity.

7.3.3.6 Breeding Birds

Habitat Suitability for Breeding Birds

Habitats within the Proposed Project site are considered suitable for a variety of common breeding bird species; particularly those associated with farmland, scrub and woodland habitat, including species listed on the BoCCI red and Amber lists.

Breeding Bird Surveys

A total of 11 target bird species (refer to Table 7.6) were recorded during the breeding bird surveys, including those which are listed on the BoCCI4 Red or Amber list (Gilbert et al. 2021) and those listed under Annex 1 (Birds Directive). Table 7.20 summaries the key results of these surveys.

Table 7.20: Breeding Bird Survey Results (2023, 2024 and 2025)

Target and non target (noteworthy) Species Recorded	BOCCI Status	Habitats (fossitt codes)	Max count for individual transect	Transects	Notes
Yellowhammer	Red	BC1, WL2, WS1, GS4, GA1	3	1, 3, 4, 2 and 5	Widespread throughout site.
Swallow	Amber	GA1, GS4, GM1, BL1	4	1	Nesting in stone buildings
Starling	Amber	BC1, WL1, WL2	17	1	
Linnet	Amber	WS1, GS4, GM1	1	1,3	
Willow warbler	Amber	WS1	5	Widespread	
Spotted Flycatcher	Amber	WS1, GS4, GM1	1	1	
Grey wagtail	Red	FW1	1	Owenduff River off site	
<i>Dipper</i>	Green	FW1	2	Owenduff River off site	2 dipper nesting in Neighbourly Bridge, recorded during bat survey
Kingfisher	Amber	FW1	1	Owenduff River off site	
Mallard	Amber	FW1, GS4	3	Owenduff River off site	
Goldcrest	Amber	WN6, WL1, WL2	1		
<i>Buzzard</i>	Green	WN, BC1, GA1, GS4	2	1,	Dead Juvenile found
<i>Sparrow hawk</i>	Green	WS1, GS4	1		
<i>Lesser Black Backed Gull</i>	Amber	BC1	2	1	
<i>Great spotted woodpecker</i>	Green	WN6	2	6	
Woodcock	Red	WS1, WN6, WD3 (off site)	0	2	None recorded. Potential habitat avoided.

No evidence of breeding woodcock was recorded during the dedicated breeding woodcock surveys in May 2024. However, two separate live individuals were recorded during the winter season when flushed from wet grassland during walkover surveys in February 2023.

Incidental Bird Records

Incidental records of birds during walkover and non-bird related surveys are listed in Table 7.21 below.

Table 7.21: Incidental Records of Note

Target Species and non target (noteworthy) Recorded	BOCCI Status	Habitats (fossitt codes)	Date	Max count	Field Number	Notes
<i>Tree creeper</i>	Green	WN6	May 2024	2	16	
Yellowhammer	Red	WL1, BC1	May 2024	1	7, 8, 9, 11, 12, 13, 14	Multiple incidental records, constant presence in these fields
<i>Rook</i>	Green	WL2	May 2024	4 nests	10	Rookery
<i>Buzzard</i>	Green	GA1	May 2024	2	22, 23, 24, 25, 26.	
<i>Long-eared owl</i>		FW2, GS4, WS1	May 2024	1	Flying upstream Owenduff River, entered field northwest of Neighbourly bridge	Seen during bat survey

In the context of the wider area the breeding bird population in **key breeding areas** of the site is evaluated as being of **Local Importance (Higher Value)**

In summary relatively important **breeding bird habitats** on the site and adjacent areas include

- Owenduff River and riparian area (wet grassland, scrub, marsh and woodland). Noteworthy species included; kingfisher, reed bunting, grey wagtail, dipper and stonechat. Off site and no impacts to habitat except pollution considerations.
- The hedgerows and treelines around most of the site which include typical concentrations of red listed yellowhammer a red listed species relatively common in the area. Other noteworthy species include skylark, linnet and a single spotted flycatcher.
- Wet grassland and semi natural woodland and plantation forestry on the western boundary of the site. Snipe, great spotted woodpecker, goldcrest and relatively higher. densities of common passerine species.
- The site also includes a range of common (green listed) breeding passerine species widespread throughout Ireland e.g. wren, robin, blackbird etc. These species typically nest in overgrown and wooded habitats. This fact is considered in Mitigation Section 7.5.

Key breeding bird habitats (wooded areas) are evaluated as being of Local Importance (Higher) value for breeding birds. Open farmland is not an IEF for breeding birds.

The extensive arable farmland fields have limited value for breeding birds with the exception of low densities of breeding skylark. The field edges are used by hedgerow nesting species including yellowhammer, greenfinch and linnet.

7.3.3.7 Wintering Birds

Table 7.22 summarises the survey results from the wintering bird surveys undertaken in 2023 and 2025.

Table 7.22: Winter Bird Survey Results (Summary)

Target (bold) and non target noteworthy species Recorded	BOCCI ¹⁵ Status	Peak Count	
		2023 Surveys	2025 Surveys
Woodcock	Red	1	1
Snipe	Red	22	17
Golden plover	Red	1	-
Cormorant	Amber	1	-
Yellowhammer	Red	8	9
<i>Greenfinch</i>	Amber	2	1
<i>Redwing</i>	Red	10	75
<i>Skylark</i>	Amber	1	90
<i>Owl (unidentified, owl pellet found)</i>	N/A	1	-
<i>Dipper</i>	Green	2	-
<i>Buzzard</i>	Green	2	2
<i>Raven</i>	Green	1	-
<i>Great spotted woodpecker</i>	Green	1	5
<i>Long tailed tit</i>	Green	Unknown	-
<i>Mistle thrush</i>	Green	1	-
<i>Fieldfare</i>	Green	5	6
Jacksnipe	Green	1	-
<i>Jay</i>	Green	-	3
Meadow pipit	Red	-	60
<i>Reed bunting</i>	Green	-	17
<i>Stonechat</i>	Green	-	3

Very low numbers of four waterfowl species (Woodcock, Jack snipe, cormorant and golden plover) were recorded. Snipe was the only abundant waterfowl species noted, and this species is very widespread in Ireland during the winter. Snipe (and Jack Snipe) were mainly recorded in wet grassland and marsh which is avoided by the proposed development. Woodcock is a species of scrub and woodland which is avoided by the proposed development. Cormorant use rivers or fly over the site. Golden plover are attracted to large arable fields but very low numbers (1 on one occasion) indicate that the site is not core habitat for wintering golden plover and abundant alternative fields exist in the region for flocks that move around in the winter.

Red listed passerine (Yellowhammer and meadow pipit) are common on arable farmland in the winter. The arable farmland areas also attract flocks of other wintering small passerines species e.g. linnet (incidental record 200+ noted), meadow pipit (incidental record 60+ noted) and skylark.

In the context of the local area large arable fields and wet grassland / marsh (avoided) are evaluated as being of Local Importance (Higher) value predominantly due to winter passerine flocks. The wetter habitats attract one species snipe and possibly woodcock in locally important numbers and these areas are avoided.

¹⁵ Gilbert, G., Stanbury, A., Lewis, L., (2021) Birds of Conservation Concern in Ireland 4: 2020–2026

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7.3.3.8 Marsh Fritillary

The dedicated marsh fritillary surveys did not identify any evidence of the species despite presence of the food source plant *Succisa pratensis* throughout fields surveyed within the Proposed Project site.

7.3.3.9 Invasive Species

No schedule 3 listed invasive species were recorded.

7.3.3.10 Other Terrestrial Fauna

Other common mammal species recorded included Irish hare, rabbit and fox.

No amphibian or reptile species were noted. Key habitats including wetlands and scrub for these species are avoided

7.3.4 Summary Evaluation of Important Ecological Features (IEF)

Based on review of the ecological baseline, an evaluation of IEFs identified are provided in Table 7.23. Justification is provided for the omission or inclusion of IEFs. Only designated and notable conservation sites which were deemed to have connectivity with the site are considered.

Only IEFs deemed of local importance (higher value) or above will be carried through to the assessment stage.

Table 7.23: Evaluation of IEFs

Ecological Feature		Justification for Inclusion	Conservation Valuation	Important Ecological Features (IEF) Status
Designated Sites and Notable Sites	Bannow Bay SPA (004033)	Hydrological connectivity via Owenduff river adjacent to the site	International	Yes
	Bannow Bay SAC (000697)	Hydrological connectivity via Owenduff river adjacent to the site	International	Yes
	Bannow Bay (000697) pNHA	Hydrological connectivity via Owenduff river adjacent to the site County Yes	International	Yes
Habitats	Wet Grassland (GS4)	Habitat is avoided except locally	Local Importance (Higher) and County examples	Yes
	Marsh (GM1)	Habitat is avoided. A site ecologist is required to ensure indirect impacts are avoided.	Local Importance (Higher) and County examples	Yes
	Hedgerow (WL1)/ Treelines (WL2)	Habitat is largely avoided except locally for some new access points through field boundaries.	Local Importance (Higher)	Yes
	Wet Willow Alder Ash Woodland (WN6)	Habitat is avoided in design. A site ecologist is required to ensure indirect impacts are avoided.	Local Importance (Higher) and County examples	Yes
Aquatic Habitats, riparian areas, fish	Owenduff and Tellarought River and riparian areas	Habitat is avoided in design. A site ecologist is required to ensure indirect impacts are avoided.	County	Yes
Badger	Four separate badger setts identified away from proposed works areas	Badger are protected under the Wildlife Act. One sett is adjacent to proposed fencing. Three others are well removed from potential disturbance areas.	Local (Higher)	Yes
Otter	No holts recorded. Riparian areas are used by badgers	Otter are protected under the Wildlife Act. No disturbance likely as no works proposed near riparian areas	County	Yes
Volant Mammals (Bats)	Roost site identified, treeline, riparian and woodland forage habitat	Roost site is avoided. Impacts to habitat are minimal. Key consideration is lighting and indirect disturbance during construction and operation phase.	Local (Higher)	Yes

Ecological Feature	Justification for Inclusion	Conservation Valuation	Important Ecological Features (IEF) Status
Breeding Birds	Common farmland bird assemblage includes Yellowhammer. Riparian birds associated with Owenduff River. Woodland and some wetland species on western site boundary	Potential localised woody vegetation clearance. Riparian and more extensive woodland and wetland areas are avoided	Local Importance (Higher Value) within key breeding bird habitats only.
Breeding Birds	Open farmland	Low densities of breeding skylark on large arable fields	Local Importance (Lower value)
Wintering Birds	Open farmland in particular arable farmland is used by relatively large numbers of passerines in the winter period. Wet grassland and marsh areas support locally important concentrations of snipe during the winter	Potential loss habitat for wintering finches is a consideration	Local Importance (Higher Value) – Arable farmland and wetland.
Marsh Fritillary	Wet grassland and marsh is potential supporting habitat for rare populations in the wider region	Potential loss of suitable wet grassland habitat for Marsh Fritillary. This habitat is largely avoided in the design but a site EcoW is required to demarcate potential habitat during construction	Local Importance (Higher Value) – Arable farmland and wetland.
Invasive Species	None recorded but may become established in future and risk of introduction during construction phase	Pre construction survey required in works areas.	
Herpetofauna	Amphibians (Common frog and smooth newt)	Common frog and smooth newt are protected under the Wildlife Act. Suitable habitat for foraging common frog and smooth newt is present within the hedgerows and puddles throughout the site	Local Importance (Higher Value)

Ecological Feature	Justification for Inclusion	Conservation Valuation	Important Ecological Features (IEF) Status
Reptile (Common lizard)	Common lizard is protected under the Wildlife Act. Suitable Habitats within the Site are suitable for common lizard, notably well as loose rocks and dead wood, often associated with hibernacula. No evidence of this species was recorded during surveys, but their presence is assumed as a precaution, noting the potential for occupancy within the site prior to the commencement of works.		

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7.4 Do Nothing Scenario/Future Baseline

As recommended by CIEEM (2024), consideration should be given to the likely baseline situation at the time of project construction, as it may not be the same as the conditions at the time of the impact assessment. To determine this, any changes that will alter the conditions prior to the start of the proposed construction should be considered. Construction works related to the Proposed Project will likely begin within 3 years.

Within this timeframe, there will likely be no major changes to the condition and presence of flora and fauna on the site. Disturbance will remain consistent with agricultural activities and mowing continuing as well as maintenance of existing access tracks.

Consequently, baseline conditions are not likely to significantly change. The impact would be neutral.

7.5 Likely Significant Effects

This section aims to quantify the ecological effects of the Proposed Project, with reference to ecological evaluation presented in Table 7.23. All potential impacts are identified in the absence of control measures or mitigation.

Impacts are outlined for Construction Phase (Section 7.5.2). Operational and Maintenance Phase (Section 7.5.3) and Decommissioning Phase (Section 7.5.4).

The assessment informs the requirement of mitigation and / or monitoring measures, which are presented later in Section 7.7, while Section 7.9 presents the predicted residual effects, following the implementation of mitigation and / monitoring measures.

7.5.1 Identification of Impact -Effect Pathways: Rational

Following a review of information within Chapter 1 (Introduction), Chapter 9 (Water), Chapter 10 (Air Quality) and Chapter 11 (Noise and Vibration) of this EIAR, potential effect pathways are considered in line with the rational described in Table 7.24.

Table 7.24: Impact Pathways Rationale

Impact	Rationale	Potential IEF Effected
Construction Phase		
Disturbance/Mortality	Pollutant runoff to watercourses, disturbance of mammal and bird breeding sites	Badger, fish and breeding birds.
Dust	- Large dust emissions will result from earthworks associated with levelling the site where the BESS units are located (not from the solar farm). In addition, underground cables installed from the transformer substation to the terminal substation along the L40332 and L4030. - Medium dust emissions will result from construction of the solar energy farm, BESS units and substation.	Direct - Habitats including wet grassland, marsh, hedgerow/treelines and wet alder ash woodland as well as aquatic habitats and flora, fish, otters and amphibians are low sensitivity receptors within 20m of the Impact. - Increased traffic will increase the risk of introduction of invasive flora species.
Habitat Loss	- Habitat loss due to construction of BESS Units - Habitat loss due to substation - Habitat loss due to access tracks.	Direct:: Localised hedgerow loss due to new access tracks Indirect: Loss of foraging habitat for IEFs including badgers, herptofauna, bats, breeding and wintering birds
Increased Noise and Vibration	- Construction activities are predicted not to result in significant effects - On less trafficked roads, there are predicted significant impacts from noise due to the low existing traffic flows.	Noise impacts from traffic may affect sensitive IEFs including breeding and wintering birds,
Invasive species	No Schedule 3 invasives noted on site but there is a risk of introduction from machinery during construction phase	Imported machinery from other sites with soil material may assist spread of invasive plants such as Himalayan balsam and three-cornered leek.
Light	No impact likely	n/a
Surface and ground water	- Impact to surface water quality from sediment runoff, spillages and discharges - Impacts on drainage patterns from working near watercourses - Impacts from a new water supply and wastewater infrastructure - Impacts on flood risk	Direct: - Habitats including wet grassland, marsh and wet alder woodland are sensitive receptors to changes in water regimes. - Fish and other aquatic species are sensitive to increase sediment, hydrocarbon spills, release of concrete and cement. No instream or riparian works/ disturbance are proposed. - Surface water drainage for the substation and BESS compound will be discharged via an existing drainage ditch which is hydrologically connected to the Owenduff River, potentially affecting aquatic habitats and species. Possible contaminated

Impact	Rationale	Potential IEF Effected
		water from a fire (emergency) will be collected in a separate underground chamber to surface water collection on the site.
Visual	Disturbance to wildlife during the construction phase	None likely as no significant wintering waterfowl or sensitive ground nesting bird species recorded.
Maintenance and Operation Phase		
Disturbance/Mortality	No impacts identified	n/a
Dust	The effects of operation road and traffic contributions from the Proposed Project are low and not significant.	n/a
Habitat Loss	No impacts identified	n/a
Increased Noise and Vibration	No impacts identified	n/a
Invasive species	No impacts identified	n/a
Light	Additional light pollution associated with the new substation and BESS development. Security lighting etc. Refracted/polarised light and lake effect from solar panels on birds	Disturbance to a recorded small bat roost adjacent to the proposed substation. Localised disturbance to commuting and foraging bat populations near hedgerows and treelines. No impacts are likely from refracted light and "lake effect" associated with solar panels., refer to Section 7.5.3.
Surface and ground water	- Filter drains are proposed along proposed access tracks and silt traps and oil/fuel interceptor proposed located upstream of detention pond minimising effect of run off on IEFs. Adverse impacts on surface water quality during operation will be imperceptible (Chapter 9). - Abstraction of ground water for potable water and firefighting purposes will not result in any adverse impacts on surface water quality and is assessed as imperceptible. No groundwater fed habitats (e.g. fens) occur in the vicinity of the proposed BESS development that will be affected.	Direct: - Proposed detention basin will create habitat for amphibians and foraging bats as well as attract invertebrates. - No IEFs are likely to be affected by run off during the maintenance/operation phase or due to abstraction.
Visual	No impacts identified	n/a
Decommissionings Phase		
Summary	No detailed information is available on the decommissioning phase. However, the impacts noted for the construction phase should be referred to.	

7.5.2 Construction Phase Effects

Construction Phase Impacts to IEF are summarised in Table 7.25.

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Table 7.25: Construction Phase Potential Impacts

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Bannow Bay SPA Bannow Bay SAC Bannow Bay pNHA	International	There is a hydrological link to Bannow Bay SPA. The site is not an important area for wintering SCI of these European sites. In the absence of mitigation there is potential for increased soil water runoff during the construction phase. Given the distance (>6km) of the project up stream and the relatively localised nature of works within the overall Bannow Bay catchment, impacts are likely to be temporary and imperceptible at a county scale.
Wet Grassland	Local Importance (Higher) and County examples	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of wet grassland habitat. During the construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc
Marsh	Local Importance (Higher) and County examples	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of marsh habitat. During construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc
Hedgerow (WL1)/ Treelines (WL2)	Local Importance (Higher)	The potential impacts are summarised as follows. - Hedgerow Removed at site entrances (m) - 385.5 (Hedgerow reinstated at site entrances (m) – 213m) - Net hedgerow loss at site entrances = 172.5m - Hedgerow loss for MV cabling crossing from Array B/C to A – 20m – not replaced. - Other hedgerow impacted - 132.5m. In total net 305 m of permanent hedgerow loss for new access routes. In the absence of mitigation this is assessed as a permanent moderate effect at a local scale in the absence of mitigation.
Wet Willow Alder Ash Woodland (WN6)	Local Importance (Higher)	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of marsh habitat. During construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc.

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Aquatic and riparian habitats, fisheries: Owenduff and Tellarought River and associated bankside habitats (riparian)	County Importance	This habitat is avoided in the design of the proposed development. Given riparian areas are very close to proposed works areas there is a potential for a pollution incident (s) during the construction phase and disturbance to riparian habitat at the Owenduff and Tellarought River During construction phase there is potential for significant runoff as there will be extensive earthworks and land reprofiling associated with the BESS groundworks. Impacts assessed as temporary and significant effect at a county scale in the absence of mitigation.
Badger (4x sett away from Proposed Project)	Local (Higher) Importance	Three of the badger setts are well removed from the proposed development and are not at risk of disturbance. One sett is close to proposed fencing (<10m). There is low potential for disturbance to badgers at this location (Confidential). During construction phase there is potential for temporary and moderate effects at a local scale in the absence of mitigation
Otters	County Importance	No otter holts are likely to be disturbed. There is potential that a holt could establish in works areas i.e. drainage ditch between the most recent survey and construction phase. During construction phase there is potential for short term and moderate effects at a local scale in the absence of mitigation
Bats	Local (Higher) Importance	No trees with potential as bat roosts will be disturbed. There is potential for noise and vibration disturbance to a very small bat roost (local importance) adjacent to the proposed substation. In the absence of mitigation there is potential for short-term slight effects at a local scale. The small roost may bats temporarily get disturbed during construction phase though bats would likely return post construction.
Breeding birds	Local (Higher) Importance	Localised hedgerow clearance (see hedgerow impact above) during construction may lead to disturbance if trees are removed during the bird breeding season (March – September inclusive). In the absence there is potential for short tern slight effects at a local scale.
Wintering birds	Local (Higher) Importance	Works during the wintering period will likely lead to localised disturbance / displacement to flocks of wintering passerine species that use the site. This effect is likely to be imperceptible as abundant alternative habitat is available in the locality.

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Marsh Fritillary	Local (Higher) Importance	Potential for suitable habitat to be impacted / damaged in construction phase. No Marsh fritillary noted but important to retain potential habitat as this species is very rare in region. This effect is likely to be imperceptible at a local scale.
Invasive Flora	Schedule 3 listed invasive species	None recorded on the site. A risk exists of transfer of invasive species to the site and adjacent aquatic habitats during the construction phase. In the absence of mitigation potential for permanent moderate effects at a local scale. Noted that three cornered leek and Himalayan balsam may be introduced which are currently scarce locally, but very common in other parts of Ireland and spread rapidly if introduced.
Amphibians	Local (Higher) Importance	Suitable breeding and typical forage habitat will be avoided by the proposed development, no direct impacts. There is potential for disturbance to suitable habitat during the construction phase. In the absence of mitigation there is potential for imperceptible effects at a local scale.
Reptiles	Local (Higher) Importance	Suitable breeding and typical forage habitat will be avoided by the proposed development, no direct impacts. There is potential for disturbance to suitable habitat during the construction phase. In the absence of mitigation there is potential for imperceptible effects at a local scale.

7.5.3 Operational and Maintenance Phase

Operational including Maintenance Phase Impacts to IEF are summarised in Table 7.26.

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Table 7.26: Operational Phase Potential Impacts

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Bannow Bay SPA Bannow Bay SAC Bannow Bay pNHA	International	A key consideration is potential risk of runoff from contaminated water associated with a fire which would present a risk to wintering birds in Bannow Bay SPA. This is addressed in more detail in the NIS. Design mitigation includes a fire water storage system which will avoid risk of toxic runoff to the Owenduff river which is hydrologically connected to Bannow Bay SAC, SPA, pNHA. No significant impacts are likely. The site is not important as an ex situ wintering bird site based on desk and field surveys conducted. The presence of a large array of solar panels potentially attracting waterbirds is discussed here and in the accompanying NIS.. No measurable adverse effects are likely to remote SCI birds that may possibly fly/ migrate over the site from the new solar and other developments (including additional overhead line and other infrastructure for the new substation and BESS). It is acknowledged that migrating waterfowl may potentially fly over the site, but in general based on the field surveys conducted, and desk study, the baseline is that the area of the proposed development is not attractive to wetland birds. The only waterfowl species of note using the site in winter is the locally common snipe which are widespread across Ireland in the winter. Studies on “lake effect hypotheses” i.e. solar park looking like a lake which may attract waterfowl which collide with solar panels, were reviewed. Studies include Diehl <i>et al</i> (2021)¹⁶ identify that solar parks can influence flight patterns in that birds may fly closer to “look” at solar arrays in arid areas, but generally reorientate and continue flights. No dead birds were found in solar facilities for this study. As the Proposed Project is well removed from wetlands in the wider region it is likely that risks to migrating birds from “lake effect hypothesis” are imperceptible and not a likely significant effect.
Wet Grassland	Local Importance (Higher) and County examples	The management of these habitats will require consideration during the operational phase as some areas may be cut off and not grazed or excessively grazed if sheep are used. In the absence of mitigation (ecologist advice for

¹⁶ Diehl, Robert, Bruce Robertson, Karl Kosciuch. 2021. Investigating the “Lake Effect” Influence on Avian Behavior From California’s Utility-Scale Photovoltaic Solar Facilities . California Energy Commission. Publication Number: CEC-500-2024-055.

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
		management of these habitats) operational (indirect) impacts may be long term moderate at a local scale, if these habitats are not retained and revert to a low value rank grassland or woodland type habitat.
Marsh	Local Importance (Higher) and County examples	The management of these habitats will require consideration during the operational phase as some areas may be cut off and not grazed or excessively grazed if sheep are used. In the absence of mitigation (ecologist advice for management of these habitats) operational (indirect) impacts may be long term moderate at a local scale, if these habitats are not retained and revert to a low value rank grassland or woodland type habitat.
Hedgerow (WL1)/ Treelines (WL2)	Local Importance (Higher)	No significant effects are likely.
Wet Willow Alder Ash Woodland (WN6)	Local Importance (Higher)	No significant effects are likely.
Aquatic and riparian habitats as well as fish: Owenduff and Tellarought River and riparian areas	County Importance	The proposed design including a separate chamber for collection of potential contaminated water in the event of a fire and a separate attenuation pond mean no significant pollution or other impacts to aquatic habitats and fisheries are likely.
Badger (4x sett away from Proposed Project)	Local (Higher) Importance	No significant effects are likely.
Otters	County Importance	No significant effects are likely.
Bats	Local (Higher) Importance	Low level security (automatic) lighting is proposed at the substation and BESS plant. It is likely that this will lead to localised increased levels within 100m of a small bat roost and commuting and forage habitat (Hedgerows) local to the roost. This is likely to result in a permanent imperceptible effect noting that similar developments have been assessed by Mott MacDonald ecologists where bats continue to roost in roost features adjacent to new substations
Breeding birds	Local (Higher) Importance	Impacts to suitable hedgerow breeding habitat have been carefully considered and will be minimised with additional replanting post construction. There will be a change in land management to grassland under the solar panels and localised additional hedgerow and other biodiversity enhancement away from new, refer to Section 7.7 and 7.8. This may result in less food availability locally for Yellowhammer, Linnet and more specialised breeding birds of farmland.

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
		Given low numbers and abundant alternative habitat as well as likely more "weedy" areas developing near hedgerows, impacts are likely to be long-term imperceptible .
Wintering birds	Local (Higher) Importance	There will be permanent loss of relatively extensive areas of arable farmland used by wintering flock of passerines including meadow pipit, and skylark. This impact is assessed as long term slight adverse at a local scale
Marsh Fritillary	Local (Higher) Importance	No significant effects are likely.
Invasive Flora	Schedule 3 listed invasive species	No significant effects are likely.
Amphibians	Local (Higher) Importance	No significant effects are likely.
Reptiles	Local (Higher) Importance	No significant effects are likely.

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7.5.4 Decommissioning Phase

The activities associated with the decommissioning phase will be similar to those associated with the construction phase. Therefore, provided that appropriate mitigation is used, the impacts of the decommissioning phase should be, as a worst-case scenario, similar to those at construction phase. A Decommissioning Management Plan (DMP) will be prepared by Gen7 Renewables Energy Ltd.

7.6 Cumulative Effects

Cumulative effects take account of the addition of many minor or significant effects to create larger, more significant effects. As outlined in the EIAR Guidelines, while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant.

A single effect which may, on its own, have a significant effect, may also have a reduced and insignificant impact when combined with other effects. This section 7.6 addresses the cumulative effects of the project alone (including the various project elements) and 'other developments' which may act cumulatively.

7.6.1 Intra-Project Cumulative Effects

In the case of the proposed development, potential intra-project parts (solar, BESS and substation) effects are considered under the project alone (Section 7.5).

The BESS, substation and solar park effects are outlined specifically where potential impacts are likely due to impacts on specific biodiversity receptors in sections 7.5.2 (construction) and 7.5.3 (operation). The main impacts overall include localised loss of hedgerows (new access tracks), potential surface water pollution and lighting.

7.6.2 Other Projects/Developments

The nature and scale of the other development has been evaluated and the potential for temporal overlap within the topic-specific zone of influence (Zoi) has been assessed, having regard to the potential for significant cumulative effects. It is considered that given the nature and scale of the Proposed Project and nature of potential impacts that a local scale (10km from the proposed development) is the maximum distance for possible cumulative effects.

A planning search for applications was conducted in August 2025 (including An Bord Pleanála, Wexford, Kilkenny and Waterford County Council's websites) of projects within 10km, Table 7.27. The full list of projects considered is available in Chapter 3 – EIA Methodology.

None of these projects occur locally to the Proposed Project which is a rural farming area. The key cumulative impacts considered are loss of habitat and water quality risks (Owenduff River catchment) linked to the downstream Bannow Bay SAC/ SPA.

Table 7.27: Projects and Proposals that Might Act in-Combination with the Proposed Development

Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
Local Authority - S34.					
Wexford County Council					
20181743	PERMISSION FOR RETENTION OF UPGRADES TO WASTEWATER TREATMENT PLANT, PERMISSION FO	New Ross M.D.	13th March 2019	10km	An Appropriate Assessment screening report concluded that there is no potential for significant effects to Natura 200 sites. There is also no hydrological connection to the Proposed Development. As such, given the nature and scale of the development, no potential for in combination effect is identified. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
20220900	Permission for a 10-year planning permission for development which will consist of the construction of a solar PV farm with an operational life of 35 years on a site of 12.6 hectares.	Ballygowry, Killesk	26th August 2022	5km	A Natura Impact Statement was produced in relation to this development. The report identified the following effects with potential to adversely affect the conservation objectives of Bannow Bay SPA and Bannow Bay SAC: Loss of, or disturbance to habitats, and the potential impairment of water quality. Mitigation measures were proposed within the report to ameliorate this risk. No cumulative effects are likely to other biodiversity receptors described for the proposed development. Given the location of the development relative to the Proposed Development, should works be carried out concurrently there is potential for cumulative impacts with the proposed development due to loss of or disturbance to habitats, and degradation in water quality.
20230871 / ABP-318204-23	Permission for development consisting of: A 10 year planning permission for the construction of a Grid Stability Service Development and all associated site clearance and site development works. The proposed grid stability service development consists of the provision of a synchronous condenser within a building circa 13 metres in height; elevated modular containers to house electrical and control equipment and all associated plant/apparatus including: a) a generator circuit breaker, b) transformers, c) outdoor cooler equipment, d) underground cabling (including a connection to the existing substation, e) all associated above ground cabling, piping and electrical connections, f) 1 no. generator and associated diesel tank, g) firewater tank and pumphouse, h) perimeter fencing and 2 no. gates and i) all associated site development works including hardstanding, drainage, gabion wall and landscaping. The proposed site clearance works include the removal of a temporary portacabin and construction rubble from the site. The application relates to an establishment which holds an Integrated Pollution Prevention and Control (IPPC) license and to which the major accident regulations apply.	Greatisland, Kilmokea	Case is due to be decided by 22/02/2024	9km	An appropriate assessment provided with the application states that this project will not have any significant effects on any Natura 2000 site.
Kilkenny County Council					

Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
2314510	development from townland of Marshmeadows, New Ross, Co. Wexford to townland of Raheen, Rosbercon, Co. Kilkenny. The project passes under the River Barrow across the county boundaries of Wexford and Kilkenny. The development consists of (1) Medium Voltage (MV) electricity system improvement by the installation of a new 20kV electricity underground cable (UGC) by means horizontal directional drilling (HDD) under the River Barrow to connect the Lake Region circuit at Marshmeadows, County Wexford to the Beechgrove circuit at Raheen, Rosbercon, County Kilkenny. From end to end the UGC measures approximately 580m. The majority of the circuit, approximately 365m will be installed by HDD under the River Barrow. The remainder of the circuit, approximately 215m will be a UGC installed by traditional trenching and ducting means. Approximately 355m of this UGC will be installed within County Wexford and the remaining 225m will be installed within County Kilkenny. (2) A second "spare" duct will be installed within the HDD to enable a second circuit to be installed at a future date to further enhance and future proof the network. (3) Permission is sought for all associated works including temporary works required. Planning permission is sought for a ten (10)year period. A Natura Impact Statement (NIS) has been prepared and will be submitted to the planning authority with the application	Raheen , Rosbercon , Co. Kilkenny	December 8, 2023	10	ESB report (NIS within "Planning & Environmental Considerations Report") state that the project will have no adverse effects on the Natura 2000 sites. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
Waterford County Council					
SID/ ABP Developments					
308906	Proposed development will form part of the Greenlink Interconnector and will consist of the development of a new converter station, tail station, MV substation and 23km of high voltage direct current (JVDC) electricity cables, 420m of high voltage alternating current (HVAC) cables, 23.42km of fibre optic cable and all associated site works with an overall proposed development site area of 83.8ha.	Great Island, Kilmannock, Dunbrody, Saltmills, Grange, Kilhile, Rosetown, Coleman, Ramsgrange, Kilbride, Ballinruan, Aldridge, Booley, Broomhill, Lewistown, Kilcloggan, Templetown, Graigue Little, Graigue Great, Lambstown and Ramstown in Co. Wexford	June 23, 2021	7km	The NIS created by DixonBrosnan have stated that the project will not have significant effects as long as mitigation is followed. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
302475	Ten-year permission for a solar farm on a site of approximately 152.8 hectares	Raheenduff, Haresmead, Rosspile, Coolcliffe, Horetown North, Clongeen, Co Wexford	July 5, 2019	8.52 km	Natura sites screened out due to no hydrological connection. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
318103	Development of a new electricity circuit. A Natura Impact Statement (NIS) has been prepared.	New Ross, Co. Wexford	Case is due to be decided by 07/02/2024		NIS resulted in no significant effects on the Natura 2000 network. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
318204	Grid stability service development and associated site works.	Great Island Power Station, Great Island, Campile, New Ross, Co. Wexford	Case is due to be decided by 22/02/2024	8.94km	Decision status still live. NIS is required but no documents are available at the link provided. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
315856	The development consists of an existing 25 metre high telecommunications support structure and associated works as previously granted under local authority reference 13/30.	Drumdowney Upper Townland , Murtaghstown , Co. Kilkenny	26/03/2024	10.84 km	Inspectors report states that the AA screening screened out effects on any Natura site. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
307962	Construction of an 18 metre high free standing communications structure.	Grange (ED Fethard), Fethard, Co. Wexford.	04/02/2021	13.69 km	No AA/NIS/EIAR done as project was deemed too small to require one. No cumulative effects are likely to other biodiversity receptors described for the proposed development.

Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
318914	110kV substation and 110kV underground grid connection	in the townland of Great Island, Kilmokea, County Wexford. (kilmokeagreatislandsubstation.ie)	Case is due to be decided by 17/07/2024	8.75 km	AA screening determined the proposed project to not affect any Natura 2000 site, directly or indirectly. No cumulative effects are likely to other biodiversity receptors described for the proposed development.

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7.7 Mitigation and Monitoring Measures

Mitigation is prescribed in accordance with the EPA guidance on EIAR (EPA, 2022) which requires mitigation by avoidance as a first approach. Where this is not feasible, measures to prevent impacts from giving rise to adverse effects will be adopted (eg design of bunded storage for chemicals). Where impacts cannot be avoided, eg generation of noise, mitigation by reduction of impact is required to limit the exposure of the receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor).

Mitigation is prescribed hereunder to address the impacts such that adverse effects do not occur.

Mitigation is described with respect to:

- how the measures will avoid/prevent/reduce the adverse impacts on the site to an acceptable level;
- the degree of confidence in their likely success;
- the timescale, relative to the project, when they will be implemented;
- how and when the measures will be monitored.

Care has been taken throughout the design process to avoid impacts to sensitive ecological receptors. Additional mitigation measures to ameliorate the impacts as described in this chapter are outlined hereunder. These are incorporated into the CEMP for the proposed development.

Mitigation measures were designed in accordance with the mitigation hierarchy. This is a sequential order of mitigation actions whereby the preference for mitigation measures is as outlined below:

- Avoidance: Steps to avoid harm to biodiversity.
- Minimisation: Where adverse effects cannot be avoided, action is taken to minimise these effects.
- Compensation: Only considered after all possibilities for avoidance and minimisation of effects have been implemented.

As outlined previously in Chapter 5, the design of the Proposed Project has been an iterative process. In the early stages of the project, ecological sensitivities formed part of the consideration of alternatives. This has continued into the design of the Proposed Project for consent, in that, where Important Ecological Features (IEFs) have been identified, the design has been amended to avoid / minimise risk of effects in the first instance. Biodiversity assessments provided a comprehensive consideration of the biodiversity identified and communicated constraints at the earliest opportunity to the design team.

A preliminary Ecological Assessment including a site visit and desk study was conducted at the commencement of the project programme to inform the proposed design and identify sensitive ecological receptors within the site for avoidance of infrastructure as far as possible.

Additional mitigation measures to further avoid and/or reduce the effects as described in Section 7.5 are outlined hereunder.

These will be incorporated into the CEMP for the Proposed Development as outlined in Chapter 5 (CEMP is contained within Volume 3, Appendix 5.1).

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7.7.1 Construction Phase

7.7.1.1 Pre-Construction Confirmatory Surveys

Given the dynamic distribution of species and habitats over time significant changes can arise between baseline surveys and construction. For example, invasive species distribution may change following treatment, or dispersal by humans, animals, or water.

In advance of enabling works, the Contractor will commission targeted pre-construction confirmatory surveys of IEFs outlined in this EIAR. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for:

- Otter breeding/resting sites within the Zol of the Proposed Development, 150m for breeding sites; noting that TII guidance recommends 20m for non-breeding sites.
- Badger setts within the Zol of the Proposed Development (locations as per Appendix 7.2).
- Invasive species a resurvey.
- Confirm presence of wetland (Marsh and wet grassland) habitats

Invasive species surveys will be carried out having regard to Guidance of Transport Infrastructure Ireland¹⁷. All other surveys will be carried out having regard to relevant guidance e.g. NRA (2009).

The Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of river crossings. Survey methods will be as per *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* where access is available within third party lands affected by infrastructure. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.

The Contractor's ECoW will conduct confirmatory badger surveys having regard to *Surveying Badgers* (Harris et al.1989) and record signs of badgers including tracks, hair, latrines and setts.

The extent of survey area for badger surveys will be defined with regard to *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes* (NRA, 2006) as 150m beyond all works areas within suitable habitat.

Should works progress within habitat identified as suitable for amphibians during the spawning season (March/April are the peak breeding months within the programme of the works) a pre-construction confirmatory survey for frogs and newts will be undertaken within peatland habitat.

All surveys will be undertaken by a suitably qualified ecologist (s) who may be the Contractors ECoW, but who will have demonstrable experience in the survey and assessment of the feature.

The results of pre-construction confirmatory surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping.

Ecological Clerk of Works (ECoW)

An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

¹⁷ TII (2020) <https://www.tiipublications.ie/library/GE-ENV-01105-01.pdf>

The ECoW will be suitably experienced and will have experience of identifying species rich wet grasslands and marsh habitats to be avoided or works areas minimised if no alternative access available noting habitat will be retained and expected to recover post construction..

The Contractor's ECoW will have stop works authority, in agreement with the Independent ECoW within the Employer's Representative Team.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), and have demonstrable experience in ecological supervision, water quality protection during construction and habitat restoration works.

No disturbance licenses are required based on baseline surveys up to September 2025. However, bats, otter and badger breeding sites may become established in the next few years in areas that could be disturbed before construction commences. The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised. The ECoW will have stop/ start work authority in particular in relation to water pollution protection measures.

The Contractor will provide all necessary method statements to the Contractor's ECoW to demonstrate how mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt fence, silt traps) and ground protection (i.e. bog mats).

Independent Ecological Clerk of Works (ECoW)

An independent Ecological Clerk of Works (ECoW) will be employed on behalf of the Employer's Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

Reporting

Survey reporting and mapping will also be provided to the Developer, and as additionally required by any planning conditions.

7.7.1.2 Terrestrial Habitats

Semi natural wet grassland and marsh habitat identified in Appendix 7.1 Habitat Map will be avoided. If localised access is required for machinery to cross these areas then the area will be minimised in consultation with the site EcOW. Wet grassland and marsh will not be used as laydown or storage areas. The site Ecow will mark these areas and/ or outline them to Contractors to ensure they are not impacted.

In relation to hedgerows loss a detailed Landscape plan (Appendix 5.3 , Volume 3 of this EIAR) has been developed for the site which will result in a net increase in hedgerow and linear woodland planting on the site compared to hedgerow loss including;

- 2,700 linear meters of degraded hedgerow (earth bank (BL2) with few woody species will be replanted and reinforced to develop high quality hedgerows.
- 3,800 linear meters existing hedgerow will be retained and reinforced with new planting.
- 8,600 linear meters of higher quality hedgerow will be retained with no works proposed.

- Retention of key habitats of biodiversity habitat (wet grassland, marsh and woodland) within the site and avoiding important offsite riparian and river habitats (Owenduff and Tellerought Rivers).

This replanting and reinforcement planting of low diversity earth bank (BL2) field boundary habitat far exceeds the estimated 305m of hedgerow that will be permanently lost to facilitate new access points and the proposed cable route.

In addition, biodiversity enhancement measures are proposed that will further increase biodiversity value and woodland extent on the site, refer to Section 7.8.

In summary over 15% of the total development area of the Energy Farm will be set aside for Biodiversity conservation and enhancement.

7.7.1.3 Badgers

Where applicable following the preconstruction survey, heavy machinery will not be permitted within 30 m of an active badger sett, although lighter machinery may be used within 20 m and light work such as vegetation clearance can generally be undertaken within 10 m of setts (NRA, Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes, 2005). Where avoidance measures and exclusion zones cannot be used, consultation with NPWS will be necessary to permit disturbance (noting that the NPWS does not presently issue derogation licences for badger sett disturbance or destruction but can give authorisation and should be consulted). This assessment assumes that if authorisation is granted then appropriate mitigation and compensation will be provided. During the breeding season (December to June inclusive), none of the above works shall be permitted within 50 m of any active setts.

7.7.1.4 Otters

In advance of construction works, the Contractor will commission pre-construction confirmatory surveys of IEFs outlined in the EIAR. These surveys will update the findings of the surveys completed to date. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for:

- Otter breeding/resting sites within the ZoI of the Proposed Project (150 m for breeding sites, where access allows at river crossings);
- The Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of the works areas (where access is available from affected landowners) as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.

7.7.1.5 Bats

No features likely to support bat roosts requiring removal were identified within potential works areas.

Temporary lighting may be required during the construction phase of the works. Any temporary lighting associated with the construction works will be placed strategically by the Contractor following consultation with the ECoW, such that illumination beyond the works area is controlled and kept to a minimum. Lighting will be cowed and directional, to reduce significant light splay. Lighting will be directed away from potential roosts and foraging habitats. Low level security (automatic – triggers only when persons enter substation) lighting is proposed at the substation and BESS plant. It is likely that this will lead to localised increased levels within 100m of a small bat roost and commuting and forage habitat (Hedgerows) local to the roost. However this will

not be consistent lighting and most of the time the substation lighting will be same as baseline (pre development).

7.7.1.6 Breeding Birds

Pre-construction nest check surveys will be carried out for breeding birds prior to removal of limited areas of required hedgerow. Surveys will also be conducted within arable farmland for skylark prior to construction of access tracks, earthworks, construction of BESS units and substation construction. If nesting activity is observed, then the programme of works will be modified to avoid significant disturbance risk e.g. vehicular movements, exclusion zones and personnel present. The nest area will be monitored until fledging occurs or the nest site becomes inactive after which works can commence.

The removal of vegetation which may be used as nesting sites by breeding birds, will be cleared where possible outside of the birds nesting season (1st March to 31st August inclusive).

Where vegetation clearance is proposed within the nesting season, a suitably qualified ECoW will conduct pre-construction surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event where pre-construction surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance), and no vegetation clearance may proceed until young have fledged, or nesting has failed. Pre-construction confirmatory surveys will be undertaken no more than 72 hours before clearance, after which repeat surveys will be required if vegetation has not been cleared.

The loss of hedgerow will be compensated for by the planting of a greater extent of hedgerow along the periphery of the Proposed Project site, as outlined in the restoration plan.

7.7.1.7 Wintering Birds

No specific mitigation is required for wintering birds during the construction phase

7.7.1.8 Marsh Fritillary

Potential habitat for Marsh Fritillary occurs at the northwest of the site near Fields 15 and 17, Refer to Figure 7.1. These areas include semi natural wet grassland and marsh habitat identified in Appendix A Habitat Map.

These areas will not be used as laydown or storage areas. The site ECoW will mark these areas and/ or outline them to Contractors to ensure they are not impacted, and any access is minimised and habitat retained.

7.7.1.9 Herpetofauna

Should works progress within habitat identified as suitable for amphibians during the breeding season (March and April) a pre-construction confirmatory survey for frogs will be undertaken. The Contractor will commission pre-construction confirmatory surveys of amphibians within drainage ditches where works are proposed.

Where common frog is recorded within the footprint of the works, any spawn or adult frogs recorded will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat. This will be carried out under license from the NPWS.

Should hedgerow removal occur during the hibernation period (October to March), impacts to torpid reptiles will be mitigated. Hedgerow removal should occur by cutting down and raking off the vegetation to allow for the displacement of common lizards.

7.7.1.10 Invasive species

No schedule 3 listed species were recorded. However, they could establish before construction phase. Prior to works commencing a full confirmatory invasive species survey will be carried out by the contractor's ECoW in accordance with Guidance of Transport Infrastructure Ireland¹⁸. All other surveys will be carried out having regard to guidance of NRA (2009). The pre-construction invasive species surveys will be carried out within the works areas, including compound locations and laydown areas, and along proposed access tracks to identify the presence of all invasive species within and adjacent to works areas.

Any additional findings of this invasive species survey will be incorporated into the final CEMP for the works. The measures relating to the Invasive Species will be identified prior to any works commencing. These measures will be regularly reviewed and updated throughout the works to include for any additional invasive species encountered.

The Invasive Species Management Plan will set out site-specific and species-specific measures to manage invasive species. It will incorporate the following measures as a minimum:

- All machinery will be steam-cleaned prior to entering site
- Any stands of invasive species that are recorded within the site will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for, noting the reduced extents for Japanese knotweed based on recent research (Fennell et al., 2018). No works will be carried out within the exclusion zones unless fully supervised by the Contractor's ECoW.
- The Contractor's ECoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species.
- A Check, Clean, Dry protocol will be undertaken with all equipment, machinery and vehicles entering and leaving the application site boundary.
- Any fill that is required will be from a licensed facility identified by the contractor.

7.7.1.11 Mitigation Against Water Quality Impacts to Surface Water

Mitigation measures will ensure all impacts associated with construction are controlled and managed.

The measures prescribed are best practice measures and are proven technologies/methods. Mitigation and monitoring will be legally binding and outlined as a requirement in contracts.

Pollution prevention measures will be in place before the construction works commence and maintained throughout the construction and post construction including landscaping stages.

Daily monitoring of all pollution control measures will be required to be carried out and recorded by the Contractor. As outlined monitoring and maintenance of effective pollution prevention measures based on standard best practise outlined herein will be legally binding and detailed in contracts in advance of project authorisation.

All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for '*Environmental Good Practice on Site*' (C741) and '*Control of water pollution from linear construction projects. Technical guidance*' (C648).

The following shall apply with regard to contractor responsibility:

- A waste management plan to ensure that waste generated during the project will be managed in a way that ensures the relevant provisions of the Waste Management Act 1996

¹⁸ TII (2020) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. Available online: <https://cdn.tii.ie/publications/GE-ENV-01105-01.pdf> [Accessed 11 September 2025]

and associated amendments and regulations are met, particularly with regard to the use of appropriately permitted Waste Contractors and destinations for waste materials.

- A Sediment Erosion and Pollution Control Plan will be implemented for all construction works. This includes measures to manage soil and silt-laden water on site, accidental leaks/spills to ground and water quality monitoring to ensure compliance with environmental quality standards specified in the relevant legislation. The plan for erosion and sediment control will also specifically deal with the potential impacts of material deposition areas during the construction phase of the project.
- All construction staff will be properly trained to respond to accidental discharge or leaks and appropriate spill management kits will be in place to allow rapid response on site. An Incident Response Plan will be in place detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous substances or wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident at any point over the proposed working areas.
- Prior to commencement of construction, the contractor will prepare method statements for discharge of construction water discharges. Further discussions will take place with the relevant authority to determine the required permit licence agreements to permit the discharge of water during the construction phase to either sewer or to ground.
- Under no circumstances will treated water be discharged to a water course without the respective water quality meeting the statutory limits as set under the relevant EU environmental objectives for surface water.
- A groundwater monitoring plan will be in place, to provide early warnings and prevent possible impacts on groundwater resource during constructions works and to monitor post construction conditions.
- Some of the standard mitigation measures proposed to minimise effects of impacts involved with the proposed construction activities comprise of:
- The provision of boundary treatments such as silt fencing and berms will be installed prior to the commencement of any construction works in order to enhance the protection of surrounding environment during the full construction phase.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated and controlled area. Furthermore, temporary stockpiles of excavated material will be managed on a site-per-site basis and designated areas will be suitably sized and isolated from open excavations or sensitive receptors.
- Where possible excavated material will be reused within the project for the construction of embankments, in backfill, for bunding and landscaping requirements.
- If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous using an approved classification method.
- Excavated contaminated soils will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure no cross-contamination with clean soils elsewhere throughout the site.
- If the water table is encountered during excavation works, groundwater management measures (sheet piles installation, dewatering, etc..) will be implemented to provide a dry working environment. Silt fencing will be installed around the works to prevent silt / suspended solid run off.
- If a daily abstraction volume higher than 25 m³ is required for dewatering activities, a dewatering / discharge permit should be obtained (with specific mitigation measures specified in the permit). If possible, any abstracted water, if of suitable quality, should be discharged back into the same waterbody. There will be regular checks on the treatment

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system as well as continuous monitoring equipment to measure, but not limited to, pH, temperature, conductivity, Total Suspended Solids and Totals Dissolved Solids.

- A programme of water quality monitoring (groundwater and surface water) will be implemented by the Contractor. The CEMP Volume 3, Appendix 5.1) contains a water quality management plan which will be further developed by the Contractor, prior to any construction on site. In the event that parameters are breached during the construction period, additional mitigation will be implemented to ensure that water quality is not adversely affected by the works.
- Potential impacts resulting from the proposed development are reduced due to the programme of works being carried out within the dry season. During the dry season, in the majority of locations, groundwater will not be encountered. However, if groundwater will be encountered, which is likely during maximum recorded groundwater level conditions, the appropriate mitigation measures will be carried out as described above.
- A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
- No instream works are proposed. Any works in the vicinity of drains (no fisheries importance) or watercourses will be carried out in accordance with the guidelines set out by IFI in *'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters'* (IFI, 2016).
- The IFI Biosecurity Protocol for Field Survey Works¹⁹ will be complied with. The applicant should provide a detailed biosecurity plan to prevent the spread of invasive species, including a protocol disinfect plant, equipment and PPE and the facilities in place to allow for same in particular machinery from other sites will be cleaned and disinfected before they commence work on the site.
- In the case of a warning of a flood event, plant and materials vulnerable to flooding in 'at risk' construction compounds will be relocated to parts of the compound that are considered to be not at risk of flooding.

The following mitigation measures will be implemented prior to commencement and throughout the duration of the construction works:

- Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed and ruts will be created that will act as miniature rivers where dirty water will flow.
- Tracking beside streams will be avoided to avoid damage to the bankside.
- Geotextile or timber matting will be used on soft ground, and in all protected areas
- A buffer zone of 10m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works.
- The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable.
- Re-instatement method statements will be subject to approval by the EnCoW.
- Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
- In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed.

¹⁹ [research_biosecurity_biosecurity_for_fieldsurveys_2010.pdf](#)

- All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations:
- Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;
- Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces;
- All tanks and drums will be banded in accordance with established best practice guidelines; and
- Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works.
- Works will not be carried out during extreme rainfall or high flow events. An early flood warning system will be set up to allow the removal of plant and material from construction areas located in Flood Zones A and B in the event of a flood warning. The duration of works within Flood Zone A and B will be minimised to reduce the potential of impact.
- Temporary works will be designed so as not to increase flood risk elsewhere from overland flow, by limiting excavated lengths and providing suitable drainage provision.
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
- Any instream works will be conducted during the period July – September to avoid effects on fisheries, or otherwise agreed with IFI.

Silt Control Measures

- Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses. These areas include all drainage ditches adjacent to works areas that link to the Owenduff and Tellerought Rivers.
- Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.
- Silt fences must be installed in the working areas and not at the watercourse.
- Access routes will be delineated such that an appropriate set back distance from watercourses is maintained. Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site.
- Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained.
- Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.

Silt Fences

- Silt fences will be installed downslope of the area where silt is being generated on disturbed ground.
- To be effective the silt curtain must contain the area where silt is generated and must terminate on high ground (i.e. an elevated area not in the watercourse).
- Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh.
- The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals.
- Once installed the silt fence will be inspected by the Environmental Clerk of Works regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains.

- The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately.
- Two lines of silt curtain / fence will be installed, where considered necessary, by the EnCoW.
- Any build-up of sediment along the fence boundary will be removed daily.
- Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW.
- The silt fencing must be left in place until the works are completed (which includes removal of any temporary ground treatment).
- Silt fences will not be removed during heavy rainfall.
- The silt fence will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when it was installed, inspected and removed will be maintained by the EnCoW.

Silt Traps

The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply:

- Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low.
- Silt traps will be made of terram or similar material, not mesh.
- The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides.
- The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.
- The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it.
- Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth.
- Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom.
- In sensitive areas a series of silt traps will be placed in the drain.
- The silt trap will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when it was installed, inspected and removed will be maintained by the EnCoW.

Stockpiling Material

- All excavated material will be stored a minimum of 50m from rivers and any drainage ditches hydrologically connected to the watercourse.
- Silt fences or gravel drains will be positioned around the stockpiles to prevent surface water run-off. The silt fences and gravel drains will be regularly inspected and maintained.
- Stockpiled material, comprising soil, earth, stone etc. will be covered in order to prevent surface water run-off.

Concrete

The pouring of concrete will be required for foundation works. No pouring of concrete will be undertaken at the stormwater outfall location.

- No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck.
- Quick setting concrete mixes will be used to reduce the risk of contaminated runoff to the nearby watercourses.
- Where concrete pours are to take place instream, they will only take place within an isolated, dry, works area.
- Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour, and remain off until concrete has hardened negating a runoff risk; and such that the discharge will not result in a change in pH of +/-0.5 units.
- The Contractor's EnCoW will ensure that covers are available for freshly poured concrete to avoid wash off in the event of rain.
- Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal.
- The Contractor will schedule concrete works during relatively dry weather conditions (i.e. when there are no active Met Eireann yellow, orange or red warnings) to reduce the elevated risk of runoff.
- Concrete trucks will be washed down within a designated wash down area within the construction compound only and will be washed into appropriately sized containers which shall be inspected for defects in advance. Where the container is defective it shall not be used. Concrete trucks will be washed down in a sealed mortar bin/skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from waterbodies.
- Wet concrete operations adjacent to waterbodies will be avoided where possible.

Hydrocarbons

- A spill response plan should be in place and all employees and site staff made aware of it to mitigate impacts of any potential spills or leaks.
- Where mobile equipment is required, e.g. generators, these will be housed in a suitably sized bund/plant nappy such that any leaks/spills are intercepted. All mobile equipment used at the proposed discharge outfall will be stored within a plant nappy.
- All chemicals and hydrocarbons (oils, fuels and lubricants etc) should be stored in containers of up to 110% capacity to ensure there is a reduced risk of overflow spill and should be stored an absolute minimum of 10m from any watercourses and/or drains. If more than 200 litres of any oil type are to be stored on site, this must be stored in oil storage containers including drums and intermediate bulk containers (IBCs). All chemicals and hydrocarbons are to be stored within a bunded area, within the construction compound. All hand-held equipment and generators will be stored on site in appropriately sized bunds when not in use.
- Fuelling and lubrication of plant and equipment will be restricted to the construction compound site only. No refuelling will be permitted to occur within 10m of watercourses, waterbodies or drainage ditches.
- All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Acts 1996, as amended.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.
- Welfare/hygiene facilities will be located within temporary construction compounds a minimum of 50m from any watercourse/drainage ditch.

- All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No water will be discharged into any watercourses or drainage ditches.

Silt Fences

- Silt fences will be installed throughout the scheme, around stockpiles of material and around the designated vegetated areas where groundwater will be discharged.
- Silt fences will be installed in advance of any ground disturbance.
- The silt fences must be positioned to allow an appropriate working area within the site. Where possible the silt fences will be positioned above areas prone to flood.
- The silt fences will have the following design features:
 - the geotextile fabric will be entrenched at least 100mm into the ground with the ends upturned inward towards the works;
 - the fence posts will have a maximum spacing of 2m to prevent sag on the fence; and
 - the geotextile fabric will be anchored to the fence posts as opposed to wrapped.
- Daily inspection of silt fences will be carried out by the Contractor to assess the effectiveness of the measures, to carry out maintenance, and to determine if there has been any damage/breach to the control measures. The silt fences will also be inspected immediately following heavy rainfall or strong winds (equating to a yellow weather warning). Where repair is necessary, this will be carried out immediately and may require replacement of any damaged/degraded material.
- Accumulated silt will be removed regularly from the base of silt fences and will be removed offsite. Silt will not be permitted to build up such that it reaches half the height of the fence or exceeds 15cm in height (whichever is the lesser value). Note commercially available fences will show a maximum height which should not be exceeded.
- Silt fences will remain in place until the disturbed areas within the sites have been reinstated and revegetated.
- Silt fences will only be removed during dry weather.

Dewatering

- Any water ingress associated with the compound excavation will be removed to facilitate suitable working conditions. The water will be over pumped and treated via a filter bag before being discharged within a vegetated area located north of the construction compound. Silt fences will be installed around the vegetated area to ensure there is no runoff of sediment laden surface water. Any contaminated water unsuitable to be discharged to ground will be removed and disposed of offsite.

7.7.1.12 Mitigation of Dust Effects

Dust emissions during the construction phase of the Proposed Development is unavoidable throughout the scheme as a degree of dust will be generated from ground works. As such this is an unavoidable impact which is expected to occur but should impose minimal risk of impacts with suitable mitigation:

- Development and implementation of a Dust Management Plan (DMP) for the site prior to commencement of works, this plan is to be agreed upon and all site staff aware of it's measures and adhere to them.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results and update of log.
- Ensure suitable dust suppression is carried out at times when certain construction activities which may increase dust generation is being carried out as well as during days where dust generation may be increase i.e. hot dry days.

- Revegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Communication and Site Management
 - Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
 - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager / engineer or the site manager.
 - Display the head or regional office contact information.
 - Develop and implement a dust management plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
 - Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken.
 - Make a complaint log available to the planning authority, when requested.
 - Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.
- Monitoring
 - Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested.
 - Increase frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
 - Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
- Preparing and maintaining the site
 - Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
 - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
 - Avoid site runoff of water or mud.
 - Keep site fencing and barriers clean using wet methods.
 - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site.
 - Cover, seed or fence stockpiles to prevent wind whipping.
- Operations vehicles / machinery and sustainable travel:
 - Ensure all vehicles switch off engines when stationary – no idling vehicles.
 - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable
 - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Operations
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction.

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- Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate.

An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The ECoW will oversee implementation of mitigation and deliver toolbox talks and preconstruction confirmatory ecology surveys, as appropriate. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented and impacts to IEFs are minimised and avoided where practical.

The ECoW will also ensure any disturbance licenses (if required later) are arranged if any significant findings are determined from confirmatory pre-construction surveys outlined above. The ECoW will seek advice on mitigation measures and oversee implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) and have demonstrable experience in ecological supervision.

The Contractor's ECoW will also ensure any disturbance licenses (if required later) are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised.

All monitoring reports will be provided to the Employer's Representative team and to the local authority or other parties where required by condition. An independent Environmental Clerk of Works (EnCoW) will be employed on behalf of the Employers Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

7.7.2 Operational Phase

The perimeter fencing for the Proposed Project will have mammal gates installed at regular intervals (small mammal gates every panel (between posts) and large mammal passes every tenth panel) to allow the mammal access points to ensure species such as foxes, badgers, rabbits, hares etc. have unfettered movement throughout the solar farm.

The surface water drainage pond will be maintained and managed as wetland feature for biodiversity enhancement purposes. The emergency storage pond for possible storage of fire water will be maintained as per manufacturers specification and any effluent will be removed and treated off site in a suitable waste management facility. There will be no discharges to groundwater or surface waters draining the site.

Wet grassland and marsh in Fields b, c, d and e (Figure 7.1) will require appropriate management during the operational phase as some areas may be cut off and not grazed or excessively grazed if sheep are used. An appropriately experienced ecologist will be retained to advise on appropriate management of these habitats to ensure they are maintained as species rich wet grassland and marsh potentially suitable for marsh fritillary. This will likely require low density grazing by cattle (<0.5 LU/ HA and specific seasonal grazing²⁰) and avoidance of farm

²⁰ Conservation Grazing Stocking Rates and Timing | Irish Native Rare Breed Society

improvement activities including drainage and reseeded. This will be a positive outcome for retention of a declining and now rare habitat in the locality. Some parts of these fields are species rich unimproved wet grassland consistent with the Annex 1 habitat *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)* (6410).

7.8 Biodiversity Enhancement Measures

Biodiversity Enhancement Measures

Drawing 25WX01-DR-0120 summarises areas that will be managed for biodiversity within the site. The proposed landscaping is illustrated in the accompanying landscape plan (refer to Appendix 5.3, Volume 3 of this EIAR).

Over 15% of the total development area of the Energy Farm will be set aside for Biodiversity conservation and enhancement.

As an outcome of the landscape and visual impact assessment, mitigation in the form of additional hedgerow and woodland planting is proposed. This will bolster existing hedgerows within and on the boundaries of the project development site to provide further screening.

Other biodiversity enhancements are based on the preservation of existing local habitats which support flora and fauna of local, regional or national importance. In this regard, areas of marsh, scrub and wet woodland habitats will be retained. Any retained habitats are best managed via low maintenance methods, i.e. reduced grazing or self-regeneration, while no pesticides or herbicide usage will be employed within the Project site.

Sheep grazing will be used to provide a natural form of grass management throughout the solar farm, this has biodiversity benefits to maintain meadow areas and prevent scrub encroachment.

The predominate enhancements are focused on bolstering existing hedgerows on the eastern part of the Project site, where current agricultural practices (intense arable farming) have resulted in rigorous management of hedgerows. Hedgerows will be bolstered with the planting of native hedgerow species, such as hawthorn, sloe, hazel, holly, spindle and guelder rose. Where trees will be planted within hedgerows these species include a mix of oak, crab apple, wild cherry and Scots pine.

In addition, areas of the site will be planted with native deciduous woodland species common to the area. Species planted will be of Irish provenance.

A 2.31 hectare field at the northeast corner of the site (Figure 7.6) has been identified for specific biodiversity enhancement. This site is currently undergoing regrowth of semi natural vegetation following plantation tree removal in the recent past. This field comprises a river floodplain with remnant fen and wet woodland habitat. Tree planting predominantly alder and oak (on drier areas) will be conducted by hand under the supervision of an ecologist to ensure that tree planting is located outside remnant fen/ wet woodland, which will be retained. This will enhance biodiversity within the floodplain of the Owenduff River which forms a boundary of the Project site.

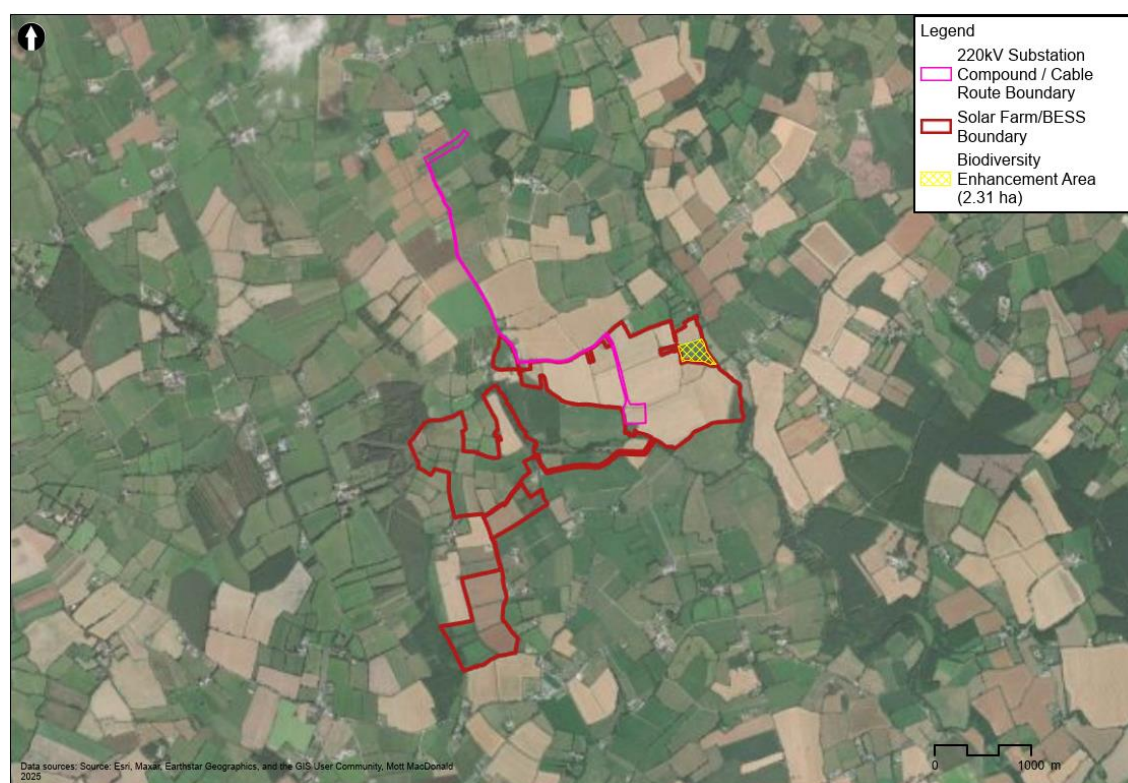
The planting of alder and oak has been identified as appropriate within areas of the Project site (refer to drawing 25WX01-DR-0120 in Appendix 5.3, Volume 3 of this EIAR).

The biodiversity enhancement measures are listed below.

- 2.01 hectares of existing wet grassland and scrub mix to be conserved and managed to protect existing habitats.
- 2.64 hectares of existing marsh and scrub mix to be conserved and managed to protect existing habitats.

- 5.33 hectares of existing marsh, wet grassland, and scrub mix to be conserved and managed to protect existing habitats.
- Retention of 0.73 hectares including an existing building and bat roost to be left undisturbed.
- Retention of 1.45 hectares of mixed woodland.
- 3.21 hectares of former agricultural pasture and tillage land is to be planted with native woodland; Alder and Oak on lower lying ground adjacent streams and flood prone areas and Hazel and Oak woodland on drier ground.
- Additional mitigation planting adjoining dwellings will consist of dense native woodland and shrub planting and provides a cumulative area of 1.03 hectares.
- Replanting of degraded hedgerows over and a cumulative area of 1.35 hectares.

Figure 7.6: Field with remnant marsh proposed for soft planting alder (wetter areas - floodplain) and oak (drier areas).



Source: Mott MacDonald

7.9 Residual Effects

7.9.1 European and Nationally Designated Sites

The assessment which is provided in the NIS for the Proposed Project concluded that the mitigation measures detailed will ensure no adverse effects on the integrity of any European sites in light of the site's conservation objectives. In EIA terms, there are no residual effects likely on European sites. Based on the assessment of the Proposed Development alone and in combination with other projects and plans, including the implementation of mitigation measures, it can be concluded that no adverse effects on the integrity of any European sites will arise, in view of the site's conservation objectives.

No residual adverse effects are likely to Nationally designated sites including proposed Natural Heritage areas.

7.9.2 Other Important Ecological Features

No significant residual effects are likely. It is expected that with mitigation and biodiversity enhancement measures outlined that there will be

- Retention of the vast majority of existing semi natural habitat within the site except for localised gaps required for access routes,
- Additional hedgerow planting and reinforcement will far exceed the amount of hedgerow removal
- Protection and retention of key sensitive habitats (including Owenduff and Tellarought Rivers) on and adjacent to the site including riparian corridors, woodland and wet grassland/ marsh areas.
- Additional biodiversity improvement on the site including biodiversity enhancement measures (Section 7.8), management of new silt ponds as wildlife areas and additional hedgerow planting. These measures will be expected to improve overall biodiversity on the site and increase the overall area which is managed for biodiversity on the site compared to the baseline.

A summary of residual effects on IEF during the construction, operation and decommissioning phased are detailed in Table 28.

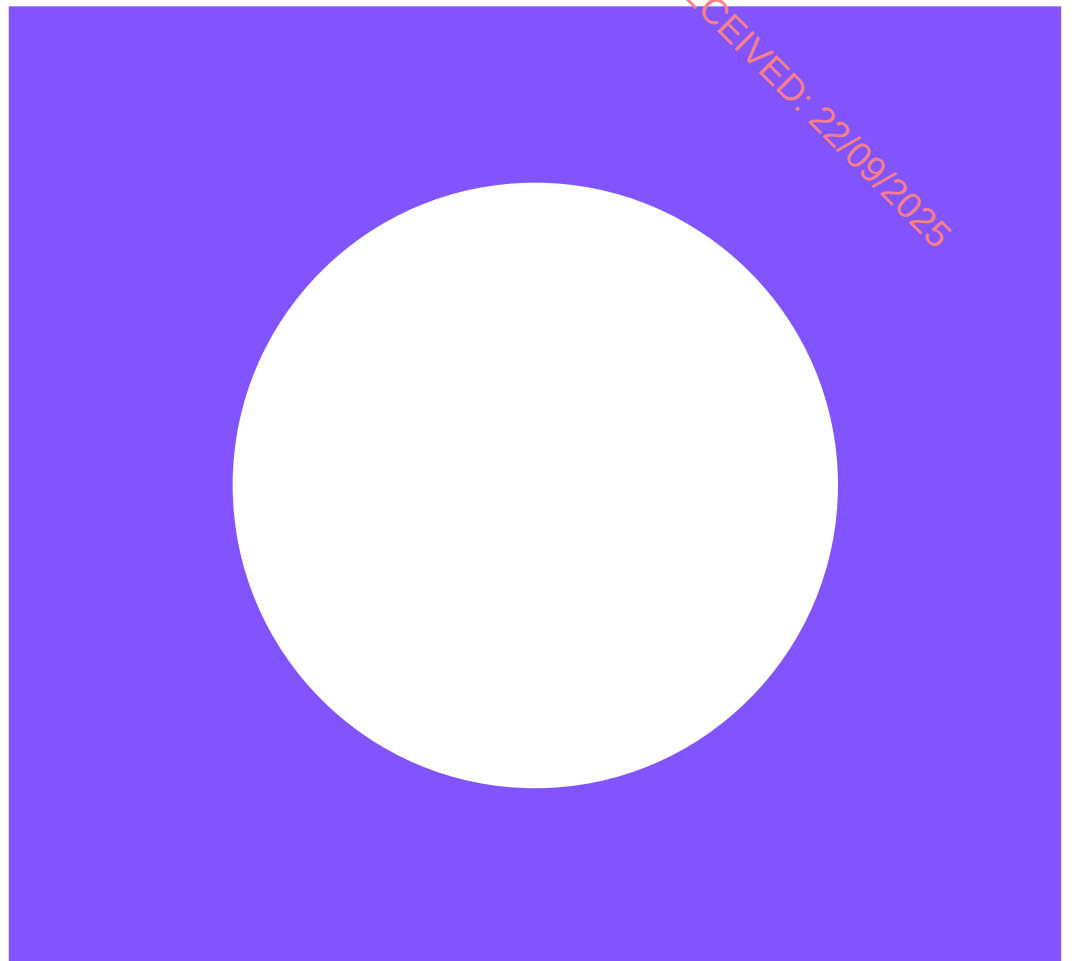
Table 7.28: Residual Impacts to Important Ecological Features Following Implementation of Mitigation Procedures

Receptor		Evaluation	Potential for Impact in the Absence of Mitigation	Residual Impact
Habitats	Wet grassland	Local importance (higher value)	Temporary slight negative effect at a local geographic scale.	Imperceptible
	Marsh	Local importance (higher value)	Temporary moderate negative effect at a local geographic scale.	Imperceptible
	Hedgerow (WL1)/ Treelines (WL2)	Local importance (higher value)	Permanent slight effect at a local scale geographic scale.	Positive (increased woodland)
	Wet willow alder ash woodland	Local importance (higher value)	Temporary slight negative impact at a local geographic scale.	Positive (Increased woodland)
Mammals	Otter	County Importance	Short-term moderate negative effect at a local scale.	Imperceptible
	Badger (4x sett away from Proposed Project)	Local (Higher) Importance	Short-term moderate negative effect at a local scale.	Imperceptible
	Bat roosts	Local Importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Imperceptible
River , riparian and fisheries	Aquatic and riparian habitats, fisheries: Owenduff and Tellarought	County Importance	Temporary and significant at a county scale	Neutral

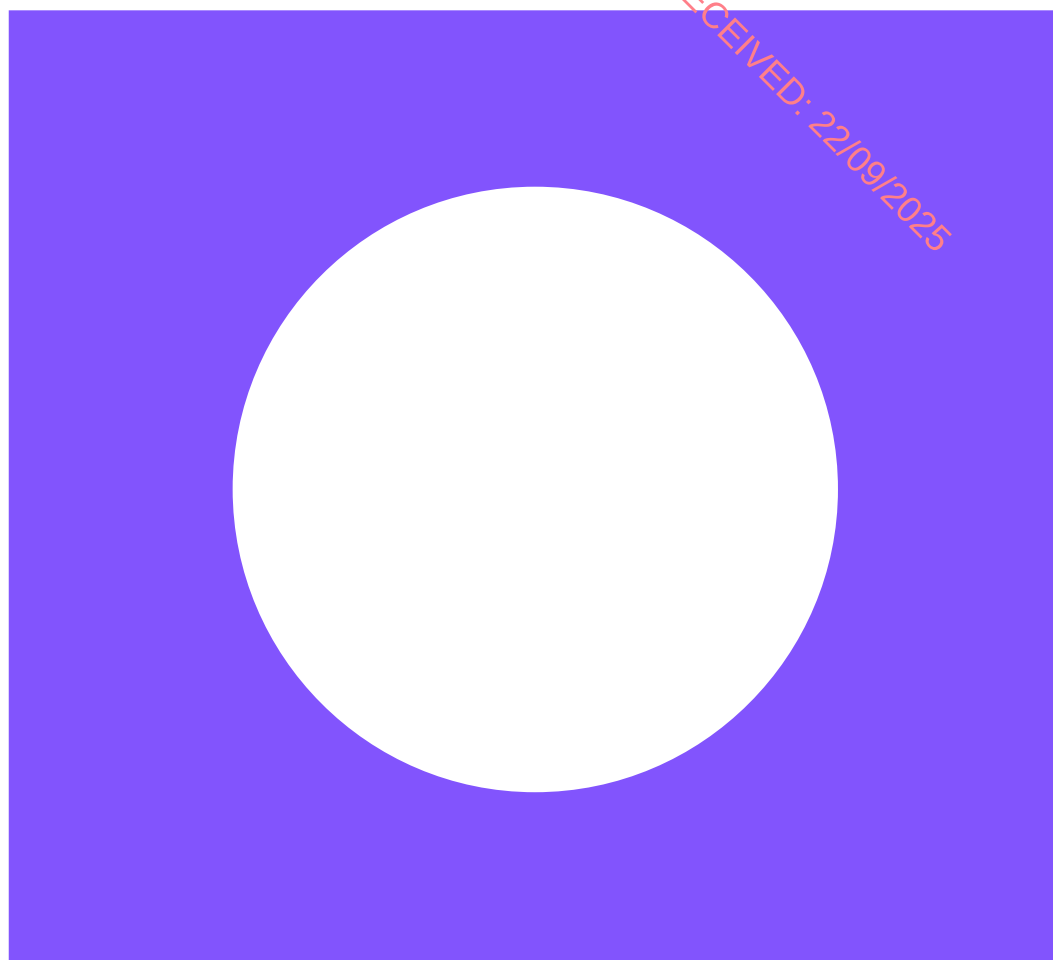
Receptor		Evaluation	Potential for Impact in the Absence of Mitigation	Residual Impact
	River and riparian areas			
Breeding birds	Assemblages of breeding birds	Local importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Imperceptible (Potentially positive)
Wintering Birds	Assemblages of wintering waterfowl	Local importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Long term slight adverse at a local scale (loss arable farmland for winter passerine flocks)
Amphibians	Common frog	Local importance (Higher Value)	Imperceptible	Imperceptible
	Smooth newt	Local importance (Higher Value)	Imperceptible	Imperceptible
Reptiles	Viviparous lizard	Local importance (Higher Value)	Slight temporary negative effect at a local scale.	Imperceptible
Invertebrates	Marsh fritillary	Local importance (Higher Value)	Imperceptible	Neutral (suitable habitat retained and managed appropriately)
Invasive Species	Schedule 3 listed invasive species	Schedule 3 listed invasive species	Permanent moderate effects at a local scale. (invasive species introduced to site)	Imperceptible

In summary while there will be some localised loss of winter bird habitat for flocks of passerines the main effects of the proposed development will be positive regarding biodiversity. There would be an expected significant increase in biodiversity on the site due to increased woodland planting and reduced farming intensity within the solar array area in particular. This conclusion considers the baseline where the focus of development is within intensively managed farmland of low ecological value. The design, mitigation and biodiversity enhancement have been led by principles of avoidance and protection of IEF both within and off site.

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 8 Land, Soils and Hydrogeology

September 2025

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8 Land, Soils and Hydrogeology

8.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the likely significant environmental effects posed by the Proposed Project. This assessment is based on the full outline design as described in Chapter 5 – *Description of Development*.

This assessment evaluates the pre- and post-mitigation (i.e. residual) effects arising during construction and operational phases on a series of sensitive receptors identified for land and land use, soils and geology and hydrogeology. This chapter should be read in conjunction with the following chapters and their appendices, which present related impacts arising from the Proposed Project and proposed mitigation measures:

- Chapter 7 – Biodiversity; and
- Chapter 9 – Surface water resources and flooding.

A specific Water Framework Directive (WFD) screening has been conducted (Section 8.5.4) for the WFD groundwater bodies intersected by the scheme working areas, to assess the impact of the proposed construction activities on their status and to WFD objectives.

8.2 Policy and Guidance

8.2.1 Policies

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

The requirements of the following legislation have also been complied with:

- The Water Framework Directive (WFD) 2000/60/EC (as amended) (European Commission, 2000) provides a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. The WFD requires Member States to establish river basin districts and, for each district, a river basin management plan (RBMP) which is revised, implemented and reviewed every six years;
- The Groundwater Daughter Directive 2006/118/EC (European Commission, 2006) establishes a regime which sets groundwater quality standards and introduces measures to prevent or limit the input of pollutants into groundwater, and was amended by Directive 2014/80/EU (European Commission, 2014);
- The WFD was implemented in Ireland by Statutory Instrument (S.I.) 722/2003 (Office of the Attorney General, 2003). Objectives for protection of groundwater against pollution and deterioration were implemented in S.I. 9/2010 (Office of the Attorney General, 2010);
- EU Directive 80/68/EEC (European Commission, 1979), amended by the Priority Substances Directive 2013/39/EU (European Commission, 2013), concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. The objective of the Directive 2013/39/EU is to protect the environment from the adverse effects of these waste water discharges, and is implemented in Ireland as S.I. No. 684/2007 (Office of the Attorney General, 2007);
- The Drinking Water Directive 98/83/EC (European Commission, 1998), amended by Directive 2020/2184 (European Commission, 2020) concerns water quality for human

consumption, and is implemented in Ireland as S.I. No. 122/2014 (as amended) (Office of the Attorney General, 2014). Thresholds for potable groundwater quality indicators are specified in S.I. No. 366/2016 (as amended) (Office of the Attorney General, 2016);

- The Waste Framework Directive 2008/98/EC (European Commission, 2008) provides waste management principles for the protection of water, soils and places of special interest, and establishes an order of preference for managing and disposing of waste.

Geology is recognised as an important component of natural heritage in three separate pieces of national legislation which include the following:

- Planning and Development Act 2000 (as amended) (Law Reform Commission, 2000);
- Planning and Development Regulations 2001 (as amended) (Minister for the Environment and Local Government, 2001);
- Wildlife Act 1976 (as amended) (Irish Government, 1976).

This legislation requires various branches of Government and statutory agencies to consult and take due regard for potential conservation of geological heritage features. Any geological features within the red line boundary (RLB) that are considered valuable and worthy of protection, these features would be classified as Geological Heritage Sites and County Geological Sites, which may be viewed online (Geological Survey Ireland, 2025).

8.2.2 Guidance

The assessment was carried out with reference to the following guidance and adapted to reflect the nature of the Proposed Project and attributes of the receiving environment based on professional judgement and experience:

- Guideline for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (Institute of Geologists of Ireland, 2013);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports. Environmental Protection Agency (Environmental Protection Agency, 2022);
- Guidelines on the Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Road Authority, 2009) (now Transport Infrastructure Ireland (TII));
- Planning for Watercourses in the Urban Environment: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (Inland Fisheries Ireland);
- Control of Water Pollution from Construction Sites - Guide to Good Practice (C532) (CIRIA, 2001).
- Methodology for establishing groundwater threshold values and the assessment of chemical and quantitative status of groundwater, including an assessment of pollution trends and trend reversal. Wexford: Environmental Protection Agency (O'Connell & Craig, 2024).

8.3 Methodology

The main scope of this assessment consists of the analysis of the likely significant effects posed by the Proposed Project works (considering both construction and operational phases) on land use, soils, geological and hydrogeological elements, and to provide indications for appropriate mitigation measures where required. A detailed description of the overarching methodology of the EIAR is presented in Chapter 3.

The assessment method follows a staged approach involving:

- Acquisition of construction works details for the study area under investigation, based on information summarised in Chapter 5, to establish the location, type and scale of required works and activities. This includes (but is not limited to) consideration of elements such as earthworks, storage/transport of leachable and hazardous materials, lowering of groundwater levels by pumping or drainage, discharges to ground, and penetrative works above or below water table;
- Establish the baseline conditions and sensitivity of potential receiving environments in respect to the land use, soils, geological and hydrogeological elements in the study area;
- Quantify the magnitude of impacts and the significance of associated effects on identified receptors;
- Identify relevant mitigation measures to apply where required, and determine residual effects;

The impact assessment methodology is based on the guidance listed in Section 8.2 and tailored accordingly based on professional judgement and experience. Details of the author and experience is provided in Appendix 1.1. The Approach used for each stage of this assessment is discussed in detail below.

8.3.1 Approach to Data Collection

A desktop study was undertaken to review the existing accessible data, in addition to assessments carried out to date. From this data, outlined in Table 8.1, constraints and likely sensitive receptors have been identified.

Table 8.1: Summary of available sources used to inform Land, Soils and Hydrogeology Chapter

Data Source	Date	Data Content
Land and Land Use		
CORINE Land Cover (CORINE, 2018)	2018	● CORINE Land Cover.
EPA Maps	2025	● Waste facilities (licenced and historical). ● Integrated pollution control (licenced and historical).
National Library of Scotland (National Library of Scotland, 2025)	2025	● Historical maps.
Ordnance Survey Ireland (Ordnance Survey Ireland, 2025)	2025	● Historical maps.
EPA Maps (National Monument Service, 2025)	2025	● Special Area of Conservation. ● Special Protection Area. ● Proposed Natural Heritage Area. ● WFD groundwater body and groundwater body status.
Soils and Geology		
Irish Soil Information System (Environmental Protection Agency, Teagasc, Cranfield University, 2025)	2025	● Soil type.
Geological Survey of Ireland (GSI) Web Map Viewer (Geological Survey Ireland, 2025)	2025	● Superficial Deposits (scale 1:50,000). ● Bedrock Geology (scale 1:100,000). ● Geohazards include landslide susceptibility. ● Geological Heritage sites. ● Active Quarries
EPA Maps	2025	● Radon risk.

Data Source	Date	Data Content
		● SIS national soils. ● Special Areas of Conservation. ● Special Protection Areas. ● National Heritage Areas (NHA).
Hydrogeology		
Geological Survey of Ireland (GSI) Web Map Viewer (Geological Survey Ireland, 2025)	2025	● Groundwater Bodies. ● Karst features including caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs. ● Karst traced underground connections. ● Groundwater Resource Potential. ● Groundwater Vulnerability. ● Wells and Springs. ● Group Scheme and Public Supply Source, Protection Areas. ● Superficial Deposit Permeability.
EPA Maps (National Monument Service, 2025)	2025	● WFD groundwater body and groundwater body status.

No existing ground investigation data is available for the site, as such this review will be solely summarised on desk-based information.

8.3.2 Approach to Impact Assessment

8.3.2.1 Identification of Receptors

A part of the current scope consists of identifying the environments and associated sensitive receptors potentially impacted by the Proposed Project. The criteria used to define receptors for the study area (based on a 250m buffer zone extended from each proposed working area) are summarised below in Table 8.2.

Table 8.2: Summary of Key Receptors to be Considered

Environmental Elements	Key Receptor
Land and Land Use	● Land use types and potential contaminants
Human Health	● Site end users
Soils and Geology	● Soils, superficial deposits, bedrock geology and other geological features, further to a review of GSI data and site specific ground investigation. ● Mapped karst landforms including caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs. ● Geological heritage sites. ● Geohazards: recorded events, primarily landslides, karst features. ● Economic geological sites.
Hydrogeology	● Groundwater body and both quantitative and qualitative status classification as assigned under the WFD. ● Groundwater: Groundwater abstractions from Public Supply Schemes, Group Water Schemes and local domestic/agricultural wells (with varying degrees of location accuracy) mapped by the GSI including Source Protection Zones (SPZs). ● Traced underground connections of known water dye trace studies. ● Groundwater Drinking Water Protection Areas.

Environmental Elements	Key Receptor
	● Aquifer Type, as assigned by the GSI; relates to the aquifers productivity in terms of well yields as detailed below: – LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones; – Lm – Bedrock which is Generally Moderately Productive; – Lk – Locally Important Aquifer – Karstified to a limited degree or area; – Rkd – Regionally Important Aquifer–Karstified (diffuse); – Lg – Locally Important Aquifer– Sand and gravel. ● Designated sites that are hydrologically or hydrogeologically connected to the Proposed Project (e.g. by way of karst connections, or by linear features such as water courses). ● Boreholes.
Water Quality	All of the above under hydrogeology.

Source: (National Road Authority, 2009)

8.3.2.2 Assessment of Receptor Sensitivity

A receptor is defined as an element potentially subjected to an impact by the proposed construction activities. The sensitivity (also referred to as “importance” in the 2009 National Road Authority (NRA) guidelines) of soil, geological or hydrogeological receptors should be assessed on the basis of their quality, extent (scale) and rarity. Typical criteria to be applied in assessing the importance of these elements are provided by NRA - Guidelines on the Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Road Authority, 2009) hereafter referred to as the NRA Guidelines, and EPA - Guidance on the Information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022), hereafter referred to as the EPA EIAR Guidelines, as set out in Table 8.3 and Table 8.4. These guidelines are an industry standard, which are typically used for projects akin to the Proposed Project.

Quantitative guidance regarding the importance/sensitivity for land use receptors or human health receptors is not addressed in the NRA methodology in the NRA Guidelines. As such, professional judgement has been used to assign receptor values based on the perceived ecological, economic and societal value of land use types.

Table 8.3: Estimation of Sensitivity/Importance of Soil and Geology Receptors

Sensitivity/Importance	Criteria	Example
Very High	● Attribute has a high quality, significance, or value on a regional or national scale ● Degree or extent of soil contamination is significant on a national or regional scale. ● Volume of peat and / or soft organic soil underlying route is significant on a national or regional scale	● Geological feature rare on a regional or national scale such as National Heritage Areas (NHA). ● Large existing quarry or pit. ● Proven economically extractable mineral resource.
High	● Attribute has a high quality, significance, or value on a local scale. ● Degree or extent of soil contamination is significant on a local scale. ● Volume of peat and/or soft organic soil underlying site is significant on a local scale.	● Contaminated soil on site with previous heavy industrial usage. ● Large recent landfill site for mixed wastes. ● Geological feature of high value on a local scale (County Geological Site). ● Well drained and/or high fertility soils. ● Moderately sized existing quarry or pit. ● Marginally economic extractable mineral resource. ● Land

Sensitivity/ Importance	Criteria	Example
Medium	- Attribute has a medium quality, significance, or value on a local scale. - Degree or extent of soil contamination is moderate on a local scale. - Volume of peat and / or soft organic soil underlying site is moderate on a local scale.	- Contaminated soil on site with previous light industrial usage. - Small recent landfill site for mixed wastes. - Moderately drained and / or moderate fertility soils. - Small existing quarry or pit. - Sub-economic extractable mineral resource.
Low	- Attribute has a low quality, significance, or value on a local scale. - Degree or extent of soil contamination is minor on a local scale. - Volume of peat and / or soft organic soil underlying site is small on a local scale.	- Large historical and / or recent site for construction and demolition wastes. - Small historical and / or recent site for construction and demolition wastes. - Poorly drained and / or low fertility soils. - Uneconomically extractable mineral resource.

Table 8.4: Estimation of Sensitivity/Importance of Hydrogeology Attributes

Sensitivity/ Importance	Criteria	Example
Extremely High	Attribute has a high quality or value on an international scale.	- Groundwater supports river, wetland or surface water body. - Ecosystem protected by EU legislation, e.g., Special Areas of Conservation (SAC) or Special Protection Areas (SPA) status.
Very High	Attribute has a high quality or value on a regional or national scale	- Regionally Important Aquifer with multiple wellfields. - Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. - Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale.	- Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers. - Locally important potable water source supplying >1000 homes. - Outer source protection area for regionally important water source. - Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale.	- Locally Important Aquifer. - Potable water source supplying >50 homes. - Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale.	Poor Bedrock Aquifer Potable water source supplying <50 homes.

8.3.2.3 Assessment of Magnitude of Impact

The significance of any potential effect has been determined based on the sensitivity of the feature to be protected and the magnitude of the impact on the receiving soil, geological and

hydrogeological environments. The terms used to define magnitude of impact are in accordance with NRA Guidelines and in line with the concepts provided by the EPA EIAR Guidelines (2022). A classification of attributes is provided in Table 8.5.

The NRA Guidelines state that impacts associated with construction of new developments are not necessarily always negative and that positive impacts are sometimes possible (e.g. enhancement of geological exposures, reduction in serious pollution risks to surface waters). Impacts should, therefore, be identified as positive, neutral or negative. Impacts may further be categorised according to type; they may be “direct” or “indirect” or in the case of negligible or neutral impact have “no predicted impact”.

The assessment of the impact of the Proposed Project on identified receptors will also include the duration of relative effect: temporary or permanent.

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Table 8.5: Criteria for Rating Impact Significance

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
Large Adverse (Negative) – Direct. – Indirect.	Results in loss of attribute and / or quality and integrity of attribute.	- Removal of large proportion of aquifer. - Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. - Potential high risk of pollution to groundwater from routine run-off. - Calculated risk of serious pollution incident >2% annually.	- Loss of high proportion of future quarry or pit reserves. - Irreversible loss of high proportion of local high fertility soils. - Removal of entirety of geological heritage feature. - Requirement to excavate / remediate entire waste site. - Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Moderate Adverse (Negative) – Direct. – Indirect.	Results in impact on integrity of attribute or loss of part of attribute.	- Removal of moderate proportion of aquifer. - Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. - Potential medium risk of pollution to groundwater from routine run-off. - Calculated risk of serious pollution incident >1% annually.	- Loss of moderate proportion of future quarry or pit reserves. - Removal of part of geological heritage feature. - Irreversible loss of moderate proportion of local high fertility soils. - Requirement to excavate / remediate significant proportion of waste site. - Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Small Adverse (Negative) – Direct. – Indirect.	Results in minor impact on integrity of attribute or loss of small part of attribute.	- Removal of small proportion of aquifer. - Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. - Potential low risk of pollution to groundwater from routine run-off. - Calculated risk of serious pollution incident >0.5% annually.	- Loss of small proportion of future quarry or pit reserves. - Removal of small part of geological heritage feature. - Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. - Requirement to excavate / remediate small proportion of waste site. - Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Negligible (Neutral) – No predicted impact.	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity.	Calculated risk of serious pollution incident <0.5% annually.	No measurable changes in attributes.

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
Minor Beneficial (Positive) – Direct. – Indirect.	Results in minor improvement of attribute quality.	Not specified.	- Minor enhancement of geological heritage feature. - Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial (Positive) – Direct. – Indirect.	Results in moderate improvement of attribute quality.	Not specified.	- Moderate enhancement of geological heritage feature. - Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial (Positive) – Direct. – Indirect.	Results in major improvement of attribute quality.	Not specified.	- Major enhancement of geological heritage feature. - Calculated reduction in pollution risk of 75% or more where existing risk is >1% annually.

8.3.2.4 Assessment of Significant Effect

The significance of an impact and its effect are determined based on the sensitivity of the potential receptor (Table 8.3 and Table 8.4) and the magnitude of the impact considered (Table 8.5). The matrix to determine the significance of an effect is provided in the following table (Table 8.6).

Table 8.6: Significance of an Effect Matrix

Magnitude of Impact					
Sensitivity of Receptor		Negligible	Small	Moderate	Large
	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/ Profound	Profound
	High	Imperceptible	Slight/Moderate	Moderate/ Significant	Significant/ Profound
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

8.3.2.5 WFD Methodology

The European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. 9 of 2010) establish a new strengthened regime for the protection of groundwater in line with the requirements of the Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC). Parts (IV) – (VI) of the Regulations identify the Environmental Protection Agency as the responsible body for establishing and maintaining a list of Threshold Values (TVs) for pollutants in groundwater, assessing the chemical and quantitative status of groundwater bodies and undertaking pollutant trend and trend reversal assessments.

The achievement of good groundwater status involves meeting a series of conditions, which are designed to satisfy the criteria defined in the WFD and the Groundwater Directive. In order to assess whether these conditions are being met, a sequence of tests has been prescribed for each of the quality elements defining good (chemical and quantitative) groundwater status. There are five chemical and four quantitative tests to satisfy for compliance. Each test is applied independently, and the results are combined to give an overall assessment of groundwater body chemical and quantitative status. The worst-case classification from the relevant chemical status tests is reported as the overall chemical status for the groundwater body, and the worst-case classification of the quantitative tests is reported as the overall quantitative status for the groundwater body. The worst result of the chemical and quantitative assessments is reported as the overall groundwater body status.

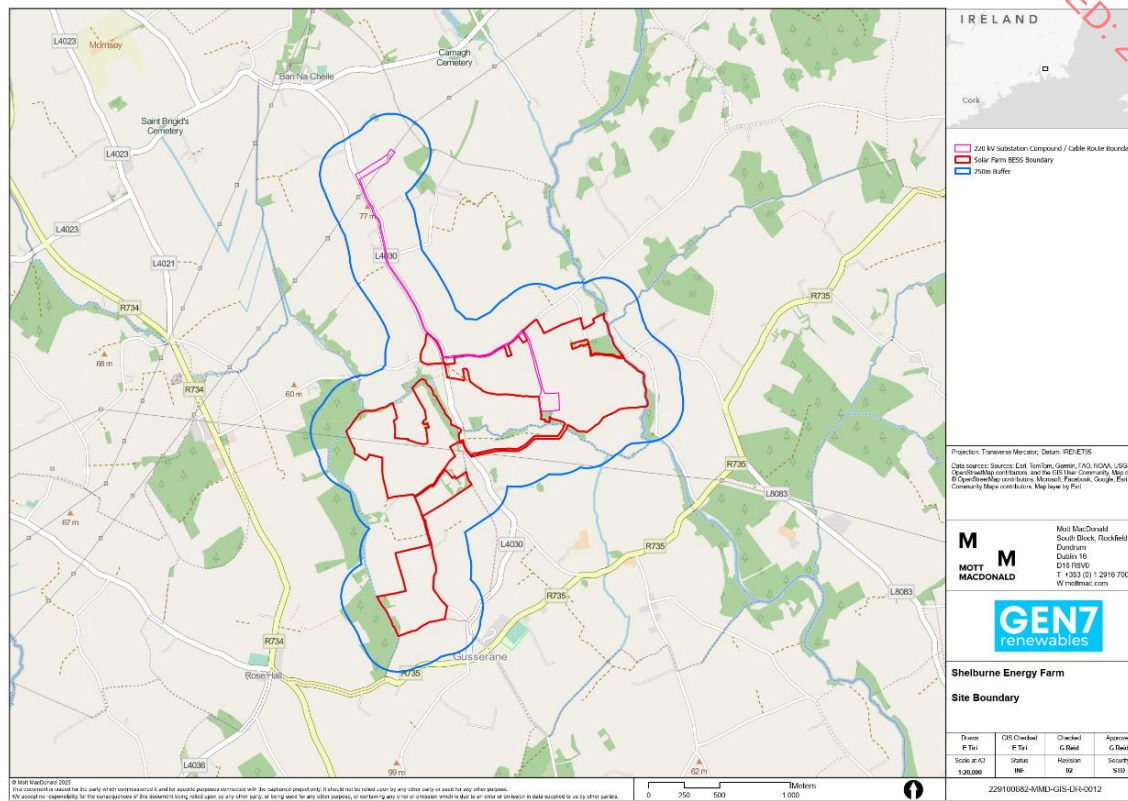
Status assessments are undertaken at the end of every six-year River Basin Management Planning (RBMP) cycle (currently in its third cycle from 2022 – 2027) and are used to generate a snapshot that shows the impacts of abstraction and pollution on groundwater. The baseline WFD screening assessment will be conducted using the latest available data for WFD status (2016 – 2021 RBMP cycle).

A baseline WFD screening assessment (Section 8.5.4) has been conducted against WFD status for the one groundwater body intersected by the Proposed Project, following the EPA WFD groundwater quantitative status guidelines (O'Connell & Craig, 2024).

8.3.3 Study Area

The study area is defined by the site boundary and a 250m buffer as shown in Figure 8.1.

Figure 8.1: Study Area and 250m Buffer



Source: Mott MacDonald 2025 from ArcGIS

The 250m buffer zone has been informed by the design of the Proposed Project, noting that the potential effects on ground conditions will be limited to the project footprint, and not the wider area. However, the immediately surrounding land is also considered in terms of any potential contamination to migrate onto or off site via groundwater.

8.3.4 Limitations of this EIAR

- This EIAR is predominantly based on desk-based information.

8.4 Receiving Environment

The following sections present an overview of the baseline conditions for the receiving environments and associated receptors (following methodology provided in Section 8.3 within the working areas defined in Chapter 5).

8.4.1 Land and Land Use

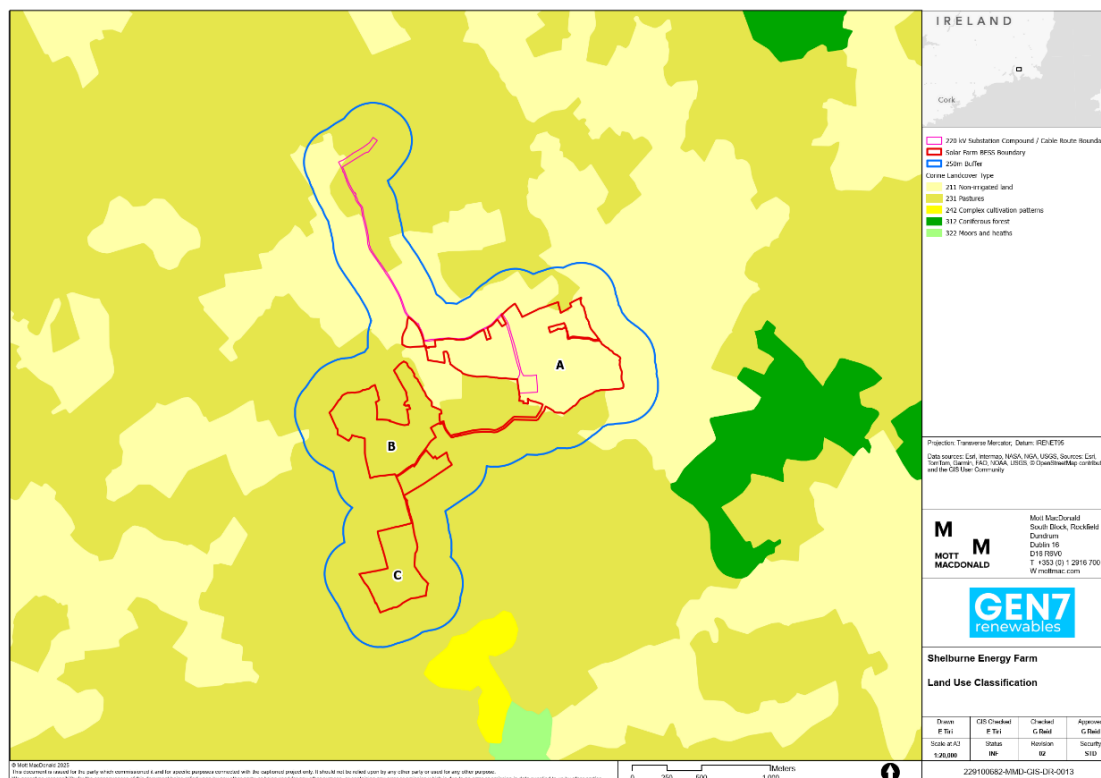
The land use designations in the study area have been obtained using CORINE Land Cover Dataset (CORINE, 2018). The land use within the study area is summarised below:

- The land use identified within the areas B and C to the south and west is pastures, localised areas within the boundary to the north and east are pastures. Land use of this nature is abundant within the local area and is therefore considered to have a low sensitivity;
- Non-irrigated arable land is dominant in area A to the north and east of the Proposed Project, land use of this nature is abundant within the within the local area and is therefore considered to have a low sensitivity;

- No other land use is identified by CORINE within 250m of the site, although it should be noted that mixed woodland is noted on satellite imagery to the border areas B and C, mostly to the northeast and west of these areas.

The relationship between the land use and the site boundary is shown in Figure 8.2.

Figure 8.2: CORINE Land Use 2018



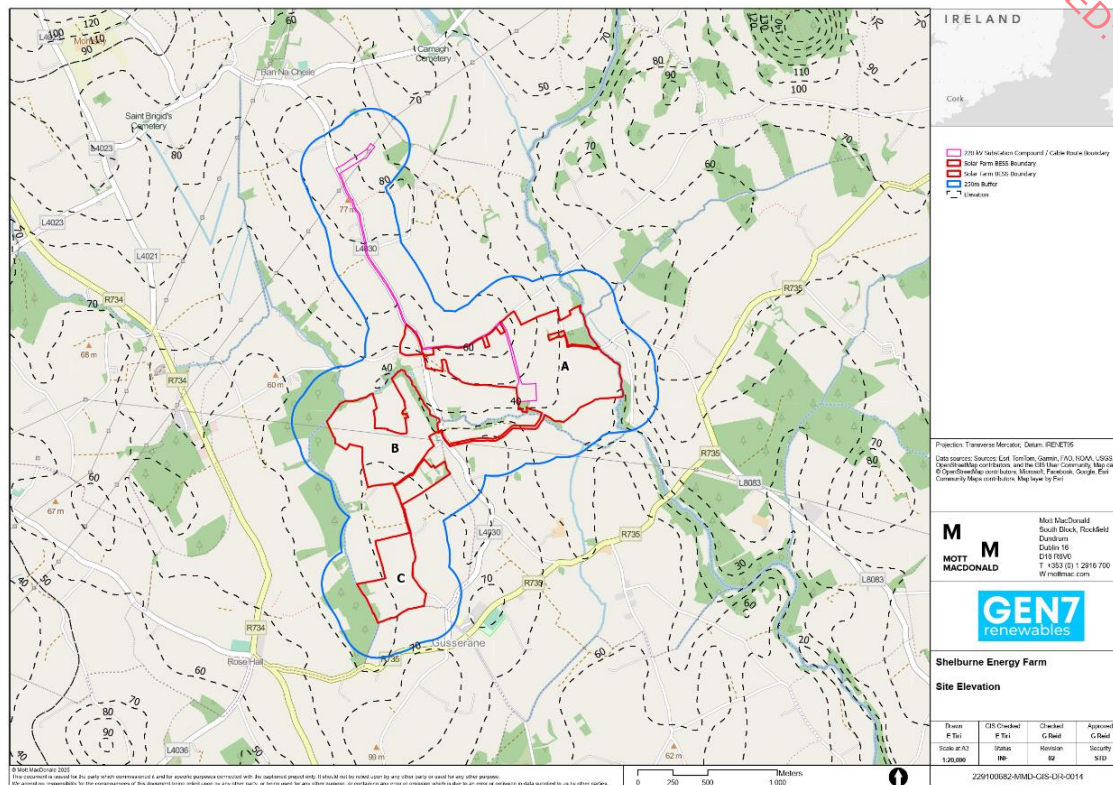
Source: Mott MacDonald 2025 from ArcGIS including data from CORINE (CORINE, 2018)

A review of historical mapping and historical aerial imagery (National Library of Scotland, 2025; Ordnance Survey Ireland, 2025) indicates there have been no major changes to the land use in the study area between 1830s and 2023. However, the following noteworthy changes have been identified on the available records:

- On-site potential sand pit within the northwest of area A;
- Off-site features include:
 - Gravel pit – to the north of Area A;
 - Corn Mill 260m to the south of Area A;
 - Two ringforts located 130m and 160m to the south of Area A;
 - Springs located adjacent to the west of Area C.

Topography (Tailte Eireann , 2023) varies across the site. The minimum elevation across the site is 29.5m OD and the maximum elevation is 77m OD. The highest elevation within the solar array is 66.5m OD located within Area A. In area A the topography typically slopes to the south, with localised variations sloping towards watercourses to the east (Owenduff River) and south (Tellarought River). In area B, the topography slopes to the southeast. In areas C the topography slopes towards the west. Elevation rises along the underground cable route towards the north, the elevation rises to a maximum topography of 77m OD. A topographic contour plot is included in Figure 8.3.

Figure 8.3: Topographic Contour Plot



Source: Mott MacDonald 2025 from ArcGIS including data from Tailte Eireann (Tailte Eireann, 2023)

No licenced or historic waste facilities have been identified within the study area (Environmental Protection Agency, 2025).

No licensed or surrendered Integrated Pollution Control (IPC) sites have been identified within the study area (Environmental Protection Agency, 2025).

A summary of the identified land and land use receptors, and associated sensitivity classifications is provided in Table 8.7.

8.4.1.1 Protected Areas

There are no protected areas within the site such as Special Area of Conservation (SAC) or Special Protection Area (SPA) or proposed Natural Heritage Area (pNHA), the closest mapped protected area is a pNHA, Boley Fen is 1km to the southeast of the Proposed Project (Environmental Protection Agency, 2025).

Table 8.7: Summary of Land Uses and Land Uses Receptors

Design Element	Land Use Type	Distance from Red Line boundary (m)	Potential Contaminants	Sensitivity
Solar array and underground cable	Pastures	0	Pesticides, fertilisers, ammonium	Medium
Solar Array, BESS substation and underground cable	Non-irrigated arable land	0	Pesticides, fertilisers, ammonium	Medium

Design Element	Land Use Type	Distance from Red Line boundary (m)	Potential Contaminants	Sensitivity
Protected areas				
No protected areas are located within the study area. The closest protected area is 1km to the southeast this is not considered to be sensitive to activities within the study area.				

8.4.2 Soils and Geology

Soil types were identified using the Teagasc database (Environmental Protection Agency, Teagasc, Cranfield University, 2025). Superficial deposits and bedrock were identified using the Geological Survey of Ireland (GSI) database (Geological Survey Ireland, 2025).

8.4.2.1 Soils

The soil associations mapped within the area are as follows:

- Clonroche association: Characterised as well-drained *Brown Earths*. Developed on drift, typically fine loamy with siliceous stones, and with good nutrient retention;
- Kilpierce association: Characterised as *Groundwater Gleys*. Developed on drift, typically fine loamy with siliceous stones. These soils are poorer draining, particularly where not drained, leading to periodic waterlogging and anaerobic conditions; and
- River association: Characterised as *Alluvial Gleys*, *Drained Alluvial Soils* and *Humic Alluvial Gleys*. A large soil association with 12 component series of all texture characteristics (sandy, silty, clayey or loamy). Alluvial soils are typically very fertile due to their formation in fluvial sediments rich in minerals, but are also subject to regular periods of waterlogging where undrained.

Soil sensitivity values have been assigned based on the classifications in Table 8.3. Soils considered well drained and/or highly fertile and are classified as having High sensitivity. As such, Clonroche and River associations are considered as having high sensitivity and Kilpierce association as having Medium sensitivity.

8.4.2.2 Human Health

The Proposed Project is to include areas of industrial end use (BESS and substation areas) and retain current land use which is typically agricultural (cable route and solar array).

In areas that retain the current land use of agricultural land use the human health sensitivity is assessed as high sensitivity. Where the proposed land use is industrial the human health sensitivity is assessed as medium sensitivity.

8.4.2.3 Superficial Deposits

GSI mapping of superficial deposits show the majority of the site has mapped superficial deposits, with areas of no mapped superficial deposits corresponding with areas of subcrop and bedrock outcrop.

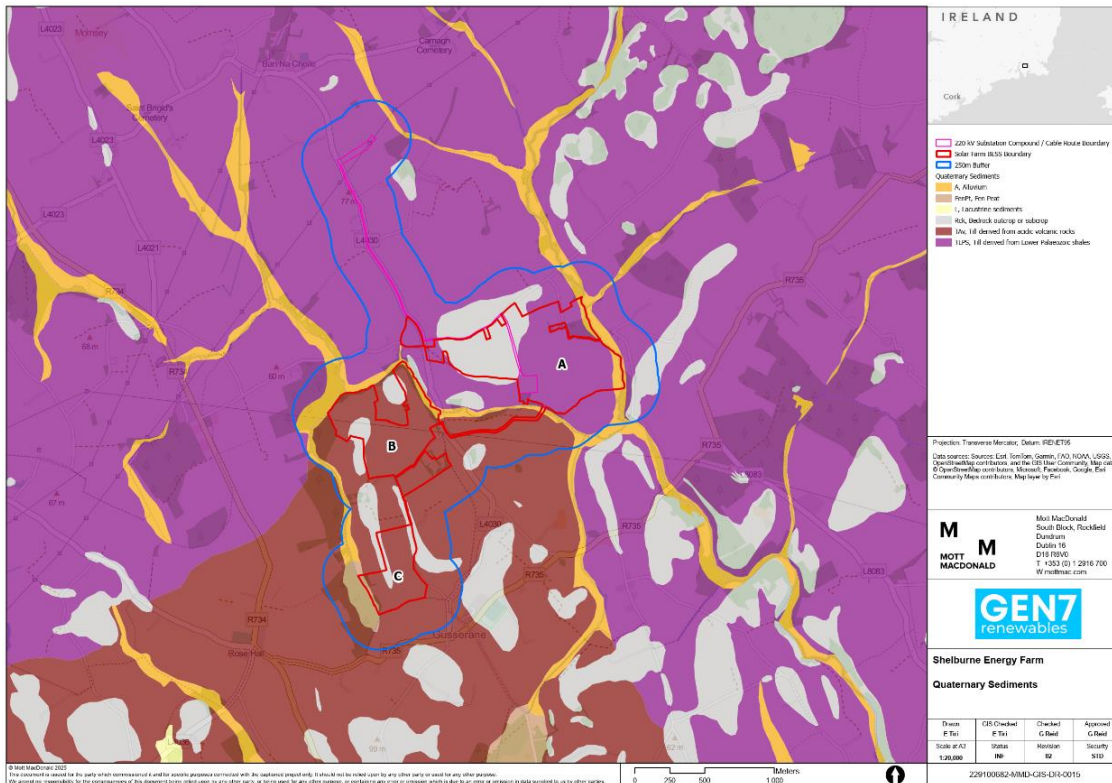
The superficial deposits to the north of the site underlying Area A including solar array, BESS, substation and cable route, area are mapped as Glacial Till derived from Lower Palaeozoic shales, to the east and south of the Proposed Project are alluvium deposits which correspond to the watercourses within the site.

The superficial deposits underlying Solar Farm A and B are Till derived from acidic volcanic rocks, alluvium is present to the north and west corresponding to the watercourses bounding the

Mapped Quaternary geomorphology includes meltwater channels and streamlined bedrock features the are typically orientated NNW-SSE.

The superficial geological deposits related to the site are shown in Figure 8.4.

Figure 8.4: Superficial Geology



8.4.2.4 Bedrock Geology

The units of the Campile Formation present beneath the site are Rhyolitic volcanics, grey and brown slates, Felsic volcanics and intermediate volcanics of Ordovician age. The Campile Formation has been intruded by Doleritic dykes from the Slieve Gullion Complex of Tertiary age. General mapped dip of the geology in the area is to the northwest dipping between 55 and 70°. Structural features in the area include faulting orientated generally north-south.

The bedrock mapping and linear features related to the site are shown in Figure 8.5.

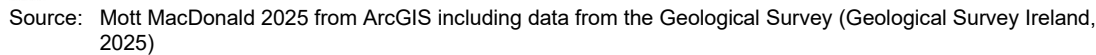
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IRELAND

Cork

230 kV Substation Compound / Cable Route Boundary
Solar Farm BSS Boundary
Solar Farm
Cork Aerodrome

Irish NLR0000

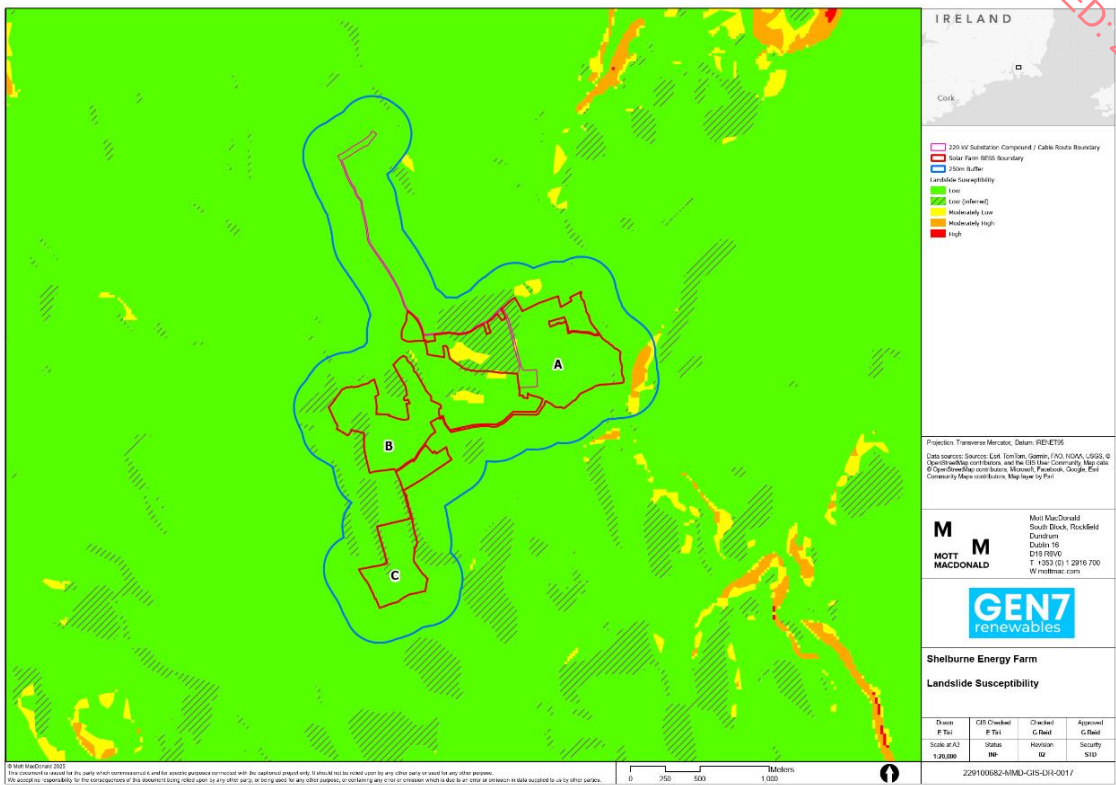


The GSI Geological Heritage mapping portal does not identify any geological heritage sites within the study area (Geological Survey of Ireland, 2025). The closest heritage site is Carrigadagban (a country Geological site), located 4.5km northeast of the study area (Geological Survey Ireland, 2019)). The geological significance of the site is therefore considered to be low, with the bedrock geology considered to have a Low sensitivity. The sensitivity of the bedrock aquifer is discussed in Section 8.4.3.

The GSI indicated that the landslide susceptibility classification is Low across most of the study area, however minor areas of moderately low susceptibility are present within the site and within 250m of the site. A minor area of 'moderately high' landslide susceptibility is present 70m to the east of Area A. Landslide susceptibility is shown in Figure 8.6. No landslide extents are mapped within the site or within 250m.

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Figure 8.6: Landslide Susceptibility

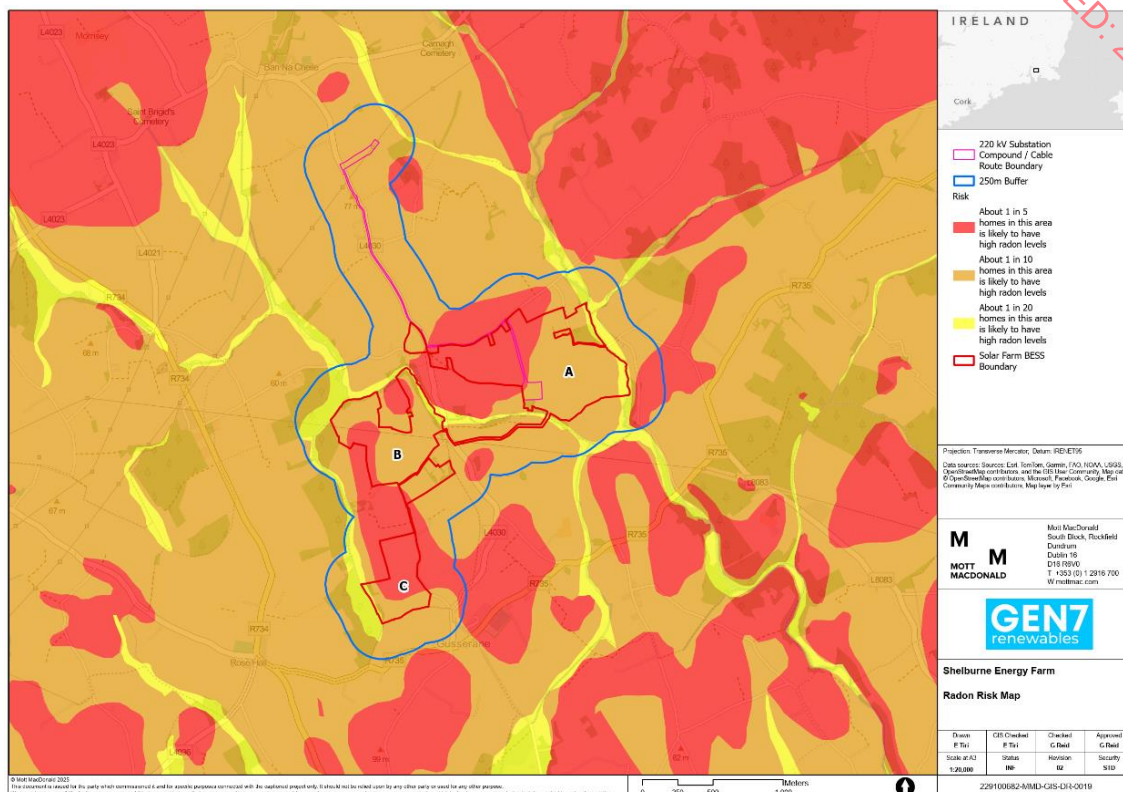


Source: Mott MacDonald 2025 from ArcGIS including data from the Geological Survey (Geological Survey Ireland, 2025)

8.4.2.7 Radon

The EPA Radon map, categorises radon risk based on indoor radon measurements and geological information, including bedrock type, quaternary geology, soil permeability and aquifer type (Environmental Protection Agency, 2025). This map shows that the study area is primarily located in an area where 20% of homes are estimated to be above the reference level of 200 becquerels per cubic metre (Bq/m³). Radon risk in these areas is considered to be High. However, there are areas estimated as having 5 and 10% of homes above the 200Bq/m³ reference level, which are classified as moderate risk. A radon test is legally required for ground floor and basement workplaces located in high radon areas and new buildings should be consider including radon protection measures (Government of Ireland, 2023 (amended)).

Figure 8.7: Radon risk



Source: Mott MacDonald 2025 from ArcGIS including data from the Environmental Protection Agency

8.4.2.8 Sensitivity

A summary of the identified soils and geology receptors and associated sensitivity classifications is provided in Table 8.8

Table 8.8: Soils and Geology Sensitivity

Receptor Category	Receptor	Distance from Redline boundary (m)	Sensitivity
Soils	Clonroche association	On-site	High
	River association	On-site	High
	Kilpiere association	On-site	Medium
Human Health	Agricultural Land use	On-site	High
	Industrial Land use	On-site	Medium
Geology- Superficial Deposits	Fen Peat	On-site (locally to the southwestern border)	Low
	Alluvium	On-site (localised to adjacent to watercourses)	Low
	Glacial Till derived from Lower Palaeozoic shales	On-site	Low
	Glacial Till derived from acidic volcanic rocks	On-site	Low
	Bedrock Outcrop or Subcrop	On-site	Low

Receptor Category	Receptor	Distance from Redline boundary (m)	Sensitivity
Geology - Bedrock	Slieve Gullion Complex (Dolerite Dykes)	Adjacent to the site	Low
	Campile Formation (Rhyolitic volcanics, grey and brown slates, Felsic volcanics and intermediate volcanics)	On-site	Medium
Landslides*	Low Susceptibility	On-site	N/a
	Moderately Low Susceptibility	On-site	N/a

*Landslides not considered a receptor – assessed in relation to potential impacts of landslides on surrounding receptors

8.4.3 Hydrogeology

A series of hydrogeological elements/attributes including groundwater karst features, aquifer designations, aquifer vulnerability, groundwater abstraction sources, public supply source protection areas (PSSPA), group scheme preliminary source protection areas (GSPSPA) and springs have been screened for the study area, to classify hydrogeological sensitive receptors, with the support of mapping tools available on the GSI Groundwater Data Viewer (Geological Survey Ireland, 2025). Hydrogeological receptors sensitivity/value is based on classification described in Table 8.4.

8.4.3.1 Aquifers

The Campile Formation and Dolerite Dykes which underly the whole study area are classified as regionally important Aquifers associated with the fissured bedrock.

There are no sand and gravel aquifers within the study area associated with the superficial deposits.

Groundwater vulnerability within the study area, identified using the GSI Groundwater Data Viewer (Geological Survey Ireland, 2025) ranges between low to extreme, with some areas classified as 'rock at or near surface or Karst'. The areas of extreme groundwater vulnerability within the study area occur where the fractured bedrock is outcropping or near surface, with the groundwater vulnerability classification decreasing with distance away from the outcrop. In general, areas of extreme and high groundwater vulnerability are predominant within the site.

8.4.3.2 Wells springs and Abstractions

No Group Scheme or Public Supply Scheme Source Protection Areas are located within the study area (Geological Survey Ireland, 2025). It is assumed that all residential properties obtain their potable water supply from a private well, due to the absence of water mains identified within the study area. The location of private wells is not mapped; however, private wells are required to be located in the overall residential property boundary and not lands private adjacent lands (i.e. private wells are not located within the Project site). There are a total of 47 residential properties within the study area, and therefore it is assumed each property obtains drinking water from their own private well.

A screening of larger private groundwater abstractions has been carried out using the GSI Groundwater Data Viewer (Geological Survey Ireland, 2025). The available dataset does not provide the exact location of abstractions but rather provides circles within which the abstractions are located, with differing sized circles shown depending on location accuracy. No private groundwater abstractions have been identified with location radii which intersect the study area. The closest private groundwater abstractions radius is 400m to the east of the site

where two radii are located. Due to the distance of the abstractions from the site the sensitivity of the abstractions is not being assessed.

There are no sand and gravel aquifers or groundwater Source Protection Areas within the vicinity of the study area.

An on-site well named Saint Colman's Well is mapped on the historical environmental viewer, it should be noted that according to the notes on the feature it could not be found in 1988 and is unlikely to be in use (National Monument Service, 2025). Additional historical springs and wells are mapped adjacent to the west of the site boundary, these are not mapped on modern maps and their current status is unknown, it should be noted that these wells are not recorded in the dataset of abstractions (Geological Survey Ireland, 2025).

8.4.3.3 WFD Groundwater Bodies screening

The study area is located within the Adamstown WFD Groundwater Body (IE_SE_G_001) which is classified as productive fissured bedrock. The WFD status of the groundwater body is 'Good', and the risk status is currently 'Not at Risk' (Environmental Protection Agency, 2025).

8.4.3.4 Summary

A summary of the identified hydrogeological receptors, and associated sensitivity classifications is provided in Table 8.9.

Table 8.9: Summary of Hydrogeological Receptors

Receptor	Distance From Red Line Boundary	Sensitivity
Aquifers		
Campile Formation (regionally important aquifers)	On-site	High
Dolerite Dykes (regionally important aquifers)	On-site	High
Source Protection Areas		
No Group Scheme or Public Supply Scheme Source Protection Areas are located within the study area. The closest Source protection area is approximately 5.5km northeast. This is not considered to be sensitive to activities within the study area		
Wells, springs and abstractions		
Mapped groundwater abstraction wells /Private residential wells	>400m	Not considered to be sensitive to activities within the site.
Historical wells	On-site	Low (not anticipated to be in use)
Historical mapped spring	Off-site adjacent to west of site	Low
Groundwater/surface water interactions		
No groundwater/surface water interaction features have been identified in relation to ecologically designated SPA/SAC sites.		

8.5 Likely Significant Impacts

Construction phase effects considered include those include which have the potential to impact the following receiving environments:

- Land and land use;

- Soils and Geology; and
- Hydrogeology.

8.5.1 Do Nothing

In the event that the Proposed Project does not proceed, the 'do nothing' effect would be that effects on land, soils and hydrogeology would not occur. The positive benefits of generating renewable energy solar will not be realised if the Proposed Project is not developed.

8.5.2 Construction Phase

The construction phase activities associated with the construction of the BESS and Solar Farm, which could pose risks to land, soils and hydrogeology, are summarised below, and are described in more detail in Chapter 5 – *Description of Development* of this EIAR.

The site preparation works for the whole Proposed Project will include vegetation removal and re-contouring including earthworks (mostly located in the area of BESS development and substation, with minimal earthworks anticipated within the solar farm area). A temporary construction compound/laydown area is proposed.

8.5.2.1 Assessment of Effects

The construction phase assessment of effects for lands, soils and hydrogeology are summarised in Table 8.10.

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Table 8.10: Construction Phase Assessment of Effects

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
Land Use	Solar Array	Loss/change of land use. Temporary works during the construction of the solar array include foundations works, re-contouring, profiling of internal access tracks for drainage.	Solar array has been designed such that post construction the land use can remain as agricultural land. The land surface adjacent to solar arrays will be restored following construction to similar to existing conditions. Access roads allowed to grass over post construction. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: Medium Significance of effect: Imperceptible	Construction (temporary)
	BESS	Loss/change of land use. The BESS will be built on an area of agricultural land use. Temporary works during the construction of the BESS re-contouring, internal access tracks and associated access track drainage	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Slight	Construction (temporary and permanent)
	Substation	Loss/change of land use. The substation will be built on an area of agricultural land use. Temporary works during the construction of the substation include re-contouring and foundation works.		Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Slight	Construction (temporary and permanent)
	Cable route	Loss/change of land use. Temporary works during the construction of the cable route include temporary excavations in agricultural land and within roads.	Installation of the cable route will be undertaken sequentially and the construction area will move in tandem with the progress of the installation, to	Magnitude and Quality of Impact: Negligible (neutral)	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
			minimise the section of the route cordoned off at any point. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Receptor Sensitivity: Medium Significance of effect: Imperceptible	
Land and Soils	Solar Array	Impact on land/soils. Localised Topsoil stripping may be required as part of the solar array works to allow for piling works.	Staged construction is planned to minimise disturbance to soils. Additional hedgerow planting proposed in solar array area. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: Medium/High Significance of effect: Imperceptible	Construction (temporary)
	BESS	Impact on Soils. Topsoil will be stripped from the BESS area to allow for construction of the BESS platform.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Construction (temporary and permanent)
	Substation	Impact on Soils. Topsoil will be stripped from the substation area to allow for construction of the substation platform.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Construction (temporary and permanent)
	Cable route	Impact on land/soils. Localised Topsoil stripping may be required as part of the	Staged construction is planned to minimise disturbance to soils.	Magnitude and Quality of Impact: Negligible (neutral)	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
		cable installation works to allow for installation.	Topsoil will be stored within the construction swathe during installation to allow for re-use. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Receptor Sensitivity: High Significance of effect: Imperceptible	
	All	Impact on land/Soils. Vegetation clearance is to take place around the site where required.	Additional hedgerow planning proposed in solar array area. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: Medium/High Significance of effect: Imperceptible	Construction (temporary and permanent)
Soils, Geology and hydrogeology	Solar Array and cable route	Exposure to Radon: Areas of high radon risk are located within the Solar Array areas and cable route area of the site. It is unlikely that the solar array and cable route will include areas requiring person entry as such radon risk is considered low. This should be confirmed during detail design. Human health receptors in this area are considered to have a High sensitivity.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7. However, it is unlikely that the solar array and cable route will require structures with enclosed structures as such no effect is anticipated.	No effect anticipated.	Construction (temporary)
	BESS and substation	Exposure to Radon. The site is located in an area that radon tests are recommended within. Human health receptors in this area are considered to have a Medium sensitivity.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7. Dependant on the design of structures with person entry radon protection measures may be necessary.	Magnitude and Quality of Impact: Large Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Significant	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
Soils, Geology and hydrogeology	Solar Array	Loss of Bedrock. The solar array foundations dimensions are currently unknown. Minor re-profiling is also required in areas of the Project to provide a flat platform for the containerised transformer systems Some excavation of bedrock could be required in areas where bedrock is close to the surface	The volume of potential bedrock excavation in comparison to the volume of the geological formation is considered to be negligible. This is not expected to significantly impact local or regional scale geological receptors.	Magnitude and Quality of Impact: Negligible (Neutral)	Construction (permanent)
	BESS	Loss of Bedrock. The BESS compound including the retention basin requires approximately 23,540m ³ of cut. Groundwater vulnerability underlying the BESS is moderate suggesting that bedrock could be close to the ground surface. As such it is possible that some bedrock excavation may be required into the Campile Formation Aquifer.		Receptor Sensitivity: Low/Medium	
				Significance of effect: Imperceptible	
				Magnitude and Quality of Impact: Negligible (Neutral)	Construction (permanent)
				Receptor Sensitivity: Medium	
				Significance of effect: Imperceptible	
	Substation	Loss of Bedrock. The substation covers an area of approximately 7200m ² , and requires 5650m ³ of cut, with foundations required for the GIS building, AIS transformer, and control building. Re-profiling is also required in areas of the project. Some excavation of bedrock could be required in areas where bedrock is close to the surface.		Magnitude and Quality of Impact: Negligible (Neutral)	Construction (permanent)
				Receptor Sensitivity: Medium	
				Significance of effect: Imperceptible	
	Cable route	Loss of Bedrock. The 220kV cable route is 2.9 km long and a minimum depth of ca. 1.75 m it is possible that Some excavation of bedrock could be required in areas where bedrock is close to the surface.		Magnitude and Quality of Impact: Negligible (Neutral)	Construction (permanent)
				Receptor Sensitivity: Low/medium	

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
				Significance of effect: Imperceptible	
	All	Use of Concrete. Concrete is highly alkaline and can affect groundwater and surface water quality through direct spillages and/or migration through the subsoil. Contamination from wet concrete and concrete wash-out during construction has the potential to infiltrate through the subsoil and migrate to the Campile Formation aquifer and Dolerite aquifer.	Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided. The Contractor will ensure that all concrete truck wash watering/cleaning is undertaken offsite and/or within a contained system where possible. A concrete washout procedure will be developed by the contractor prior to works commencing.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	All	Leaks/spills from construction vehicles. A maximum of approximately 62 HGV movements per day will be required during construction phase. There is risk of contamination of soils and groundwater from increased use of vehicles during construction, that have the potential to leak/spill hydrocarbons onto the road surface. Groundwater vulnerability is Low to Extremely High across the site, indicating that there is the potential for a rapid pathway from ground surface to groundwater in the area. Soils in this area are classified as High sensitivity. The Campile Formation aquifer and Dolerite aquifer is classified as High sensitivity.	Additional mitigation measures are to be considered in areas of High and Extreme groundwater vulnerability. This could include additional speed restrictions, wheel washing and exclusion of refuelling activities in these areas. Following adherence to the avoidance and mitigation measures listed above, the risk of a serious pollution incident from leaks and spills from construction vehicles is considered to be <0.5% annually.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
Hydrogeology	All	Migration of residual agricultural contaminants to groundwater. Potential to encounter residual agricultural	None in current design. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible Receptor Sensitivity: High	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
		contaminants that could become remobilised during excavation works. Due to the agricultural land use within the study area, there is the potential for agricultural contaminants to be present within the shallow soils. However this is unlikely and will be confirmed during a ground investigation.		Significance of effect: Imperceptible	
	Solar Farm	Migration of contamination along piled foundations. There is potential for piling works to act as a preferential pathway for contaminants from the ground surface to groundwater, especially in areas where there are no significant superficial deposits. In areas where the full thickness of superficial cover is removed, a permanent, more permeable pathway from ground surface to the aquifer may be created. Due to the agricultural land use within the study area, there is the potential for agricultural contaminants to be present within the shallow soils. However this is unlikely and will be confirmed during a ground investigation.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (permanent and temporary)
	Solar Farm	Groundwater contamination from silt and stockpile runoff. It is anticipated that a quantity of soil will be stockpiled for a limited time prior to reinstatement or removal from site. This poses some contamination risk to receptors from turbidity/silt runoff	Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to watercourses and groundwater. Silt fences will be installed downslope of any area where silt is generated. Daily visual monitoring of the silt fences will be undertaken.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	BESS	Groundwater contamination from silt stockpile runoff. Material will be		Magnitude and Quality of Impact: Negligible (Neutral)	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
		excavated from the BESS platform and a will require some short- term stockpiling required before it is removed from site or reinstated. This will be stockpiled for a limited time. This poses some contamination risk to receptors from turbidity/silt runoff	Particular attention should be made to areas of High and Extreme groundwater vulnerability. Soil stockpiles from topsoil stripping will be maximum 2m in height depending on local soil conditions, as well as working strip width, to preserve topsoil integrity.	Receptor Sensitivity: High Significance of effect: Imperceptible	
	Substation	Groundwater contamination from stockpile runoff. It is anticipated that a quantity of soil will be stockpiled for a limited time prior to reinstatement, use or removal from site. This poses some contamination risk to receptors from turbidity/silt runoff	Excavated soils shall not be placed within 10m of watercourses or wetlands where it could be eroded and enter the watercourse.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	Cable Route	Groundwater contamination from silt and stockpile runoff. Soil will be stockpiled for a limited time prior to reinstatement or removal from site. This poses some contamination risk to receptors from turbidity/silt runoff		Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	All	Accidental leakages and spills. Numerous substances used on construction sites have the potential to pollute water if not properly managed and treated. Such substances include fuels, lubricants, cement, silt, and other substances which arise during construction. Accidents may result in spillage or leakage of fuel or oil and pose a contamination risk. In areas of High and Extreme groundwater vulnerability, there is likely a rapid pathway from ground	Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces. All tanks and drums will be banded in accordance with established best practice guidelines. Spill kits will be provided at all compound locations.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of effect	Duration of Effect
		surface to the Campile Formation and Dolerite Dykes aquifer.			
	Solar Farm	Dewatering impacts (if required) on nearby groundwater abstractions. Due to the shallow nature of the excavations for the site. It is likely that dewatering will not be required during construction. There are no recorded abstractions within the site and the closest recorded abstractions are not anticipated to be impacted by any abstractions.	No mitigation is possible in relation to the impact of dewatering on groundwater abstractions. However, construction will be phased and as such dewatering would only occur over a small area at a time. Monitoring requirements are considered in Section 8.7.	Magnitude and Quality of Impact: Small adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Construction (temporary)
	All	Preferential flow pathway through dewatering wells (if required). Shallow contamination from agricultural sources or from construction phase leaks/spills have the potential to migrate to the Dolerite and Campile Formation aquifer via borehole flooding/cross completion of dewatering wells. Due to the shallow nature of the proposed excavations, it is likely that dewatering will not be required during construction.	None included in current design. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Small adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Construction (temporary)
	Solar Farm	Potential for groundwater abstractions to be located within red line boundary. No recorded groundwater abstraction wells are located within the site boundary, historical wells are recorded within the site boundary however, it is unknown if these are in use.	None included in current design. Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: Low Significance of effect: Imperceptible	Construction (permanent and temporary)

8.5.3 Operation and Maintenance Phase

Construction phase effects considered include those include which have the potential to impact the following receiving environments:

- Land and land use;
- Soils and Geology; and
- Hydrogeology.

Operational phase activities, outlined in Chapter 5, are assessed in Table 8.11.

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Table 8.11: Operational Phase Assessment of Effects

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of Effect	Duration of Effect
Land Use	Solar Farm and cable route	Loss/change of land use. The land use will be re-instated post construction for the solar farm and cable route as such the land use will return to agricultural use.	None required	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: Medium Significance of effect: Imperceptible	Operational (long term)
	BESS and substation	Loss/change of land use. The land use will be altered in areas of BESS and substation. The land use sensitivity will be altered from a medium sensitivity land use.	Additional mitigation measures have been proposed to manage this effect, which are included in Section 8.7.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Slight	Operational (long term)
Soils and Geology	All	No soils and geology impacts anticipated during operational phase.	None required	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)
Geology, Soils and Hydrogeology	Solar Farm and cable route	Exposure to Radon: Areas of high radon risk are located within the Solar Array areas and cable route area of the site. It is unlikely that the solar array and cable route will include areas requiring person entry as such radon risk is considered low. This should be confirmed during detail design. Human health receptors in this area are considered to have a High sensitivity.	Additional mitigation measures have been proposed to manage this risk, which are included in Section 8.7. However, it is unlikely that the solar array and cable route will require structures with enclosed structures as such no effect is anticipated.	No effect anticipated.	Operational (long term)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of Effect	Duration of Effect
	BESS and substation	Exposure to radon. The BESS and substation areas are located in areas that radon testing is recommended		Magnitude and Quality of Impact: Large Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Significant	Operational (long term)
Hydrogeology	Solar Farm	Impact on groundwater flow. Solar panel foundations could act as a barrier to groundwater flow.	Due to the anticipated shallow and diffuse nature of the subsurface structures, these are considered unlikely to significantly impede groundwater flow.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)
	BESS	Impact on groundwater flow. BESS foundations could act as a barrier to groundwater flow.	Due to the anticipated shallow nature of the subsurface structures, these are considered unlikely to significantly impede groundwater flow.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)
	Substation	Impact on groundwater flow. Substation foundations could act as a barrier to groundwater flow.	Due to the anticipated shallow nature of the subsurface structures, these are considered unlikely to significantly impede groundwater flow.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)
	Cable route	Impact on groundwater flow. The installation of cables in the subsurface could act as a barrier to groundwater flow. Excavations are expected to extend to a depth of approximately 1.75m below ground level.	Due to the shallow and insignificant nature of the subsurface structures, these are considered unlikely to significantly impede groundwater flow.	Magnitude and Quality of Impact: Negligible (Neutral)	Operational (long term)

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of Effect	Duration of Effect
				Receptor Sensitivity: High	
				Significance of effect: Imperceptible	
	BESS	Groundwater abstractions impact on groundwater levels A groundwater abstraction well is proposed for firefighting at the BESS site.	Groundwater abstraction is only in the case of a fire, as such. regular abstraction is not anticipated.	Magnitude and Quality of Impact: Adverse (Negative)	Operational (long term)
				Receptor Sensitivity: High	
				Significance of effect: Slight/Moderate	
	Substation	Groundwater abstractions impact on groundwater levels A potable groundwater abstraction well is proposed for welfare facilities at the substation site.	Groundwater abstraction is required for the welfare facilities at the GIS substation building, regular abstraction is anticipated, which will be required to serve four maintenance person during maintenance visits, which will occur on average once per month. Therefore, water requirement for the operational and maintenance phase will be significant below 25m3 per day. If daily abstraction is greater than 25m³/d an abstraction license will also be obtained from the EPA (Environmental Protection Agency, 2024). The two fire water tanks will be filled at the beginning of the operational and maintenance phase to ensure supply is present, these tanks will only be filled after depleted from fire fighting activities.	Magnitude and Quality of Impact: Adverse (Negative)	Operational (long term)
				Receptor Sensitivity: High	
				Significance of effect: Slight/Moderate	
	BESS	Site water dischargers. Discharges, such as firewater discharge may contain contaminants that have the potential to pollute groundwater.	In a fire event, surface water from the BESS area will automatically be redirected to a firewater storage tank via an automated penstock. The tank	Magnitude and Quality of Impact: Negligible (Neutral)	Operational (long term)
				Receptor Sensitivity: High	

Receiving Environment	Design Element	Construction Phase Impacts	Avoidance and embedded mitigation measures included in design to date	Magnitude and quality of remaining impact and significance of Effect	Duration of Effect
			will be sized to ensure no flooding of the proposed site occurs for the critical storm with a 1 in 10-year return period, including a 30% allowance for climate change. The facilities themselves will store potentially contaminative substances in secure bunded areas which are further secured by the site drainage system.	Significance of effect: Imperceptible	
	Substation	Site water dischargers. Discharges, from welfare facilities on-site.	It is anticipated that any foul water from welfare facilities on site will be connected to existing sewer network or will be managed on-site and will not be discharged to groundwater.	Magnitude and Quality of Impact: Negligible (Neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)

8.5.4 WFD Groundwater Status

The groundwater screening assessment is summarised in Table 8.12. The small scale of the Proposed Project relative to the magnitude of the WFD waterbody is deemed to pose very low risk to the delivery of long term WFD no deterioration and status objectives, such that no further (additional) assessment is required.

Table 8.12: WFD Groundwater Assessment

Test	Impact Assessment
Quantitative Status	
Saline (or other) intrusions	No impact on saline intrusions is anticipated due to the distance of the site from saline waterbodies.
Impact of groundwater on surface water ecological/quantitative status	In areas where the superficial deposits are thin or absent, groundwater within the Campile Formation and Dolerite aquifers is likely to be in continuity with surface water. Potential dewatering during construction works have the potential to impact groundwater levels and baseflow to rivers, especially works adjacent to the River Owenduff and unnamed streams. There is also potential for construction phase activities to impact on groundwater quality, which could impact local surface water bodies. However, if required, dewatering is anticipated to be short-term and localised, and following the mitigation measures outlined in Sections 8.5.2 and 8.5.3, no significant impacts are anticipated to effect recharge or water quality in the aquifer. As such, the remaining risk to surface water is low from an ecological/quantitative perspective
Groundwater Dependant Terrestrial Ecosystem (GWDTE) quantitative status	Adamstown WFD Groundwater body has been designated as a protected area for Groundwater in SAC habitats. However, the closest SAC area to the scheme is the River Barrow and River Nore SAC located more than 5km southwest of the Proposed Project and the Proposed Project is unlikely to have any significant impact on the GWDTE.
Water balance	No predicted impact to water balance of the WFD groundwater body. Dewatering, if required, will be temporary and phased over small areas. Addition of hardstanding across the BESS area will slightly reduce recharge locally. However, due to the relatively minor size of the site compared to the underlying groundwater body, the impact is considered to be negligible. The ground surface beneath the solar farm will be reinstated to natural conditions, so this element will not have any significant impacts on recharge rates.
Chemical Status	
Saline (or other) intrusions	No impact on saline intrusions is anticipated due to the distance of the site from saline waterbodies.
Impact of groundwater on surface water ecological/quantitative status	Dewatering discharge locations have not been identified. There is potential for small amounts of groundwater intercepted in excavations to be discharged to local streams or watercourses. Any discharges to surface water will be treated to remove contaminants and silt in accordance with IFI requirements. This may have a minor, local, temporary impact on surface water chemistry, but would be expected to have a negligible temporary impact (and no permanent impact) to the wider WFD surface water bodies.
GWDTE quantitative status	Adamstown WFD Groundwater body has been designated as a protected area for Groundwater in SAC habitats. However, the closest SPA/SAC area to the scheme is the River Barrow and River Nore SAC located more than 5km southwest of the Proposed Project and the Proposed Project is unlikely to have any significant impact on the GWDTE.
Drinking Water Protected areas	Carrigbyrne PWS, located approximately 5.5km northeast of the Proposed Project, is the closest Public Supply Source Protection Areas. Due to it's distance from the Proposed Project, the impact to this water source from the Proposed Project is considered to be negligible. No designated public supply or group scheme source protection areas have been identified within 2.5km of the scheme and therefore the impact of this scheme to drinking water supplies is considered negligible.
General chemical assessment	The risk of accidental spills and leaks of contaminants (accidents and disasters), such as hydrocarbons, will be minimised by the embedded and additional

Test	Impact Assessment
	mitigation measures implemented during construction and operation. The impact to the chemical status of the Adamstown WFD groundwater body is considered negligible.

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8.5.5 Decommissioning Phase

The Proposed Project is expected to have a design life of 40 years and as such, it is not possible to identify at this stage either the waste management routes or specific facilities that will be used, as these are liable to change over such a timescale. Where decommissioning takes place, it is assumed that all above-ground components associated with the Proposed Project will be disassembled and removed from the site.

8.6 Cumulative Effects

Cumulative effects are those arising from impacts of the Proposed Project in combination with impacts of other proposed or consented development projects that are not yet built or operational.

An assessment of potential cumulative effects is provided in Section **Error! Reference source not found.** below. There are no intra-project effects as this EIAR has been prepared for all elements of the Project, cumulative effects from other Developments are detailed below.

8.6.1 Other Developments

Further to a review of planning applications undertaken in September 2025 (as presented in Table 3.2, Chapter 3 of this EIAR), a list of other known existing and/or approved developments and other known planned developments, which may result in cumulative effects was undertaken.

No significant developments were identified within 2.5km of the site, as such, no cumulative effects are anticipated.

8.7 Mitigation and Monitoring Measures

Design and embedded mitigation measures are specified in Table 8.11. A Construction Environmental Management Plan (CEMP) will be prepared, included within the planning application, and implemented during the construction phase in consultation with the Planning Authority. This will specify the range of measures to avoid and minimise impacts that may occur in construction. This requires the appointed contractor to have in place appropriate consents for works that could affect groundwater and to implement specific measures to protect nearby receptors. Key CEMP measures of relevance to soils geology and hydrogeology will include;

- Fuel storage - bunded tanks to prevent spillages and designated fuelling areas with spillage control;
- Chemical storage - all potentially polluting chemicals will be stored in secure weatherproof enclosures with spill kits;
- Concrete to be brought to site by covered truck, with wet concrete operations adjacent to watercourses avoided;
- Concrete truck wash watering/cleaning will be undertaken off-site if possible;
- Failing concrete washout being carried out offsite a concrete washout management plan will be developed prior to construction by the appointed contractor;
- All concrete wash water generated on site will be collected;

- The site will be kept secure to prevent vandalism which can lead to pollution from stored liquids escaping and entering drains;
- Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations;
- Silt control measures will be used to control run-off generated from activities on site and prevent it from entering nearby waterbodies; and,
- A dewatering management plan will be developed by the contractor before construction work commences. All construction activities, including construction traffic, will be managed through the site Construction Environmental Management Plan (CEMP), which will set out key mitigation measures for, and monitoring of, potential impacts from traffic.
- Should dewatering be required any discharges will be treated to remove contaminants and silt and disposed of in accordance with EPA requirements.
- Bentonite Breakout procedure will be developed.
- An appropriately qualified person will be present on-site during construction to identify visual and olfactory evidence of contamination during excavation.
- Any contaminated ground will be characterised according to generic screening criteria and dealt with via a bespoke remediation strategy or a materials management plan.
- Any waste arising will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations.
- In addition to the above, a pre-construction confirmatory survey of wells and groundwater abstractions will be undertaken.
- Should dewatering be required, water level monitoring will be undertaken pre-construction, during construction and post-construction for groundwater abstractions which may be impacted by dewatering. A dewatering license will also be obtained for any dewatering operations over 25m³/d, in line with EPA regulations and EU law (Environmental Protection Agency, 2024).
- Water quality testing will also be undertaken pre-construction, during construction and postconstruction for any identified drinking water abstraction sources which may be impacted by construction activities.
- To address risks of exposure to radon, workplace radon tests will be carried out in areas of high risk, as required by S.I. Regulation 66 of S.I. No. 30 of 2019 (Minister for Communications, Climate Action and Environment, 2019). Radon barriers are also to be installed in areas where a high radon risk have been identified.

The following mitigation measures will be implemented to address residual risk to soils, landslide risk and risk of contaminant migration (as summarised in Section 8.8):

- Soil Management Plan - based on recognised best management practices to minimise the loss of soil quality during handling. This will include a suitable soil survey within the area of permanent land take to inform on the soils sensitivity to handling and its potential for reuse on or off site;
- Where groundwater seepage poses a risk to excavation stability, additional measures (such as dewatering) will be used to mitigate these risks.
- A suitably designed drainage system will be installed to divert water away from the landslide risk zones.
- A phase of ground investigation prior to construction will include an assessment of shallow groundwater quality within the superficial deposits (if present) and shallow bedrock. This will identify existing contamination and inform any requirement of remediation (as outlined in the CEMP detailed above).

8.8 Residual impacts

Following mitigation, the remaining component of an effect is considered a residual effect. Significance of residual effects is also determined using the criteria of Table 8.5.

In assessments for both construction and operational phase, the majority of impacts are negligible or minor and would be mitigated by rigorous land, soils and hydrogeology protection measures, resulting in effects which are imperceptible. However, following the mitigation measures included in the design, some risks remain with effects which are Slight, Moderate/Significant and Profound. To address these outstanding risks, additional mitigation measures have been proposed, which result in residual effects which are all imperceptible. These are summarised in Table 8.13.

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Table 8.13: Residual Effects

Receiving Environment	Design Element	Potential Residual Impact	Magnitude and quality of remaining impact and significance of effect	Further Mitigation	Residual Effect	Duration of effect
Land Use	BESS and substation	Loss/change of land use. The land use will be altered in areas of BESS and the substation. The land use sensitivity will be altered from a medium sensitivity land use.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: Medium Significance of effect: Slight	No further mitigation.	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: Medium Significance of effect: Imperceptible	Construction (temporary and permanent) Operational (long term)
Land and Soils	BESS	Impact on Soils. Topsoil will be stripped from the BESS area to allow for construction of the BESS platform.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Soil stripping, excavation and temporary storage will be undertaken in accordance with recognised good management practices to minimise/avoid loss of quality (TEAGASC, 2022; EPA, 2021; EPA, 2019; EPA, 2024). and Where soils are not to be replaced (i.e. BESS area), appropriately managed soil handling will allow for suitable of site reuse. Sustainable handling will be informed by the production and use of a soil management plan	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary and permanent) Operational (long term)
	Substation	Impact on Soils. Topsoil will be stripped from the substation area to allow for construction of the substation platform.	Magnitude and Quality of Impact: Small Adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate		Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary and permanent) Operational (long term)
Land, Soils, Geology and hydrogeology	BESS and substation	Exposure to Radon. The site is located in an area that radon tests are recommended within.	Magnitude and Quality of Impact: Large Adverse (Negative)	Radon protection measures should be designed into structures with person entries, workplace radon tests will be	Magnitude and Quality of Impact: Negligible (neutral)	Construction (temporary)

Receiving Environment	Design Element	Potential Residual Impact	Magnitude and quality of remaining impact and significance of effect	Further Mitigation	Residual Effect	Duration of effect
		Human health receptors are considered to have a Medium sensitivity.	Receptor Sensitivity: Medium Significance of effect: Significant	carried out in areas of high risk, as required by S.I. Regulation 66 of S.I. No. 30 of 2019 (Government of Ireland, 2023 (amended)). Radon barriers are to be installed in areas where a high risk has been identified.	Receptor Sensitivity: Medium Significance of effect: Imperceptible	Operational (long term)
Hydrogeology	Solar Farm	Dewatering impacts (if required) on nearby groundwater abstractions. Due to the shallow nature of the excavations for the site. It is possible that dewatering will not be required during construction. There are no recorded abstractions within the site and the closest recorded abstractions are not anticipated to be impacted by any abstractions.	Magnitude and Quality of Impact: Small adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	A no derogation agreement will be made with owner/operators of groundwater sources to ensure continuity of water supply during period in which water supply may be impacted.	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	All	Preferential flow pathway through dewatering wells (if required). Shallow contamination from agricultural sources or from construction phase leaks/spills have the potential to migrate to the Dolerite and Campile Formation aquifer via borehole flooding/cross completion of dewatering wells. Due to the shallow nature of the proposed excavations, it is possible that dewatering will not be required during construction.	Magnitude and Quality of Impact: Small adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate		Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Construction (temporary)
	BESS	Groundwater abstractions impact on groundwater levels A groundwater abstraction well is proposed for firefighting at the BESS site.	Magnitude and Quality of Impact: Adverse (Negative)		Magnitude and Quality of Impact: Negligible (neutral)	Operational (long term)

Receiving Environment	Design Element	Potential Residual Impact	Magnitude and quality of remaining impact and significance of effect	Further Mitigation	Residual Effect	Duration of effect
			Receptor Sensitivity: High		Receptor Sensitivity: High	
			Significance of effect: Slight/Moderate		Significance of effect: Imperceptible	
	Substation	Groundwater abstractions impact on groundwater levels A potable groundwater abstraction well is proposed for welfare facilities at the substation site.	Magnitude and Quality of Impact: Adverse (Negative) Receptor Sensitivity: High Significance of effect: Slight/Moderate	Groundwater abstraction is for the welfare facilities at the substation, regular abstraction is anticipated. Pumping tests should be undertaken as part of ground investigation works prior to construction to determine feasibility. If daily abstraction is greater than 25m ³ /d a dewatering license will also be obtained for any dewatering operations over 25m ³ /d, in line with EPA regulations and EU law (Environmental Protection Agency, 2024).	Magnitude and Quality of Impact: Negligible (neutral) Receptor Sensitivity: High Significance of effect: Imperceptible	Operational (long term)

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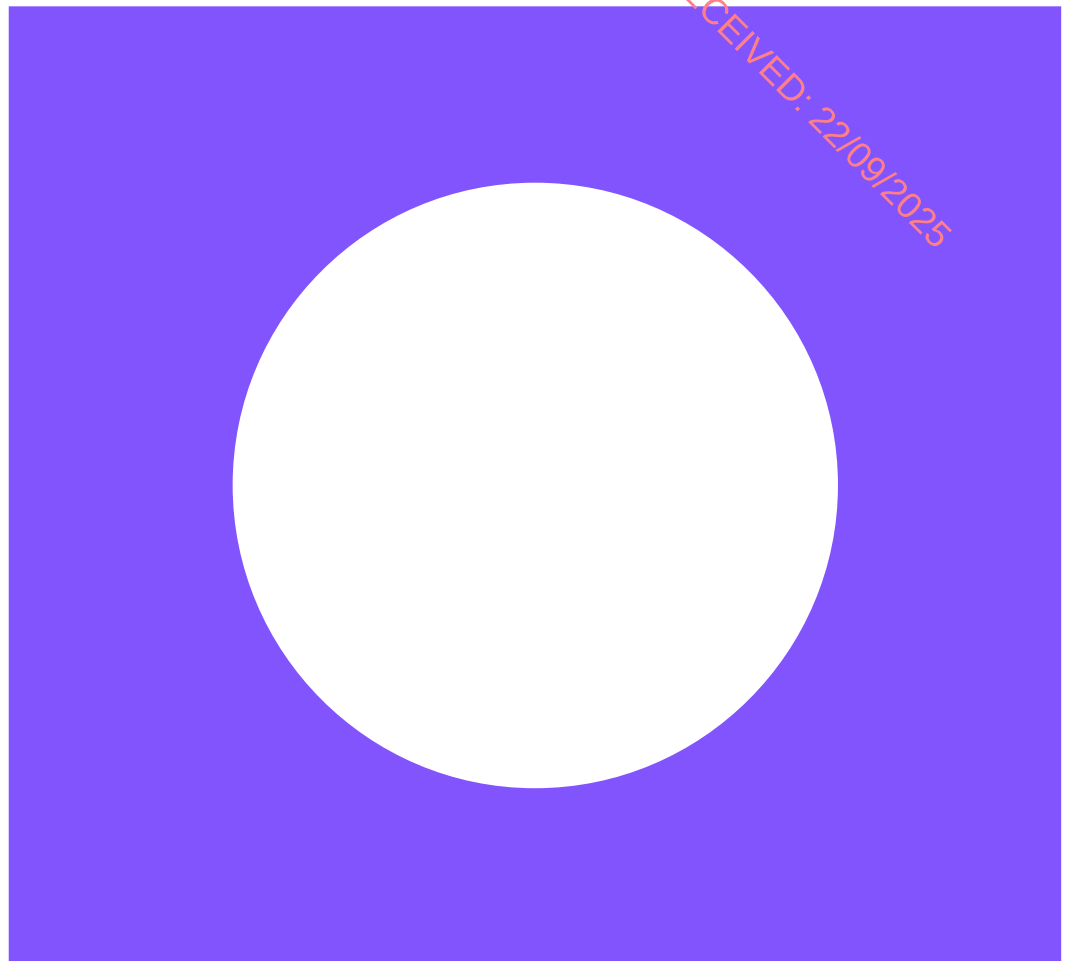
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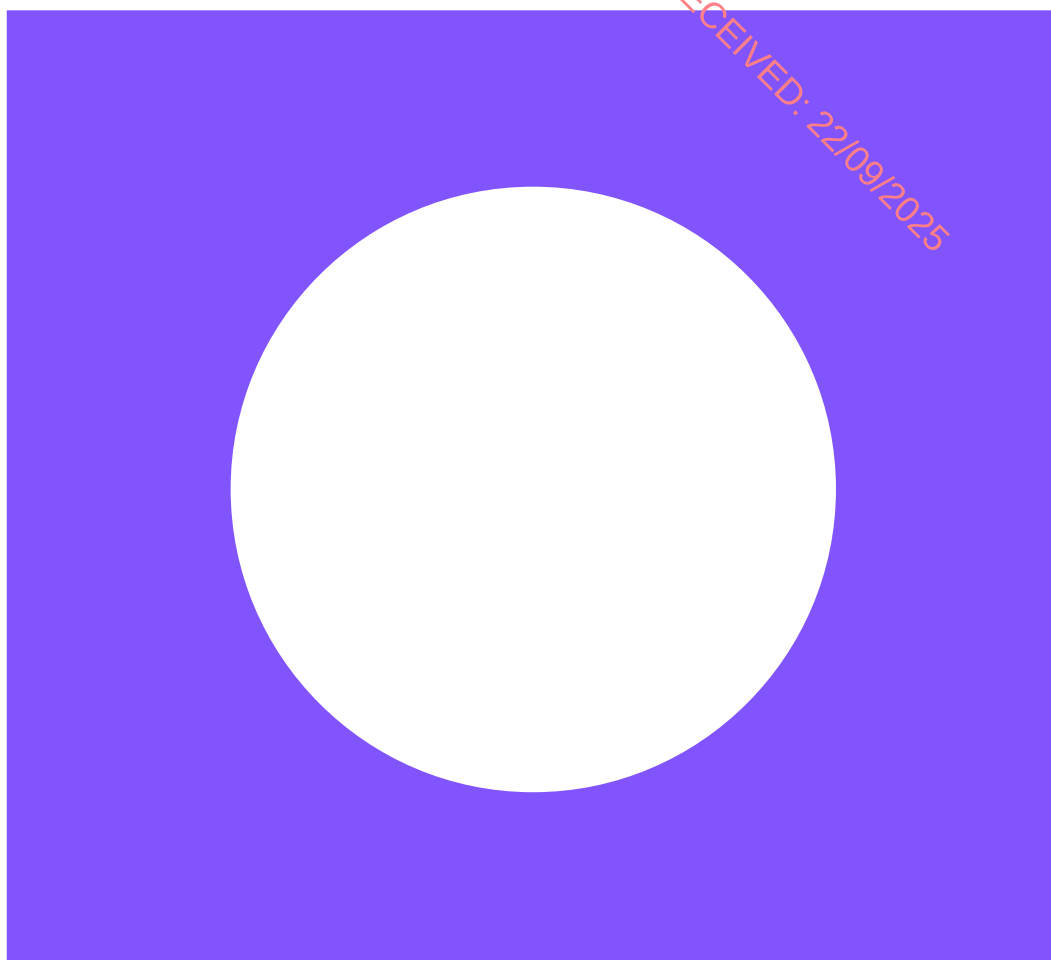
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 9 Surface Water Resources and
Flooding

September 2025

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9 Surface Water Resources and Flooding

9.1 Introduction

This chapter considers the potential impacts during construction, operation (including maintenance) and decommissioning associated with:

- Surface waterbodies;
- Water supply and wastewater discharge (including drinking water supply network, foul water and the drainage network);
- Water Framework Directive (WFD) surface water objectives; and
- Flood risk.

This assessment focuses on impacts associated with the construction of the Proposed Project proposed as detailed on Chapter 5 - *Description of Development*.

Proposed mitigation measures to prevent, reduce and/or offset the anticipated potential impacts are presented as appropriate.

The assessment of the likely significant effects arising from the Proposed Project on groundwater is presented in Chapter 8 Land, Soils and Hydrogeology. The assessment of impacts on biodiversity is discussed in Chapter 7 Biodiversity.

9.2 Guidance

This assessment follows guidelines established by Transport Infrastructure Ireland (TII) / National Roads Authority (NRA) in its *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009), hereafter referred to as the NRA Guidelines. Regard has also been had to:

- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016);
- Planning for Watercourses in the Urban Environment: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (Inland Fisheries Ireland, 2020);
- Control of Water Pollution from Construction Sites - Guide to Good Practice (C532) (CIRIA, 2001); and
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (hereafter referred to as the Flood Risk Guidelines) (The Department of the Environment, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) 2009)

9.3 Methodology

9.3.1 Approach to Data Collection

Identification of surface water features / waterbodies, such as rivers and lakes, has been based on site walkovers, desktop data such as those detailed on Environmental Protection Agency (EPA) datasets and mapping.

The following data sources were used in the compiling of this chapter;

- Water quality data for Ireland - Catchments.ie – (DHLGH, EPA and Local Authority Waters Programme 2024) accessed in August 2025.
- Water Quality in 2023 - An Indicators Report (EPA, 2024)
- Environmental Protection Agency Water map - online map viewer (EPA 2025) accessed in August 2025.
- GeoHive (Ireland) – National Geospatial Data Hub (Government of Ireland and Tailte Éireann 2025)
- Flood Mapping available on floodinfo.ie (Office of Public Works, 2025), accessed in August 2025.
- National Parks and Wildlife Service (NPWS) - Designated Sites (NPWS 2025)
- Tailte Éireann Drainage ditch layer from Prime 2 data (Tailte Éireann 2025)

9.3.2 Study Area

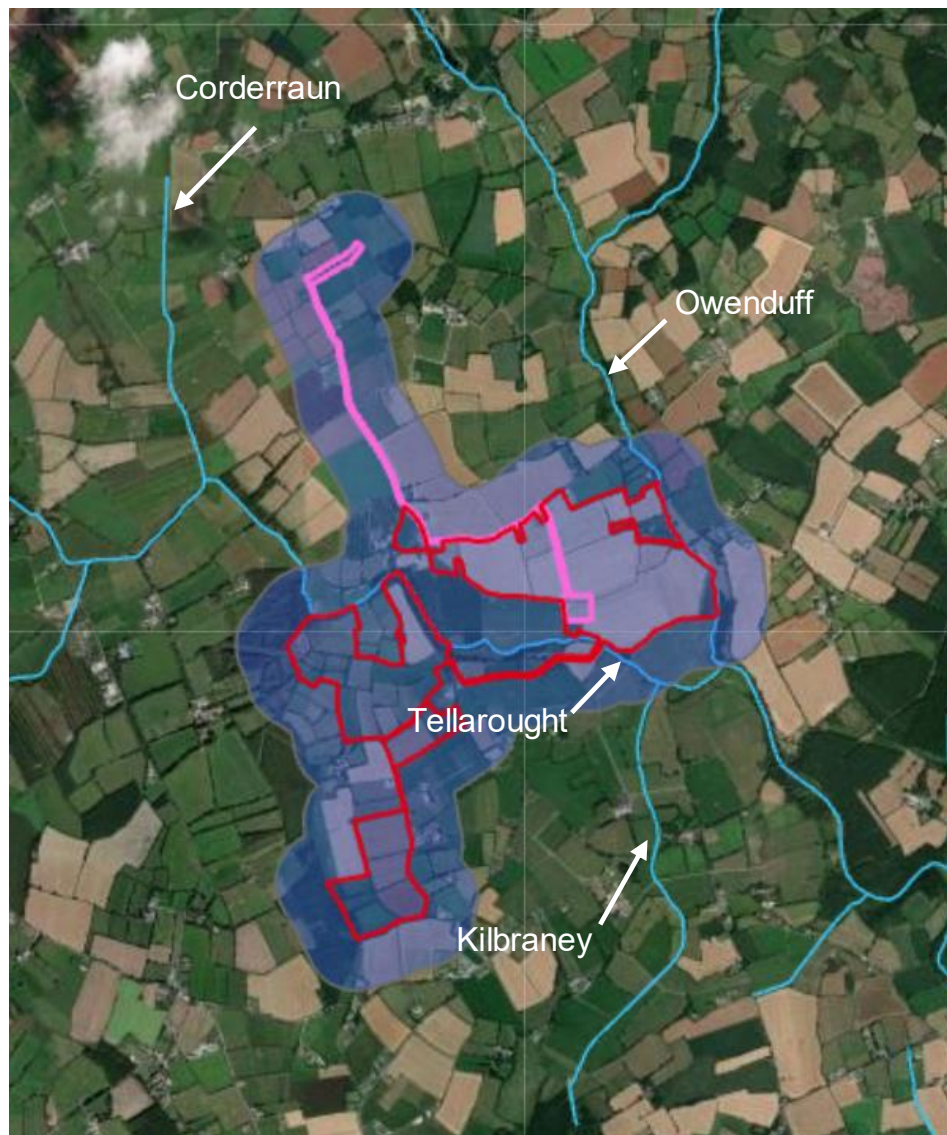
The study area includes surface waterbodies adjacent to the Proposed Project. It is noted that there are no direct works within any identified surface water body as part of the Proposed Project.

The zone of influence for surface waters extends downstream from works areas in terms of potential effects on surface water quality. The zone of influence will differ depending on the potential pollutants. A 250m study area (250m radius from the Proposed Project boundary) has been applied and is considered appropriate to encompass all water bodies that may be susceptible to significant impacts.

Figure 9.1 illustrates the surface waters which are the basis for assessment, and the 250m study area.

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Figure 9.1: Study Area and surface waterbodies within 250m radius



Source: Mott MacDonald Ireland Limited

9.3.3 Approach to Impact Assessment

The surface water environment is intrinsically linked to flood risk, ecological receptors and groundwater, which are respectively considered in the Flood Risk Assessment Report (Appendix 9.1, Volume 3 of this EIAR), and Chapter 7 (Biodiversity) and Chapter 8 (Soils, Geology and Hydrogeology) in Volume 2 of this EIAR.

Commercial and recreational uses of the water environment are not included in the scope of this Chapter, as commercial and recreational interests are considered and assessed in Chapter 6 (Population and Human Health) and Chapter 17 (Material Assets) in Volume 2 of this EIAR.

The following tables outline the criteria for rating site attributes, the reference values for biological water quality and WFD status, the criteria for rating flood risk receptors, the criteria for rating impact magnitude and the rating of significant environmental effects.

Table 9.1: Criteria for Rating Site Attributes – Estimation of Importance of Hydrology Attributes (NRA, 2009)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)

Table 9.2: Reference Values for Q Value / WFD Status (Riverine only)

Q Value*	WFD Status	Pollution Status	Condition**
Q5, Q4-5	High	Unpolluted	Satisfactory
Q4	Good	Unpolluted	Satisfactory
Q3-4	Moderate	Slightly polluted	Unsatisfactory
Q3, Q2-3	Poor	Moderately polluted	Unsatisfactory
Q2, Q1-2, Q1	Bad	Seriously polluted	Unsatisfactory

Source: [Environmental Protection Agency Ireland \(epa.ie\)](http://www.epa.ie)

Notes:

* These Values are based primarily on the relative proportions of pollution sensitive to tolerant macroinvertebrates (the young stages of insects primarily but also snails, worms, shrimps etc.) resident at a river site.

** "Condition" refers to the likelihood of interference with beneficial or potential beneficial uses.

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Table 9.3: Criteria for Rating Flood Risk Receptors

Vulnerability class	Land uses and types of development which include*
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure
Water compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

Source: Table 3.1 Classification of vulnerability of different types of development, The Planning System and Flood Risk Management (2009)

Table 9.4: Criteria for Rating Impact Magnitude

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Loss or extensive change to a waterbody or water dependent habitat Increase in predicted peak flood level >100mm Extensive loss of fishery Calculated risk of serious pollution incident >2% annually¹

¹ Refer to Annex 1 of HA216/06 Highways Agency (2006) Road Drainage and the Water Environment (HA216/06), Design Manual for Roads and Bridges (DMRB). The UK DMRB suggests that where the probability of a serious pollution incident is greater than 1%/year, spill-containment measures should be considered. It also suggests that, in particularly sensitive waters, areas at lower risk of serious pollution may also warrant special measures. The formula is however tailored for road developments where increasing traffic densities and higher proportions of heavy goods vehicles (HGVs) are likely to lead to an increased risk

Magnitude of Impact	Criteria	Typical Examples
		Extensive reduction in amenity value
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm Partial loss of fishery Calculated risk of serious pollution incident >1% annually Partial reduction in amenity value
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm Minor loss of fishery Calculated risk of serious pollution incident >0.5% annually Slight reduction in amenity value
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level Calculated risk of serious pollution incident <0.5% annually
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)

Table 9.5: Rating of Significant Environmental Effects

Importance of Attribute	Magnitude of Impact			
	Negligible	Small	Moderate	Large
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
High	Imperceptible	Moderate / Slight	Significant / Moderate	Severe / Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)

9.3.4 Limitations of this EIAR

Identification of surface water features / waterbodies, such as rivers and lakes, has been based on site walkovers, desktop data such as those detailed on Environmental Protection Agency (EPA) datasets and mapping.

of accidents that could give rise to hazardous spills. While the calculation is not appropriate for use on this project, having regard to the characteristics of the proposals as detailed in Section 11.3, regard has been had to the proposed mitigation as appropriate.

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9.4 Receiving Environment

A desktop qualitative appraisal was undertaken to identify the baseline characteristics relating to the hydrology of surface waterbodies proximal to the Proposed Project.

9.4.1 Catchment Overview

The Proposed Project is located in the Ballyteigue-Bannow Hydrometric Area (Catchment ID 13). This catchment measures an area of 654km² within County Wexford. The third Cycle Catchment Report (EPA, May 2024) described the catchment as the area drained by all streams entering tidal water between Greenore Point and Railway Bridge, Great Island, Co. Wexford

The Ballyteigue-Bannow Catchment is divided into five sub catchments with 115 river waterbodies, 19 lakes, two transitional waterbodies, four coastal waterbodies and 37 groundwater bodies.

There are no large urban centres in the catchment. The only urban centres in this catchment are Lady's Island, Kilmore Quay, Bridgetown, Wellingtonbridge, Duncannon, and Campile.

9.4.2 Surface Water Features

There are three surface waterbodies within the study area, these are;

- Owenduff river (EPA Code: 13O01, segment code: 13_645)
- Tellarought river (EPA Code: 13T14, segment code: 13_232)
- Kilbraney river (EPA code: 13K04, segment code: 13_561)

Under the Water Framework Directive monitoring programme, all three watercourses are collectively named the Owenduff (Wexford)_010 (European code: IE_SE_13O010100) and assigned a Moderate status for the monitoring period 2016-2021². The Risk status is categorised 'At Risk', with the significant pressure identified as agriculture, which are described as "Impacts from agriculture include nutrient and organic pollution. A significant agricultural pressure can be diffuse and/or point source of pollution." The latest Q Values

The Owenduff (Wexford)_010 is attributed an importance rating of High in accordance with the NRA's Estimation of Importance of Hydrology Attributes presented in Table 9.1 above. The NRA categorises rivers with Q Values of 3-4 (Class B) as High importance.

There are no lakes within the study area.

9.4.3 Protected Areas

A review was conducted to determine those European sites which are within the study area and / or hydrologically connected to the study area. There are no designated bathing waters or shellfish protection areas within 5km of, or in direct hydrological connection to the Proposed Project.

There are hydrological links to the following designated sites;

Special Protection Areas (SPA)

The Proposed Project is located a significant distance from the Bannow Bay SPA (this SPA also shares a boundary with Bannow Bay proposed Natural Heritage Area). A hydrological link has been identified to the SPA via the Owenduff River. The closest separation distance between the SPA and the Project site is 8.4km.

² https://www.catchments.ie/data/#/waterbody/IE_SE_13O010100?_k=7n12td

The Proposed Project is located a significant distance from the Seas off Wexford SPA. A weak hydrological link has been identified to the SPA via the Owenduff River. The closest separation distance between the SPA and the Project site is 12.1km.

Special Areas of Conservation (SAC)

The Proposed Project is located a significant distance from the River Barrow and River Nore SAC with no downstream hydrological connectivity although it is within the same catchment area. The closest separation distance between the SAC and the Project site is 5.6km.

The Proposed Project is located a significant distance from the Bannow Bay SAC (this this SAC also shares a boundary with Bannow Bay proposed Natural Heritage Area). with no downstream hydrological connectivity although it is within the same catchment area. The closest separation distance between the SAC and the Project site is 7.4km.

The Proposed Project is located a significant distance from the Hook Head SAC with no downstream hydrological connectivity although it is within the same catchment area. The closest separation distance between the SAC and the Project site is 12.2km.

9.4.4 Non-designated watercourses

It is proposed that surface water drainage from Array Area A will discharge to an existing ditch via a headwall discharge outfall, this ditch is hydrologically connected to the Owenduff River (EPA Code: 13O01, segment code: 13_645) to the east.

There are number of ditches within the study area, which will not be crossed by any element of the Proposed Project.

9.4.5 Drinking Water Supply

There are no surface water Geological Survey Ireland (GSI) Public Supply Source Protection Areas or National Federation of Group Water Schemes (NFGWS) Source Protection Areas located within the study area. There are no known surface water abstractions within the study area. None of the river segments within the study area are designated Drinking Water Rivers.

9.4.6 Drainage, Water Supply and Wastewater Infrastructure

The Project site comprises agricultural pasture, anecdotally it is known that localised field drainage is present in agricultural fields used for hay production, however details of the types of subterranean drainage is not known. The proposed MV cabling between the solar array areas and the 220kV grid connection will be located within the local tertiary road network in which potable water pipes are present. There is no agglomeration for any urban wastewater treatment plant present within the study area due its rural setting, and therefore wastewater sewers are not anticipated to be in present in the local road network.

9.4.7 Flood Risk

A Stage 1 Flood Risk Assessment (FRA) was prepared to accompany this EIAR and is contained in Appendix 9.1 (Volume 3 of this EIAR). The FRA has been prepared in accordance with the Flood Risk Guidelines (DEHLG and OPW, 2009).

The FRM Guidelines define three Flood Zones:

- **Flood Zone A** where the probability of flooding from rivers and the sea is highest (greater than 1% Annual Exceedance Probability (AEP) or 1 in 100 year for river flooding or 0.5% AEP or 1 in 200 for coastal flooding);

- **Flood Zone B** where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP or 1 in 1,000 year and 1% AEP or 1 in 100 year for river flooding and between 0.1% AEP or 1 in 1,000 year and 0.5% AEP or 1 in 200 year for coastal flooding); and
- **Flood Zone C** where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1,000 for both river and coastal flooding). Flood Zone C covers all areas which are not in Flood Zone A and Zone B.

There are no vulnerable or highly vulnerable development types (i.e. 220 kV substation compound) located in Flood Zone A or B. The majority of the Proposed Project is located in Flood Zone C, with the exception of perimeter fencing for Shelburne Energy Farm which occurs in close proximity to the Owenduff River. A detailed baseline assessment of flood risk, including flood zone mapping, is provided in Appendix 9.1 in Volume 3 of this EIAR.

9.5 Likely Significant Impacts

This section presents the potential impacts that may occur due to the Proposed Project on the identified and in-scope receptors. All potential impacts are identified in the absence of control measures or mitigation.

The assessment informs the need for mitigation and / or monitoring measures, which are presented in Section 9.7, while Section 9.8 presents the predicted residual impacts, following the implementation of the prescribed mitigation and / or monitoring measures.

9.5.1 'Do Nothing' Scenario

Under a 'Do Nothing' scenario it is expected that the site will continue to be utilised for agricultural purposes. As is, the site potentially represents a source of contamination to the water environment, as diffuse agricultural sources continue to be a main threat to the quality of water in Ireland.

9.5.2 Construction Phase

Given the nature of the Proposed Project, the potential for impacts on the water environment are for the most part associated with the construction phase of the Proposed Project and are similar to any civil engineering project. These include:

- Impacts to surface water quality from sediment runoff, spillages and discharges;
- Impacts on drainage patterns from working in or near watercourses;
- Impacts from new water supply and wastewater infrastructure; and
- Impacts on flood risk.

9.5.2.1 Surface Water Quality

Vegetation clearance and excavations can pose a risk to surface water quality through surface water run-off and the release of sediment to watercourses. Ground damage from construction vehicles and machinery can also cause rutting and increased erosion of soils. Access tracks used during construction may affect surface run-off patterns, creating alternative flow paths, promoting erosion and localised flooding.

The construction of the BESS compound and substation compound will require earthwork activities to create a level platform over a total area of 6.92 hectares. This has potential to result in elevated dust levels and sediment run-off which may impact surface water bodies in the absence of mitigation.

Elevated levels of sediment could impact on spawning fish, through issues including the sedimentation of spawning gravels, clogging of fish gills and reduction in dissolved oxygen.

Accidental release of potentially polluting substances such as oils (hydrocarbons) can result in significant impacts on the aquatic environment. The release of hydrocarbons can impact water dependent species resulting in disruption to neurosensory, abnormal behaviour and development issues as well as direct impacts on fertility. Oil spills can reduce the capacity of a waterbody to exchange oxygen as well as result in oil coating the gills of aquatic species causing lesions on respiratory surfaces. This can result in significant respiratory difficulties for aquatic organisms. Benthic invertebrates can be adversely affected if fractions of hydrocarbons settle and accumulate in sediments. This can result in the mortality of populations and prevent future colonisation.

Concrete and cement are highly alkali and fresh concrete has corrosive properties. Concrete wash water is a particularly severe pollutant, as it typically has a high pH (11-12) coupled with extremely high suspended sediment content. In the freshwater environment, pH levels which are elevated beyond natural conditions can have significant impacts upon water bodies.

Schedule 5 of SI 272 of 2009 (European Communities Environmental Objectives (Surface Waters) Regulations 2009) includes the following (WFD) pH limits for rivers and lakes:

- Soft water $4.5 < \text{pH} < 9.0$, where soft water is $\leq 100 \text{ mg/l CaCO}_3$; and
- Hard water $6.0 < \text{pH} < 9.0$, where hard water is $> 100 \text{ mg/l CaCO}_3$.

There are no in-stream works of any designated watercourse. The closest separation distance to the Owenduff River during the construction phase is ca. 15m, which relates to the installation of the 38kV polesets to carry the MV cabling across the Tellarought River.

The proposed MV cabling from Array Area B and C will be required to cross the Tellalought River to reach the AIS substation compound. This river crossing will be facilitated via the provision of a section of overhead line, with the cabling strung between two 38kV wooden polesets (setback distance from the top of the river bank is ca. 15m) to avoid in-stream works and impacts to the riparian zone. There is no requirement for concrete in the installation of the wooden 38kV poles as these will be driven into the ground to an appropriate depth below ground level (subject to site specific ground conditions).

The proposed earthworks associated with the substation compound and BESS compound may result in localised changes to surface water drainage patterns and restrictions to infiltration of rainfall in soils. The proposed access tracks may affect surface runoff patterns, creating alternative flow paths and may promote erosion of previously unaffected areas.

Given the rural setting of the Proposed Project existing drainage networks are available, and any disturbance will be localised and temporary in duration. Surface water contributions will remain unchanged and will likely discharge to the same catchment.

The use of construction vehicles and machinery can cause increased erosion of exposed surfaces, which once exposed to rainfall, can result in excessive volumes of eroded material entering surface water features.

There is a chance that construction traffic could accidentally release fuel/oil which could cause a pollution incident if it reaches a watercourse. There are several bridges crossing watercourses which construction traffic will encounter on haulage routes to the Project site; however, there is no potential for likely significant effects from such a pollution event caused by construction traffic.

The magnitude of adverse surface water quality impacts in the absence of additional mitigation is expected to be localised in scale but large and adverse, relative to Table 9.4, resulting in

severe / significant effects of temporary duration prior to the implementation of additional mitigation measures.

9.5.2.2 Surface water drainage, water and wastewater infrastructure

During construction, welfare facilities will be provided at each of the temporary construction compounds, and any discharges will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility. Water will be tankered onto site as required.

The MV cabling for the solar farm will utilise public roads to reach the proposed AIS substation compound, however, utility services records will be consulted by the appointed Contractor to ensure that the micro-siting of the cabling will avoid other in-road utilities. Consequently, significant adverse impacts on water or wastewater utility infrastructure during the construction phase are not likely and the effect will be short-term and imperceptible.

9.5.2.3 Flood Risk

The proposed inter-array (MV) cabling and the 220kV grid connection is mostly buried underground and is designed to continue to be operation under flood conditions. The BESS compound and substation compound are located in Flood Zone C. The only element of construction works occurring within Flood Zone A or B is the erection of the perimeter fencing. It is proposed that wire mesh deer stock fencing is provided, which does not require foundations instead each wooden pole will be installed to a minimum depth of 900mm, with excavated material being reused and compacted at the base of each wooden pole. Consequently, significant adverse impacts on flood risk during the construction phase are not likely and the effect will be temporary and imperceptible.

9.5.3 Operation and Maintenance Phase

9.5.3.1 Surface Water Quality

The drainage design has been developed in accordance with Sustainable Drainage Systems (SuDS) principle, consequently the solar farm will continue to drainage to the existing greenfield run-off rates. In order to reduce sediment erosion and flow velocity gravel-filled filter drains are proposed along the proposed access tracks. All new cable infrastructure will be located below-ground and will not interface with surface water receptors. The land will continue to drain as per the existing arrangements along the proposed MV and 220kV cable routes.

Within the surface water drainage system for the BESS and substation compound it is proposed to locate a silt trap chamber and oil/fuel interceptor located upstream of the dry detention basin to help remove pollutants which may have become entrained in runoff from any hardstanding areas that may be at risk of contamination from oil or fuel spills associated with vehicles.

The surface water runoff generated by the BESS facility will be collected via a gravity drainage system and managed using a dry detention basin. The proposed future substation will also be connected to main gravity drainage system serving the BESS compound. The basin will be unlined allowing for infiltration and it will be sized to ensure no flooding of the proposed site occurs for the critical storm with a 1 in 100-year return period, including a 30% allowance for climate change. The operational efficiency of infiltration systems is dependent on the geotechnical properties of underlying soil at the proposed location and should be confirmed through ground investigation. The dry detention basin will include a sediment forebay at the inlet of the basin that will provide sediment treatment by allowing particulates to settle out and preventing their resuspension within the main detention area. Furthermore, a permanently wet volume will be provided to enhance the treatment of surface water runoff by encouraging the adhesion of entrained contaminants to vegetation planted within the pond. The outfall from the

basin will be discharged via a headwall into the existing drainage ditch located to the southeast. The discharge to a watercourse is to be restricted in accordance with sustainable drainage principles and limited to the greenfield runoff rate.

An emergency shut-off valve chambers located upstream of the dry detention basin to prevent discharge from the drainage network in an emergency event and during periodic maintenance. In case of a fire event, surface water from the hardstanding areas within the BESS compound will be automatically redirected to an underground firewater storage tank via an automated penstock. The fire water will be tested to determine the appropriate disposal method. For example, if it is not contaminated, it can likely be discharged through the attenuation pond. Otherwise, fire water will be collected by a licenced waste contractor and tankered off-site for disposal at a licenced wastewater treatment facility.

With regard to the transformer centres within the solar farm, these units will be bunded and fitted with an in-bund interceptor to prevent any oil spillage to ground. Similarly, the transformer within the AIS compound will be an oil filled transformer. This transformer will be bunded and will have the capacity to hold 110% of the volume of oil.

Given the nature of the surface water design which has embedded mitigation it is expected that there are no adverse or significant impacts on surface water quality during operation and maintenance phase, impacts are likely to be long-term but imperceptible.

9.5.3.2 Surface water drainage, water and wastewater infrastructure

An on-site water supply will be provided for fire fighting purposes in relation to the BESS compound. This proposed on-site borehole will fill each of the two tanks, which have a combined capacity of 248m³. It is proposed that both tanks would be filled at the commencement of the operational and maintenance phase to ensure that fire water is present and will only be refilled when emptied as a result of fire fighting measures. In addition, this borehole will provide the potable water supply for the GIS building. Due to the limited requirements for water during the operational phase, which under a normal operating scenario is limited to use during monthly site visits to the GIS building it is estimated that the weekly average consumption is ≤50litres.

Once the GIS building is operational, domestic type wastewater will be produced by the onsite welfare facilities (toilet, wash hand basin and mess room sink). It is proposed that wastewater will be discharged by gravity sewer to a sealed foul wastewater holding tank. The holding tank is sized according to the anticipated staff numbers, which is predicted to be four people visiting once per month, thus emptying frequency will occur once every 12 months. The holding tank will be monitored by a high-level alarm which will alert the site operators when the tank capacity is approaching full.

The water abstraction volumes from groundwater for potable water and fire fighting purposes are limited, and sized appropriate based on predicted operational staff and size of the BESS installation in accordance with National Fire Chiefs Council publication 'Grid Scale Battery Energy Storage System Planning – Guidance for FRS. Consequently, this groundwater abstraction will not result in any likely adverse impacts on surface water quality of flow levels during the operation and maintenance phase, impacts will be imperceptible.

As there will be no discharge of wastewater (importance low and magnitude negligible), effects will be imperceptible.

9.5.3.3 Flood Risk

A desk-based assessment of the Proposed Project was undertaken (contained within Appendix 9.1, Volume 3 of this EIAR), which concludes that the impact on flood risk is negligible at

operation stage as all elements are located within Flood Zone C (with the exception of perimeter fencing occurs in Flood A or B and one 38kV poleset).

9.5.4 Decommissioning Phase

The Proposed Project has a predicated design life of 40 years any decommissioning works will have effects similar to those of the construction phase, assuming that materials are removed for disposal and the site is restored. It is not intended to decommission the proposed 220kV substation compound and electricity infrastructure, however, over time elements of the Proposed Project, for example, cables, may need to be replaced. The activities associated with the decommissioning phase will be similar to those associated with the construction phase.

Therefore, the impacts of the decommissioning phase should be, as a worst-case scenario, similar to those at construction phase.

9.6 Cumulative Effects

9.6.1 Other Developments

A review of the projects detailed in Table 3.2 of Chapter 3 *EIA Methodology* was undertaken to determine if there are any other projects which could act in combination with the Proposed Project such that cumulative effects would be likely on surface water receptors or flood risk.

The potential for any future extension of the solar farm into undeveloped lands immediately north of the proposed BESS compound, any construction phase would not overlap with that of the Proposed Project. There would be no requirement for re-contouring or development of access tracks (or associated drainage) within these lands which may be developed, and therefore sediment or concrete pouring construction activities would be limited (based on the assumption that no more than one new transformer centre [which will be banded] would be required for the extension).

Construction phase activities would likely be negative, short term and imperceptible.

The proposed solar farm extension would not impact flood risk as these lands are located in Flood Zone C, and there is very limited change to surface water run-off patterns in addition to what is proposed by the subject Proposed Project.

There are no likely significant cumulative operational and maintenance phase impacts predicted as there will be limited changes to surface water run-off patterns.

The potential future expansion of the BESS compound into undeveloped lands abutting the proposed BESS compound will result in the requirement for earthworks to create a level platform is likely to have a negative, short-term but not significant effect impact on surface waterbodies due to potential for an increase in sediment laden runoff. The same mitigation measures listed in section 9.7.1 would be utilised to mitigate any potential impacts to surface water quality.

During the operational and maintenance phase the extended surface water drainage will tie into the subject proposed BESS compound drainage detailed in this EIAR, and there is no requirement to provide additional supply for the fire water tanks. There are no likely significant cumulative impacts predicted.

There are no other proposed projects within the vicinity of the Owenduff River that could act cumulatively with the Proposed Project.

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9.7 Mitigation and Monitoring Measures

9.7.1 Construction Phase

The following mitigation measures will be implemented prior to commencement and throughout the duration of the proposed works. These measures will also be incorporated into the Construction and Environmental Management Plan (CEMP), which the Contractor will develop based on the CEMP which accompanies this application.

- A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed by the Contractor prior to commencement of works.
- Confirmatory pre-construction surveys will be carried out and seasonal constraints will be confirmed in agreement with IFI and National Parks and Wildlife Service (NPWS) and Wexford County Council, as appropriate.
- Works will be carried out in accordance with the guidelines set out by IFI in '*Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters*' (IFI, 2016) including the programming of instream works within the period July to September.
- The IFI Biosecurity Protocol for Field Survey Works³ will be complied with.
- In the case of a warning of a flood event, plant and materials vulnerable to flooding in 'at risk' construction compounds will be relocated to parts of the compound that are considered to be not at risk of flooding.

The following mitigation measures will be implemented prior to commencement and throughout the duration of the works:

- Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed, and ruts will be created that will act as miniature rivers where dirty water will flow.
- Tracking beside streams will be avoided to avoid damage to the bankside.
- Geotextile or timber matting will be used on soft ground, and in all protected areas
- A buffer zone of 15m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works.
- The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable.
- Re-instatement method statements will be subject to approval by the EnCoW.
- Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
- In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed.
 - All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations:
 - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;
 - Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces;
 - All tanks and drums will be banded in accordance with established best practice guidelines; and

³ <file.html> (fisheriesireland.ie)

- Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works.
- Works will not be carried out during extreme rainfall or high flow events as determined by the EnCoW. An early flood warning system will be set up by the appointed Contractor to allow the removal of plant and material from construction areas located in Flood Zones A and B in the event of a flood warning. The duration of works within Flood Zone A and B will be minimised to reduce the potential of impact.
- Temporary works will be designed so as not to increase flood risk elsewhere from overland flow, by limiting excavated lengths and providing suitable drainage provision.
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
- Any instream works will be conducted during the period July – September to avoid effects on fisheries or otherwise agreed with IFI.

Silt Control Measures

- Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses.
- Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.
- Silt fences will be installed in the working areas and not at the watercourse.
- Access routes will be delineated such that an appropriate set back distance of 30m from watercourses is maintained except where existing access . Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site.
- Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained.
- Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.

Silt Fences

- Silt fences will be installed downslope of the area where silt is being generated on disturbed ground.
- To be effective the silt curtain will contain the area where silt is generated and will terminate on high ground (i.e. an elevated area not in the watercourse).
- Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh.
- The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals.
- Once installed the silt fence will be inspected by the Environmental Clerk of Works regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains.
- The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately.
- Two lines of silt curtain / fence will be installed, where considered necessary by the EnCoW.
- Any build-up of sediment along the fence boundary will be removed daily.
- Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW.

- The silt fencing will be left in place until the works are completed (which includes removal of any temporary ground treatment).
- Silt fences will not be removed during heavy rainfall.
- The silt fence will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when silt fences were installed, inspected and removed will be maintained by the EnCoW.

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Silt Traps

The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply:

- Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low.
- Silt traps will be made of terram or similar material, not mesh.
- The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides.
- The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.
- The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it.
- Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth.
- Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom.
- In sensitive areas a series of silt traps will be placed in the drain.
- The silt trap will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when it was installed, inspected and removed will be maintained by the EnCoW.

9.7.2 Operation and Maintenance Phase

Mitigation for stormwater is embedded in the design, described in section 9.5.3.1, and includes that surface water runoff will flow through a silt trap chamber and oil/fuel interceptor and conveyed to the underground fire water retention tank before discharging to the existing drainage.

Wastewater from the GIS building foul holding tank will be tankered and removed off site, no mitigation is required.

9.8 Residual Impacts

Following the implementation of mitigation measures during construction and the embedded mitigation built into the design for the operational phase, residual effects in terms of water quality will be imperceptible (Owenduff Wexford)_010. The residual effect on water supply, wastewater and drainage will be imperceptible.

Table 9.6: Residual Effects

Receiving Environment	Construction Effect	Operational Effect	Residual Effect
Surface water quality	Moderate - Significant	Imperceptible	Imperceptible
Water supply, wastewater, drainage	Imperceptible	Imperceptible	Imperceptible
Flood Risk	Moderate	Imperceptible	Imperceptible

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9.9 Water Framework Directive Assessment

9.9.1 Introduction

The EU Water Framework Directive (Directive 2000/60/EC)⁴ (referred hereafter as the WFD) establishes a framework for the protection of inland surface waters, transitional waters, coastal waters, and groundwater. It aims to prevent and reduce pollution, promote sustainable water use, protect and improve the aquatic environment and mitigate the effects of floods and droughts.

In Ireland, the WFD is transposed by the following national regulations:

- European Communities (Water Policy) Regulations (2003 and 2014) and;
- European Union Environmental Objectives (Surface Waters) Regulations (2009, 2012, 2015 and 2019)

Under the WFD, a water body is the basic management unit used to assess if the environmental objectives for that water body have been met.

River water bodies are defined as all or part of a river system within operational sub catchments which are located in larger catchments within river basin districts. Relevant examples for this study would include:

- Water body: Owenduff River water body;
- Sub catchment: Owenduff[Wexford]_SC_010
- Catchment: Ballyteigue-Bannow
- River Basin Districts (RBD): Ireland's national River Basin District.

The Irish River Basin District (RBD) covers an area of 70,273km², with 46 catchment management units, consisting of 583 sub-catchments, with 4,829 water bodies (DHLGH, 2018).

The key environmental objectives of the WFD are set out in Article 4 of the Directive. It requires member states to use their River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) to protect and, where necessary, restore water bodies in order to reach good status, and to prevent deterioration. Good status means both good chemical and good ecological status. RBMPs are key tools for implementing the WFD and are drawn up every six-years following extensive public consultation.

In Ireland, the Department of Housing, Local Government and Heritage leads the development and implementation of Ireland's river basin management plans. To date, there have been two cycles of river basin management planning in Ireland: the first cycle covered the period 2010-2015 and the second cycle the period 2018-2021. Ireland's third cycle RBMP for the period

⁴ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (accessed on 29 August 2025 via <https://eur-lex.europa.eu/eli/dir/2000/60/oj>)

2022-2027 was published in September 2024 and titled The Water Action Plan 2024 – A River Basin Management Plan for Ireland⁵.

Under the requirements of the WFD member states must ensure that the requirements of Article 4 are met. Specifically, the relevant competent authorities of a member state must consider whether proposals for new schemes/development have the potential to:

1. Cause a deterioration of a water body from its current status or potential, and or,
2. Jeopardise attainment of good status or potential where not already achieved.

As a result, new schemes/developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

If the tests above cannot be satisfied, Article 4.7 of the Directive sets out conditions and specific situations that permit derogations.

There are three stages in a WFD assessment:

- A screening assessment which can either screen in or screen out an activity based on the available evidence;
- A no deterioration assessment which considers if the activity will result in a deterioration in the current status of a water body;
- Achievement of good status assessment which considers if the activity will jeopardise the water body from achieving good status in the future.

9.9.2 Outline of the Proposed Project

The Proposed Project comprises a solar photovoltaic farm with an accompanying and co-located battery energy storage system, collectively referred to as Shelburne Energy Farm, which is proposed within a circa 121.5 hectare site in the townlands of Nash, Ballygarvan and Cloonagh, Gusserane, County Wexford. A connection to the national electricity grid for Shelburne Energy Farm is also proposed and will comprise a 220kV substation and an associated 220kV 2.9km cable connection to an existing transmission overhead line (Great Island - Lodgewood 220kV circuit) in the vicinity north of Shelburne Energy Farm.

There are no in-stream works proposed to any designated waterbody, the proposed drainage system for the BESS and substation will include a discharge outfall being installed within an existing drainage ditch.

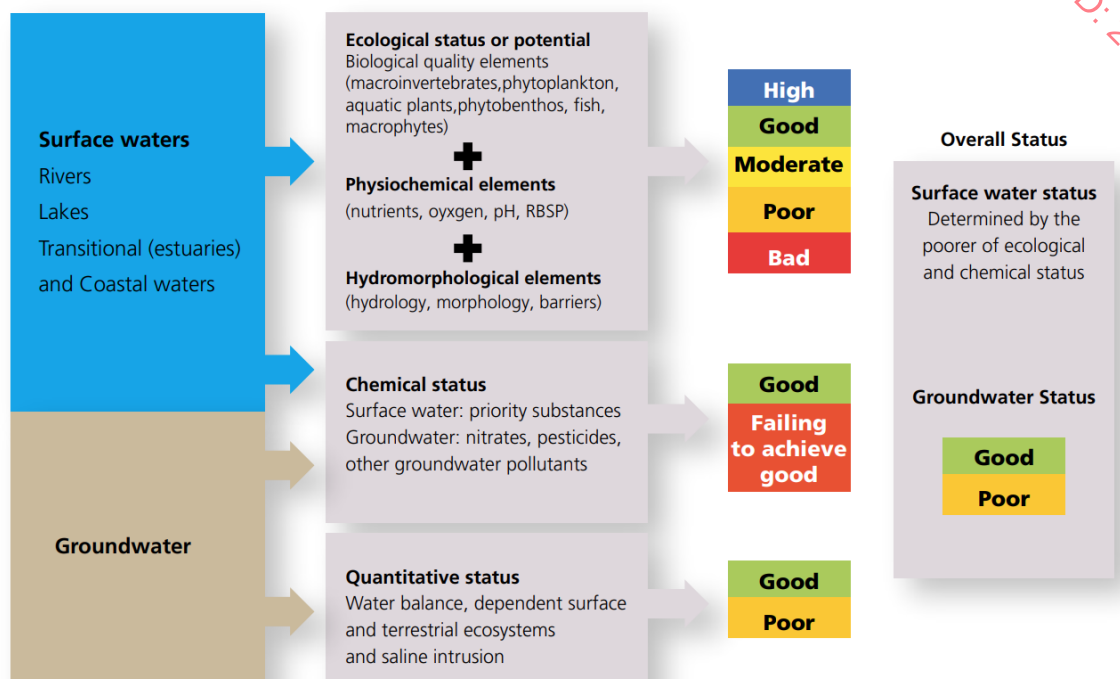
9.9.3 Waterbody Status

Surface waters are classified by their ecological status (biology, water quality and hydromorphology combined) and chemical status (level of harmful chemicals in the water). Groundwaters are classified according to their chemical status and quantitative status (the amount of water present). The way this information is combined to provide an overall status of surface waters and groundwaters is illustrated in Figure 8.2. The element with the lowest status in each step of the process determines the overall classification. This is called the 'one out, all out' principle.

The quality elements used to determine water status are detailed in Annex V of the Directive.

⁵ The Water Action Plan 2024 – A River Basin Management Plan for Ireland (accessed 08 September 2025 via <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/policy-information/river-basin-management-plan-2022-2027/>)

Figure 9.2: Process on Assigning water body status



Source: Water Quality in Ireland 2016-2021 (EPA, 2022) https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/EPA_WaterQualityReport2016_2021.pdf

The Owenduff river waterbody (Owenduff (Wexford_010)) has been assigned a Moderate ecological status by the Environmental Protection Agency (EPA), the competent authority responsible for assigning water status in Ireland. The assessment technique to assign this status was based on monitoring as stated on EPA catchments website (catchments.ie⁶) and status confidence is listed as medium confidence. The biological Q rating system applied under the Water Framework Directive monitoring programme assigned a Q value of 3-4 (moderate), taken up-stream of the Proposed Project at Rathnageeragh Bridge (Station code: RS13O010060). The data as listed by the EPA on the www.catchments.ie is reproduced in Table 9.7.

Table 9.7: Owenduff (Wexford)_010 Water Quality data

Attribute	Value
Name	Owenduff (Wexford)_010
Code	IE_SE_13O010100
Subcatchment	Owenduff[Wexford]_SC_010
Catchment	13 Ballyteigue-Bannow
Latitude	52.3347146
Longitude	-6.8809047
Local Authority	Wexford County Council
Waterbody Category	River
Ecological Status	Moderate
WFD Risk	At Risk

⁶ https://www.catchments.ie/data/#/waterbody/IE_SE_13O010100?_k=9pic7z (accessed 04 September 2025)

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Attribute	Value
Protected Area	No
High Status Objective	No
Heavily Modified	Unknown
Artificial	Unknown
Length (Km)	22.86

Source: https://www.catchments.ie/data/#/waterbody/IE_SE_13O010100?k=9pic7z

9.9.4 Assessment

Table 9.8 below assesses the potential of effects on the Owenduff (Wexofrd)_010 and the potential for effects on the hydromorphological status, physicochemical status and biological status of the stream during the construction and operational phases of the Proposed Project.

Table 9.8: WFD Assessment

Element	Assessment	Control Measures
Biological Assessment		
Benthic invertebrates	During construction there is the potential for increased sedimentation.	Silt mitigation – see section 9.7.1 - Silt Control Measures
Phytobenthos	During construction and operation there is the potential for increased sedimentation and runoff of pollutants.	Silt trap chamber and oil/fuel interceptor – see section 9.7.2
Fish	During construction and operation there is the potential for increased sedimentation and runoff of pollutants.	
Macrophytes	During construction and operation there is the potential for increased sedimentation and runoff of pollutants.	
Hydromorphological Assessment		
Quantity and Dynamics of water flow	During the construction phase there is limited requirement for any over-pumping, and therefore a negligible volume would reach any watercourse adjacent the Proposed Project	Not applicable.
Connection to groundwater bodies	During excavations, there is potential for groundwater to be encountered and dewatering required, however, this would be localised and minor in scale.	Should dewatering be required any discharges will be treated to remove contaminants and silt and disposed of in accordance with waste management legislation and EPA guidance.
River Continuity	There are no proposed instream structures which could act as a barrier to river continuity.	Not applicable.
River depth and width variation	There will no change to river depth or width as a result of the Proposed Project.	Not applicable.
Structure and substrate of the river bed	Increased sedimentation could affect river bed substrate over time. There are no structures proposed within the river.	Silt measures – see section 8.7
Structure of the riparian zone	There are no structures within the riparian zone of the Owenduff (Wexofrd)_010, the closest structure is a proposed electricity poleset in proximity to the banks of the Tallarought river. A separation distance of 15m from the top of the bank has been provided.	Minimise effects on the riparian zone and consult with IFI with regards to method statements for the works.
Physico-chemical Assessment		
Thermal conditions (temperature)	There is no potential for effects on the thermal condition of the stream.	N/A

Element	Assessment	Control Measures
Nutrient conditions	During construction and operation there is the potential for increased sedimentation and associated phosphate and ammonia.	Silt mitigation – see section 9.7.1 – Silt Control Measures
Oxygenation conditions	Potential for some localised reduction in oxygenation conditions during the construction phase associated with fine sediment mobilisation (assuming it has an associated oxygen demand). During operations, wastewater will be tankered off site (and disposed of an urban wastewater treatment plant) and therefore no discharge of wastewater will occur to the Owenduff (Wexford)_010.	Silt mitigation – see section 9.7.1 – Silt Control Measures; and, embedded mitigation – see section 9.7.2.
Acidification (pH)	There is potential for run-off from concrete construction activities.	The headwall for the discharge outfall pipe will be constructed with pre-fabricated cast concrete, thereby reducing the volume of concrete required on site. Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided. The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.

9.9.5 Conclusion

With the implementation of the proposed mitigation measures proposed, the Proposed Project will not result in a change in status of any WFD quality elements or prevent any connected waterbodies from reaching good status in the future.

The assessment has shown that the Proposed Project upon completion will have no permanent impact on the hydromorphological (i.e. flow, continuity, morphology) and physicochemical (i.e. thermal, nutrient, oxygenation, acidification) elements of the Owenduff (Wexford)_010 and the ability of these elements to provide a supporting environment for the river's ecology. As such the assessment has demonstrated that the potential impacts associated with the proposed development are unlikely to cause a deterioration at the water body scale.

The mitigation measures included in this assessment will be incorporated into the accompanying CEMP. The CEMP will be further developed by the appointed Contractor and will incorporate any statutory requirements that may arise during the consenting process. The CEMP will be agreed with relevant planning authority (Wexford County Council and / or An Coimisiún Pleanála) prior to the commencement of construction works.

In summary the Proposed Project would not result in status deterioration of the Owenduff (Wexford)_010 waterbody or directly prevent the future attainment of good water status or indirectly impact measures that may be put in place by the relevant competent authorities to achieve the environmental objectives of the WFD.

It can therefore be concluded that the Proposed Project is fully compliant with WFD and therefore does not require assessment under Article 4.7 of the WFD.

9.10 References

CIRIA 2001. Control of Water Pollution from Construction Sites - Guide to Good Practice (C532)

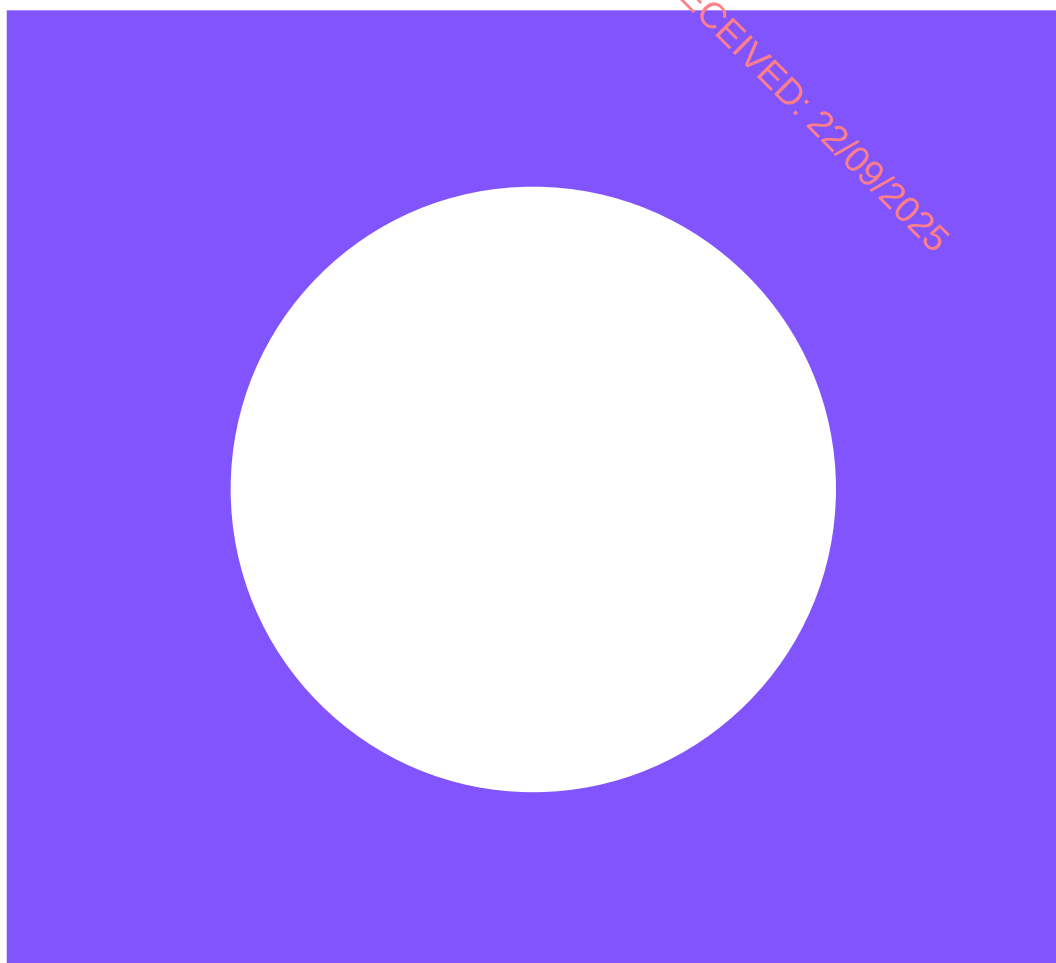
<https://gis.epa.ie/EPAMaps/> (accessed 29 August 2025)

Inland Fisheries Ireland, 2016. Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters

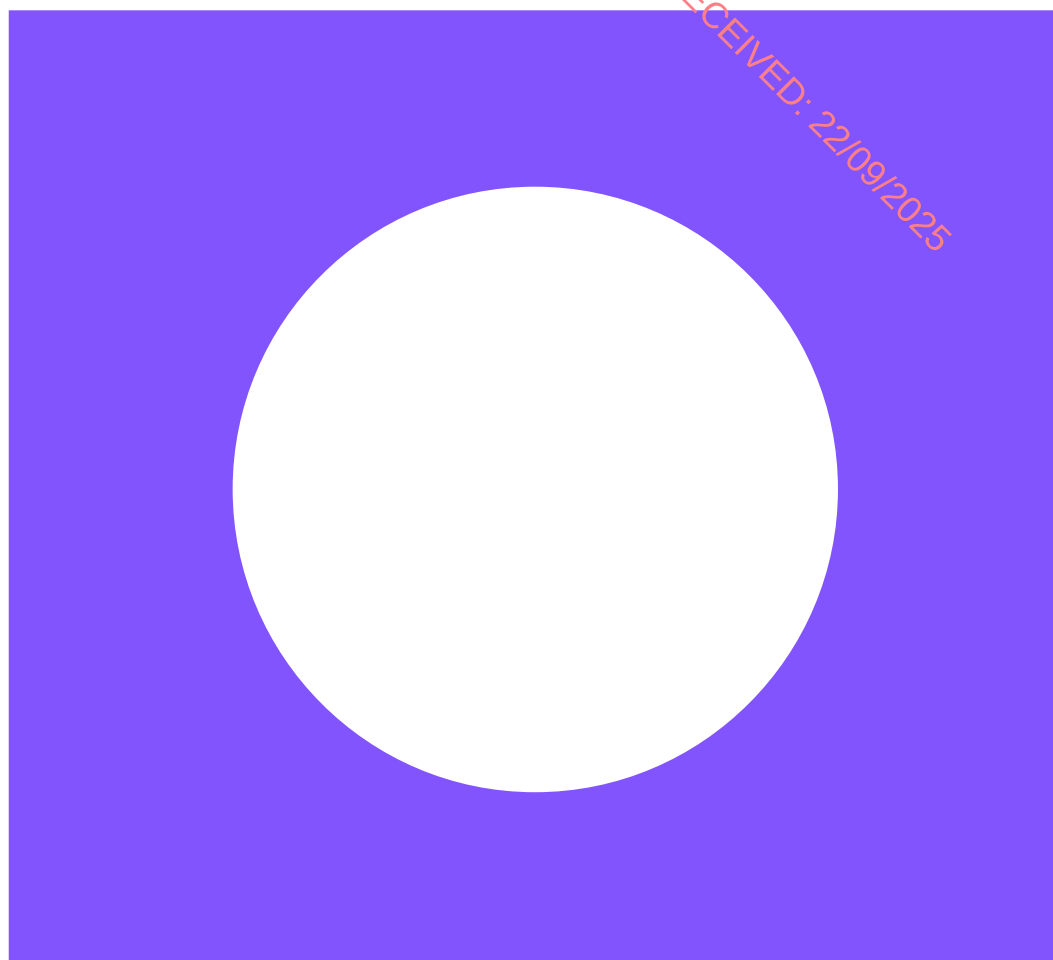
Inland Fisheries Ireland, 2020. Planning for Watercourses in the Urban Environment: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 10 Air Quality

September 2025

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10 Air Quality

10.1 Introduction

This chapter provides an assessment of the potential effects and likely significance of the Proposed Project on local air quality. The assessment is based on the Proposed Project as described in Chapter 5 – *Description of Development*.

The assessment considers the effects of the Proposed Project at sensitive receptor locations, both human health and ecological, by considering the existing baseline and impacts of the Proposed Project to assess air quality during construction and operation phase. The air quality assessment therefore includes:

- Identification of applicable legislation and emission limits;
- Assessment of existing air quality conditions in the study area;
- Assessment of construction dust and construction road traffic effects;
- Assessment of operation and maintenance road traffic effects; and
- Identification of mitigation measures for both construction and operation and maintenance phases where necessary.

10.2 Policy and Guidance

Policies and guidance documents of potential relevance to the air quality are set out in this section.

10.2.1 National Legislation

10.2.1.1 Ambient Air Quality

Directive 2008/50/EC¹ on Ambient Air Quality and Cleaner Air for Europe was adopted in May 2008 and consolidates previous air quality directives (apart from the Fourth Daughter Directive). This Directive sets out a range of mandatory limit values (LVs) for different pollutants and times by which they are to be achieved for the purpose of protecting human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants. The Directive 2008/50/EC was transposed into Irish legislation by the Ambient Air Quality Standards Regulations 2022². The Fourth Daughter Directive sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

The Air Quality Standards Regulations 2011³ implement the Directive 2008/50/EC and define the air quality standards currently applicable in Ireland. These regulations set out upper and lower assessment thresholds for the pollutants of concern. The Air Quality Standards include thresholds to encourage a higher standard of air quality where possible.

Table 10.1 presents the air quality standards and target values for the pollutants relevant to this assessment as prescribed by the EU and Irish legislation, hereafter referred to as air quality

¹ European Union. (April 2008), 'Directive on Ambient Air Quality and cleaner Air for Europe', Directive 2008/50/EC Official Journal, vol. 152, pp. 0001-0044.

² Ambient Air Quality Standards Regulations 2022 (S.I. No 739 of 2022)

³ Air Quality Standards Regulation 2011 (S.I. No. 180 of 2011)

standards (AQS). Standards for the protection of vegetation and ecosystems are referred to as 'critical levels'.

Table 10.1: Relevant Air Quality Standards

Pollutant	Averaging period	AQS / Critical Level (µg/m³)	Allowance	Limit Value Attainment Date
For the protection of human health				
Nitrogen dioxide (NO ₂)	1-hour	200	18 times pcy	1 Jan 2010
	Annual	40	–	1 Jan 2010
Particulates (PM ₁₀)	24-hour	50	35 times pcy	1 Jan 2005
	Annual	40	–	1 Jan 2005
Fine particulates (PM _{2.5})	Annual	20	–	1 Jan 2020
Critical level for the protection of vegetation and ecosystems				
Nitrogen oxides (NO _x)	Annual	30	–	

Source: Environmental Protection Agency Air Quality Standards⁴

Notes: pcy = per calendar year

The AQS presented in Table 10.1 are for the protection of human health and only apply at locations of relevant exposure. The Air Quality Standards Regulations sets out that the limit values (AQS) apply everywhere with the exception of:

- any locations situated within areas where members of the public do not have access and there is no fixed habitation;
- in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply;
- on the carriageway of roads; and
- on the central reservations of roads except where there is normally pedestrian access to the central reservation.

The areas where the critical levels for the protection of vegetation apply are as follows:

- More than 20 kilometres (km) from an agglomeration (i.e. an area with a population of more than 250,000); and
- More than 5 kilometres away from other built-up areas, industrial installation or motorways or major roads with traffic counts of more than 50,000 vehicles per day.

10.2.2 National Policy

10.2.2.1 National Air Emission Targets

Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (hereafter referred to as the National Emissions Reduction Directive) was published in December 2016.

The National Emissions Reduction Directive applied the limits set out in Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants (hereafter referred to as the National Emission Ceiling

⁴ Environmental Protection Agency (2021). 'Air Quality Standards'. Available at: <https://airquality.ie/information/air-quality-standards>

Directive) until 2020 and established new national emission reduction commitments which are applicable from 2020 and 2030 for SO₂, NO_x, non-methane volatile organic compounds (NMVOC), ammonia (NH₃), PM_{2.5} and methane (CH₄).

In relation to Ireland, the 2020 to 2029 emission targets are 25 kt (kilotonnes) for SO₂ (65% on 2005 levels), 69kt for NO_x (49% reduction on 2005 levels), 57kt for NMVOCs (25% reduction on 2005 levels), 118 kt for NH₃ (1% reduction on 2005 levels) and 15 kt for PM_{2.5} (18% reduction on 2005 levels) as shown in Table 10.2. In relation to 2030, Ireland's emission targets are 85% below 2005 levels for SO₂, 69% reduction for NO_x, 32% reduction for VOCs, 5% reduction for NH₃ and 41% reduction for PM_{2.5}, also shown in Table 10.2.

The report Ireland's Air Pollutant Emissions 1990 – 2030⁵ discusses the outlook for future compliance with 2030 targets. It notes that SO₂, NO_x, NH₃ and PM_{2.5} targets are projected to be met in 2030 with existing policies and measures, however no measures have yet been set to ensure compliance with NMVOC emission ceiling for 2030.

Table 10.2: National Air Emission Target (Ireland Air Pollutant Emissions 2020 to 2030)

Pollutant	2020 to 2029 Reduction Commitments (kt) (and % Reduction Compared to 2005 Levels)	2030 Reduction Commitments (kt) (and % Reduction Compared to 2005 Levels)
SO ₂	25.5	11.0
	-65%	-85%
NO _x	69.0	42.0
	-49%	-69%
NMVOC	57.0	51.6
	-25%	-32%
NH ₃	118.4	113.6
	-1%	-5%
PM _{2.5}	15.5	11.2
	-18%	-41%

Source: Ireland's Air Pollutant Emissions 1990-2030.

10.2.2.2 Clean Air Strategy

The Clean Air Strategy was published in April 2023⁶ and provides the high-level strategic policy framework to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner ambient air, while delivering on wider national objectives. The strategy commits Ireland to achieving the new World Health Organisation (WHO) guideline values for air quality by 2040, with progress to be measured against interim targets by 2026 and 2030. This Strategy sets out seven strategic frameworks includes:

- Targeted policy measures
- Ambition and strong governance

⁵ Environmental Protection Agency (2022), Ireland's Air Pollutant Emissions – 1990-2030. Available at: https://www.epa.ie/publications/monitoring-assessment/climate-change/air-emissions/EPA-Irelands-Air-Pollutant-Emissions-report_2021Final.pdf (accessed 23 February 2024)

⁶ Department of the Environment, Climate and Communications; Clean Air Strategy. Available at: <https://www.gov.ie/en/press-release/aa501-government-approves-irelands-first-ever-clean-air-strategy/#:~:text=The%20new%20Clean%20Air%20Strategy,polluting%20fossil%20fuels%2C%20for%20example.>

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- Policy developments
- Legislation
- Enforcement
- Monitoring
- Communications

The aims of these key strategic frameworks are:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country, to deliver health benefits for all.
- To ensure the integration of clean air considerations into policy development across Government.
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health, in order to address them more effectively.
- To enhance regulation required to deliver improvements across all pollutants.
- To improve the effectiveness of our enforcement systems.
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

10.2.3 Local Policy

The Proposed Project lies within the local government area of Wexford County Council, which has the potential to be affected by air quality impacts. Local government objectives on air quality, where relevant to the Proposed Project, are summarised below.

10.2.3.1 Wexford County Development Plan 2022-2028

The following objectives are of relevance to air quality and renewable energy developments:

Environmental Management Objective EM05, which states that:

- *“To implement the provisions of EU and National legislation and other relevant legislative requirements on protecting and improving surface and ground water quality, air quality and climate, and on reducing adverse noise and light nuisance, as appropriate and in conjunction with all relevant stakeholders in the interests of the protection of the environment, public health and the sustainable development of the county.”*

Air Quality Objectives AQ01 and AQ03, which state that:

- AQ01: *“To have regard to the Air Quality Standards Regulation 2011 (S.I. No. 180 of 2011) when assessing planning applications for development which may have effects on air quality.”*
- AQ03: *“To manage development to provide the efficient use of land and infrastructure, thereby controlling and limiting air emissions.”*

Climate Action Objective CA16, which states that:

- *“To support change across business, public and residential sectors to achieve reduced greenhouse gas emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture.”*

Green Economy Objective ED85, which states that:

- “To develop the county as a leading innovator in the green economy in areas such as sustainable agriculture, sustainable construction, the production of renewable energy and the bio-economy, and to support development of enterprises and technologies that employ green technologies and support a low carbon economy.”

Power Transmission Objective PT02, which states that:

- “To support, subject to the objectives of this section and Volume 10 Energy Strategy, connecting infrastructure for the integration of low carbon and renewable energy generation projects including community scaled projects with power transmission infrastructure. To support, subject to the objectives of this section and Volume 10 Energy Strategy, connecting infrastructure for the integration of low carbon and renewable energy generation projects including community scaled projects with power transmission infrastructure.”

10.2.4 Guidance

In addition to the specific statutory air quality standards, the assessment has referred to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of ambient air quality impacts. These are summarised below:

- Institute of Air Quality Management’s (IAQM) ‘Guidance on the assessment of dust from demolition and construction’, January 2024⁷
- Environmental Protection UK and Institute of Air Quality Management (2017), ‘Land-Use Planning and Development Control: Planning for Air Quality’⁸
- Transport Infrastructure Ireland (TII) ‘Air Quality Assessment of Proposed National Roads – Standards’, December 2022⁹,
- TII ‘Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document’, December 2022¹⁰.

10.3 Methodology

10.3.1 Approach to Data Collection

The air quality assessment has been based on the information as presented in Table 10.3.

Table 10.3: Data Sources for air quality assessment

Data source	Date	Data contents
Project team	June 2025	Boundary of Proposed Project
Project team	July 2025	Estimate of construction information for screening of need of assessment
Project team	July 2025	Estimate of construction traffic for screening of need of assessment
Environmental Protection Agency (EPA) ¹⁵	June 2024	Ambient air quality monitoring

⁷ Institute of Air Quality Management (January 2024 (Version 2.2)). ‘Guidance on the assessment of dust from demolition and construction.’

⁸ Environmental Protection UK and Institute of Air Quality Management (2017), ‘Land-Use Planning and Development Control: Planning for Air Quality’

⁹ Transport Infrastructure Ireland (December 2022), ‘Air Quality Assessment of Proposed National Roads – Standard’. Accessible at: <https://www.tiipublications.ie/advanced-search/results/document/?id=3218>

¹⁰ Transport Infrastructure Ireland (December 2022), ‘Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document’. Accessible at: <https://www.tiipublications.ie/library/PE-ENV-01106-01.pdf>

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10.3.2 Approach to Impact Assessment

10.3.2.1 Construction Phase Methodology

Construction Dust Emissions

Construction activities can result in temporary effects from dust. Dust is a generic term and usually refers to particulate matter in the size range of 1-75 microns in diameter. The most common effects from dust emissions are soiling and increased ambient PM₁₀ concentration. Dust can arise from numerous construction activities such as concrete batching, piling, rock breaking, wind erosion on material stockpiles and earth moving. It can be mechanically transported either via wind or through the movements of vehicles onto public roads (transport of debris on vehicle wheels or uncovered loads).

The IAQM guidance⁷ recommends splitting the construction activities into four separate source categories, as listed below, and determining the dust risk associated with each of these individually. Each assessment has determined the risk of each of the following categories:

- Demolition
- Earthworks
- Construction
- Trackout¹¹.

The risk of each source for dust effects can be described as 'negligible', 'low risk', 'medium risk' and 'high risk' depending on the nature and scale of the construction activities and the proximity of sensitive receptors to the construction activities or site boundary. Each assessment is used to identify the mitigation measures proportional to the level of risk to reduce the effects such that they are not significant.

The assessment considers three separate effects from dust:

- Annoyance due to dust soiling
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects; and
- Risk of human effects due to increased exposure to PM₁₀.

As per the IAQM guidance, Step 1 of the assessment applies screening criteria to the Proposed project which states that an assessment will be required where there is:

- A 'human receptor' within:
 - 250m of the boundary of the site; and/or
 - 50m of the route(s) used by construction vehicles on the public highway up to 250m from the site entrance(s)
- An 'ecological receptor' within
 - 50m of the boundary of the site; and/or
 - 50m of the route(s) used by construction vehicles on the public highway up to 250m from the site entrance(s).

¹¹ Trackout = "The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/ demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site" as defined by the IAQM guidance on the assessment of dust from demolition and construction.

No further assessment is required if there are no receptors within the defined boundaries.

To assess the likely dust risk, the need to quantify the overall dust emission magnitude ('small', 'medium' or 'large') from each of the dust sources identified (demolition, earthworks, construction and trackout) is first established in alignment with the criteria provided in Table A.1 in Appendix 10.1.

The sensitivity of receptors is then defined (as 'high', 'medium' or 'low') for each dust effect (dust soiling, human health and ecosystem impacts) and the sensitivity of the surrounding area determined for each activity. The sensitivity of the area is based on the distance of the source to the closest receptors, the receptors sensitivity and in the case of PM₁₀ effects, the local background concentration, as outlined in Table A.2 to Table A.5 in Appendix 10.1. The highest level of area sensitivity defined for dust effect has been used in each assessment.

The final step of the assessment combines the dust emission magnitude and the sensitivity of the area to determine the dust risk categories for each activity for dust soiling and health effects, as outlined in Table A.6 to Table A.9 in Appendix 10.1.

The dust risk category defined for each dust source and effect is then used to determine appropriate site-specific mitigation measures to be adopted. It should be noted that, in line with the recommendations of IAQM guidance, significance is only assigned to construction effects following mitigation. To determination of the significance effects, as recommended in the IAQM guidance, implementation of proportional and appropriate mitigation measures should result in construction dust having a negligible impact on air quality and the overall effect being not significant. There may be some cases, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Results of the dust assessment are presented in Section 10.5.

Construction Site Plant and Machinery Emissions

Construction requires the use of different equipment such as excavator, cranes and onsite generators. All construction plants have an energy demand with some resulting in direct emission to air from exhausts. The IAQM guidance notes that the exhaust emissions from onsite plant and site traffic suggests that they are unlikely to make a significant impact on local air quality. The effects of plant emissions on local air quality are not considered significant as emissions are small and air quality monitoring, presented in Section 10.4.2, shows monitored NO₂ and PM concentrations are well below the AQS. Construction plant emissions have therefore not been assessed further with respect to air quality. However, mitigation measures to reduce the effects on local air quality are presented in Section 10.7.

Construction Road Traffic Emissions

There are two relevant screening methods for construction road traffic emissions.

Firstly, the TII guidance *Air Quality Assessment of Proposed National Roads – Standard*⁹ and *Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document*¹⁰ advises that where construction activities are programmed to last less than six months they are unlikely to constitute a significant air quality effect and can be scoped out of assessment. Where construction activities are programmed to be longer than six months and would change traffic flows by more than the following, the assessment of traffic emissions should be undertaken:

- Change of 1,000 or more of annual average daily traffic (AADT)¹²
- Change of 200 or more of heavy duty vehicles (HDV)¹³ expressed as an AADT

¹² Annual average daily traffic

¹³ HDVs are vehicles greater than 3.5 tonnes and include buses and coaches

- Change of 10 kilometres or more per hour (kph) expressed as a daily average speed
- Change of 20 kph or more expressed as a peak hour speed

If none of the above criteria are met then the effects of construction traffic on air quality are considered to be not significant.

Secondly, the more stringent Environmental Protection UK and Institute of Air Quality Management (EPUK / IAQM)⁸ guidance indicates that an assessment of traffic emissions is only likely to be required for large, long term construction sites that will generate an additional AADT flow of greater than 100 HDVs¹³ per day or greater than 500 Light Duty Vehicles (LDV)¹⁴ per day.

The construction period is expected to be 20 – 26 months and it is expected that there would be approximately 45 HDV and 125 LDV vehicle movements (one in / one out) per day. Given the construction traffic generated is well below the TII and EPUK/IAQM criteria and air quality monitoring, presented in Section 10.4.2, shows monitored NO₂ and PM concentrations are well below the AQS, the effects of construction traffic emissions on local air quality are considered to be low and not significant. On this basis, even with more stringent screening, no assessment is required, therefore no further consideration has been given to the effects of construction road traffic on ambient air quality.

10.3.2.2 Operation and Maintenance Phase Methodology

Operational road traffic emissions

As presented in Chapter 5 of this EIAR, during operations, the Proposed project will be monitored and operated remotely by a management team and will be visited regularly by security and/or maintenance personnel. Given the frequency of maintenance, the effects of operation road traffic contributions from the Proposed project are considered of low and not significant.

10.3.3 Study Area

For the construction phase, the study area covers human health receptors and ecologically designated sites within 250m of the construction site boundary and within 50m of the routes used by construction vehicles on the public highway, up to 250m from the site entrances.

As mentioned in Section 10.3.2.2, no further considerations have been given to the effects of operational and maintenance, and construction traffic and construction plant. As such these have not been included in the study area.

10.3.4 Limitations of this EIAR

As discussed in Section 10.4.2, background air concentration data from 2020 and 2021 have the potential to be impacted by effects associated with the coronavirus pandemic such as a reduction in traffic movements resulting in reduced monitored pollutant concentrations. Therefore, data from 2020 and 2021 may not be representative of existing concentrations.

¹⁴ LDVs is refer to cars and small vans less than 3.5 tonnes.

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10.4 Receiving Environment

10.4.1 Overview

Information on existing air quality in Ireland can be obtained from the Environmental Protection Agency (EPA) ¹⁵ who undertake monitoring at a number of locations across the country. For the purpose of air quality, Ireland is split into four main regions:

- Zone A: Dublin conurbation;
- Zone B: Cork conurbation.
- Zone C: 23 cities and large towns with population >15,000 (Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise); and
- Zone D: Rural Ireland, i.e. the remainder of the state excluding zones A, B and C.

The Proposed project is located within Zone D. A review of the closest Zone D (rural) most recent monitoring from the EPA highlights that the most representative site is actually the Kilkitt, County Monaghan site. Kilkitt, County Monaghan, located approximately 194.0km to the north of the Proposed Project, has also been presented. This site monitors NO₂, sulphur dioxide and ozone only, however the characteristics and location of this site (inland in a rural background location) makes it the most representative of the conditions found at the Proposed project.

This site, however, does not monitor PM₁₀ or PM_{2.5}. The closest monitoring site to the Proposed Project that does monitor PM₁₀ or PM_{2.5} is located in Zone C monitoring site, located at Paddy Browne's Road in Waterford. Paddy Browne's Road is located approximately 19.9km to the southwest of the Proposed Project. It is an urban background site monitoring NO₂, PM₁₀, PM_{2.5}, and ozone. Despite being located the closest to the Proposed Project, the conditions found at this monitoring site are likely to be an overestimate of the concentrations found at the Proposed Project and are presented for reference only for PM₁₀ and PM_{2.5}.

10.4.2 Representative Monitoring

The location and pollutants measured for both of the Kilkitt and Paddy Browne's Road stations are summarised in Table 10.4.

Table 10.4: Air quality monitoring stations

Site Name	Location		Site Type	Distance from Proposed project	Pollutants monitored	Rationale for reporting
	X	Y				
Paddy Browne's Road, Waterford	658625	610916	Urban background Zone C	19.9	NO ₂ , PM ₁₀ , PM _{2.5} , and ozone	Closest to Proposed project
Kilkitt, Co. Monaghan	672860	815338	Rural background Zone D	194.0	NO ₂ , sulphur dioxide and ozone	Closest site that is representative of the conditions found at the Proposed project (rural background)

Source: EPA Air Quality Map. Available at: <https://airquality.ie/>

Table 10.5 presents the NO₂, PM₁₀ and PM_{2.5} monitoring results for these two monitoring sites for 2019 to 2023. Data from 2020 and 2021 have the potential to be impacted by effects

¹⁵ Environmental Protection Agency (2021), 'Air Quality Zones'. Available at: <https://airquality.ie/information/air-quality-zones>

associated with the coronavirus pandemic such as a reduction in traffic movements resulting in reduced monitored pollutant concentrations. Therefore, data from 2020 and 2021 may not be representative of existing concentrations and is presented for reference only.

Paddy Browne's Road, Waterford, which is considered to be less representative of the conditions at the Proposed Project and an overestimate of expected concentrations, shows that the mean concentrations for all three pollutants are far below the respective AQS for all years. There are also no recorded exceedances of the short-term NO₂ and PM₁₀ objective for any of the years.

Kilbitt, County Monaghan, which is considered to be more representative of the conditions found at the Proposed Project, shows that the mean NO₂ concentration is also far below the AQS, with no recorded exceedances of the short-term objective for any years.

Overall, the annual mean concentrations measured at both monitoring sites for the relevant pollutants indicate a decrease of all pollutants between 2019 to 2023. Therefore, based on the above, it is considered that the annual mean objective for NO₂, PM₁₀ and PM_{2.5} is unlikely to be exceeded due to the construction of the Proposed Project.

Table 10.5: Automatic monitoring results

Site Name	Site type	2019 ^a	2020 ^a	2021	2022	2023
NO₂ annual mean concentration (µg/m³) / Exceedance of the short-term objective (-)						
Paddy Browne's Road, Waterford	Urban background Zone C	8.0 (0)	7.0 (0)	6.6 (0)	7.3 (0)	6.9 (0)
Kilkitt, Co. Monaghan	Rural background Zone D	5.0 (0)	2.0 (0)	2.4 (0)	2.0 (0)	1.7 (0)
PM₁₀ annual mean concentration (µg/m³) / Exceedance of the short-term objective (-)						
Paddy Browne's Road, Waterford	Urban background Zone C	15.0 (0)	14.0 (0)	13.7 (0)	15.2 (0)	12.2 (0)
PM_{2.5} annual mean concentration (µg/m³)						
Paddy Browne's Road, Waterford	Urban background Zone C	11.0	10.0	9.4	9.9	7.8

Source: EPA Annual Air Quality Reports

Note: Data Capture is >75% for all pollutants in all years presented.

(a) Concentrations presented in report as rounded concentrations.

10.5 Likely Significant Impacts

10.5.1 Do Nothing

Under a 'Do Nothing' scenario, there would be no change to baseline Air Quality. The positive benefits of generating renewable solar energy will not be realised if the Proposed Project is not developed.

10.5.2 Construction Phase

10.5.2.1 Construction Dust Emissions

The magnitude and sensitivity descriptors that have been applied to assess the overall effect of the construction phase are presented in Appendix 10.1. Table 10.6 presents a summary of the dust emission magnitude assigned to each construction activity based on these descriptors.

There are no ecological designated sites within 50m of potential dust sources of the Proposed Project or from roads to be used by construction traffic. The nearest ecological designation is the Boley Fen Natural Heritage Site (NHA) located approximately 1.0km to the south of the

Proposed Project. Therefore, ecological designations are not considered further as part of this assessment.

Table 10.6: Dust emission magnitude

Activity	Dust emission magnitude	Justification
Demolition	N/A	No demolition works associated with this project.
Earthworks	Large	The total site area is estimated to be 121.5 hectares for the solar energy farm, BESS and substation/grid connection. The land being built on is agricultural, therefore is a potential dusty soil type. Earthworks will be required to level the site where the BESS units are located, but not for where the solar farm is located. Underground cables from the transformer station to the terminal substation will be directly buried, except for crossing roads or other services where the cable will be installed in ducts covered in concrete. These cable trenches are to be installed on sections of the L40232 and L4030 on both sides of the road.
Construction	Medium	Materials are expected to have a low-to-medium potential for dust release (concrete, ground mounting frames, metal support structures). The solar energy farm will have photovoltaic panels and modular containerised transformer units. The BESS units are also modular, which minimises on-site construction for both types of units. Underground cabling will be buried in trenches/ducts where crossing roads or other services and covered in concrete (estimated 3780m ³ of concrete for cable trenches). The volume of concrete is expected to be a further 6170m ³ approximately (total of 9950m ³) for the whole site, including the base foundations for the substation. The substation will comprise of a two-storey over partial basement structure, with an estimated total volume of 15,000m ³ . As such, the total building volume is expected to be 12,000-75,000m ³ , and therefore is medium.
Trackout ¹⁶	Medium	It is estimated that there could be up to approximately 84 heavy goods vehicle movements in a single day (two-way movement- worst case scenario). Internal access tracks will be constructed from compacted gravel surface.

Table 10.7 presents the sensitivity of the receptors to effects caused by construction activities and is based on the criteria presented in Table A.2 to Table A.5, Appendix 10.1. Figure 10.1 and Figure 10.2 present the dust assessment buffers.

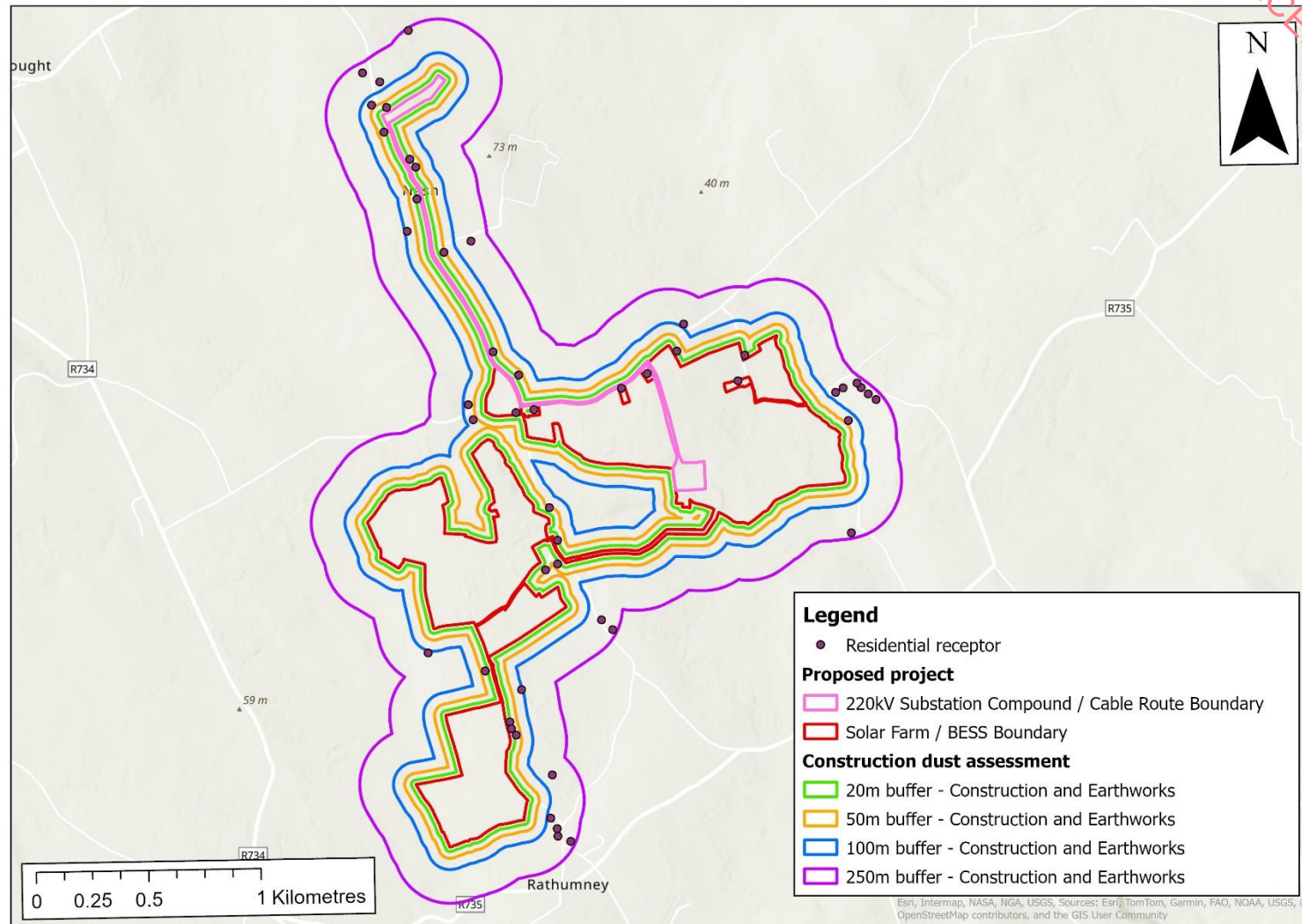
Table 10.7: Sensitivity of the Area

Activity	Dust soiling		Health effects of PM ₁₀	
	Sensitivity	Comment	Sensitivity	Comment
Demolition	Not applicable	No demolition activities.	Not applicable	No demolition activities.
Earthwork	High		Low	Background annual mean PM ₁₀ concentrations are <24µg/m ³ (See Table 10.5).
Construction	High	There are 12 high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m of the work area. These are mainly located on the site boundary or where cable routes are expected to be constructed.	Low	There are 12 high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m of the work area. These are mainly located on the site boundary or where cable routes are expected to be constructed.

¹⁶ Trackout route for haulage includes any internal haulage routes that leave the site boundary to enter into another section of the site. Any internal haulage routes which do not leave the site boundary have not been included.

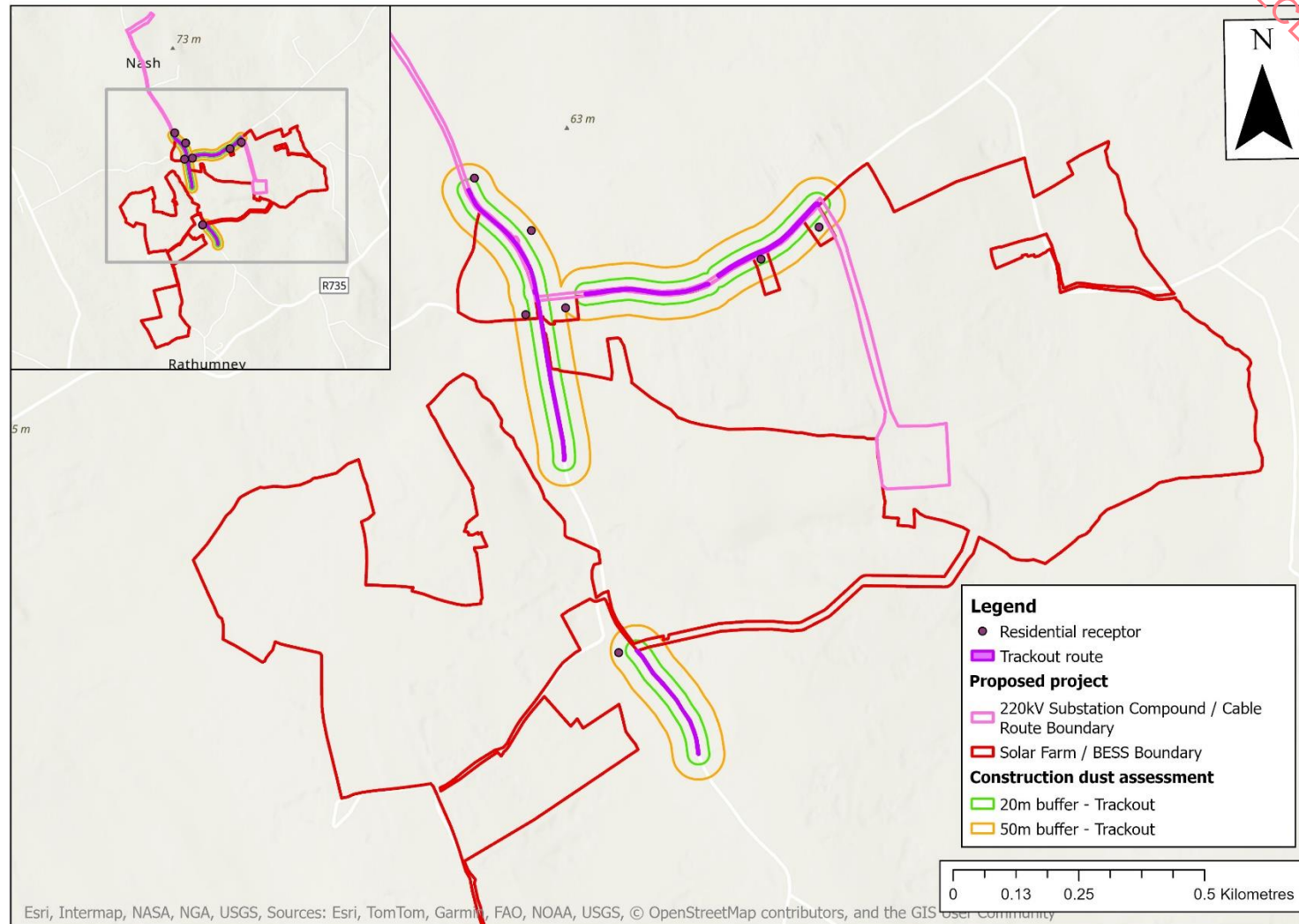
Activity	Dust soiling		Health effects of PM ₁₀	
	Sensitivity	Comment	Sensitivity	Comment
Trackout	Medium	There is one high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m from the side of potential routes used for construction traffic (up to 250m from potential site exits).	Low	As above, background annual mean PM ₁₀ concentrations are <24µg/m ³ (See Table 10.5). There is one high sensitivity receptors (residential properties) and several low sensitivity receptors (farmland) within 20m from the side of potential routes used for construction traffic (up to 250m from potential site exits).

Figure 10.1: Construction Dust Assessment Buffers (Earthworks and Construction)



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Figure 10.2: Construction Dust Assessment Buffers (Trackout)



Source: Mott MacDonald

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The overall risks to receptors to dust effects are presented in Table 10.8 based on the criteria outlined in Table A.9 in Appendix 10.1.

Table 10.8: Summary of the risk of construction effects

Activity	Dust soiling effects	PM ₁₀ effects
Demolition	Not applicable	Not applicable
Earthworks	High	Low
Construction	Medium	Low
Trackout	Medium	Low

Dust soiling effects are 'Medium' to 'High' risk and PM₁₀ effects are 'Low' risk without mitigation. Mitigation measures appropriate for the level of risk have been presented in Section 10.7.1. These measures are set out within the Construction Environmental Management Plan (CEMP) which forms part of this submission.

10.5.3 Operation and Maintenance Phase

As presented in Chapter 5, during operations, the Proposed Project will be monitored and operated remotely by a management team and will be visited regularly by security and/or maintenance personnel. Given the frequency of maintenance, the effects of operation road traffic contributions from the Proposed project are considered of low and not significant.

10.5.4 Decommissioning Phase

As presented in Chapter 5, the design life of the Proposed Project is approximately 40 years. No detailed information is available to complete an assessment for the decommissioning. However, the impacts stated for the construction phase should be referred to for the decommissioning phase. Therefore, the impact of the decommissioning phase on air quality would be no worse than the construction dust risk and construction traffic movements similar or less than those presented in this chapter. These effects are therefore considered to be not significant if the mitigation measures mentioned in Section 10.7 are implemented.

10.6 Cumulative Effects

10.6.1 Other developments

Cumulative construction impacts are possible where the construction of the Proposed Project coincides with the construction phases of nearby committed developments or future developments. There are no potential cumulative projects within a 5km radius of the Proposed project. Therefore, cumulative effects with other developments in the area has not been considered any further.

If a future development should arise that is within 250m of the site boundary in line with IAQM guidance, it is recommended that regular liaison meetings are held with other high risk construction sites within 250m of the site boundary to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.

10.7 Mitigation and Monitoring Measures

10.7.1 Mitigation measures

During the construction phase, construction activities associated with the Proposed Project are predicted have at worst, a 'medium' to 'high' risk for dust soiling effects and 'low' risk for human

health impacts from construction activities with no mitigation in place. It is anticipated that dust and particulate matter emissions produced during construction activities and emissions from site plant would be controlled through the implementation of good practice measures which will be documented in a CEMP, which is a live document that will be regularly reviewed.

Good practice mitigation measures for the Proposed Project as outlined in IAQM guidance⁷ are presented below, based on the dust risk levels presented in Table A.3 in Appendix 10.1.

10.7.1.1 Standard mitigation applicable to all area (for low to high risk)

- Communication and Site Management
 - The appointed Contractor will develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
 - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This will be the environment manager / engineer or the site manager.
 - Display the head or regional office contact information.
 - The Contractor will develop and implement a dust management plan (DMP) as part of the updated CEMP, which will include measures to control other emissions, approved by the Local Authority.
 - Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken.
 - Make a complaint log available to the planning authority, when requested.
 - Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the log book.
- Monitoring
 - Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
 - Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested.
 - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Preparing and maintaining the site
 - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
 - Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
 - Avoid site runoff of water or mud.
 - Keep site fencing, barriers and scaffolding clean using wet methods.
 - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as stated below.
 - Cover, seed or fence stockpiles to prevent wind whipping.
- Operations vehicles / machinery and sustainable travel:
 - Ensure all vehicles switch off engines when stationary – no idling vehicles.

- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Operations
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction.
 - Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate.
- Waste management
 - Avoid bonfires and burning of waste materials.
- Mitigation specific to earthworks
 - Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
 - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
 - Only remove the cover in small areas during work and not all at once.
- Mitigation specific to construction:
 - Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Mitigation specific to trackout:
 - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
 - Avoid dry sweeping of large areas.
 - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
 - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
 - Record all inspections of haul routes and any subsequent action in a site log book.
 - Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
 - Access gates to be located at least 10 m from receptors where possible.

10.7.2 Monitoring measures

At all times, these mitigation measures will be strictly monitored and assessed by the Site Manager. Site inspections will be carried out and an inspection log will be made available to the local authority when requested.

10.8 Residual Impacts

With the successful incorporation of best practice mitigation as detailed in the CEMP which accompanies the application, the residual impacts on dust emissions from construction activities will be negligible.

There are therefore no significant impacts predicted during the construction and operational phases for air quality with the successful incorporation of best practice mitigation.

10.9 References

The Air Quality Standards Regulation 2011 (S.I No. 180 of 2011)

Environmental Protection Agency (2021). 'Air Quality Standards'. Available at: <https://airquality.ie/information/air-quality-standards>

European Union (April 2008) Directive on Ambient Air Quality and cleaner Air for Europe, Directive 2008/50/EC Official Journal, vol. 152, pp. 0001-0044

Environmental Protection Agency (2022), Ireland's Air Pollutant Emissions – 1990-2030. Available at: https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Irelands-Air-Pollutant-Emissions-report_2021Final.pdf

Department of the Environment, Climate and Communications; Climate Action Plan 2019. Available at: <https://www.gov.ie/en/publication/ccb2e0-the-climate-action-plan-2019/>

Institute of Air Quality Management (January 2024 (Version 2.2)). 'Guidance on the assessment of dust from demolition and construction'

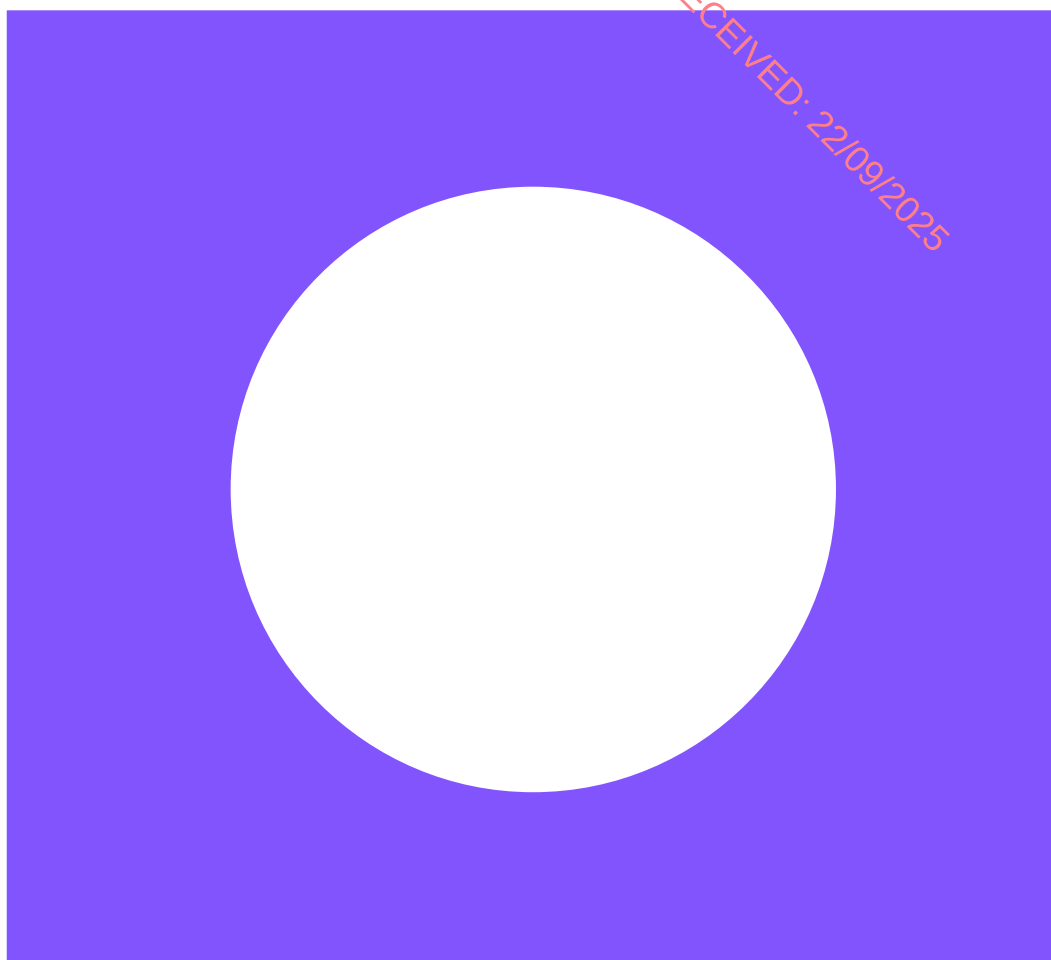
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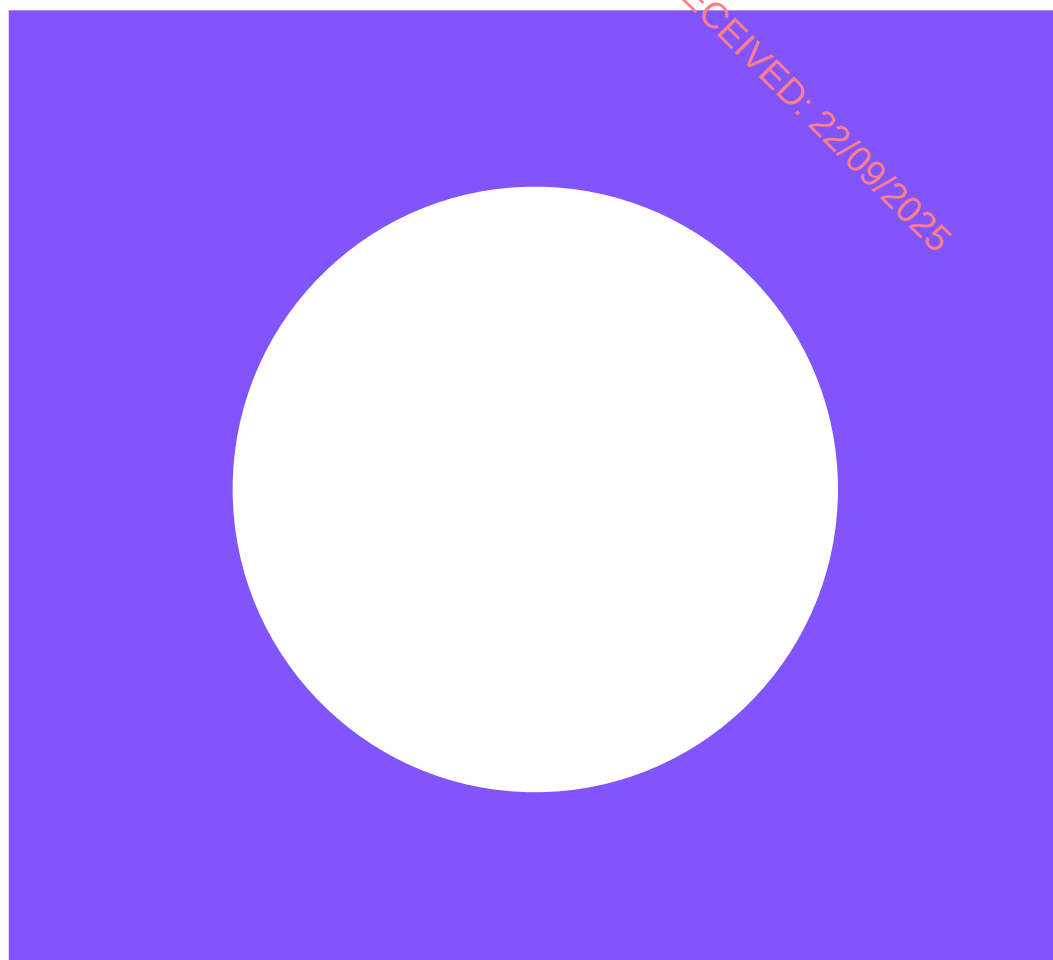
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 11 Noise and Vibration

September 2025

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11 Noise and Vibration

11.1 Introduction

The assessment considers the potential noise and vibration impacts on the surrounding environment arising from the construction and operation of the Proposed Project (as described in Chapter 5 - *Description of Development*), and where appropriate, specifies mitigation measures to reduce potential impacts.

The construction and operation of the Proposed Project will involve activities and equipment which emit noise. Some types of construction work will also result in ground-borne vibration.

11.2 Policy and Guidance

11.2.1 Policies

The Environmental Noise Regulations (ENR)¹ transpose the EU Directive 2002/49/EC² (commonly referred to as the Environmental Noise Directive (END)) for the strategic control of environmental noise within the Republic of Ireland. The ENR was revised and revoked by the European Communities (Environmental Noise) Regulations 2018³.

Nuisance due to noise is dealt with by the Environmental Protection Agency Act S.I. No. 7/1992 (as amended)⁴, and the Protection of the Environment Act 2003 S.I. No.27/2003 (as amended)⁵ require Best Available Techniques in controlling noise as a result of human activity: *“which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment”*. Both acts clarify that ‘noise’ includes vibration.

11.2.2 Guidelines

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022)
- Draft EPA Advice Notes for Preparing Environmental Impact Statements (hereafter referred to as the Draft EPA Advice 2015) (EPA, 2015)

There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines

¹ Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006).

² The European Parliament and the Council of the European Union, 2002. Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise.

³ The European Communities (Environmental Noise) Regulations 2018 (Statutory Instrument No. 549/2018).

⁴ Government of Ireland. Environmental Protection Agency Act, 1992.

⁵ Government of Ireland. Protection of the Environment Act, 2003.

relating to noise and / or vibration impact for environmental sources. These are summarised below:

- British Standard Institution (BSI) British Standard (BS) 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 1: Noise
- BS 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 2: Vibration
- BS 7385 (1993) Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration
- BS 6472 (2008) Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting
- European Communities (EC) (Environmental Noise) Regulations 2018 (S.I. No. 549 / 2018)
- EC (Environmental Noise) Regulations 2006 (S.I. No. 140/2006)
- EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241 / 2006)
- International Organization for Standardization (ISO) 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation
- ISO 1996-1 (2016) Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures
- ISO 1996-2 (2017) Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels
- National Roads Authority (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1
- National Roads Authority (2014) Good Practice Guide for the Treatment of Noise during the Planning of National Road Schemes Noise Guidelines
- UK Department of Transport and Welsh Office (1988) Calculation of Road Traffic Noise (CRTN)
- World Health Organization (WHO) (1999) Guidelines for Community Noise
- WHO (2018) Environmental Noise Guidelines for the European Region
- Institute of Environmental Management and Assessment (IEMA) (2014) Guidelines for Environmental Noise Assessment

11.3 Methodology

The Proposed Project is expected to give rise to both temporary (construction and decommissioning) and permanent (operational) noise and vibration impacts. The potential for these to exceed threshold values associated with annoyance and disturbance has been considered within separate construction and operational assessments. This section describes the approach to the assessment based on the various relevant requirements and criteria. Cumulative impacts due to the contributions of noise from other nearby licenced sites are also assessed.

11.3.1 Approach to Data Collection

The information and data sources given in Table 11.1 have been considered during the production of this chapter. The data used is considered to be a 'worst case scenario'.

Table 11.1 Data Sources used to inform this noise and vibration chapter of this PECR

Data source	Date	Data contents
Noise Data Sheet – Quantum HE and PE Twin Skid	May 2024	Manufacture noise data for Wärtsilä BESS container of Quantum HE, 100% Fan Speed
Technical note Noise Reduction for PCSK GEN3 Inverters (TN0056GI)	Nov 2023	Manufacture noise data for PCSK GEN3 Inverters and Transformers
220/110 kV transformer (200 MVA) + cooling fans	n/a	Sound power levels obtained from the Mott MacDonald database for representative items of equipment

11.3.2 Approach to Impact Assessment

11.3.2.1 Construction Noise

BS 5228 Part 1:2009+A1:2014 has been adopted for the assessment of effects at noise sensitive receptors (refer to Appendix 11.1). It provides comprehensive guidance including details of typical noise levels associated with items of plant and activities, prediction methods, and options for mitigation measures, and therefore has been considered appropriate for use in this assessment.

Based on the BS 5228 Part 1 'Example method 2 – 5 dB(A) change' in BS 5228 Part 1 2009+A1:2014, noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq, T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect.

11.3.2.2 Construction Vibration

The British Standard BS 5228 (2009+A1:2014) 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration' provides a methodology to predict and assess temporary noise and vibration impacts arising during construction.

BS 5228 provides comprehensive guidance on the assessment of vibration due to construction activity. It considers levels of vibration from construction in terms of peak particle velocity (PPV) defined as the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position and is expressed in millimetres per second (mm/s). BS 5228 provides guidance on the levels of vibration associated with human perception and disturbance and the onset of potential structural damage to different types of buildings.

Table 11.2 presents guidance on threshold values for the human perception of vibration arising during construction.

Table 11.2: BS 5228 Part 2 guidance on the human perception effects of vibration due to construction activity and significance of effect

Vibration level PPV mm/s	Effect
0.14	Vibration might be perceptible in most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning has been given to the residents.
10.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Source: BS 5228 Part 2:2009+A1:2014

Table 11.2 above indicates that vibration levels of more than 1.0 mm/s can be considered significant.

11.3.2.3 Construction Traffic

Changes in noise from road traffic on public roads can arise due to diversion routes (not required for the Proposed Project) or due to additional traffic for the transfer of materials and equipment and the attendance of site personnel. The National Roads Authority Guidelines⁶ and Guidance⁷ do not provide a method for the assessment of temporary changes in road traffic noise associated with construction, specifically. However, the 2014 Guidance describes requirements for noise monitoring in Section 3.13. This states:

“The baseline noise level should be established for every noise-sensitive building or group of buildings where traffic noise levels are likely to change significantly as a result of the scheme. This includes areas where traffic flows are reduced by 20% or more, and where existing flows are increased by 25% or more. Traffic noise will also change where traffic parameters other than total flow volumes are changed. An increase in the percentage of heavy vehicles, or in traffic speed, will also lead to increases in traffic noise. It is sufficient to calculate the Basic Noise Level with and without the scheme to determine whether there would be a difference of 1dB or more.”

This is mainly concerned with permanent changes in road traffic noise but indicates that a change of 1 dB is the minimum threshold to assess for significance of impact. Although the Proposed Project is not a road scheme, this is adopted for the assessment of temporary changes in road traffic noise as a result of the Proposed Project on a precautionary basis.

11.3.2.4 Operational Noise

The EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016)⁸ describes a methodology to assess and control the predicted and measured noise impacts associated with licenced sites. It specifically considers operational noise impacts only.

The NG4 Guidance sets out a methodology for setting appropriate noise criteria on operational noise emissions with the potential to affect NSLs defined as:

“Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.”

Firstly, sites are screened to determine whether they are Quiet Areas based on the proximity of the Proposed Project to urban areas and other major sources of environmental noise. The Quiet Area Noise Criteria for applicable sites is a limit defined as 10 dB below the average background noise level for the day (07:00 to 19:00), evening (19:00 to 23:00) and night-time (23:00 to 07:00) periods obtained by long-term noise monitoring.

For NSLs that are not identified as being within Quiet Areas, the NSLs are first screened for low background noise defined as those where the average background noise levels (L_{AF90}) are less than or equal to:

⁶ National Roads Authority (2004) Guidelines for the treatment of noise and vibration in national road schemes, Revision 1

⁷ National Roads Authority (2014) Good practice guide for the treatment of noise during the planning of national road schemes noise guidelines

⁸ Environmental Protection Agency Office of Environmental Enforcement Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). January 2016.

- Daytime: 40 dB L_{AF90}
- Evening: 35 dB L_{AF90}
- Night-time: 30 dB L_{AF90}

The noise criteria for NSLs with low background noise are:

- Daytime (07:00 to 19:00) 45 dB $L_{Ar,T}$
- Evening (19:00 to 23:00) 40 dB $L_{Ar,T}$
- Night-time (23:00 to 07:00) 35 dB $L_{Aeq,T}$

where $L_{Ar,T}$ is the rated noise level, which is equal to the L_{Aeq} plus any correction for tonal or impulsive acoustic features.

Where low background noise criteria are not met, then the general criteria apply as follows:

- Daytime: (07:00 to 19:00) 55 dB $L_{Ar,T}$
- Evening: (19:00 to 23:00) 50 dB $L_{Ar,T}$
- Night-time: (23:00 to 07:00) 45 dB $L_{Aeq,T}$

The EPA NG4 Guidance states that the limit values for noise from licensed sites apply to “*noise attributable solely to on-site activities, expressed as a free field value at any NSL*”.

Where the predicted noise impacts exceed these values, the final significance of effect shall be considered with regard to:

- Sensitivity of receptor
- Whether the impact is temporary (construction-related) or short-term (operational)
- The magnitude by which the limit value is exceeded
- The change in ambient noise levels as a result of the contribution of the Proposed Project

Operational noise is not expected to include significant tonal or impulsive features and therefore no corrections of the daytime and evening noise levels are applied to represent rating levels.

The operational noise levels will be predicted by using 3-dimensional computer modelling software that based on the methodology provided in ISO 9613-2 (2024)⁹ at all of the considered NSLs which are mostly likely to be affected by operational noise.

BS 4142 (2014+A1:2019) also provides a method to assess noise from fixed plant affecting residential receptors. The method compares the rating level (equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location plus any adjustment for the characteristic features of the sound) with the representative background noise level. Character corrections are applied to the specific sound level, accounting for tonality, impulsivity and intermittency, to determine the rating level. The rating level is compared against representative background sound level to determine the magnitude of noise impact. Typically, the greater the difference between the rating level and background sound level, the greater the magnitude of impact. The criteria for defining magnitude for the assessment of operational noise impacts are provided in Table 11.3.

⁹ International Organization for Standardization (ISO) 9613-2 (2024) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation

Table 11.3: Impact criteria in accordance with the BS 4142 methodology

Difference between rating level and background sound level	BS 4142 description
Less than 0 dB	'Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'
Greater than or equal to 0 dB and less than +10 dB	A difference greater than 0 dB is an indication the noise impact is greater than 'low', depending on the context. 'A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.'
Greater than or equal to +10 dB	'A difference of around + 10 dB or more is likely to be an indication of a significant adverse effect, depending on the context.'
Substantially greater than +10 dB	'A difference of around + 10 dB or more is likely to be an indication of a significant adverse effect, depending on the context.'

Summary of significance of effect criteria

Table 11.4 summarises the assessment criteria applied within this assessment.

Table 11.4: Significance of effect

Category	Significance of effect
Construction and decommissioning noise	Exceedance of the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect
Changes in road traffic noise during construction and decommissioning	A significant effect is considered to occur where the predicted temporary increase in daily average road traffic noise due to the Proposed Project is 1 dB or more
Operational Noise	A significant effect is considered to occur where the applicable daytime, evening or night-time threshold values for areas of low background noise as given by the NG4 guidance are exceeded at a NSL due to the Proposed Project Consideration is also given to the findings of an assessment in accordance with the methodology described in BS 4142 – 2014 +A1:2019, which takes into account context

11.3.3 Study Area

The study area was chosen to represent the nearest receptors most likely to be impacted by the noise levels of the proposed plant as part of the BESS and substation compounds.

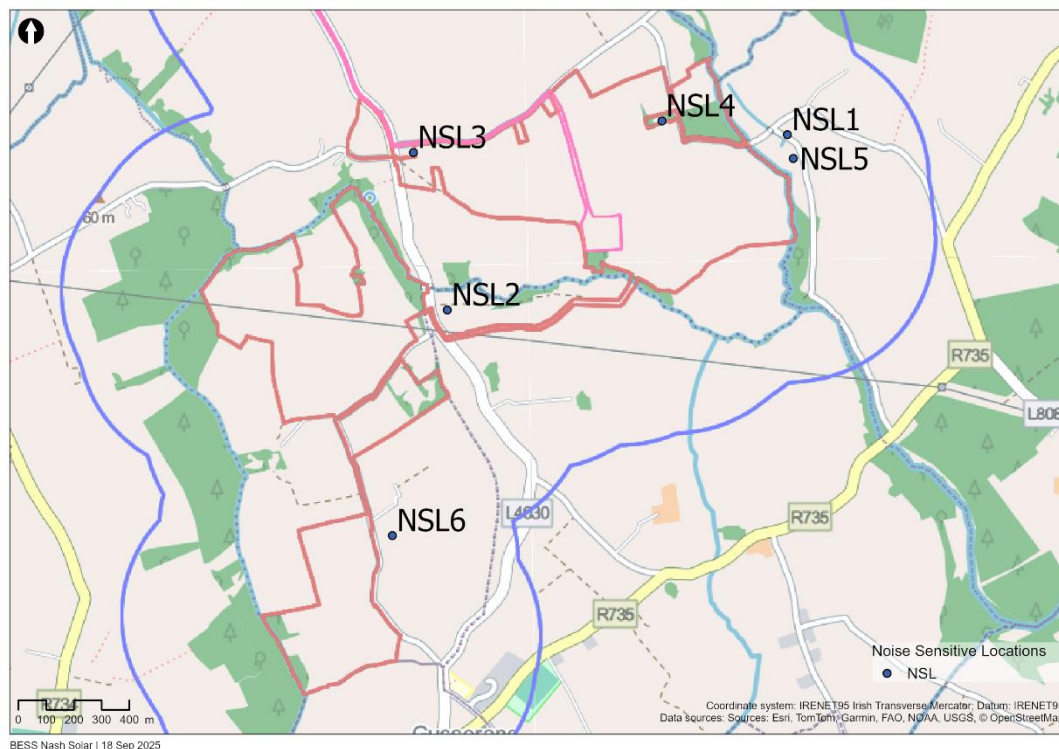
This area covers approximately 900m from the boundary of the BESS compound. Locations within the study area have been identified that are sensitive to noise and are summarised in Table 11.5 and presented in Figure 11.1.

Table 11.5: Noise Sensitive Locations

ID	Location
NSL1	Kilbraney, Gusserane, Co. Wexford Y34 NA43
NSL2	Ballygarvan Mill, Ballygarvan, Gusserane, Co. Wexford Y34 KC99
NSL3	Nash, Gusserane, Co. Wexford Y34 RC85
NSL4	Neighbourly Bridge, Nash, Gusserane, Co. Wexford Y34 T856
NSL5	Kilbraney, Gusserane, Co. Wexford Y34 KP70
NSL6	Cloonagh House, Cloonagh, Gusserane, Co. Wexford, Y34 XD77

ID	Location

Figure 11.1: Noise Sensitive Locations



Source: OpenStreetMap/Mott MacDonald

11.3.4 Limitations of this EIAR

The specific inventory of plant and working methods to be applied during the construction phase will be devised by the appointed contractor. Therefore, these specific details are not available to inform the assessment of potential noise and vibration impacts. However, the assessment has been undertaken based on the impacts of construction activities that are expected to be required. The construction activities are chosen to represent a reasonable worst-case scenario. It is assumed that the majority of works can be undertaken during weekday daytime periods and that works during the night-time would only be undertaken by exception.

With regards to the Proposed Project, there is no specific equipment selected for the substation and the BESS. Data from similar projects has been used to inform the operational assessment.

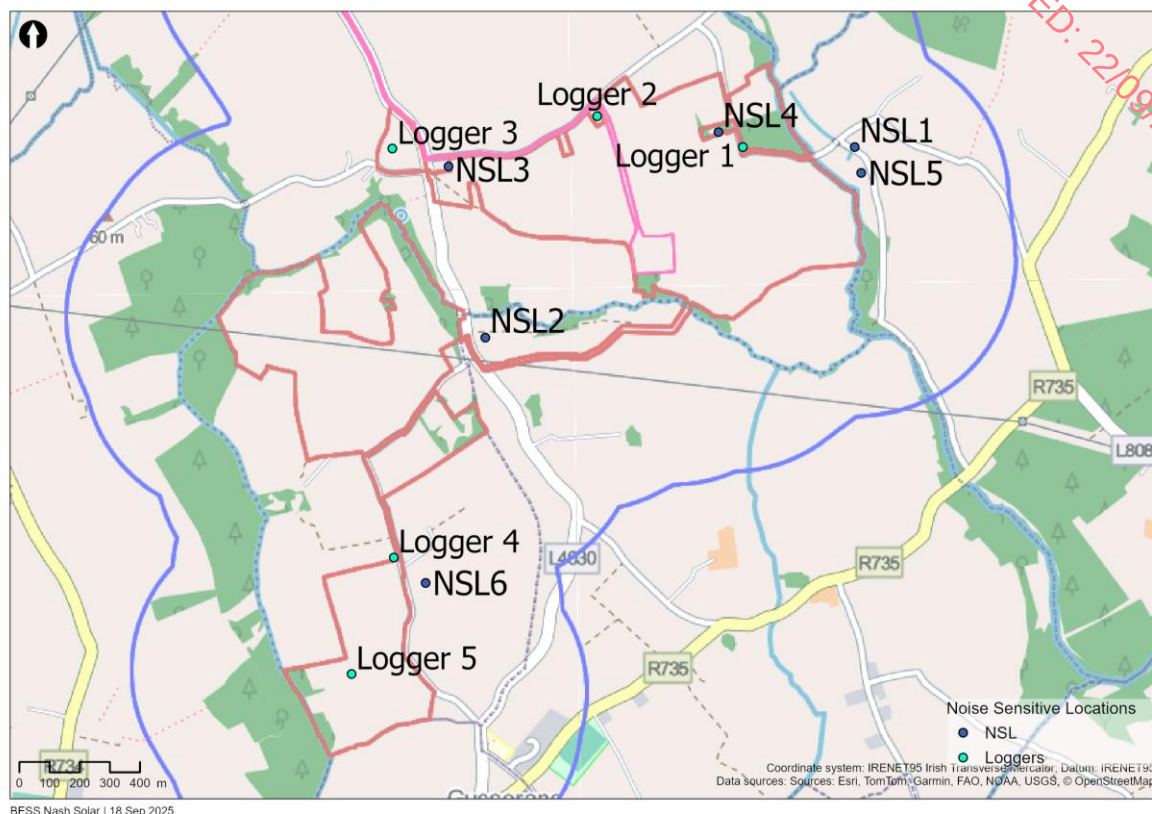
11.4 Receiving Environment

The Proposed Project site is located within a rural area in the townlands of Ballygarven, Cloonagh and Nash, Gusserane, Co. Wexford.

Background sound level measurements comprised a combination of attended and unattended long-term measurements undertaken by Amplitude Acoustics from the 31 July to 6 August 2025 for Loggers 1, 2, 4 and 5, and from 31 July to 03 August 2025 for Logger 3.

The locations of the long-term measurements are shown in Figure 11.2.

Figure 11.2: Noise monitoring and NSL locations



Source: OpenStreetMap/Mott MacDonald

The summary of the measurement results is given in Table 11.6:

Table 11.6: Typical measured background sound levels

Location	Nearest identified sensitive location	Daytime $L_{Aeq,12h}$ dB	Evening $L_{Aeq,4h}$ dB	Night $L_{Aeq,8h}$ dB	Typical daytime L_{A90} dB	Typical night-time L_{A90} dB
Logger 1	NSL2	44	41	34	33	22
Logger 2	NSL4	45	32	28	27	19
Logger 3	NSL1, NSL5	37	34	32	29	25
Logger 4	NSL3	47	42	36	32	22
Logger 5	NSL6	39	42	32	31	21

Noise levels between 23:00 on 03 August 2025 and 07:00 on 05 August 2025 were excluded on all loggers due to high noise levels considered to be anomalous.

The full measurement charts are presented in Appendix 11.2.

The survey report with the details of the survey is appended in Appendix 11.3.

11.5 Likely Significant Impacts

11.5.1 'Do Nothing' scenario

There would be no change to the receiving environment under the 'Do Nothing' scenario. The impacts are assessed as negligible and therefore not significant.

11.5.2 Construction Phase

An indicative list of construction plant is presented in Table 11.7 and has been compiled from the inventories for similar projects and through consultation with the project team. Reference Sound Pressure Levels (SPL) for continuous operation are presented. The level of noise emission is corrected for utilisation time based on the estimated percentage of time the plant is expected to be in use over a working day.

Table 11.7: Details of noise-emitting equipment considered for the construction of the Proposed Project and reference noise levels used for noise calculations

Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB
Substation compound	Site preparation	Tracked excavator	C2-14	2	50	75	86
		Backhole loader	C2-18	2	50	80	
		Concrete truck	C4-29	1	25	64	
		Compactor	C4-42	1	50	78	
		Tipper lorry	C8-19	2	50	78	
		MEWP	C4-59	1	50	82	
		Mobile crane	C4-45	1	25	85	
		Small tools	C4-69	1	25	66	
		Generator	C4-78	1	100	68	
		Loader	C2-8	1	50	80	
		Forklift	C2-34	1	50	67	
		Tracked crane	C3-28	1	25	79	
		Tracked crane	C3-28	1	25	79	
	Civil Works	Tracked excavator	C2-14	1	50	75	80
		Backhole loader	C2-18	1	50	80	
		Concrete truck	C4-29	1	50	64	
		Compactor	C4-42	1	50	78	
		Tipper lorry	C8-19	1	50	78	
		MEWP (Mobile Elevating Work Platform)	C4-59	1	50	82	
		Mobile crane	C4-45	1	50	85	
		Small tools	C4-69	1	50	66	
		Generator	C4-78	1	100	68	
		Loader	C2-8	1	50	80	
		Forklift	C2-34	1	50	67	
		Tracked crane	C3-28	1	50	71	
		Tracked crane	C3-28	1	50	71	
	Electrical Works	Telescopic handler	C2-35	1	25	71	83
		Tracked mobile crane	C4-50	1	50	85	
		Small tools	C4-69	1	50	50	
		Compressor	D7-10	1	50	80	
		Tractor (towing trailer)	C4-74	1	50	67	
	Energisation	MEWP (Mobile Elevating Work Platform)	C.4.57	1	50	65	82
		Diesel generator	C.4.86	1	50	85	

Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB
Underground 220kV Cabling	Pre-Construction	Small tools	C.4.69	1	50	68	79
		Water pump (diesel)	C.4.88	1	50	75	
		Tracked excavator 21t	C.2.3	1	25	66	
		Articulated dump truck 30t	C.2.32	1	25	74	
		Disc cutter	C.5.36	1	10	78	
		Mobile telescopic crane	C.4.39	1	50	83	
		Cement spreader	C.4.18	1	25	74	
		Cement mixer	C.4.24	1	25	75	
		Power for welder - diesel generator	C.4.85	1	75	56	
	Civil works (Trenching and ducting works and temporary reinstatement)	Compactor	C2-42	1	50	73	82
		Jack Hammer	C1-6	1	50	71	
		Tracked excavator	C5-35	1	50	85	
		Vibratory roller	C5-35	1	50	78	
	Cable installation and jointing	Hydraulic winch	Datasheet	1	25	66	69
		Tractor (towing trailer)	C4-74	1	25	74	
		Telescopic handler	C2-35	1	25	78	
	HV cable commissioning (sheath test, cross bonding and HV/AC testing)	Small tools	C4-69	1	25	83	80
Solar PV Farm	Civil Works	Tracked excavator	C2-14	1	50	79	81
		Backhole loader	C2-18	1	50	75	
		Concrete truck	C4-29	1	50	80	
		Compactor	C4-42	1	50	64	
		Tipper lorry	C8-19	1	50	78	
	Mechanical Works	Mobile crane	C4-45	2	50	82	86
		Small tools	C4-69	1	50	85	
		Generator	C4-78	1	100	66	
		Loader	C2-8	1	50	68	
		Forklift	C2-34	1	50	80	
		Tracked crane	C3-28	2	50	67	
	Electrical Works	Telescopic handler	C2-35	1	50	71	83
		Tracked mobile crane	C4-50	1	50	71	
		Small tools	C4-69	1	50	85	
		Compressor	D7-10	1	50	78	
		Tractor (towing trailer)	C4-74	1	50	73	
	Commissioning	Small tools	C4-69	1	50	85	82
BEES	Site Clearance and enabling works	Tracked excavator	C2-14	2	50	79	87
		Backhole loader	C2-18	1	50	75	
		Concrete truck	C4-29	1	50	80	
		Compactor	C4-42	1	25	64	
		Tipper lorry	C8-19	4	50	78	
		MEWP	C4-59	1	50	78	
		Mobile crane	C4-45	1	25	82	
		Small tools	C4-69	1	50	85	
	Civil works	Tracked excavator	C2-14	1	50	79	77
		Backhole loader	C2-18	1	50	75	

Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB
		Concrete truck	C4-29	1	25	80	
		Compactor	C4-42	1	50	64	
		Tipper lorry	C8-19	1	50	78	
		MEWP (Mobile Elevating Work Platform)	C4-59	1	25	78	
		Mobile crane	C4-45	1	50	82	
		Small tools	C4-69	1	25	85	
		Generator	C4-78	1	50	66	
		Loader	C2-8	1	50	68	
	Electrical Installation	Telescopic handler	C2-35	1	50	71	83
		Tracked mobile crane	C4-50	1	50	71	
		Small tools	C4-69	1	50	85	
		Compressor	D7-10	1	50	50	
		Tractor (towing trailer)	C4-74	1	50	80	
	BESS Container Installation	Telescopic handler	C2-35	1	50	71	77
		Tracked mobile crane	C4-50	1	50	71	
		Compressor	D7-10	1	50	78	
		Tractor (towing trailer)	C4-74	1	50	73	
	Commissioning and testing	Small tools	C4-69	1	50	85	82

Source: Mott MacDonald

The sources of noise are assumed to be evenly distributed across the site at locations adjacent to site components scheduled for construction. Normal working hours during the construction period are expected to be Monday to Friday 07:00 to 19:00 hours, and 08.00 to 14.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours, but this will be limited to inspection, testing and if necessary, emergencies.

Neither of the example methods in BS 5228 specified in Annex E 'Significance of Noise Effects' align with requirements set by the Environmental Protection Agency and as a result have not been considered as methods for deriving the definition of a significant adverse effect.

Due to the existing low background levels, the significance of impact has been assessed against lower cut-off values of 65 dB, 55 dB and 45 dB L_{Aeq, T} from site noise alone, for the daytime, evening and night-time periods, respectively.

Table 11.8: Construction noise levels at NSLs

Phase	Activity	Predicted noise level, dB L _{Aeq}				
		NSL1	NSL2	NSL3, NSL5	NSL4	NSL6
GIS Substation	Site preparation	48	46	46	51	39
	Civil Works	42	39	39	45	33
	Electrical Works	45	43	43	48	36
	Energisation	44	42	42	47	35
Underground 220kV Cabling	Pre-construction	40	49	42	49	51
	Civil works	43	52	45	52	54
	(Trenching and ducting works and temporary reinstatement)					

Phase	Activity	Predicted noise level, dB L _{Aeq}				
		NSL1	NSL2	NSL3, NSL5	NSL4	NSL6
Solar PV Farm	Cable installation and jointing	30	39	32	39	41
	HV cable commissioning (sheath test, cross bonding and HV/AC testing)	41	50	43	50	52
	Civil Works	42	51	44	51	53
	Mechanical Works	43	52	45	52	54
	Electrical Works	44	53	46	53	55
BESS	Commissioning	43	52	45	52	54
	Site Clearance and enabling works	49	46	46	52	40
	Civil Works	39	36	36	42	30
	Electrical Installation	45	42	42	48	36
	BESS container installation	39	36	36	42	30
	Commissioning and testing	44	41	41	47	35
Significant adverse effect		No	No	No	No	No

Source: Mott MacDonald

The results of the calculations indicate that predicted noise levels at the NSLs due to the construction of the Proposed Project are below the daytime criterion of 65 dB L_{Aeq} and evening criterion of 55 dB L_{Aeq}. Therefore, it is concluded that construction noise will result in no significant effects.

11.5.2.1 Construction Vibration

An assessment of the proposed plant provided in Table 11.7 has determined that plant likely to give rise to elevated levels of ground-borne vibration are the compactors.

Annex E of BS 5228–2:2009 presents empirical methods for the prediction of levels of vibration arising from mechanized construction works. This includes an equation to estimate steady state vibration arising from vibratory compaction.

Most sensitive locations such as residential dwellings and schools are located at significant distance away from the construction area and will not be impacted by vibration as a result of the construction activities. However, some receptors such as NSL6 and NSL4 are located approximately 15-20 metres away from the Proposed Project boundary.

At this distance, depending on the compactor characteristics, there is a 5% possibility that the vibration levels from vibratory compaction will be 1 to 14mm/s and a 50% possibility that the levels will be 0.3 to 4mm/s. This could result on a significant impact at the receptors. At these levels, vibration is expected to be perceptible and may cause complaint. However, these values are below threshold values for the onset of potential cosmetic damage to light-framed buildings.

It is recommended that vibration levels are minimised where practicably possible by using a drum with greater width and lower vibration amplitude. Prior notification will be given to the occupiers of the closest properties ahead of the use of vibratory compactors providing information on the timing, duration and reason for the works. Therefore, there is a low risk that there will be a significant impact.

11.5.2.2 Construction Traffic

In order to access the Proposed Project site, the contractors will be required to utilise local public roads. Traffic data as presented in Table 14.17 in Chapter 14 has been used to predict

changes in road traffic noise during construction. The 'Do nothing' traffic data (without the implementation of the Proposed Project) is for year 2027, when the peak in construction traffic movements are expected to occur.

For the assessment, the level of road traffic noise due to links with flows of less than 1,000 vehicles cannot be calculated using the CRTN methodology and have been disregarded. Furthermore, traffic noise from these roads is not likely to result significant impacts because the absolute level of road traffic noise will be relatively low. However, the overall traffic flows including the construction vehicles will not give rise to high noise levels and therefore the impacts are likely less significant as expected by magnitude of change alone.

The predicted increases in the Basic Noise Level (BNL) for road traffic noise (L_{A10} dB), based on the Annual Average Daily Traffic (AADT) flows in the year 2027 and forecasted additional movements are between 0.1 to 0.5 dB on the major roads R733, R734 and R735.

The L4023 road between N25 Junction and the L4030 Nash Junction is predicted to have an increase of 1.7 dB. This will have a temporary significant noise impact on the dwellings located alongside this road.

Table 11.9 provides the details of the calculation of traffic noise levels expressed using the L_{A10} descriptor.

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Table 11.9: Analysis of traffic data and changes in basic noise levels

		Baseline 2027				During construction					
Link	km/h	Flow	HGV	HGV%	LA10 dB	Additional LGV	Additional HGV	Flow	HGV%	LA10 dB	Change in LA10 dB
R733: Between New Ross & N25 junction.	80	7,542	771	10.2	70.6	48	50	7,640	10.75	70.7	0.1
R733: Between N25 junction and R734 junction.	80	5,622	302	5.4	68.4	104	101	5,827	6.92	68.9	0.4
R734: Between R733 junction and L4023 junction.	80	3,949	229	5.8	66.9	104	101	4,154	7.94	67.6	0.5
L4023: Between N25 Junction & L4030 Nash junction.	80	1,198	63	5.3	59.5	76	84	1,358	10.82	61.5	1.7
R734: Between L4023 Tellarought junction & R735 junction.	80	2,267	166	7.3	64.4	0	0	2,267	7.32	64.4	0.0

Source: Mott MacDonald

11.5.3 Operation and Maintenance Phase

The operational noise assessment implements the procedures of ISO 9613-2⁹ using a three-dimensional acoustic model developed using DataKustik CadnaA software.

The parameters used for the model are as follows:

- The methodology used for the calculation of noise propagation is ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors
- Mapping data has been imported from Open Street Maps
- Topographic data has been imported from site survey
- Barriers are fully absorptive and 8.5m in height
- The maximum number of reflections has been set to 2
- Buildings and barrier have been set a reflection loss of 2 dB
- Ground absorption has been set to 50% absorptive ($G = 0.5$)
- Sensitive receptor elements at first floor level

A list of operational noise sources is presented in Table 11.10 and the steady state sound power levels (SWL) that have been applied within the acoustic model. The item numbers correspond to the equipment layout presented at Figure 11.3. The noise emission data of plant items for the Proposed Project have been obtained from the data sheet of the manufacturers or other similar projects with similar specifications. It is assumed that all plant will operate continuously with no significant tonal or impulsive features. Three scenarios have been considered in the noise model.

Table 11.10: List of noise sources considered within the acoustic model for the operation of the Proposed Project¹⁰

Description	Number of items	Sound power level dB(A)
Wärtsilä Quantum BESS container operation at 100% fan speed	80	81
PCSK transformer and inverter [2]	19	96
220/110 kV transformer with cooling fans	1	72

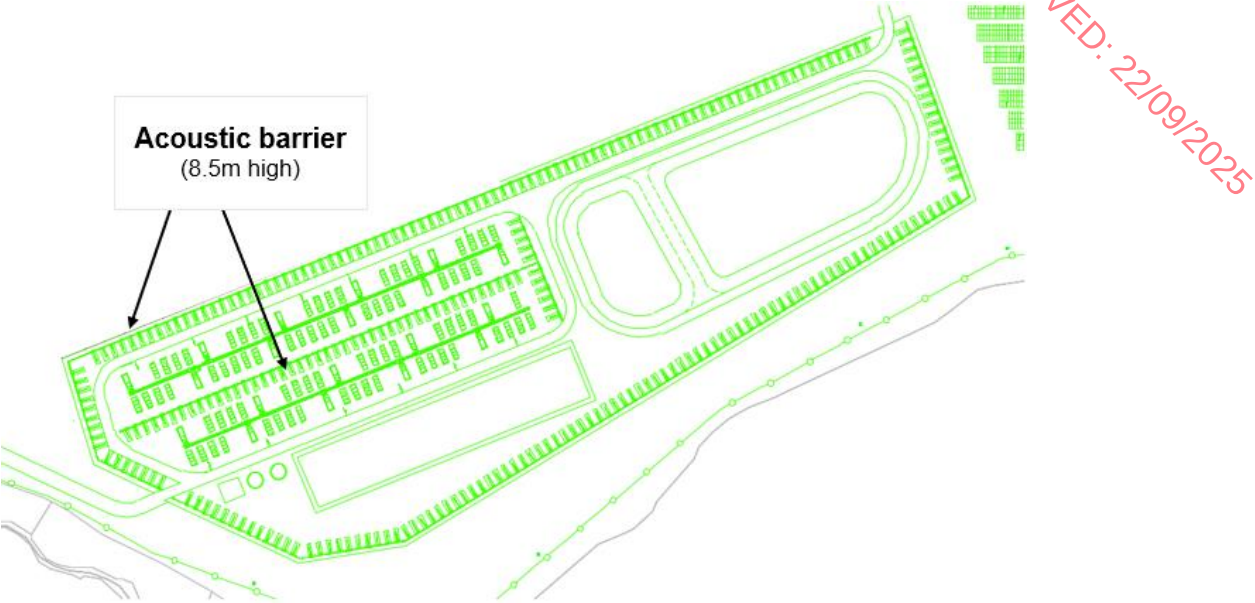
Remarks: [1] Noise attenuation kits have been considered in PCSK transformer and inverter system.

Source: Mott MacDonald

The BESS compound will include barriers, shown in Figure 11.3 in dark blue, which will be fully absorptive at a height of 8.5 metres. It is also noted that the equipment does not all run at the same time, or at full load. However, in the absence of operational information, a worst case assessment for 100% running has been presented.

¹⁰ Sound power levels obtained from the Mott MacDonald database for representative items of equipment.

Figure 11.3: Location of acoustic barriers within the BESS compound



Source: Mott MacDonald

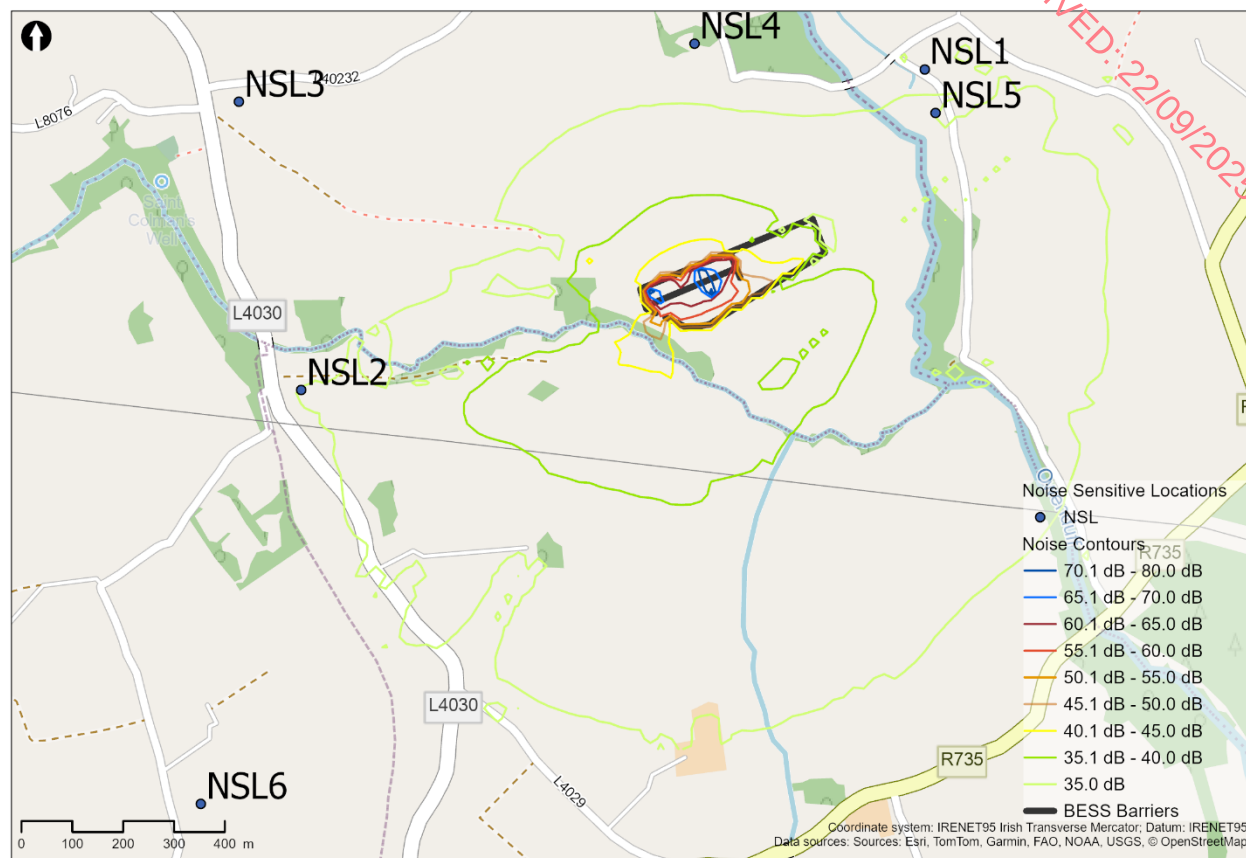
The predicted operational noise levels for each NSL are presented in Table 11.11. Noise contours plots produced by the acoustic model are presented in Figure 11.4.

Table 11.11: Predicted operational noise levels NSLs due to the Proposed Project

Noise sensitive location	Predicted noise level, dB LAeq
NSL1	34
NSL2	34
NSL3	28
NSL4	33
NSL5	35
NSL6	30

Source: Mott MacDonald

Figure 11.4: Contour plot of predicted operation noise levels



BESS Nash Solar | 16 Sep 2025

Source: Mott MacDonald

The predicted operational noise levels do not exceed the noise criteria given in the NG4 guidance of 45 dB L_{Aeq} daytime, 40 dB L_{Aeq} evening and 35 dB L_{Aeq} night-time at all locations.

An assessment in line with methodology described in BS 4142:2014+A1:2019.

Table 11.12: Predicted operation noise levels assessed in accordance with BS 4142 - daytime

	Daytime (07:00-23:00)					
	NSL1	NSL2	NSL3	NSL4	NSL5	NSL6
Total Specific Level, $L_{Aeq,Tr}$	34	34	28	33	35	30
Acoustic Feature Correction	0	0	0	0	0	0
Total Rating Level, $L_{Ar,Tr}$	34	34	28	33	35	30
Background Level (Typical daytime $L_{A90,T}$)	29	33	32	27	29	31
Difference ($L_{Ar,Tr} - L_{A90,T}$)	+5	+1	-4	+6	+6	-1

Table 11.13: Predicted operation noise levels assessed in accordance with BS 4142 – night-time

	Night-time (23:00-07:00)					
	NSL1	NSL2	NSL3	NSL4	NSL5	NSL6
Total Specific Level, $L_{Aeq,T}$	34	34	28	33	35	30
Acoustic Feature Correction	0	0	0	0	0	0
Total Rating Level, $L_{A,r,T}$	34	34	28	33	35	30
Background Level (Typical daytime $L_{A90,T}$)	25	22	22	19	25	21
Difference ($L_{A,r,T} - L_{A90,T}$)	+9	+12	+6	+14	+10	+9

The assessment presented in Table 11.12 and Table 11.13 indicate a negative impact on the receptors. However, BS 4142:2014+A1:2019 says:

“Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”

Currently, the background noise levels are 25 dB L_{A90} or lower. The predicted noise levels as a result of the operation of the Proposed Project are between 28 to 35 dB $L_{Aeq,T}$ at night. Although these noise levels are in some cases over 10 dB higher than the existing background sound levels, these are still sufficiently low not to exceed sleep disturbance threshold values indoors even with open windows.

Therefore, it is considered that with the proposed mitigation there will not be a significant operational noise impact on the nearest sensitive locations.

11.5.4 Decommissioning Phase

On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and Industrial Emission licences, unless otherwise authorised. Specific details on decommissioning are not available at this stage of the project. Impacts during decommissioning from airborne noise and ground-borne vibration due to demolition activities are expected to be of a similar magnitude to those during construction but generally of shorter duration. Therefore, it is concluded that the noise and vibration impacts due to decommissioning are not likely to result in significant effects.

11.6 Cumulative Effects

Cumulative effects consider the potential effects of the Proposed Project in combination with the potential effects of other existing or approved developments within the surrounding area.

A review of the projects detailed in Table 3.2 of Chapter 3 *EIA Methodology* was undertaken to determine if there are any other projects which could act in combination with the Proposed Project to increase noise impact at nearby receptors.

A potential extension of the BESS battery storage may have a cumulative noise impact on the receptors nearest to the compound, depending on the number of BESS units and the BESS equipment selected.

Any potential extension of the solar farm is unlikely to have any cumulative impact on noise and/or vibration when considered with the Proposed Project.

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11.7 Mitigation and Monitoring Measures

11.7.1 Mitigation Measures

No specific noise mitigation measures are proposed for the construction phase. However, in accordance with best practice, noise emissions should be minimised at source to minimise the exposure site personnel to noise from construction.

The CEMP will be implemented during the construction phase to minimise any construction noise and vibration impacts and in consultation with local councils. The Contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to):

- setting limits for the control of noise and vibration from construction activities
- the provision of mitigation measures required whilst adopting best practicable means
- noise or vibration monitoring where disturbance is reported as required.

A comprehensive noise and vibration monitoring protocol will also be implemented. As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction.

To control vibration from the use of compactors, it is recommended that the equipment is selected such that the vibration levels are as low as possible, with lower amplitude of drum vibration magnitude and maximising the vibrating roller drum width. Before the works with potential vibration impacts commence, the residents should be given prior notification.

There are no operational and maintenance phase mitigation required.

11.7.2 Monitoring Measures

No specific monitoring measures are proposed for the construction or operation and maintenance phase.

11.8 Residual Impacts

The Proposed Project is expected to generate noise during both the construction and operational stages.

The assessment has considered the likelihood of significant effects based on predictions of noise where the noise emissions of construction and operational plant have been assumed.

The likelihood of significant effects during construction are considered unlikely.

Construction traffic noise will likely not have significant impact on major roads, with the exception of the L4023 road between N25 Junction and the L4030 Nash Junction, which has a risk to have a temporary significant impact due to the increased noise levels during the peak construction traffic.

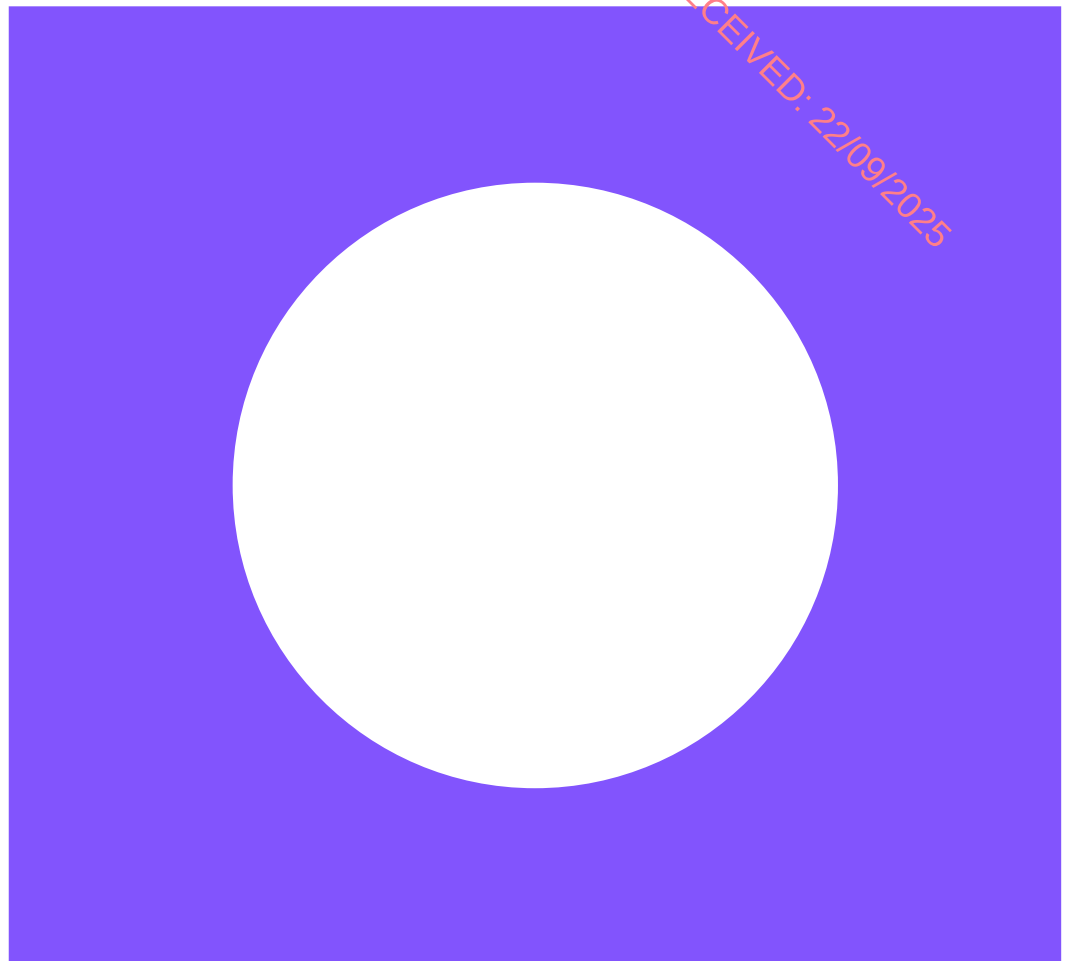
Without prior notification, vibration from compaction has the potential to have a significant impact on the receptors closest to the site in terms of disturbance. However, this will be temporary for short periods of time and with the proposed mitigation (large width drum and lower magnitude vibration), the risk can be reduced to not significant.

The BESS compound will be fitted with absorptive barriers suitable to mitigate the noise impact on the nearby receptors. Therefore, the residual operational effects are not considered significant.

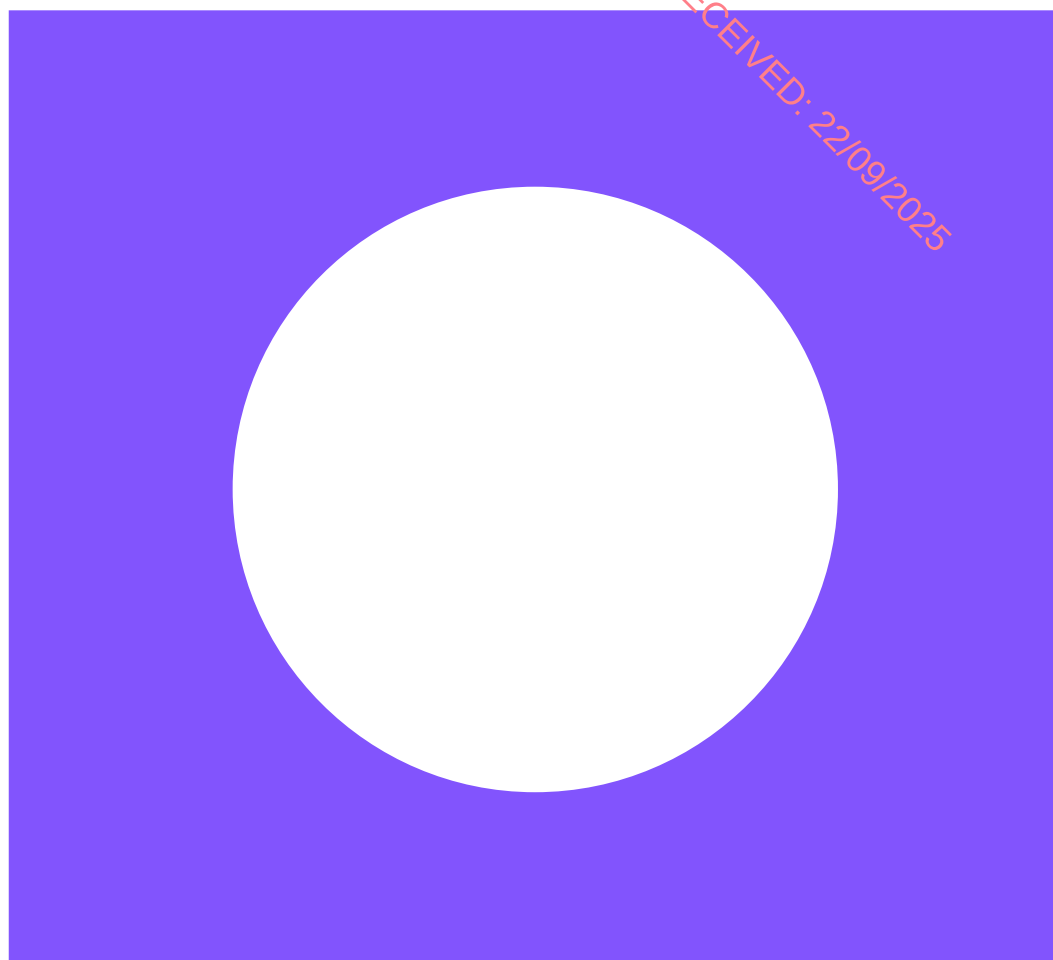
11.9 References

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 12 Landscape

September 2025

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12 The Landscape

12.1 Introduction

This chapter has been prepared in relation to the Proposed Project as described in Chapter 5 – *Description of Development*.

This LVIA describes the landscape context of the proposed project and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

- Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

A Glint and Glare assessment has been prepared (contained within Volume 4), which is a standalone report and is not incorporated into this chapter.

12.1.1 Approach and Statement of Authority

This LVIA adopts an approach that is founded in the following best practice guidance documents:

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled *Guidelines for Landscape and Visual Impact Assessment*, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

12.2 Methodology

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape:

'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded.'

12.2.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

'This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.'

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The LVIA Methodology can be summarised as undertaking the following key tasks:

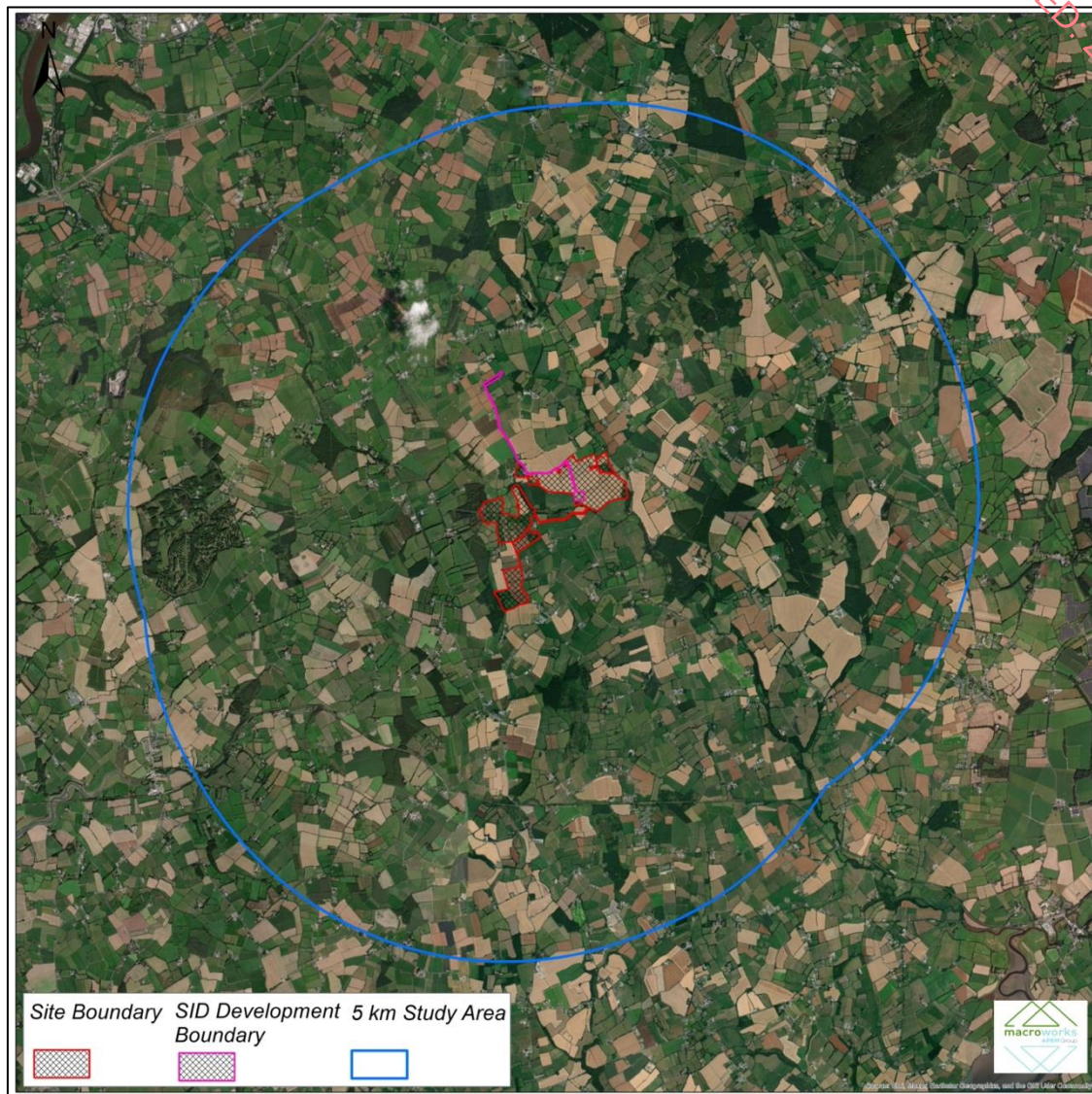
- Desk study;
- Site visits and photography in September 2024;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the proposed project;
- Consideration of Mitigation Measures;
- Assessment of Landscape Effects;
- Assessment of Visual Effects; and
- Summary Statement of Significance.

12.2.2 Study Area

From similar studies, it is anticipated that the proposed project is likely to be difficult to discern beyond approximately 5km and is not likely to give rise to significant landscape or visual impacts beyond approximately 2km. In the interests of a comprehensive appraisal, a 5km radius study area is used in this instance. However, there will be a particular focus on receptors contained within 2km, except where iconic or designated scenic viewpoints exist at greater distances out to 5km (refer to Figure 1.1). A study area of 5km has typically been used for solar projects in Ireland, Northern Ireland and Great Britain and this approach has been deemed acceptable by multiple planning authorities including Wexford County Council.

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Figure 12.1: 5km Extent of the Study Area



Source: MacroWorks

12.2.3 Landscape Impact Assessment

This part of the LVIA provides an assessment of how the introduction of the Proposed 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.

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.

12.2.3.1 Landscape Sensitivity

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. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. 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 12.1.

Table 12.1: 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.

12.2.4 Magnitude of Change – Landscape

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 proposed project and to a lesser extent the duration and reversibility of that effect. 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 12.2 outlines criteria used to inform this judgement.

Table 12.2: 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.

Criteria	Description
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.

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12.2.5 Visual Impact Assessment Criteria

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

- Direct impacts of the proposed 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.

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 proposed project. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

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.

12.2.5.1 Sensitivity of Visual Receptors

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.

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.

12.2.5.2 Susceptibility of Visual Receptors to Change

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”.

12.2.5.3 Values attached to Views

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;
- 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.

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.

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.

12.2.6 Magnitude of Change – Visual

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 proposed 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. Criteria used to inform judgements are provided in Table 12.3.

Table 12.3: Magnitude of Change – Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

12.2.7 Significance of Effect

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.

The significance category judgement is arrived at using the Significance Matrix at Table 12.4 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' (as recommended by 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 12.5

Table 12.4: 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 12.5: 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.

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.

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.

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', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

12.2.8 Quality of Effects

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.

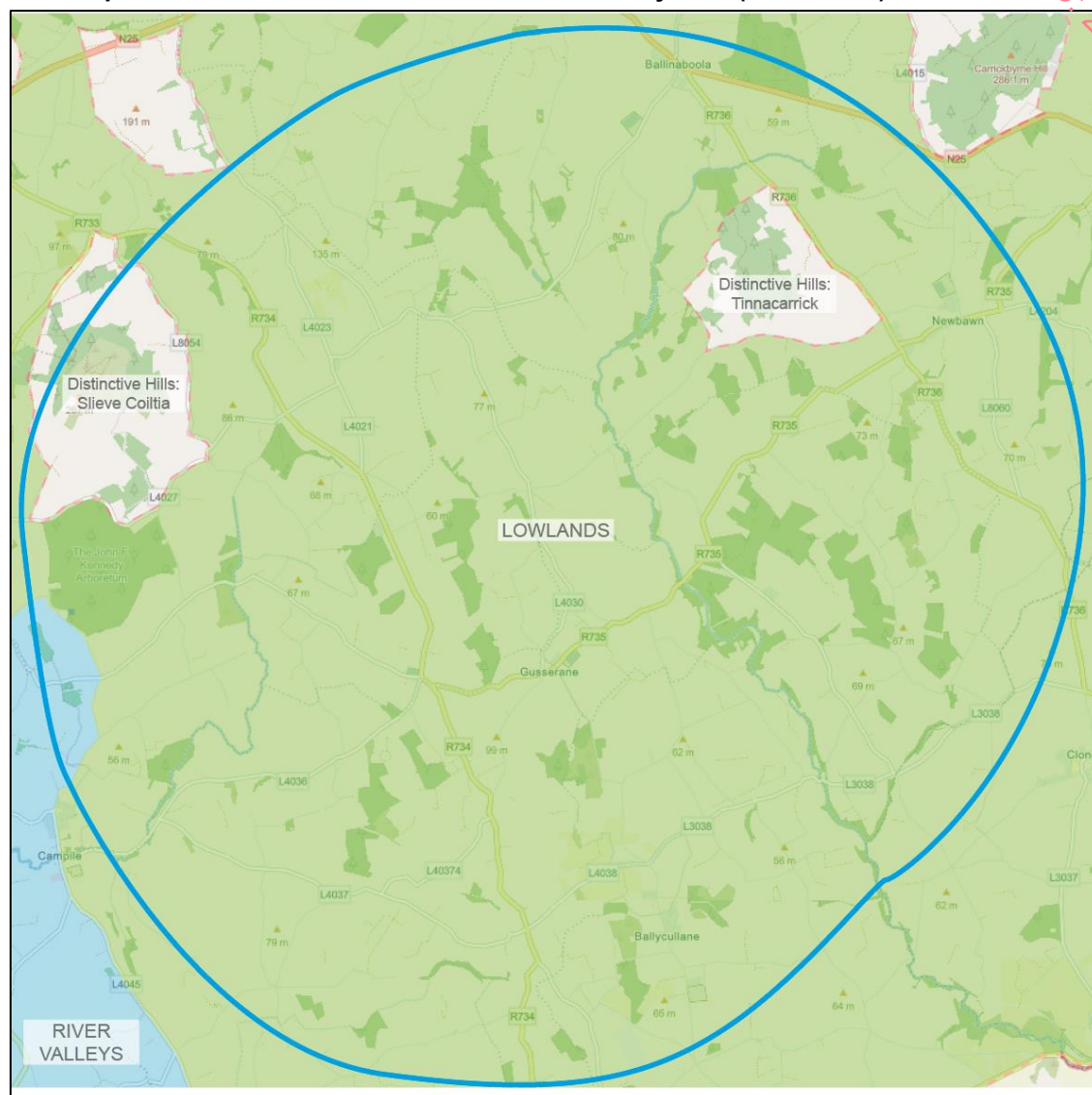
In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse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

12.3 Landscape and Visual Policy Context and Designations

12.3.1 Wexford County Development Plan 2022-2028: Volume 7, Landscape Character Assessment.

A Landscape Character Assessment has been prepared for County Wexford and is incorporated into the current Wexford County Development Plan 2022-2028. With the landscape character assessment, the landscape of county Wexford is divided into five landscape character unit (LCUs), which include; Uplands, Lowlands, River Valleys, Coastal and Distinctive. The Proposed project is wholly contained within the 'LCU – Lowlands' (Figure 12.2 refers).

Figure 12.2: Excerpt from the Wexford County Development Plan 2022-2028 showing landscape character units in relation to the 5km study area (blue buffer)



Source: MacroWorks

The Lowlands LCU is the dominant character within the local and wider site context, extending to c. 95% of the study area. There are two other LCUs within the study area: River Valleys and Distinctive, comprising c. 0.5% and 4.5% of the study area respectively. The River Valleys LCU is approximately 4.5km to the west of the Site at its closest point. There are two similarly sized instances of Distinctive Landscapes (Hills) within the study area. The nearest of these to the proposed project is Tinnacarrick, approximately 1.5km to the north-east. The other Distinctive Landscape in the study area is Slieve Coillte, which is located some 3km west of the site at its closest point. Both consist of outlier hills punctuating the lowland plateau.

The Lowlands LCU is described as follows:

The Lowlands LCU is generally made up of gently undulating lands and relates to extensive areas of the county. The slopes and topography in this unit are shallower. There are generally higher levels of population and more intensive agriculture. Agricultural lands tend to be characterised by views across larger fields as a result of

the generally low well-trimmed hedges. This landscape unit hosts the principle towns (except where transected by River Valleys) and major infrastructure such as the main roads and railways.

There are a number of prominent hills within the Lowlands LCU which provide more enclosure and 'punctuation' within the overall landscape.

The predominant agricultural use of most of the Lowlands LCU is expected to continue due, for the most part, to the high quality and fertility of the soils. Intensification of agricultural practices and expansion of urban settlements will be factors of change in this landscape.

The Lowlands LCU generally has characteristics which have a higher capacity to absorb development without it causing significant visual intrusion although, care still needs to be taken on a site by site basis, particularly to minimise the risks of developments being visually intrusive.

To the north and to the south-west of the lowlands there are transitional areas where this landscape unit meets the Uplands LCU and the higher elevations adjacent to the Barrow River Valley. To the north much of the mountain and hill peaks of the Blackstairs and Uplands LCU are inter-visible. To the south west this land rises towards some notable peaks in the New Ross district. These parts of the lowlands have lower population densities and are more sensitive than the rest of the lowlands. They are moderately sensitive to development with capacity to accommodate development subject to appropriate siting and design and consideration of cumulative impacts.

Landscape sensitivity is dealt with in section 3.2 of the landscape character assessment and designates each of the LCUs with a sensitivity rating of 'High', 'Medium' or 'Low'. Overall, the Lowlands LCU in the study area is classified as follows:

Low sensitivity landscapes are more robust landscapes which are tolerant to change and have the ability to accommodate development without significant adverse impacts on the character of the landscape. These landscapes comprise the majority of the Lowlands

The Landscape Character Assessment also outlines 'Other Landscape Considerations', which include; 'Designated Sites', 'Ecological Networks and Wildlife Corridors', 'Geological Sites', 'Ancient and Long Established Woodlands', 'Historical and Cultural Elements', 'Battlefields' and 'Specific Landscape Features'.

The Landscape Character Assessment also includes general landscape objectives for the county, some of which are relevant to the proposed project and are included below:

"Objective L04 - To require all developments to be appropriately sited, designed and landscaped having regard to their setting in the landscape, ensure that any potential adverse visual impacts are minimised and that natural features and characteristics of the site are retained.

Objective L05 - To ensure that developments are not unduly visually obtrusive in the landscape, in particular, in or adjacent to the Upland, River Valley, Coastal or Distinctive Landscape Character Units.

Objective L06 - To ensure that, where a development will have a negative impact in the Upland, River Valley, Coastal, or Distinctive Landscape Character Unit, an overriding need is demonstrated for that particular development and ensure that careful consideration is given to site selection. The development should be appropriate in scale

and be sited, designed and landscaped in a manner which minimises potential adverse impacts on the subject landscape.”

12.3.2 Views of Recognised Scenic Value – Wexford County Development Plan 2022-2028

Views of recognised scenic value are primarily indicated within Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guide books, websites, road side rest stops or on post cards that represent the area.

The current Wexford County Development Plan “does not designate specific routes but notes that scenic routes may fall into a number of categories:

- Routes through Upland, Coastal, River Valley and Distinctive Landscapes.
- Trails such as the Eurovelo, Normal Way, Greenways and Wexford Walking Trails where sightseeing visitors are more likely to be concentrated along these routes.

Other scenic views might include:

- Views to the sea and views towards land from the sea and rivers in locations which may host tourism or amenity/journeys arrivals by boat.
- Planned views and vistas such as those associated with planned settlement and heritage properties and gardens.”

Objectives relating to the preservation of views and prospects in County Wexford are included below:

“Objective L09 - To protect views worthy of protection, including views to and from sea, river, landscape feature, mountains, tourism sites, landmark structures such as bridges and urban settlements from inappropriate development that by virtue of design, scale, character or cumulative impact would block or detract from such views.

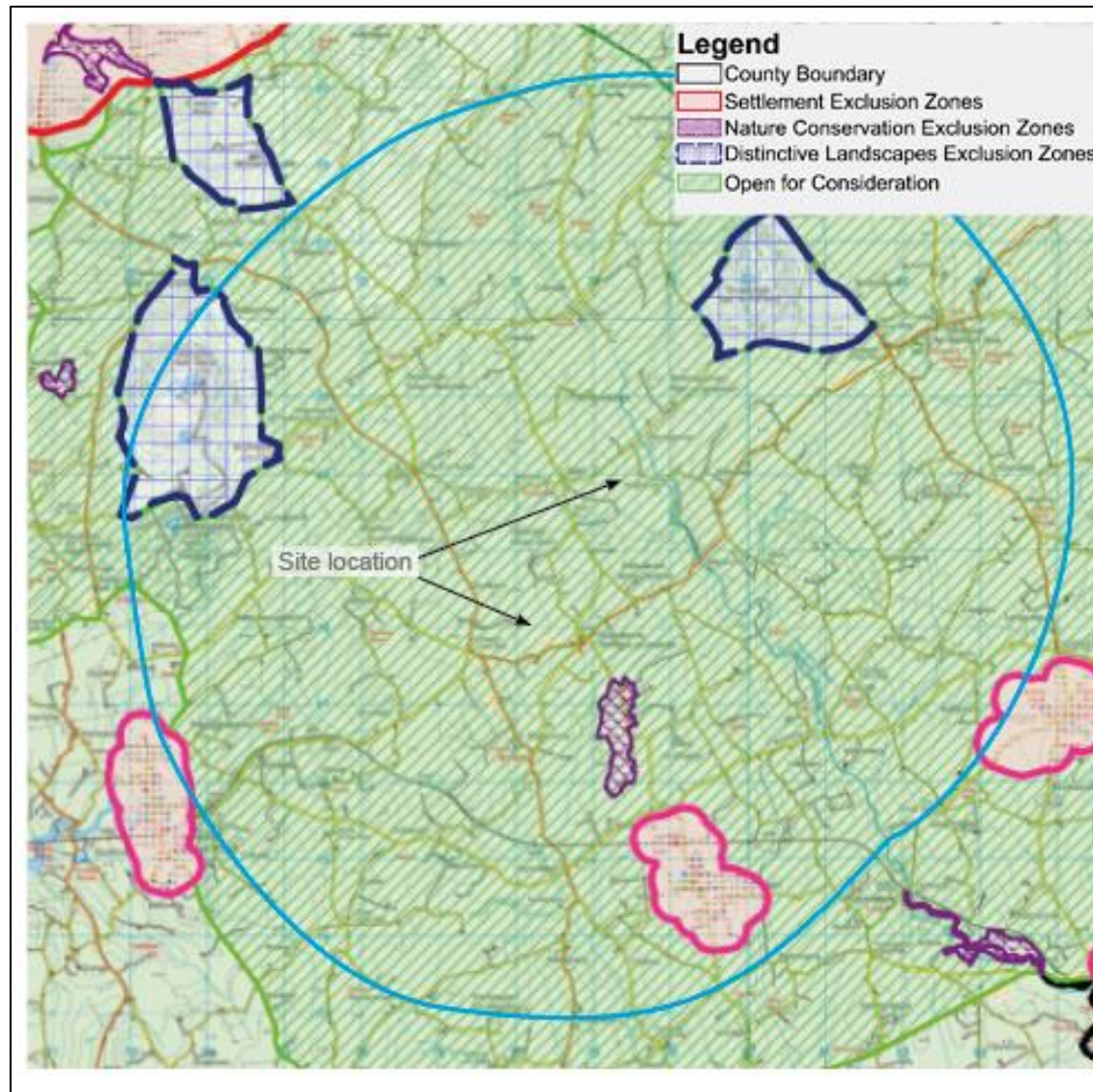
Objective L10 - To protect planned views and vistas, such as those that might be associated with planned settlements, heritage properties and monuments and ensure that that new development does not detract from such views as may be identified within towns, formal settings and designated landscapes. In evaluating planning applications for development in the foreground of such views and vistas, consideration shall be given to the effect such development may have on the view or prospect.”

12.3.3 Wexford County Development Plan 2022-2028 – Volume 10: Energy Strategy

The current Energy Strategy includes ‘Map 6 – Areas Open for Consideration for Solar Farms’ and designates the Proposed Project site as ‘Open to Consideration’. The development plan states, “following an analysis of the above criteria, Map 6 shows the area where solar farms will be open for consideration subject to the targets set for the plan period, the constraints and facilitators and the development management standards outlined below.” The other constraints and facilitators include; ‘Geological Heritage Sites’, ‘Major Roads and Railways’, ‘Tourism and Recreation’, ‘Archaeology’, ‘Protected Structures’, ‘Loss of agricultural land’, ‘Biodiversity’ and ‘Cumulative Impacts’. The current Energy Strategy includes several objectives in relation to solar PV, some of which are relevant to the Proposed Project and are included below;

“ES01: To facilitate the development of solar PV developments in the area open for consideration as shown on Map 6 subject to the renewable energy target set for the County, the proper planning and sustainable development of the area and the Development Management standards set out below.”

Figure 12.3: Excerpt from the current Wexford CDP 2022-2028 – Volume 10, Energy Strategy: showing the location of the Proposed Project in relation to areas designated ‘open to consideration’ for solar farm developments



Source: Wexford CDP 2022-2028 – Volume 10, Energy Strategy

Under the development management standards for solar farms (p34) the strategy states:

“Visual Impact Assessment All applications for solar farms should be accompanied by a Visual Impact Assessment which identifies and describes the likely effects of the proposal, 36 identifying magnitude of change as a deviation from baseline conditions. The assessment should include the following:

A zone of theoretical visibility (ZTV) should be prepared to indicate the area over which solar panels may be seen.

Representative assessment viewpoints should be identified and discussed with the relevant planning authority and other stakeholders where relevant. The number of viewpoints required will vary with the location and scale of the proposal. Priority should be given to views from

sensitive locations (e.g. residential areas, areas popular with visitors or areas used for outdoor recreation) and views from elevated locations.

Photomontages should be included from each viewpoint showing the Proposed Project with and without any proposed screen planting and detail differing views during different seasons of the year as appropriate.

An assessment of the cumulative visual impacts of the Proposed Project in combination with other solar farms and structures permitted in the area, as well as other planning applications which have been lodged with the Council or An Bord Pleanála. Landscaping

All applications for solar farms shall be accompanied by a detailed landscaping plan.

No high value habitats (trees and hedgerows) should be lost as a result of the Proposed Project and the developer should consider opportunities to provide enhanced management of landscape features and habitats where appropriate. Trees and hedges should be protected during construction.

Screening development will be important – however, letting hedgerows grow higher should only be employed where it fits with local landscape character, restores traditional management practices, does not result in deterioration of the hedge and does not produce unreasonable shading of panels.”

12.4 Existing Environment

12.4.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed project will be assessed. A description of the landscape context of the Proposed Project site boundary and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the proposed project. The visual resource will be described in greater detail in 12.4.2.

12.4.1.1 Landform and Drainage

The Proposed Project is located across a broad lowland plateau with the site's AMOD ranging between c.33-55m. The site lies immediately west of the Owenduff River, a minor watercourse oriented in a general north-west-south-east direction. In terms of the wider landscape there are two notable upland areas that punctuate the lowland plateau within the study area: Tinnacarrick and Slieve Coiltia. Slieve Coiltia rises to c. 250m AMOD whereas Tinnacarrick is c. 135m AMOD. The River Barrow is situated c. 6km west of the site at its nearest point.

12.4.1.2 Vegetation and Land Use

The principal land use within the study area is agriculture with typically medium to large scale fields serviced by a network of country lanes, third class routes and occasional regional roads. Fields are varied in shape with more irregular shapes and generally smaller sizes associated with valley landforms.

The fields in the study area are bounded by hedgerows; these are notably stronger where agriculture is less intensive such as the western parts of the site (Parcel B) where there are canopy hedgerow trees and occasional tree belts and small copses in field corners.

Woodland within the study area is not widespread and consists primarily of coniferous plantations. There are also small patches of mixed and broadleaf woodland present within the study area. Within the site and its immediate context the landcover pattern is as follows:

- Broad north-south swathe of mixed woodland running through lower lying land to the immediate west of the site providing separation between parcels B and C and Dunmain.
- Small patch of riparian natural woodland associated with Owenduff River to the east of Parcel A, field 14
- Notable stands of coniferous plantation forestry approximately 800m south-east of the site at the closest point.

There is no ancient or long established woodland (ALEW) in the study area, the nearest being Oaklands, beyond the N25 to the northwest.

Figure 12.4: Landscape context of the lands surrounding the proposed project



Source: MacroWorks

12.4.1.3 Settlements and Movement Network

There are no large or medium sized towns in the vicinity of the site. The closest small town to the site is Ballycullane, approximately 3km to its southeast. The closest settlement area to the

site is Gusserane, approximately 300m to the southeast. Gusserane has a national school and a regionally registered church (see heritage below).

There are no known recreational routes within the study area. The Eurovelo and similar routes mentioned in the Wexford Development Plan above all lie beyond the 5km study area. The nearest route to the site and the only known occurrence of this type of receptor in the study area, is the discovery trail at the John F Kennedy arboretum, introduced in 2018 as part of the 50th Anniversary celebrations.

The disused Waterford to Wexford rail route passes within approximately 2.4km of the southwest of the site at its closest point.

The N25 national primary route passes within approximately 4.5km of the site at its closest point to the northeast. There are no other national roads in the study area.

The closest regional route is R735 passing through Gusserane to the south of the site. The R734 lies approximately 800m to the west of the site at its closest point and the R736 lies some 3.3km to the east.

- There are several local roads within the site vicinity as follows:
- L8141 Nash running north-south and through the Site with Parcel A to its immediate east and Parcels B to the immediate West.
- L8059 Nash adjacent to the northern Site boundary (Parcel A).
- L8076 Nash running east-west from Parcel A and approximately 175 metres of the north of Parcel B at its closest point.
- L8141 Rathumney passing through Gusserane and approximately 175m to the southeast of the Site at its closest point.

12.4.1.4 Tourism, Heritage and Public Amenities

There are no known tourist attractions within the study area other than the John F Kennedy arboretum visitor centre, approximately 4.1km to the west of the Site. There is a viewpoint atop Sliabh Coillte near to the visitor centre, accessible by car, which at 271m provides a view over the whole arboretum as well as of six counties.

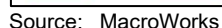
The closest regionally rated heritage asset to the site is Catholic Church of Saint John the Baptist (NIAH ref. 15704001) approximately 300m to the southeast of Parcel C. There is another heritage asset that is regionally rated in the site vicinity at Dunmain House (NIAH ref. 15703938), approximately 520m to the west of Parcel B. Ballygarvan House, a regionally rated farm house (NIAH ref. 15704002) lies approximately 1km southeast of the site.

There are numerous local heritage features within the study area, and four including Nash graveyard in the vicinity of the site although none are within the site itself.

12.4.2 Visual Baseline

12.4.2.1 Analysis of ZTV (Zone of Theoretic Visibility) Mapping

Only those parts of the receiving environment that potentially afford views of the proposed project are of concern to this section of the assessment. A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the Proposed Project is potentially visible from. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the proposed project will definitely not be visible, due to terrain screening within the 5km study area.



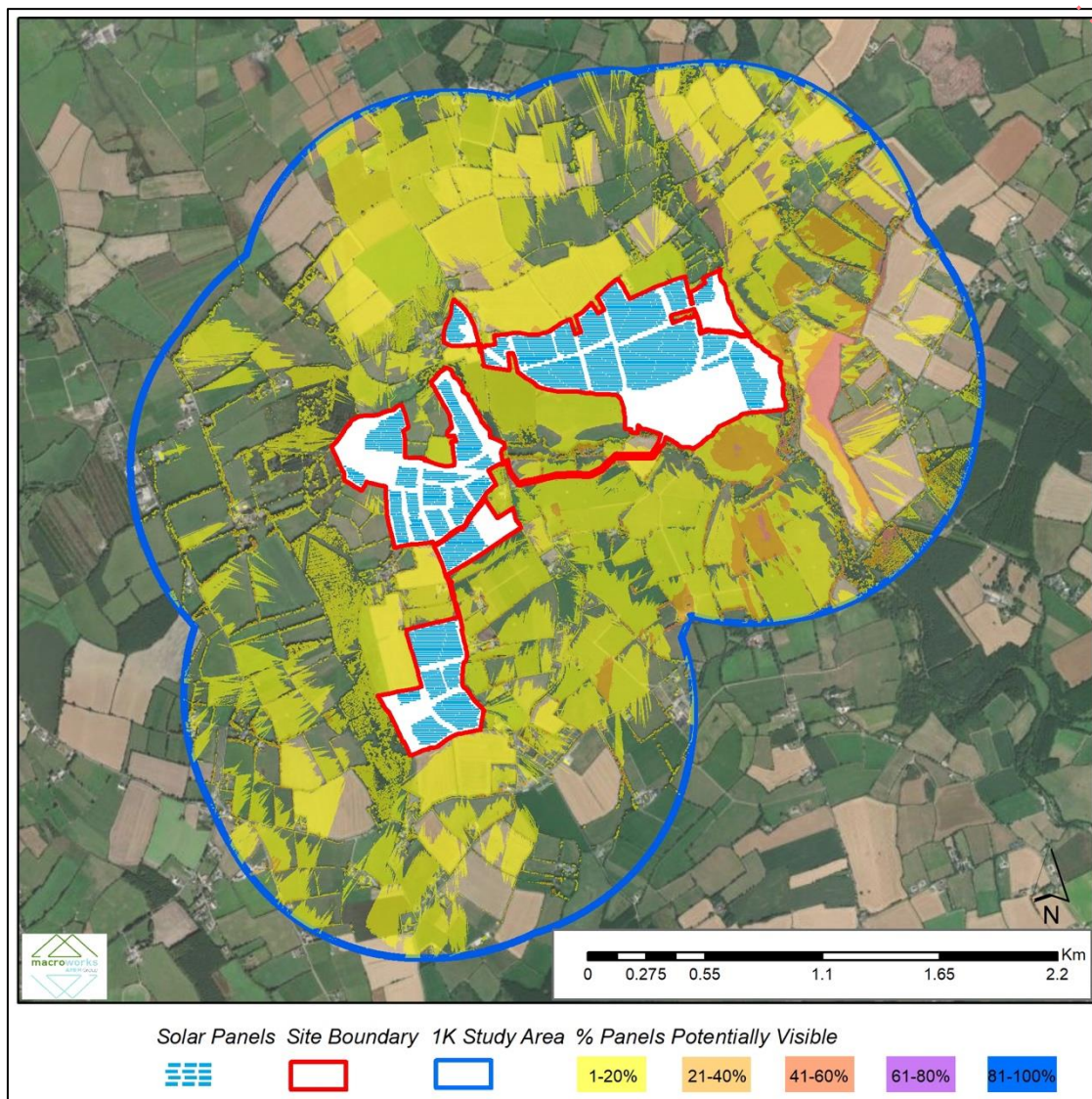
- The proposed solar arrays would be visible from approximately 50-60% of the study area.
- The broad pattern of visibility extends through all points of the 5km study area with the exception of the southwest of the site, where visibility tends to be limited to the summits of low rolling hills and ridges.
- The summit and east facing slopes of Slieve Coillte are notable areas where the majority of the array would be visible.
- The immediate central study area will also encompass some areas of comprehensive theoretic visibility (blue/purple pattern), which principally relate to locally elevated areas of surrounding terrain or lands within the immediate context of the proposed array.
- Whilst there is some potential for visibility of the proposed solar array in the surrounds of the small village of Gusserane, there is limited potential for visibility of the proposed solar array at the settlements of Newbawn and Ballynaboola.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. The proposed PV panels will not rise more than 3.860m above the underlying terrain, whilst the BESS structures will only rise to a maximum height of some 3.19m and will therefore be considerably screened by surrounding and intervening vegetation and built form within the study area, resulting in a much lesser degree of actual visibility. Nonetheless, the proposed BESS compound will be enclosed by an 8.5 m high acoustic barrier, which has the potential to result in a higher degree of visual exposure. Despite this, the location of the BESS development is in a discreet part of the site, offset from the nearest surrounding receptors, and benefits from a notable degree of screening provided by terrain and vegetation.

The proposed substation compound, which will form part of a separate application to An Coimisiún Pleanála (ACP), the GIS substation building will rise notably higher, to a maximum height of approximately 17m above the existing ground level. Whilst considerably larger than the proposed panels, the GIS substation building is well offset from all surrounding receptors in a discrete part of the site that benefits from a notable degree of screening provided by terrain and vegetation. In this regard, it is not considered that it will present as a highly prominent feature in the surrounding landscape.

The second form of ZTV mapping relies on a Digital Surface Model ("DSM"), which also accounts for terrestrial land cover elements, such as hedgerows and buildings. This is of far more value in determining the likely visibility of the solar panels. For this finer grain of visibility analysis, a more consolidated area incorporating the surrounding network of roads and dwellings within approximately 1km of the Project site boundary is used.

Figure 12.6: Digital Surface Model (DSM) based ZTV map accounting for screening by surface elements such as hedgerows, trees lines and forestry.



As can be seen from the comparison of the 'bare-ground' ZTV map (Figure 12.5) and the Digital Surface Model based ZTV map (Figure 12.6):

- There is a considerable reduction in the degree of actual panel visibility in comparison with the bare-ground scenario presented above. Indeed, the DSM mapping highlights the high level of existing screening within the site and its surrounding landscape, resulting in a much lower degree of actual panel visibility.
- Cross-valley views from the west-facing valley flanks of the Owenduff River would consist of up to 60% of the arrays, albeit further to the east of this visibility is almost entirely eliminated.
- Woodland to the west of Parcels B and C would truncate views of the proposals from receptors to the west including Dunmain house and users of the R734.
- The majority of the locations where visibility is predicted would experience partial views of 1-20% of the solar arrays.

12.4.2.2 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposed project in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed project. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed project is assessed by Macro Works using up to 6 no. categories of receptor type as listed below:

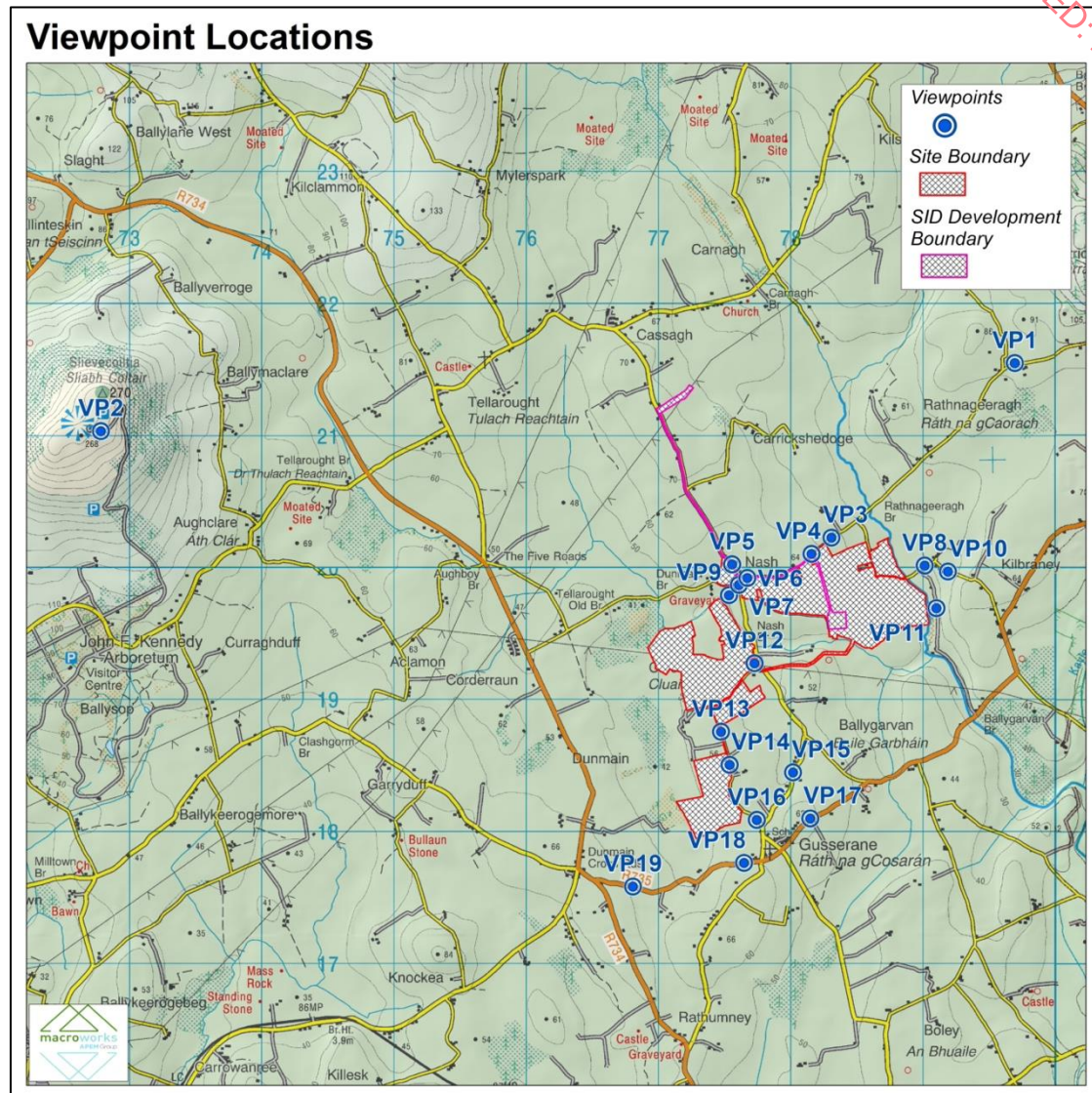
- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR);
- Amenity and heritage features (AH).

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The Viewshed Reference Points selected in this instance are set out in the Table 12.6 and Figure 12.7 below.

Table 12.6: Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	Location	Representative of
VP 1	L40232 at Rathnageeragh	LCV
VP 2	Slieve Coillte	AH, SV
VP 3	L40232 at Nash (1)	LCV
VP 4	L40232 at Nash (2)	LCV
VP 5	L4030 at Nash (1)	LCV
VP 6	L40232 at Nash (3)	LCV
VP 7	L4030 at Nash (2)	LCV
VP 8	Local road east of the River Owenduff at Kilbraney (1)	LCV
VP 9	Nash Graveyard	AH
VP 10	Local road east of the River Owenduff at Kilbraney (2)	LCV
VP 11	Local Laneway east of River Owenduff at Kilbraney	LCV
VP 12	Local road west of the L4030 at Cloonagh	LCV
VP 13	Local road at Cloonagh (1)	LCV
VP 14	Local road at Cloonagh (2)	LCV
VP 15	L4030 at Ballygarvan	LCV
VP 16	Local road at Cloonagh, north of Gusserane	LCV
VP 17	R735 at Gusserane O'Rahillys GAA	LCV, CP, MR
VP 18	R735 west of Guesserane	LCV, CP, MR
VP 19	R735 at Dunmain	LCV, MR

Figure 12.7: Viewpoint location map



Source: MacroWorks

12.5 Mitigation and Restoration Measures

The main mitigation by avoidance measure employed in this instance is the siting of the Proposed Project in a sparsely populated lowland plateau landscape relatively free of vantage points from which the proposals could be viewed. The location is also within the Development Plan "Areas of Consideration".

In addition to mitigation by avoidance measures, retention of existing hedgerow boundaries within and around the site aids visual screening, and maintains the existing field pattern. In this respect, the proposed solar farm is not perceived to impose itself on the existing landscape pattern.

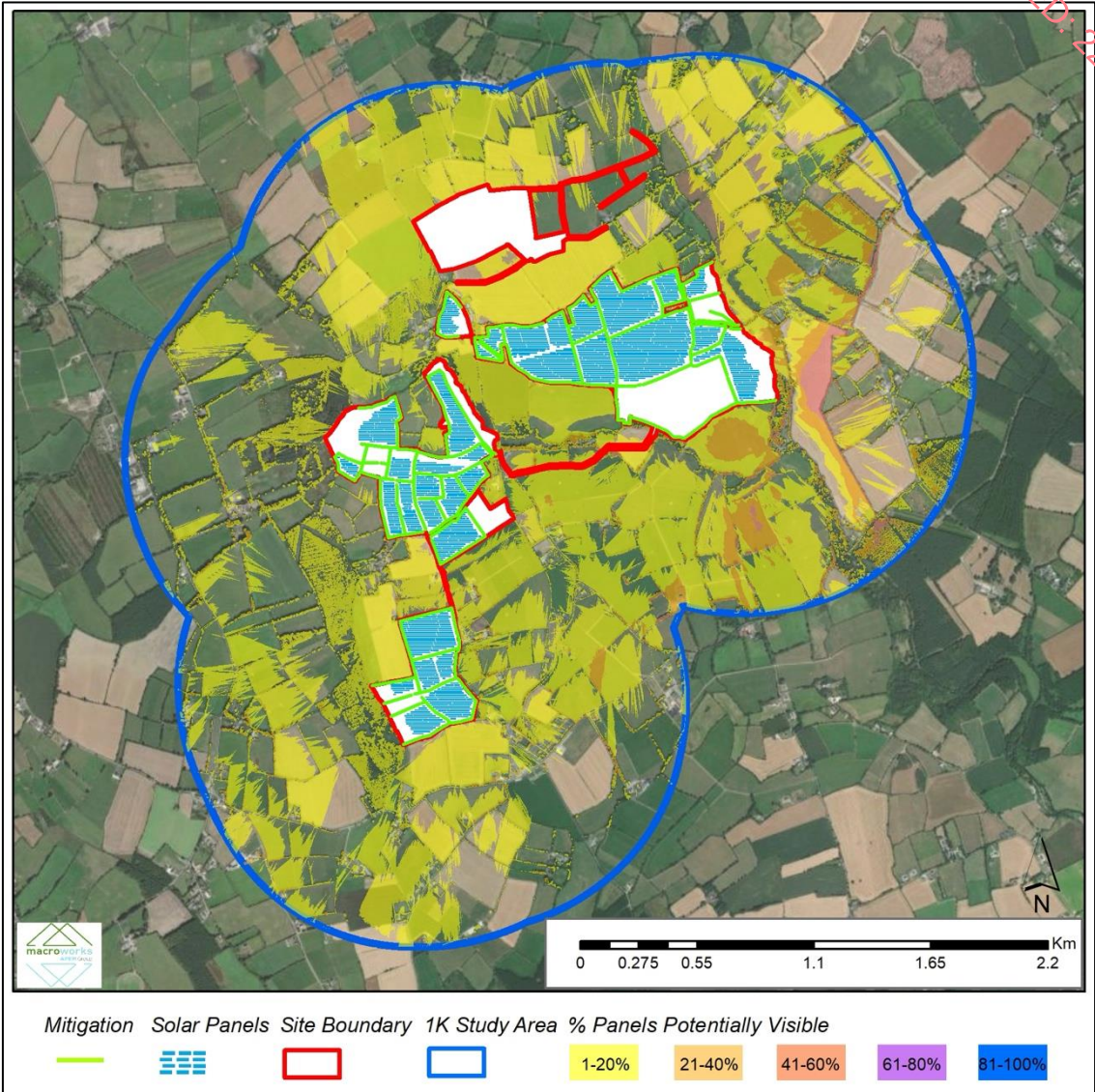
In addition to retaining the existing hedgerows within around the site, it is also proposed to bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants in order to ensure dense and consistent screening of the site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network prior to

the construction phase, thus allowing for any growth in the period between a grant of planning permission and construction of the development. Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height. This height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected hedgerows that require densification. Refer to the Landscape Mitigation Plan drawings in Appendix 5.3.

It is also proposed to plant new sections of hedgerows in some localised parts of the site, whilst additional screen planting measures area also proposed in the surroundings of some of the nearest local residential receptors. Indeed, once fully established, these new and bolstered areas of native planting will further screen and soften the development from surrounding local receptors, whilst also reinforcing the existing ecological corridors within the site and surrounding landscape.

As can be seen by the mitigation-based ZTV in Figure 12.8 (below), the combination of consolidated and proposed 3-4m high hedgerows and localised areas of screen planting will further reduce the potential for visual impacts within the surrounding area. Whilst the DSM visibility mapping highlights the potential for residual visibility, this will often be in the form of brief views of less than 20% of the proposed panel area.

Figure 12.8: Mitigation ZTV illustrating the effect of proposed mitigation planting



Source: MacroWorks

The installation method for these types of solar panels and mounting frames is undertaken using local piling to reduce the impact deriving from construction to facilitate the long-term use of the field as farmland. Panels are constructed using small-scale machinery causing very limited effect to the existing grass surface. This process is akin to timber post fence construction, whereby the post is driven a short length into the ground. This ensures that the fields' general green characteristics can be retained or quickly redressed following construction. All new cabling within the site will be buried underground. The proposed perimeter 3m stock proof fence will be set to the inside of the site boundaries. This will be maintained throughout the operational phase of the development to ensure access is prevented for both stray farm animals and human trespass. However, a small gap at the base of the fence will allow wild fauna to continue passage throughout the site. An un-grazed margin between deer fencing and the solar panels will be left for biodiversity enhancement measures. When feasible, ancillary structures such as inverters, transformer cabins and other plant will be coloured in green or muted shades to help blend them in with the surrounding countryside.

Low intensity sheep grazing is anticipated to be the main land use under and beside the proposed panels, to ensure that the areas of shorter swards and scrub will be managed. The proposed layout allows sufficient width between module rows for pastureland to be productive. Upon completion of construction, the area temporarily affected by the construction process, which includes one construction compound areas will be re-seeded with agricultural grassland species.

Wherever possible, the on-site access roads utilise the existing farm tracks and follow existing topography in order to minimise ground disturbance, alteration of physical landscape character and visual intrusion. Reinstatement of temporary construction areas, construction compounds and cable trenches to the preconstruction conditions will be carried out at the end of the construction phase. Restoration of any areas disturbed during the construction process will be undertaken on construction completion by appropriate grass seeding to return a green characteristic.

The decommissioning of the site will involve the removal of all solar panels and associated fencing, storage and operation facilities. The site will be fully restored to agricultural use through reseedling of appropriate grass species to reflect the grass sward mix in the immediate vicinity. Any site access tracks not required for on-going agricultural purposes will be excavated and top-soiled in order to reinstate them to productive agricultural use. The site will be fully restored to agricultural use in accordance with a detailed restoration plan.

Existing hedgerow field boundaries, which will have been maintained and reinforced with additional planting during the construction and operational phases, will remain intact following the restoration phase. Indeed, due to the supplementary planting proposed as part of the landscape mitigation the field boundaries are likely to be more consistent and consolidated than they are at present.

12.6 Impact Assessment

12.6.1 Do-nothing scenario

The 'do-nothing' impact refers to the non-implementation of the proposed project. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant. The site, which is currently contained in pastoral farmland, would likely be managed for typical agricultural practices, whilst the surrounding perimeter vegetation would continue to grow out, some of which would be maintained by the current landowners.

12.6.2 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the proposed project site and wider study area.

The site is not covered by any designations that recognise a particular landscape or visual importance, nor is this landscape considered rare or distinctive at a local, regional or national level.

With regard to the landscape values of the site, it is primarily recognised as a productive rural landscape valued for subsistence of the local rural economy. The only scenic values are located within the western portion of the study area, these scenic qualities are not associated with the site or its immediate landscape context. There is little evidence of any naturalistic or scenic elements within and around the site. Thus, the site presents as a robust rural landscape as

opposed to an overtly tranquil, naturalistic or heritage landscape, albeit there are some smaller elements that represent these qualities.

The majority of the study area consists of a plateau of pastoral farmland intersected by mature mixed hedgerows that provide a notable degree of containment. The principal land use within the study area is that of pastoral farmland, whilst a range of other land uses, including blocks of conifer forestry, and corridors of broadleaf woodland are also evident throughout the 5km study area. There are relatively minor variations in topography within the vicinity of the site, the River Owenduff valley being the most notable of such features. Within the study area the distinctive landscapes at Slaine Coille and Tinnacarrick are the most notable natural landscape features albeit these are some distance from the site and they would experience indirect landscape effects. Therefore, on balance of these factors and in accordance with the criteria outlined in Table 12.1, the landscape sensitivity is deemed to be Medium-low, with localised areas of medium landscape sensitivity associated with the distinctive landscapes of Slieve Coillte and Tinnacarrick.

12.6.3 Assessment of Receptor Sensitivity – Visual

The study area generally presents as a typical rural landscape, albeit some receptors within the study area have a slightly heightened sensitivity due to the presence of locally elevated terrain that affords broad open views across the wider countryside and areas of high amenity that present with some sense of the naturalistic such as Slieve Coillte.

Within the study area, many of the scenic designations are likely included as a result of their elevated nature, where views are afforded across the working rural landscape. It is important to note that while these routes and views generate a degree of scenic amenity, many of these views present with a longstanding sense of human intervention on the landscape and are influenced by an array of working and anthropogenic land uses such as wind energy, conifer forestry and urban settlements. With regard to the landscape values of the site, despite the landscape having a pleasant, pastoral aesthetic supplemented by characteristics associated with a rural area. It is primarily recognised as a working rural landscape valued for productive reasons. The relevant scenic designations in this instance are contained within Slieve Coillte and Tinnacarrick. All of the scenic views considered herein are deemed to be of High-medium sensitivity based on a balance of the elevated and pleasant vistas they afford but the typical rural context contained within those views.

Views of the working agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and conifer plantations throughout the study area contribute to some sense of naturalness and combined with its undulating topography, generates a sense of containment in many locations. However, whilst a pleasant pastoral aesthetic is noted throughout some parts of the study area, as noted above, the surrounding local and wider landscape is also influenced by an array of anthropogenic features such as urban settlements. Overall, the sensitivity of visual receptors within the more typical working landscape context tends to range between Medium and Medium-low, with those of Medium sensitivity representing broad elevated views that are not designated for scenic amenity.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on transport routes where road infrastructure and traffic volume draw from visual amenity.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 12.2.5, visual receptor sensitivity judgement are provided for each representative viewpoint in the table below in section 12.6.7 below

12.6.4 Landscape Effects – Construction Stage

During the construction phase there will be a far higher intensity of activity at the site than during the operational phase. This will consist of heavy vehicle movement to and from the site as well as construction machinery within the site. In terms of physical landscape effects, the proposed solar array will not require any significant excavation that would permanently alter the landform of the site. However, the proposed GIS substation compound and BESS compound will require some areas of cut and fill to facilitate a flat surface for which these built features will be located. This will result in some localised alterations to the land form of the site, however, it is important to note that these elements of the proposed project are discretely located within the southern portion of parcel A, well setback from surrounding local receptors. Indeed, due to the discreet location of this part of the site, the higher intensity construction stage works are likely to have less of an influence on the surrounding landscape character. In addition to the above, the Proposed project includes for 2no. Line Cable Interface Masts (LCIMs) to the north of the proposed solar array. The proposed project also includes for the removal of 1no. existing 220kV overhead line tower adjacent to the proposed interface masts. Whilst the construction stage effects here will be limited and highly localised, they will be contained away from the main solar development and will marginally increase the intensity of construction stage development within the surrounding landscape.

There is likely to be some localised removal of hedgerow vegetation to accommodate the proposed access tracks and site entrances. Notwithstanding these areas of removal, this will be offset by the planting of new native hedgerows and areas of screen planting, together with the reinforcement and protection of all existing hedgerows within the site and around its perimeter.

During the construction phase there will be a far higher intensity of activity at the site than during the operational phase. Such activity will include the movement of construction machinery on-site, as well as HGVs travelling to and from the site. It may also include temporary site lighting and the temporary storage of construction materials. Construction of the Proposed Project is estimated to take 21 – 23 months to complete. Construction and decommissioning-related effects are, therefore, brief in nature and will only result in short-term landscape and visual effects. Overall, the magnitude of construction stage effects is deemed Medium.

Combined with the low landscape sensitivity of the study area, the significance of construction stage effect is deemed Moderate and of a Negative quality.

12.6.5 Visual Effects – Construction Stage

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. In addition, there will be construction machinery on site, which may rise above intervening vegetation and buildings. There will also be stockpiles of stripped topsoil and construction materials awaiting use. There is also potential for some tower cranes to be erected to facilitate the construction of the proposed substation compound (subject to a separate application to ACP). However, aside from the site's immediate vicinity, a large part of this temporary activity within the site will remain screened and partially screened from view the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is temporary in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are like to result in a visual effect of Moderate within and immediately around the site.

Coupled with the medium and medium-low visual receptor sensitivities in the near surrounds of the site, the construction stage visual impacts in the immediate vicinity of the site will be no greater than Moderate negative, and will reduce considerably beyond 500m-1000m from the site, where the proposed project will be heavily screened. As a result, construction stage visual impacts are deemed to be Not Significant.

12.6.6 Magnitude of Landscape Effects – Operational Stage

The duration of any physical landscape impacts will last only as long as the Proposed Project is in place, which is proposed to be 40 years. Although these impacts may be classified as 'long term' (i.e. 15 to 60 years, as defined in the EPA's EIAR guidelines), within a short period of time following decommissioning there would be relatively minor evidence of the former land use and the site will be returned to agricultural land use – with the exception of the proposed substation which is likely to remain in place.

Aside from landscape impacts generated from construction of the proposed substation, the landscape impacts from the proposed solar farm are, for the most part 'reversible' – with the exception of the proposed substation compound and underground cables which are likely to remain in place. The mitigation and additional planting within and around the site, which will have consolidated as part of the mitigation strategy, will remain as an enduring and positive legacy of this Proposed Project.

In relation to landscape character, the Proposed Project seeks the introduction of modern technological structures into a rural landscape. Whilst contrasting with traditional agricultural land uses, the layout of the arrays will reinforce the existing field pattern and restore/enhance lost and/or degraded field boundaries. Whilst this provides some consistency with other forms of rural land use, the tone and texture of the panel array is clearly 'built form' and represents an increase in the intensity of built development in the immediate landscape context. The substation compound introduces a large scale new GIS building into the lowland plateau landscape, however the scale and appearance of the proposed GIS compound is agricultural/industrial and not incongruous with existing forces for change in the landscape. Indeed, the proposed substation building will be finished in a muted grey/green tone to assimilate with surrounding industrial farm sheds that are a characteristic features of the surrounding landscape. It should also be noted that the proposed BESS compound will be encircled by a 8.5m acoustic barrier, albeit this is setback from surrounding receptors and will be well screened from the nearest surrounding receptors.

The proposed project will also see an intensity of electrical infrastructure development outside of the main solar site, with the new 2no. Line Cable Interface Masts (LCIMs) contained along the alignment of an existing overhead cable corridor in the northern extent of the study area. In this regard, whilst the proposed structures will result in an increase in the intensity of development in the surrounding local landscape, they will not appear incongruous in the context of the existing overhead cable corridor.

It is also important to note that whilst the proposed solar development is relatively sizeable in scale and occupies several land holdings, there will be very few opportunities to view the proposed development in its entirety due to the dense vegetation that occurs along the perimeter of the site and within the intervening landscape, in addition to the proposed landscape mitigation measures that form part of this application.

On the basis of the factors discussed above it is considered that the magnitude of operational stage landscape effect is Medium within the site and its immediate vicinity, being those lands contained within approximately 500m of the Proposed Project. Thereafter, the magnitude of the operational stage landscape impact is deemed to reduce to Low and Negligible, as the Proposed Project becomes a progressively smaller component of the overall landscape fabric.

With reference to the significance matrix (Table 12.4) above, the Medium-low landscape sensitivity judgement attributed to the study area, coupled with a Medium magnitude of landscape impact in the immediate vicinity (<500m) of the Proposed Project is considered to result in an overall significance of no greater than Moderate-slight within the site and its immediate surrounds, with the remainder of the 5km radius study area likely to experience Slight or Imperceptible landscape impacts.

12.6.7 Magnitude of Visual Effects – Operational Stage

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed project. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing view;
2. Outline view (yellow outline showing the extent of the proposed solar farm location including all associated overground works overlaid on the photograph);
3. Montage view
4. Montage view with mitigation established.

Table 12.7: Visual magnitude of impact and Significance of effect - operational phase

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
VP1	L40232 at Rathnageeragh (Distinctive Landscape Unit) The depicted view is from L40232 Rathnageeragh Road oriented to the SW where the development is located at a distance of approx. 1500 mts. Road level is lower than the land surrounding it, thus foreground contains road with elevated land and in the midground on the western side are some houses situated further along the road interspersed with trees. Further southwest shows more vegetation in the distant background.	Medium	The Proposed Project will not be visible from here; thus, the magnitude of visual impact is Negligible by default. Proposed mitigation planting will not have a bearing on the visual impact from here.	Imperceptible / Neutral / Long Term	Imperceptible / Neutral / Long Term
VP2	Slieve Coillte (Distinctive Landscape Unit) This is a scenic panoramic view from Slieve Coillte hill, which is the highest point within several kilometres. The view is from a pathway not far from the Slieve Coillte viewing point and the site is towards SE. The viewpoint is at an altitude of 253mts. The foreground depicts part of the hill and a line of trees in the foreground. In the background the view extends across a rolling landscape cloaked in pastoral farmland and dense layers of vegetation.	High-medium	The proposals will be barely perceptible from this vantage point due to the distance of view and the presence of a backcloth of existing landscape features. Proposed mitigation planting will not have a bearing on the visual impact from here.	Slight-Imperceptible / Neutral / Medium-term	Slight - Imperceptible / Neutral / Long Term
VP3	L40232 at Nash (1) – This viewpoint is established from a local Road. Towards SE and E viewpoint stretches across a field which is adjacent to the site of development. The foreground shows field boundary vegetation with the field in the midground. In the background, there are some mature trees and hedges at the boundary of the field adjacent to site. Towards the south in the foreground, trees and vegetation alongside the road are visible	Medium-low	A number of solar panels are visible behind the hedges in the mid-distance leading to a medium magnitude of change. The proposed panels will generate a degree of enclosure at the nearby residential dwelling, which is not readily discernible from the contained local road context. Nonetheless, the terrain descends away from the dwelling, with only the nearest rows of panels visible, viewed partially against the sky. Overall, the built form of the panels will result in an increase in the intensity of built development in this location, and thus the magnitude of effect is deemed Medium.	Moderate-Slight / Negative / Medium-term	Slight-Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	with agricultural fields in the midground and a dwelling in the background.		Once the proposed mitigation screen planting has fully established, the view of the panels will be completely screened from both the local road and nearby dwellings. Whilst the mitigation screen planting will result in a marginal degree of enclosure at the nearby dwelling, it will be well assimilated into the surrounding network of established hedgerow vegetation. Post mitigation the magnitude of effect will reduce to Low-negligible		
VP4	L40232 at Nash (2) – This is a viewpoint from a local road, where this portion of the road borders the Proposed Project. Towards the east, a gate is visible which leads to a pathway into the development site towards southeast. In the midground, is the pastoral field which will be part of the development. In the background, some glimpses of rolling pastoral hilly landscape are afforded from sections of this local road corridor. Towards SE, the view is directly through the gate, one can see the pathway leading down towards south and in the background are some glimpses of rolling pastoral hilly landscape. Towards S/SW, the road borders the Proposed Project. The road is visible along with well-maintained hedges that block the view of the private residence behind on the South side. Only the chimney of the house is visible. It should be noted that this view represents a very brief view afforded from an otherwise contained local road.	Medium-low	The proposed panel array will be visible at a near distance from this local road and the neighbouring pastoral fields. However, it should be noted that this represents a fleeting view into the this solar parcel, which is otherwise well screened by well-established roadside hedgerow vegetation. Whilst the panels will be a noticeable feature from this near distance, they will be largely screened from notable sections of the immediate surrounding local road context. It is also important to note the adjacent residential dwelling, which will be surrounded on three sides by the proposed panels. Although the panels will be well screened from this dwelling, which is enclosed by a dense conifer hedge, there will nevertheless be a perceived intensity of development at the neighbouring property. Overall, the magnitude of effect is deemed Medium-Low due to the fleeting nature of this view. The proposed mitigation planting will screen and soften the built tone and textures of the proposed panel structures. Once the hedges mature, no portion of the panels will be visible, however there will be a loss of openness with solid hedgerow planting truncating easterly views and the magnitude would be Low-negligible.	Moderate-slight / Negative / Medium-term	Slight-imperceptible / Negative / Long Term
VP5	L4030 at Nash (1) – This is a viewpoint established from a local road, where a portion of the road borders the Proposed Project. Towards SE, the road is visible and both the road edges have combination of mature trees	Medium-low	The Proposed Project will not be visible in summer months due to the screening effects of foreground vegetation and built form. In winter any glimpsed views would be heavily filtered by layers of intervening vegetation such that the magnitude of visual impact is	Imperceptible / Neutral / Medium-term	Imperceptible / Neutral / Long-term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	and hedgerows. On the Eastern side, the well-maintained hedgerows are bordering a residential property. The Proposed Project will be on the opposite side of the road. towards SW, the view primarily consists of reasonably dense vegetation/hedgerows bordering the road. Towards W/NW, the view consists mainly of the vegetation/hedges on the Western side, while the road is visible on the side of the image with hedgerows and trees bordering the other side of the road as well.		Negligible. Indeed, the proposed mitigation screen planting measures will reinforce the neighbouring hedgerows resulting in very limited potential visibility of the panels even from this neighbouring context.		
VP6a	L40232 at Nash (3) – This is a viewpoint established from a local road. South side of the road has hedges and occasional mature trees bordering it, visible in the foreground along with a small structure visible to the SE, which is associated with the property neighbouring the site. In the midground is the field which will be part of the proposed site. The background shows mature trees and hedges bordering the field. Towards S/ SW, there is a dwelling visible directly in front with low vegetation and a fence in the foreground. Part of the field, which is the proposed site, is visible in the background on one side of the house while on the other side, there are other buildings as well as some trees visible. There is a slight glimpse of the general gentle hilly landscape in the distant background. Towards W, the T-junction road is visible in the centre of the view. The north edge of the road has reasonably dense hedgerows and trees while the south shows the entrance to the residence and further along the road more buildings and some vegetation on the roadside. In front, in the midground is another building with some more buildings and trees in the background of the small settlement.	Medium-low	There will be a clear view of panels in the foreground and midground. The proposals would appear prominently and will increase the intensity and diversity of built form. The proposed panels will encircle the nearby property to the east and south, generating a notable sense of containment. Whilst some sense of openness will remain to the west, due to the terrain descending in that direction from the dwelling, the panels to the south and east will truncate views across the neighbouring and surrounding pastoral setting. Prior to mitigation, the Proposed Project is considered to have a High-medium magnitude and negative quality of visual impact. Once mitigation planting has fully established, the proposed hedgerows would completely screen the nearby panels, albeit the quality of impact would remain negative due to the enclosure and truncation of views. Given the foreground intrusion and appreciable horizontal and vertical segment of view affected, the magnitude of impact post mitigation would reduce to Medium-low.	Moderate / Negative / Medium-term	Moderate-Slight / Negative / Long-term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
VP7	L4030 at Nash (2) - This is a viewpoint established from a local road adjacent to the site, the location of the viewpoint is at a T junction with another local road. E/SE side has a view of a gate and a path leading into the site area as well as part of the local road on the SE side. The road has a combination of hedges and trees along the side. The path leading into the site is also surrounded by hedges. One can see the field which is part of the site in the midground and a combination of mature trees and hedges in the background surrounding the field. On the S/SW, one can see the both sides of the local road heading further south. Left side of the road has hedges and trees and on the right side of the road in the foreground, is a disused stone structure with a wooden gate. NW affords a view of the other perpendicular local road, which has the dilapidated unused stone structure on one side and some residential buildings on the other side.	Medium-low	There will be a clear view of panels in the foreground and midground. The proposals would appear prominently, albeit visual softened by the surrounding layers of intervening vegetation, and will increase the intensity and diversity of built form. Prior to mitigation, the Proposed Project is considered to have a Medium magnitude and negative quality of visual impact. Once mitigation planting has established the foreground proposals would be screened with a glimpse of panels in the mid distance, notably reducing the visual presence of proposed panels here. The magnitude of impact post mitigation would reduce to Low-negligible.	Moderate / Negative / Medium-term	Slight-imperceptible / Negative / Long-term
VP8	Local road east of the River Owenduff at Kilbraney (1) - This is a view from a local road from a small settlement located east of the development site. This viewpoint is 168 mts away from the nearest part of the site. The local road visible towards SW is bordered by trees and hedges on both sides. On the left side of the road are two gates/entrances to houses in the foreground and one house is visible in the background. There are views of the road and neighbouring field to the W/NW. The road is bordered with tall hedges/trees and there is a field gate in the foreground with the field in the midground. In the background, the bordering	Medium-low	The Proposed Project will not be visible from here; thus, the magnitude of visual impact is Negligible by default.	Imperceptible / Neutral / Long Term	Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	hedges and trees are visible. In the far distance a hill is visible.				
VP9	Nash Graveyard - This is a view from Nash Graveyard situated in close proximity to the site. Towards NW/N, in the foreground are a number of graves and gravestones and behind the graves is an archway formed by trees. In the background, mature trees are visible. Towards the east, more of the graveyard is visible in the foreground and in the background are trees and hedges forming a boundary to the graveyard. A gate is visible on the righthand side of the image. The S/SW part of the view includes parts of the graveyard and a dense wooded area.	Medium	The upper parts of the proposed panel array will be visible at a medium distance resulting in a low magnitude of change, where they are partially visible above the nearby hedgerows along the vegetated skyline. Whilst visible, the proposed panels will have a limited visual presence from here. The mitigation screen planting will screen and soften the built tone and textures of the proposed panel structures. Once the hedges mature, no portion of the panels will be visible, and thus, the magnitude of effect will reduce to negligible.	Slight / Negative / Medium Term	Imperceptible / Neutral / Long Term
VP10	Local road east of the River Owenduff at Kilbraney (2) - This is a panoramic view from a small local road from a small settlement located east of the development site. This view points towards SW/W, the direction in which the Proposed Project is situated. The nearest solar panels to this view point are about 320 mts away. In the foreground, are two gates of two properties with their driveways. The two story house towards the right is visible in midground with more properties to its right and trees in the background. In the distance, glimpses of rolling hills are visible.	Medium-low	Glimpses of parts of the array and the substation compound can be obtained. The proposals are at medium and long range and the most noticeable components lie to the west where they break the skyline and obscure parts of the distinctive hill at Slieve Coillte beyond. Prior to mitigation, the Proposed Project is considered to have a medium-low magnitude and negative quality of visual impact. The mitigation planting will have limited screening capabilities here as the proposed panels to the west are located at a greater elevation than this local context, and the panels remain noticeable due to their contrasting appearance and tonality compared to the existing view components including the background hill at Slieve Coillte. Thus, the residual magnitude of effect remains medium-low.	Slight / Negative / Medium Term	Slight / Negative / Long Term
VP11	Local Laneway east of River Owenduff at Kilbraney- This is a view from a small local road looking West towards the site and represents one of the nearest publicly	Medium-low	The Proposed Project will not be visible from here; thus, the magnitude of visual impact is Negligible by default.	Imperceptible / Neutral / Long Term	Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	accessible locations to the east of Parcel A. The view contains reasonably dense vegetation including trees which border the western edge of the road. The nearest solar panels are 140 mts away.				
VP12	Local road west of the L4030 at Cloonagh - This is a view from a small local road adjacent to the site. Towards SW/W, in the foreground are low height shrubs and hedges, with a field visible in midground which is part of the development site. In the background, a combination of mature trees and hedges border the field. The nearest visible solar panels from this view will be situated about 77 mts away. In NW, The small road bends towards the right and is surrounded by a combination of hedges and trees. On the left side of the road, the field is visible, which forms part of the site. At the back, trees and hedges border the field. On the N/NE, the right edge of the small road is visible which contains trees and hedges affording very little view beyond.	Medium-low	The proposed panel array will be visible at a close range towards SW/W. The panels are located slightly offset from the local road corridor to mitigate the presence of the proposed development from the local road a neighbouring residential receptor. A partial side-on view and view of the backs of panels is afforded here, where the array presents with a jagged edge profile partially against the sky and backed by surrounding vegetation. Whilst the proposed development will increase the intensity of development here, only a small portion of the overall project is visible here. Indeed, the true scale and extent of the proposed project is heavily diminished here due to the contained nature of this local context. Prior to mitigation, the Proposed Project is considered to have a medium magnitude and negative quality of visual impact. The mitigation planting is set back from the road side and will screen and soften the built tone and textures of the proposed panel structures. Once the hedges mature, no portion of the panels will be visible albeit the new section of hedgerow will generate a marginal sense of enclosure with regard to views to the southwest. Overall, the residual magnitude of effect will reduce to low-negligible and the nature of effect would remain negative.	Moderate-slight / Negative / Medium-term	Slight-imperceptible / Negative / Long-term
VP13	Local road at Cloonagh (1) - This is a view from a local road within close proximity to site. There are a few houses along this road, the nearest house to this viewpoint is 30 mts away. Towards S/SW, the view shows the closest house mentioned, which is located on the right hand side of the road. The road is surrounded by low vegetation beyond which the two story	Medium-low	Glimpses of the proposed panel array will be visible between the gaps in vegetation while facing NW/N. The nearest visible solar panels are located about 45 mts away. Prior to mitigation, the Proposed Project is considered to have a Low-negligible magnitude and negative quality of visual impact. Once the proposed mitigation screen planting has fully established, the proposed panels will be fully screened	Slight / Negative / Medium Term	Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	house is visible. The nearest solar panels from the house are about 70mts away in NE direction. Towards NW/N a field entrance is visible in the midground with hedges and trees seen in the background. The road is flanked by hedgerows on either side.		from this local context and the magnitude of visual effect will reduce to Negligible.		
VP14	Local road at Cloonagh (2) - This is a view from a local road bordering the site. This viewpoint is in three parts. Part 1 (14a) points towards S/SW. Right side of the road is visible and is bordered by hedgerow, the field behind is part of the site and will have solar panels. Part 2 (14b) points towards W/NW. This is the view looking towards the opposite side and the field with solar panels now will be on the left hand side. The road is again bordered in this part with hedgerows. Part 3 (14c) points towards N. This shows the right side of the road, with entrance going into one of the residential properties just off the image. The fence to the property and is visible and behind which there is a field in the midground with trees and hedges bordering the field in the background. This field on the right side is not part of the site area.	Medium-low	There is potential for small glimpses of the proposed panel array to be afforded between the gaps in vegetation, however the development will have no notable visual presence here and is likely to go unnoticed due to the degree of intervening screening in the immediate surrounding landscape. Prior to mitigation, the Proposed Project is considered to have a low-negligible magnitude and negative quality of visual impact. Once the vegetation is planted for mitigation, no portion of the panels will be visible. And thus, the magnitude of visual effect will reduce to Negligible.	Slight-imperceptible / Negative / Medium Term	Imperceptible / Neutral / Long Term
VP15	L4030 at Ballygarvan - This is a sweeping panoramic view afforded from a local road. The viewpoint is roughly 470 mts east and 575 mts south of the redline boundary. There are several residential properties and pasture land on this road. This viewpoint is in two parts. Part 1 (15a) points towards W/NW and is an expansive view.. The road is bound by shrubs and a series fields in a gentle rolling landscape are visible behind, each bordered by a combination of trees and hedges. Part 2 (15b) points towards NW/N. This expansive view is of the left side of the road, which is bordered by shrubs and hedgerows and a mature road side tree is visible further on the	Medium-low	The Proposed Project will be completely screened by foreground vegetation such that the magnitude of visual impact is Negligible. There would be no material effect on the view.	Imperceptible / Neutral / Medium Term	Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
	roadside. In the midground is the field adjacent to the left side of the road as well as a house with its well-maintained hedge boundary. Cattle is grazing on the fields, which are bordered by trees and hedge combination.				
VP16	Local road at Cloonag, north of Gusserane - This is a view from a local road in close proximity to the site. There is a school situated roughly 85 mts south of this point. The nearest solar panels to this viewpoint are 130 mts West. This viewpoint is in two parts. Part 1 (16a) points towards W/NW. The road edges have hedgerows and trees. The left side of the road is visible with a boundary fence and hedge to a neighbouring property and a gate to the bordering field next to it. In the background is the vegetation that creates a border to the field. Part 2 (16b) shows the right-hand side of the road which is bordered by trees and high hedges.	Medium-low	The Proposed Project will be completely screened by foreground vegetation such that the magnitude of visual impact is Negligible. There would be no material effect on the view	Imperceptible / Neutral / Long Term	Imperceptible / Neutral / Long Term
VP17	R735 at Gusserane O'Rahillys GAA - This is a panoramic view from a regional road. The nearest red boundary is located 519 mts West and approx. 1 km North of this viewpoint. This viewpoint is in two parts. Part 1 (17a) points towards NW. Gate to the bordering field is visible in the foreground and the field in the midground with bordering hedges and trees in the background. In the distance one can glimpse a gentle hilly landscape. Part 2 (17b) points towards N. Again a gate to the field is visible in the foreground with the pastureland in the midground and bordering vegetation in the background with the distant landscape.	Medium-low	Small glimpses of the proposed panel array will be visible between the gaps in vegetation, however these will be difficult to discern and are unlikely to draw the eye of the casual observer. Overall, the Proposed Project is considered to have a Negligible magnitude visual impact. Once the vegetation is planted for mitigation, no portion of the panels will be visible, reinforcing the Negligible magnitude of effect.	Imperceptible / Negative / Medium Term	Imperceptible / Neutral / Long Term

VP No.	Existing View	VP Sensitivity	Magnitude of visual effect (pre & post mitigation)	Pre mitigation significance / quality / duration of effect	Post mitigation significance / quality / duration of effect
VP18	R735 west of Guesserane - This is a view from a regional road and it points in the NW/N direction. The closest solar panels to this point are located 332 mts North. The view is of the field directly north of the road bordered by hedgerows and then the field beyond which is part of the development site. In distant background, glimpses of gentle hilly landscape are visible.	Medium-low	Discreet parts of the proposed panel array will be visible at a medium distance. The panels are viewed offset from the regional road corridor, with this part of the proposed development contained within a pastoral field bounded by established hedgerow vegetation. Whilst the visible panels will contrast with the surrounding pastoral land uses, they will not block or obstruct views but are more likely to be perceived as an alternative form of land use. Prior to mitigation, the Proposed Project is considered to have a Low magnitude and negative quality of visual impact. The mitigation screen planting will screen and soften the built tone and textures of the proposed panel structures. Parts of the array would remain visible post mitigation, and thus, the magnitude of effect is deemed to remain low.	Slight / Negative / Medium-term	Slight / Negative / Long-term
VP19	R735 at Dunmain - This is a view from a regional road and it points in the N/NE direction. The nearest solar panels are at a distance of 660 mts in the NE direction from this point. The pasture field is visible in the foreground bordered by a mixture of trees and hedgerows. On the righthand side (further E) are taller trees while on the left (N) are medium height hedgerows.	Medium-low	Discreet parts of the proposed panel array will be visible at a medium to long distance. Prior to mitigation, the Proposed Project is considered to have a low-negligible magnitude and negative quality of visual impact. The mitigation screen planting will screen and soften the built tone and textures of the proposed panel structures. However, due to the locally elevated nature of this viewing context, parts of the array would remain visible post mitigation. Thus the residual magnitude of effect will remain low-negligible.	Slight-imperceptible / Negative / Medium Term	Slight-Imperceptible / Negative / Long Term

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12.6.8 Cumulative Impact Assessment

The closest other existing array to the site lies just beyond the extent of the study area at Rosspile, some 6.5km to the east of the site. Due to the heavily contained nature of the Proposed project, which is likely to give rise only to localised effects, it is not considered that the development will generate any notable cumulative landscape or visual effects in relation to other solar schemes.

12.6.9 Monitoring

12.6.9.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

All tree protection requirements will be installed on commencement of the development and removed on a phased basis as stages of the development are completed.

12.6.9.2 Operational Phase

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. All works will be monitored on an ongoing basis to ensure the quality of the development is maintained.

12.7 Conclusions

In terms of landscape impacts, the Proposed Project is considered to have only a modest physical impact on the site as it is consolidated within the existing hedgerow network and will not require significant excavation works to construct either the solar panels or the access and maintenance tracks, battery storage, underground cable connections or substation compound.

In terms of impacts on landscape character, the Proposed Project represents the introduction of a new and relatively unfamiliar form of built development into a rural setting. Nevertheless, the solar array will hug the ground plain and be consolidated within the existing field pattern, which will be enhanced as part of a comprehensive mitigation strategy. Furthermore, whilst the Proposed Project comprises several distinct solar parcels, the overall scale and intensity of the development will seldom be fully apparent due to the dispersed nature of the site and dense layers of intervening vegetation located between the proposed parcels. Indeed, the limited residual visibility of the site will limit the Proposed Projects' potential to notably alter the character of the surrounding local and wider landscape, which is currently influenced by a broad array of other productive land uses.

The site and its immediate surroundings constitute a productive modified rural landscape with associated landscape values. Whilst the Proposed Project may alter the local 'landscape fabric', it does not markedly affect the prevailing landscape pattern or overriding rural landscape character of the area. It is also important to note that once decommissioned, there will be little evidence (aside from the proposed substation, which will continue to transport renewable electricity as per national policy) that the proposed solar development ever existed.

Therefore, combined with the 'Medium-low' magnitude of operational stage landscape impact, the overall significance of operational stage landscape effect was deemed no greater than 'Moderate' and of a Negative quality.

Visual Impacts were assessed at 19 viewpoints throughout the immediate and wider landscape context, representing various viewing distances, angles and receptor types. At the vast majority of these viewpoints (12 out of 19) both the pre-mitigation and residual visual effect is deemed to be in the lower range of Slight to Imperceptible, which belies the overall extent of the solar array and highlights how readily it is visually absorbed within the well vegetated and relatively flat landscape.

VP6 is the only representative viewpoint classified with a residual significance of visual effect of Moderate-slight, with all other residual visual effect classified as Slight or lower. The proposed project will result in a notable truncation of views from this local context, most notably from the adjacent dwelling. Nevertheless, the proposed mitigation screen planting will full screen the view of panels here, whilst this dwelling still benefits from open views across the wider surrounding landscape to the west, which is the principal aspect of visual amenity at this dwelling.

All other representative viewpoints were classified as Slight or less, and in most cases, this is as a result of close and clear views of the proposed solar array in adjacent fields being fully or substantially screened by proposed mitigation screen planting at the road side of the nearest fields. Only the containment of the view by this planting results in the negative residual effect, but it is preferable to the close and unobstructed view of the panels. It should be noted that in all of these instances only a fraction of the overall array is actually visible prior to mitigation screen planting establishment.

It should be noted that mitigation screen planting is much more effective for close views of the proposed solar array than medium and long distance views of it. This occurs because any views of the solar array from mid to long distances tends to be on sloping ground where sections of it rise above intervening vegetation. That same characteristic renders screen planting around the perimeter of those sloping fields less effective.

Overall, the proposed development, whilst sizeable, is considered to be well sited in a robust part of County Wexford that is not regarded as highly rare or sensitive at a regional or national level. Indeed, the overall scale and extent of the project will never be fully perceived by surrounding receptors, due to the dispersed nature of the layout combined with the high degree of intervening vegetation. Some of the largest built structures forming part of the proposed project are set well back from the nearest surrounding visual receptors and will be barely discernible, as evidenced in the visual impact appraisal. In this regard, the proposed project is not considered to be at odds with landscape and visual policy set out in the current Wexford County Development Plan.

12.7.1 Overall Significance of Effect

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Shelburne Energy Farm is not considered to give rise to any significant residual impacts. Instead, the residual effects are all in the mid to low range, which belies the overall extent of the proposed project and highlights how readily its dispersed arrangement that is generally set back from nearest roads, is visually absorbed within the well vegetated and relatively flat landscape.

12.8 References

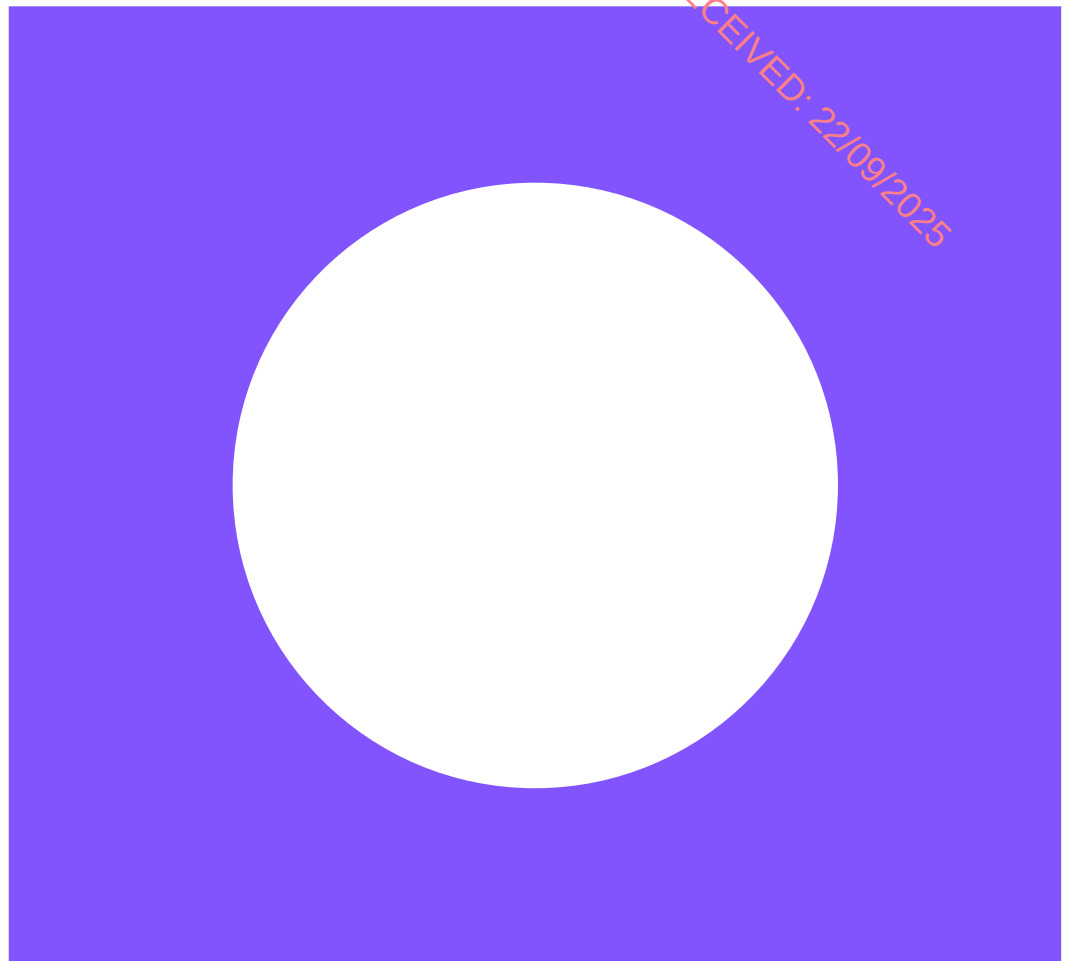
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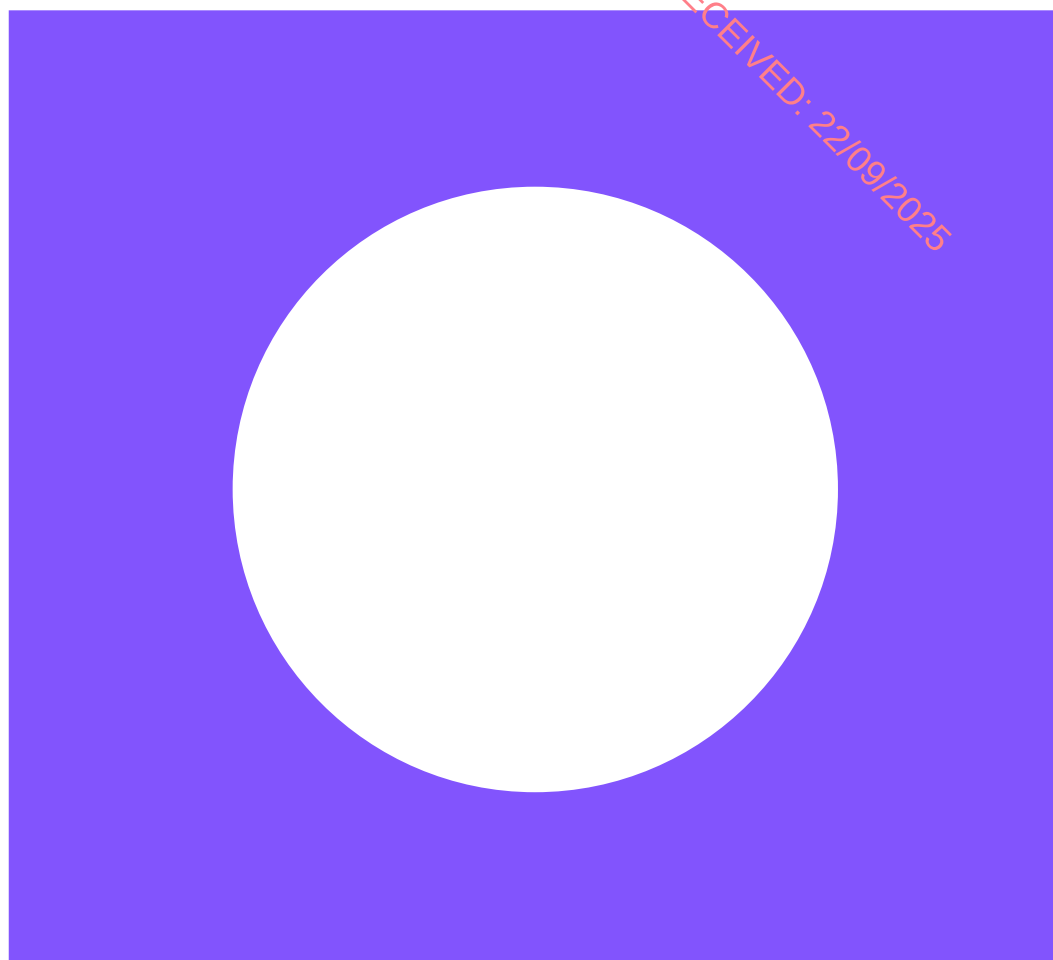
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Shelburne Energy Farm Environmental Impact Assessment

Chapter 13

September 2025

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13 Archaeology, Architecture and Cultural Heritage

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13.1 Introduction

This chapter presents the findings of an archaeological and cultural heritage impact assessment on the site of the Proposed Project located in Ballygarvan, Cloonagh, and Nash, New Ross, Co. Wexford.

There are no recorded archaeological monuments within the site; the zone of notification associated with a ringfort - rath (WX040-004----) extends within the site.

The site was subject to archaeological assessment previously, this was in the form of a geophysical survey carried out by Donald Murphy of Archaeological Consultancy Services Unit (ACSU), under licence no. 23R0080 (refer to Appendix 13.3, Volume 3). No clear anomalies of archaeological significance were detected; however, anomalies of archaeological potential, including potential monuments (Anomalies M1–M6) were recorded that require further assessment.

This assessment includes tangible cultural heritage assets, intangible cultural heritage associations (such as folklore) as well as archaeology and built heritage.

The following Appendices included in Volume 3 are to be read in conjunction with this chapter:

- Appendix 13.1 Figures
- Appendix 13.2 Site visit - Photographic Record
- Appendix 13.3 Geophysical survey Report (23R0080)

13.2 Policy and Guidance

The methodology employed for this assessment is guided by a legislative framework that governs how aspects of archaeological, cultural and architectural heritage are protected. It has been prepared in compliance with all relevant EIAR legislation and guidance (see below), in particular 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', published in 2022 by the Environmental Protection Agency (EPA).

13.2.1 Legislation

Below is a list of the legislation relevant to this assessment:

- National Monuments Acts 1930 to 2014.
- Heritage Act 1995 (as amended).
- National Cultural Institutions Act 1997.
- European Convention for the Protection of the Archaeological Heritage (Valetta Convention, 1997).
- European Convention for the Protection of the Architectural Heritage (Granada Convention, 1997).
- European Landscape Convention (Florence Convention, 2000).
- Planning and Development Act 2000 (as amended).

- UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (Paris Convention, 2003).
- Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU of the European Parliament and the Council (hereafter the EIA Directive).

13.2.2 Policy and Planning Documents

Below is a list of policies, planning documents, codes of practice and frameworks relevant to this assessment:

- Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands 1999).
- Code of Practice for Archaeology agreed between the Minister for Arts, Heritage, Regional Rural and Gaeltacht Affairs and Transport, Infrastructure Ireland (Transport Infrastructure Ireland (TII) and Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs 2017).
- Built & Archaeological Heritage: Climate Change Sectoral Adaption Plan (Department of Culture, Heritage and the Gaeltacht 2019).
- Wexford County Development Plan 2022-2028.
- National Development Plan 2021-2030 (Department of Public Expenditure and Reform 2021).
- Archaeology in the Planning Process (Department of Housing, Local Government and Heritage (DHLGH) and Office of the Planning Regulator 2021).
- A Living Tradition: A Strategy to Enhance the Understanding, Minding and Handing On of our Built Vernacular Heritage (DHLGH 2021).
- Places for People: National Policy on Architecture (DHLGH 2022a).
- Heritage Ireland 2030: A Framework for Heritage (DHLGH 2022b).
- National Planning Framework. First Revision (Government of Ireland and National Planning Framework 2025).

13.2.3 Guidelines

Below is a list of guidelines relevant to this assessment:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022).
- Guidelines for Cultural Heritage Impact Assessment of TII National Road and Greenway Projects (TII 2024).
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA 2003).
- Architectural Heritage Protection: Guidelines for Planning Authorities (Department of Arts, Heritage and the Gaeltacht 2011).
- Cultural Heritage Guidelines for Electricity Transmission Projects (Courtney Deery 2015).
- National Inventory of Architectural Heritage Handbook (2024).

13.2.4 Legislative Mechanism of Protection

On 13 October 2023, the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was enacted by the Oireachtas, which provides for the repeal of the National Monuments Acts 1930 to 2014 and related legislation. At the time of writing, most of its

provisions have not yet come into force, however. When fully enacted it will replace the previous legislation but until that time the National Monuments Acts 1930 to 2014 and related legislation remain fully in force. At present, certain provisions with enforcement measures are in effect as of 31 May 2024 including World Heritage Properties in the State. Under the 2023 Act, a “national monument (LA)”, in relation to a local authority, means a national monument in the ownership or guardianship of that authority; “national monument (M)”, in relation to the Minister, means a national monument in the ownership or guardianship of the Minister. In so far as is compatible with the requirements of section 75(1) and (2), the Minister may grant a lease or licence (not being a licence granted under section 151) in respect of land comprising a national monument (M) (or a local authority, with the consent of the Minister in respect of land comprising a national monument (LA)).

Consequently, at present, the archaeological sites and monuments are protected under the National Monuments Acts 1930 to 2014 in four ways:

- Sites recorded in the Record of Monuments and Places (RMP), established under Section 12 of the National Monuments (Amendment) Act 1994, provides a statutory list of all known archaeological monuments and such places in Ireland. It includes a set of maps and a list of monuments and places for each County. These are known as Recorded Monuments. Zones of archaeological potential are also included. These are zones in historic towns, within which archaeological deposits and upstanding pre-1700 AD archaeological remains exist. There are approximately 1,700 located in County Wexford. The RMP is not an exhaustive list of all known archaeology in existence.
- Register of Historic Monuments (RHM), established under Section 5 of the National Monuments (Amendment) Act 1987. The Register may include both historic monuments and archaeological areas. A ‘Historic Monument’ includes a prehistoric monument and any monument associated with the commercial, cultural, economic, industrial, military, religious or social history of the place where it is situated or of the country. It also includes all monuments in existence before 1700 AD or such later date as the Minister may appoint by regulations. There are 57 historic monuments registered for County Wexford. The majority of these are also included on the Record of Monuments and Places.
- a national monument in the ownership or guardianship of the Minister of Housing, Local Government and Heritage or a Local Authority. There are currently 17 monuments in Wexford listed in the ownership/guardianship of the Minister.
- monuments subject to a Preservation Order or Temporary Preservation Order (employed in order to safeguard monuments at risk). There are seven monuments/sites in Wexford listed on the Preservation Order list. Proposed work on these sites requires the prior written consent from the Minister before commencing that work.

Depending on the category of the monument a different level of protection applies to the monuments and associated with these monument’s zones of archaeological potential. The national policy for protection of archaeological heritage preferred at present is mitigation in the form of preservation in situ/avoidance/redesign; should this not be feasible in consultation with Statutory Authorities, preservation by record (full archaeological excavation) must be carried out.

The Planning and Development Act 2000 (as amended) provides for the protection of the architectural heritage. Architectural heritage is defined by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act of 1999 as structures and buildings, including attendant grounds, their settings, figures, fittings, groups of buildings and sites of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. It is the responsibility of each Planning Authority to compile in their Development Plans a list of buildings and structures subject to statutory protection. These are listed in the Record of

Protected Structures (RPS), with places, areas, groups of such structures or townscape forming a part of Architectural Conservation Areas (ACA).

13.2.5 Wexford Development Plan 2022–2028

'Chapter 13: Heritage and Conservation' of the Wexford County Development Plan 2022–2028 defines heritage after the Heritage Act, 1995 as including monuments, archaeology, heritage objects, architecture, flora, fauna, wildlife habitats, landscapes, seascapes, wrecks, geology, heritage gardens and parks and inland waterways. It recognises that the archaeological heritage is a non-renewable resource consisting of material remains in the form of sites and monuments, as well as artefact and movable object with monuments constituting manmade structures or natural features altered by a man.

Below is a list of Objectives relating to the protection of archaeological heritage:

Objective AH01

To conserve and protect archaeological sites, monuments (including their settings), underwater archaeology and objects including those listed or scheduled for inclusion on the Record of Monuments and Places and/or the Register of Historic Monuments or newly discovered sub-surface archaeological remains.

Objective AH02

To recognise the importance of monuments and sites and protect the character and integrity of these monuments and sites where appropriate. The Council will consult the National Monuments Service where a development is proposed that may impact on an archaeological monument and/or site.

Objective AH03

To protect the heritage of groups of important archaeological sites and monuments, inclusive of their contextual setting and interpretation, in the operation of development management.

Objective AH04

To fully consider the protection of archaeological heritage when undertaking, approving or authorising development. In considering such protection the Council will have regard to the advice and recommendations of the National Monuments Service and the principles set out in Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands, 1999).

Objective AH05

To require an archaeological assessment and/or investigation by qualified persons for development that may, due to its size, location or nature, have a significant effect upon archaeological heritage and to take appropriate measures to safeguard this archaeological heritage. In all such cases the Planning Authority shall consult with the National Monuments Service in the Department of Culture, Heritage and the Gaeltacht [currently DHLGH].

Objective AH06

To promote a presumption in favour of preservation in-situ of archaeological remains and settings when dealing with proposals for development that would impact upon archaeological sites and/or features. Where preservation in-situ is not possible the Council will consider preservation by record in appropriate circumstances.

Objective AH07

To protect historic and archaeological landscapes, including battlefields, and promote access to such sites provided that this does not threaten the feature.

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Objective AH08

To include archaeological landscapes, battlefields and historic landscapes as part of the updated Landscape Character Assessment of the County to be prepared following the publication of a National Landscape Character Assessment.

Objective AH09

To protect historic urban defences (both upstanding and buried) and associated features and safeguard them from inappropriate development in accordance with National Policy on Town Defences (Department of Environment, Heritage and Local Government, 2008).

Objective AH10

To identify appropriate archaeological sites in the county to which public access could be provided, and work to secure public access and the provision of signage and interpretation panels, where appropriate, in consultation with the landowner and the National Monument Service, subject to normal planning and environmental criteria and the development management standards contained in Volume 2.

Objective AH11

To retain existing street layouts, historic building lines and traditional plot widths which derive from medieval or earlier origin.

Objective AH12

To protect historical burial grounds within County Wexford and encourage their maintenance in accordance with best practice conservation principles.

Objective AH13

To have regard to the Historic Battlefield sites as listed in Table 13.6 (and those which are not listed thereon but that are, or become, known) and when assessing planning applications in the vicinity of a Historic Battlefield ensure there is no harm to the physical character or setting of these sites. Where development is proposed within the identified battlefields, archaeological assessment and recording may be required.

Below is a list of Objectives relating to the preservation and protection of built heritage:

Objective BH01

To protect the architectural heritage of County Wexford and to include structures considered to be of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest in the Record of Protected Structures.

Objective BH02

To support targeted investment in the built heritage of our region including the Built Heritage Investment Scheme and Historic Structures Fund to assist owners to maintain our built heritage assets.

Objective BH03

To promote the development of heritage-led regeneration and engage in and promote initiatives to revitalise the historic cores of our towns and villages together with local communities, heritage property owners and other stakeholders.

Objective BH04

To consider, in the preparation of future local area plans, a Town first approach to the revitalisation of historic urban centres, which focuses on the repair and upgrade of existing

historic buildings and their adaptation to new uses with regard to their architectural character and significance.

Objective BH05

To protect our Architectural Heritage in the form of the Record of Protected Structures (RPS) and identify important groups of buildings/localities suitable for designation as Architectural Conservation Areas (ACAs). Wexford County Council will also endeavour to undertake monitoring and review of the RPS and ACAs which may result in recommendations for additions or deletions and enlist measures to prevent dereliction and to support re-use of built heritage.

Objective BH06

To protect the curtilage of Protected Structures or proposed Protected Structures from any works which would cause loss of, or damage to, the special character of the structure and loss of or damage to, any structures of heritage value within the curtilage or attendant grounds of the structure.

Objective BH07

To ensure development within the curtilage of a Protected Structure is compatible with its character. This does not preclude putting forward innovative contemporary designs that respect the context of the Protected Structure.

The key Objectives in relation to the preservation and protection of Vernacular Architecture include:

Objective BH08

To promote the retention of any original or early building fabric including for example timber sash windows, stonework, brickwork, joinery, ironmongery, traditional mortars, render and decorative or weather finishes and slate and vernacular architectural details (whether relating to a Protected Structure or not). Likewise, the Council will encourage the re-instatement of historically correct traditional features and retention of original ridge heights as appropriate.

Objective BH09

To protect, maintain and enhance the established character and setting of vernacular buildings which are worthy of protection or have architectural heritage value, farmyards and settlements where they make a positive contribution to the built heritage and encourage the re-use and sensitive refurbishment of vernacular buildings using appropriate design and materials and having regard to best practice conservation guidelines.

Objective BH10

To ensure that applications in relation to Protected Structures include an Architectural Heritage Impact Assessment report where it is considered the proposed development entails extensive or complex works with a potential to have an impact on the architectural heritage. This report should assess the implications of the development on the character of the structure and the area in which it is located. This should be prepared by a suitably qualified person competent to make a qualitative assessment of the potential impact of works on the character and special interest of the Protected Structure and in accordance with the Architectural Heritage Protection-Guidelines for Planning Authorities (DAHG, 2011) and any subsequent guidelines.

Objective BH11

To ensure that all applications for Protected Structures are assessed by taking into consideration the advice contained in the Architectural Heritage Protection Guidelines for Planning Authorities (DAHG, 2011) and any subsequent guidelines.

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Objective BH12

To encourage the repair and retention of traditional timber, rendered and/or tiled shop fronts and pub fronts, including those which may not be Protected Structures. There will be a general presumption against the replacement of original shopfronts with emphasis on retention and reinstatement of traditional proportions and details.

Objective BH13

To facilitate the retention of older buildings, the Planning Authority will give consideration to the relaxation of car parking and other development management requirements in appropriate circumstances.

Objective BH14

To ensure that elements of the architectural heritage of the county, such as historic gardens and historic designed landscapes, stone or brick walls, ditches and street furniture that make a positive contribution to the built heritage, are retained.

Objective BH15

To encourage improvements to energy efficiency in traditional buildings while maintaining the architectural character and significance in line with the Heritage Protection Guidelines for Planning Authorities (Department of Arts, Heritage and the Gaeltacht, 2011) and the Advice Series Guide on Energy Efficiency in Traditional Buildings (Department of Environment, Heritage and Local Government) and any future guidelines and advice.

Objective BH16

To protect and manage trees in the curtilage of a Protected Structure or in close vicinity that contribute to its special character and setting.

Objective BH17

To support economic development of large country houses in their role as tourist attractions and other commercial uses to ensure their continued survival.

Objective BH18

In the event of catastrophic accidental fire damage the rebuilding of a Protected Structure will not be required. Support and advice will be provided in assisting the repair of damaged Protected Structures to achieve a balance between new works and the remaining original features.

13.2.6 Wexford County Heritage Plan

County Heritage Plans are strategies for the identification, protection, conservation, management, enhancement, and interpretation of the built, natural, and cultural heritage led by the local authority from each county.

At the time of the writing of this chapter, there is no County Heritage Plan for County Wexford.

The first county Heritage Plan is currently at Stage 2. Public Engagement; with meetings held in August 2025 and submissions from public invited to ensure the preservation, protection and promotion of the heritage of County Wexford. The Heritage Forum, a non-statutory advisory group, was established by Wexford County Council to provide advice on the preparation and implementation of the Counties first Heritage Plan.

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13.3 Assessment Methodology

13.3.1 Defining Cultural Heritage

Heritage is defined in the Heritage Act, 1995 as including monuments, archaeology, heritage objects, architecture, flora, fauna, wildlife habitats, landscapes, seascapes, wrecks, geology, heritage gardens and parks and inland waterways. Intangible cultural heritage, as recognised in the 2003 UNESCO Paris Convention, comprises items such as songs, poetry, folklore, traditional crafts, language and sport, and these are also included in our definition of heritage.

Cultural heritage is considered one of the environmental factors likely to be significantly affected by the projects. Cultural heritage comprises archaeology, architectural heritage, folklore and history.

Cultural heritage (after EPA 2022) is considered to consist of:

- Archaeology
 - Known archaeological monuments (SMR, RMP)
 - Areas of archaeological potential (including unknown archaeology)
 - Underwater archaeology
- Architectural heritage
 - Designated architectural heritage
 - Other significant architectural heritage
- Folklore and history
 - Designations or sensitivities

13.3.2 Assessing Baseline Data

The site was subject to an assessment comprising a desk-based study of published and unpublished documentary, cartographic and aerial imagery sources, as well as a site visit/walkover survey and a geophysical survey. These were evaluated to establish the baseline data of the receiving environment.

Cultural Heritage Receptors (CHRs) were identified within and adjacent to the site. These consist of tangible cultural heritage (e.g. archaeological features, monuments, artefacts, built heritage features, buildings, and sensitive landscapes/areas). These form the Cultural Heritage Dataset (CHD), which includes geo-referenced data on each identified heritage asset recorded and relevant to the site. Each receptor was given a number (e.g. abbreviated to CHR1 assigned to each cultural heritage receptor relevant to the site).

For the purposes of this report, the archaeology, architectural and cultural heritage assets were assessed using the following sources:

- Sites and Monuments Record (SMR).
- Record of Monuments and Places (RMP).
- Register of Historic Monuments (RHM).
- National Monuments.
- Sites reported in the Database of Irish Excavation Reports.
- Topographical files of the National Museum of Ireland.
- Architectural heritage structures (NIAH).
- Protected Structures (Wexford County Development Plan 2022–2028).
- Archaeological Reports (including Geophysical Survey of the site).

- Other documentary sources (townland and placename evidence, Griffith's Valuation, National Folklore School's Collection).
- Any other previously unrecorded sites.
- Site visit/walkover survey.

13.3.2.1 Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP)

A primary cartographic source and base-line data for the assessment was consultation of the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) for County Wexford. All known/recorded archaeological monuments are indicated on the 6-inch Ordnance Survey (OS) maps and are listed in these records. The SMR and RMP paper archives are not a complete record of all monuments, however, as newly discovered sites may not appear in the lists or accompanying maps. Accordingly, in conjunction with consultation of the SMR and RMP, the digital database of recorded monuments (Historic Environment Viewer), which may be accessed through the National Monuments Service (NMS) website, was also consulted. This database of SMR records is updated daily. The county SMR forms the basis for the statutory RMP (established under Section 12 of the National Monuments (Amendment) Act 1994). Accordingly, all sites included in the RMP are protected under the National Monuments Acts (1930–2014).

Redundant Records

There are two monuments in proximity of the site (WX035-086----, WX035-047----) classed as redundant. Records classed as 'Redundant record' are those that fulfil one or more of the following criteria:

- a record identifying a location where, according to documentary sources (e.g., published reference, cartographic sources) or personal communication, a monument might have existed, but which, on inspection, was found not to be an archaeological monument (e.g. a natural feature);
- a record classified using a term which is now obsolete (e.g. ecclesiastical remains);
- a record created in error, a duplicate record or one which has no supporting evidence recorded on file or in the database;
- an archaeological object (i.e. an artefact), e.g. a quernstone;
- a record entered as a 'Shipwreck'. Shipwrecks are recorded in a separate database

13.3.2.2 Register of Historic Monuments

The Register of Historic Monuments contains historic monuments and archaeological areas known at the commencement of the Act are subject to legal protection. The list was established under Section 5 of the National Monuments (Amendment) Act 1987.

13.3.2.3 National Monuments

The National Monuments Service website lists Monuments covered by Preservation Orders and in the ownership/guardianship of the Minister for Housing, Local Government and Heritage by county (<https://www.archaeology.ie/about-us/what-we-do/monuments-in-state-care/national-monuments-in-state-care/>).

The term 'National Monument' is defined by the National Monuments Act (1930) as being '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'. The aforementioned Act states that the consent of the Minister is required for archaeological works at or near a National Monument in the ownership or

guardianship of the Minister or a local authority, or to which a preservation order applies. The Minister is required to consult with the Director of the National Museum of Ireland in relation to such an application for consent.

13.3.2.4 Excavations Database

The Database of Irish Excavation Reports, also known as the Excavations Database, is an annual account of all archaeological investigations carried out under an excavation licence and includes works undertaken from 1970 to the present (www.excavations.ie). This database was consulted as part of the desktop research for this assessment to establish if any previous archaeological investigations under an excavation licence had been carried out in, or near the proposed development area.

13.3.2.5 The Topographical Files of the National Museum of Ireland

The topographical files of the National Museum of Ireland contain information pertaining to archaeological finds (mainly artefactual) and excavations throughout the country that were reported to the museum since the 1920s. While many of these find spots are not recorded monuments, they can provide an indication of past activity in a townland and consequently add to our understanding of the archaeological potential of an area.

13.3.2.6 Protected Structures and National Inventory of Architectural Heritage Sites

Protected Structures are buildings and other structures that the planning authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, or technical point of view. These are protected under Part IV of the Planning and Development Act 2000, as amended and listed in Volume 5: Record of Protected Structures in the Wexford County Development Plan 2022–2028.

Heritage Structures are also recorded by the National Inventory of Architectural Heritage (NIAH), a state initiative established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The list forms the basis for the recommendations for inclusion in the Record of Protected Structures (RPS).

13.3.2.7 Cartographic Sources, Aerial Imagery and LiDAR Data

Potential archaeological or cultural heritage features can also be marked on historic maps or be visible on aerial photography as cropmarks, soil marks and low earthworks. Both provide a useful resource in identifying sites, particularly if they no longer have any above ground remains.

Several cartographic sources were consulted as part of this assessment, namely The Down Survey of County Wexford (1656) and the first (surveyed 1839 – published 1841), third (surveyed 1902 – published 1904) and last, Cassini (1922-25) editions of the Ordnance Survey (OS) maps (now Tailte Éireann). Aerial photographs dating between 1995 and 2018 from Tailte Éireann were also examined, as was satellite (Google Earth) imagery dating between 2005 and 2023.

Light Detection and Ranging (LiDAR) data can also be used to identify low-relief features of potential archaeological interest. Much of this is available through the Open Topographic Data Viewer provided by Geological Survey Ireland. There is no LiDAR data available for this area at present.

13.3.2.8 Archaeological Reports

The following reports were also consulted in order to inform the assessment of all aspects of the archaeological resource within and adjacent to the Proposed Project site and to ensure that the assessment is cognisant of all relevant policies and objectives:

Geophysical Survey

Geophysical Survey, in the form of magnetic gradiometry, is a non-intrusive method that is used in Archaeology. It is a method for rapidly mapping archaeological objects, structures, deposits and other features, including geological anomalies, that survive beneath the ground surface. The results are presented as a grey-scale map of the anomalies detected, which are interpreted by an experienced archaeologist. A licence to carry out this work is required and is granted by the Department of Housing, Local Government and Heritage following submission of the licence application for the site in question. Upon completion of the on-site survey, a report detailing the results of the work is submitted to the Department and the National Museum of Ireland.

Geophysical Survey Report, Proposed Solar Farm at Nash, New Ross, Co. Wexford (Licence Number 23R0080) by ACSU (Murphy 2025; see Appendix 13.3.).

The above report includes the results of both Phase 1 (2022) and Phase 2 (2024) of the geophysical survey.

Archaeological Test Trenching

Archaeological test trenching is carried out in advance of construction and is undertaken across the footprint of a proposed development. Test trenches are excavated to facilitate the early identification of archaeological deposits and features. If test trenching is carried out following a geophysical survey, the trenches are placed to target anomalies detected in order to assess their significance, extent and depth. The results allow for an informed decision on how best to deal with any discovered archaeological finds or features prior to works on site commencing. A licence to carry out this work is required and is granted by the Department of Housing, Local Government and Heritage following submission of the licence application for the site in question. Upon completion of the on-site test trenching, a report detailing the results of the work is submitted to the Department and the National Museum of Ireland.

The current site was not subject to test trenching; however, of relevance is an assessment carried out of a plot in close proximity to the site, where an enclosure ditch with medieval pottery was identified. The reports suggest it is likely associated with an adjacent church (WX035-049001-) and graveyard (WX035-049002-) or represents a ringfort – rath.

Archaeological Assessment Report, Nash, Co. Wexford (Licence Number 13E0076) by Stafford McLoughlin (McLoughlin 2013).

13.3.2.9 Other Documentary Research

Additional documentary sources can be used to assess intangible cultural heritage (i.e history and folklore).

The Irish Townlands Database (<https://www.townlands.ie/>) and the Irish Placename Database (<https://www.logainm.ie/en/>) were consulted for the associated administrative divisions (baronies, civil parishes and townlands) and the meaning of the placenames and fields within and surrounding the Proposed Project site. The Irish Placename Database was created by Gaois, Fiontar & Scoil na Gaeilge in collaboration with The Placenames Branch of the Department of Housing, Local Government and Heritage. It contains archival records and placenames research conducted by the State. Many of Ireland's geographical names are of Irish origin, while others derive from English, with a small number from Old Norse. The anglicisation process included name standardisation, which was largely carried out in the 19th century and

recorded in the Ordnance Survey's work. Toponyms can provide useful historical and cultural heritage data, such as information on administrative divisions, natural and archaeological features that may have disappeared, as well as the ownership or character and origins of a settlement.

The National Folklore Collection (NFC) and its datasets were examined. The dataset contains manuscripts, index cards, sound recordings, photographs, and video material. As a part of this, the Schools' Collection was initiated by the Irish Folklore Commission, and contains folklore and local tradition entries from pupil's exercise books from the Irish Free State from 1937–1939.

The National Inventory of Intangible Cultural Heritage (NIICH) was also examined for sites, areas or features of further potential cultural heritage interest. While many of the designated traditions are island-wide practices, nothing was identified that was specific to the area in question.

13.3.2.10 Previously Unrecorded Sites

The site and its environs were also assessed for any other previously unrecorded sites (e.g. unrecorded archaeological and architectural heritage, industrial heritage, demesne landscapes, sites referenced in folklore, intangible heritage). This data was largely generated through desktop research but also a site visit.

13.3.2.11 Geology, Soils and Hydrology

Geology, soil types and hydrology records were also consulted to assess the landscape of the site as these can impact preservation conditions for archaeological sites and artefacts, as well as affect the efficiency of various geophysical survey techniques. Changes to local hydrology as a result of developments also have the potential to impact the preservation of sub-surface archaeological remains, particularly those preserved in waterlogged/anaerobic conditions. This data was generated through the following sources:

Geological Survey Ireland of the Department of Climate, Energy and the Environment (<https://dcenr.maps.arcgis.com/>) is a national database of soils and a mapping resource, with underlying geology, formation and soil type included.

Environmental Protection Agency/EPA Geoportal (<https://gis.epa.ie/EPAMaps/>) was developed by the Irish Environmental Protection Agency to improve access to geographic data relating to Ireland's environment. It can be used to access our WebGIS data browsers, find and download EPA GIS data and connect to the Irish Spatial Data Exchange catalogue. The EPA Rivers and Streams datasets were examined due to the presence wet ditches, streams and river (Owenduff River) adjacent to the site. Riverine, peatland and wetland environments are considered of high archaeological potential for trackways, fording points/bridges. The presence or absence of those can be established through archaeological assessment (geophysical survey but needs to be confirmed by invasive assessment – such as test trenching and wade survey/dive survey as appropriate and/or monitoring).

13.3.2.12 Site Visit/Walkover Survey

In support of this chapter, following the desk-based study of available resources, a site walk over survey was undertaken. The primary aim of the survey was to (1) confirm the condition and surface presence or absence of the remains of the identified Cultural Heritage Receptors (CHRs) located within the site and (2) to record any additional, previously unidentified, archaeological or built heritage sites/receptors as additional CHRs. The site visit included a photographic and written record of any receptors present.

The results of the walkover survey are included in Section 13.4.8. It should be noted, however, that the absence of surface remains of a receptor does not constitute the absence of sub-surface remains, and the presence or absence of such a CHR can only be established through test trenching.

13.3.3 Approach to Impact Assessment

13.3.3.1 Study Area

The study area reviewed for the assessment comprised the area within the Proposed Project site and lands extending 1km in all directions for all known sites. Distance measurements were taken from the nearest edge of the Project site boundary. This was in order to compile and appraise a baseline context for the known cultural heritage receptors within and present in the immediate environs of the site, including potential direct and indirect effects on tangible and sub-surface elements within and adjacent to the site, and to assess the potential direct and indirect effects on the locations and setting of known cultural heritage receptors. In addition, the wider landscape was reviewed for any nationally significant cultural heritage sites with high visual sensitivity (such as National Monuments and World Heritage Sites; including those listed in the tentative list).

13.3.3.2 Consultations

Consultation between ACSU and the National Monuments Services (NMS) of the Department of Housing Local Government and Heritage has taken place. The NMS are aware of the project, having approved the submitted method statements and issued a licence for the geophysical survey of the site, with the reports on the findings submitted to statutory authorities, with no queries received following submission.

A consultation with the National Monuments Archive (NMA) has taken place. This was in relation to two redundant monuments WX035-086---- and WX035-047----.

13.3.4 Significance Criteria

The main purpose of this chapter is to identify, describe and present an assessment of the likely significant effects of the Proposed Project on archaeological, architectural and cultural heritage remains (known and unknown if present). An effect can be positive, negative, or neutral/none, direct or indirect. The effect may result from the construction phase and/or the operation phase of the project.

The potential effects are assessed for each component of the development as described above, as well as cumulatively.

This chapter aims to present a precise, concise, accurate and credible description of the likely and significant effects on archaeological, architectural and cultural heritage, and offer mitigation measures where a likely significant effect is predicted. The description of effects follows the EPA Guidelines (2022, table 3.4, fig. 3.4), whereby comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance.

13.3.5 Limitations of this EIAR

The assessment is based on information available as of August 2025 and on the above sources and surveys (including geophysical survey and a site visit/walkover survey). Accordingly, subsequent to this date, additional information will become available following scheduled test trenching of the site and this new information will alter the assessment detailed in this chapter.

Additional information may also become available after the time of writing, such as that identified through archaeological assessments in the environs of the site, especially geophysical surveys and/or test trenching/excavation, as well as through further aerial/satellite imagery. This new information also has the potential to alter this assessment.

There are also general limitations that apply to archaeological, architectural and cultural heritage assessments, such as:

Inaccuracies and selective recording on historic mapping. While every effort is made to geolocate early cartographic sources, many were not recorded with the level of accuracy required to do so, accordingly the location and details of CHRs that are no longer extant and only identified through mapping are often only indicative. The sites and details recorded by early cartographers is also selective, as well as representing just a short period in time, in or around the time at which the survey took place. The gaps between mapping can also be long, with information on how the landscape was used and changed in those intervening years inaccessible.

Limited and selective historic sources. Documentary sources prior to the medieval period are rare, while those that do exist are generally limited and biased in their scope. They can be vague on location details and only provide a glimpse of land-use at a specific time.

Inaccuracies in records. The assessment includes baseline data from a variety of reliable sources, including regulatory sources, however, the accuracy and completeness of all data cannot be guaranteed and changes in our understanding of sites can impact this data, including, for example, ground truthing redundant records or geophysical surveys around known sites that can extend their zones of notification.

13.4 Receiving Environment

The development is located within the townlands of Ballygarvan, Cloonagh and Nash, in the Barony of Shelburne and the Civil Parish of Owenduff. The site consists of agricultural lands to the west of the Owenduff River and adjacent to its tributary, which also forms the townland boundary of Cloonagh and Ballygarvan with Nash townland; adjacent to and west and east of L4030 and south of L4032. Details of the site walkover survey are included in Section 13.4.8, with associated photographs in Appendix 13.2.

The site has an elevation of c. 33–66m Ordnance Datum (OD). The underlying geology is rhyolitic volcanic, grey and brown slates and is part of the Campile Formation. This bedrock geology is overlaid by a mixture of soils consisting largely of shallow, well-drained and deep, well-drain mineral soils. The bands of soil along the townland boundary stream and the Owenduff River are recorded as alluvial, shallow and well-drained (Geological Survey of Ireland). The site was subject to a geophysical survey on two occasions.

Cultural Heritage is considered here to include all recorded monuments listed in the Record of Monuments and Places (RMP) and in the Sites and Monuments Record (SMR), National Monuments (i.e. those in the ownership/guardianship of the state), Protected Structures, National Inventory of Architectural Heritage (NIAH) sites, previously unrecorded sites, sites reported in the Excavations Database if not included in the RMP/SMR, find spots or sites listed in the Topographical Files of the National Museum of Ireland, and finally, sites identified during a site visit, through examination of cartographic sources and aerial imagery, and through non-invasive geophysical survey.

13.4.1 Historical and Archaeological Background

The site is located within the County of Wexford (Cill Dara), in the townlands of Nash (An Ais), Cloonagh (Cluanach) and Ballygarvan (Baile Gharbháin), in the Barony of Shelburne and the Civil Parish of Owenduff.

Ballygarvan was first mentioned as Balygavan and in relation to Thos Knythsewyn in 1305, and referenced frequently in sources thereafter; in 1840 it was recorded as Garvan's town. Nash townland was mentioned as Naysshe in 1540, and by 1576 a rectory of S. Leonard of the Nashe was noted. Cloonagh can be translated as a meadow or lawn and was referenced in 1603 concerning Walter McPadin Branagh of Clonegh. In the Census of Ireland c. 1659, 37 people are listed in Nash and 25 in Ballygarvan (Ranson 1949). In Griffith's Valuation of County Wexford, the land is listed as belonging to Colclough and Boyse estate (Nash) and Shannon estate (Ballygarvan) prior to the land commission. The mill in Ballygarvan is listed as a corn mill and a tuck mill. The area of Kilbraney is listed as belonging to Cliffee estate and the mill at Kilbraney is described as a corn mill and a spinning mill.

The land to the east of Nash Village is described in an account in The Schools' Collection (Volume 0871, Page 326) as fertile and gently sloping towards Owenduff River that empties into Bannow Bay. Nash was recorded as a place of fairs and public meetings held at Fair Green, which is depicted on both the 6-inch and 25-inch Ordnance Survey (OS) maps adjacent to the crossroads in Nash. It appears that the fair was discontinued only after a railway station was opened in Ballycullane and Campile. It was believed by the locals that Nash got its name from a forge or fair green located in the area. A forge is depicted within Nash village on the 1839 OS map, and it is labelled as Smithy on the 1911 OS map, now in ruin. Trades listed for Nash area in the early 20th century included coopers, nailers, weavers, tailors, blacksmiths, shoe-maker, carpenter, dress-maker, tailor, carpenter and one blacksmith (ibid.). There is also a record of a Chalcolithic or Copper Age (2500–2200 BC) hoard at Carrickshedoge, Nash, Co. Wexford, to the north of the current site. This comprised four copper axes with decorated flanks and two or three cakes of copper—raw material gained by smelting the crude copper ore—reportedly retrieved from a 'cave' that could be a souterrain (Bremer 1926).

In total, there are seventeen recorded archaeological monuments located within a 1km radius. These include eight ringforts - raths (WX040-004----; WX040-003----; WX040-005----; WX040-016----; WX035-048----; WX039-084---; WX040-091---; WX040-068---), a ringfort – unclassified (WX039-017----), two redundant records (WX035-086----, WX035-047----), two ritual sites – holy wells (WX040-006-----, WX040-002----), a church (WX035-049001-), a graveyard (WX035-049002-), an enclosure (WX040-016001-) and a Castle – unclassified (WX040-051-----). The two redundant records noted above (WX035-086----, WX035-047----) are not listed in the Record of Monuments and Places for Co. Wexford 1995; their antiquity (both as enclosures) could not be confirmed by the Archaeological Survey of Ireland, hence these are now classed as redundant.

Several cultural heritage receptors (CHR) are located within and adjacent to the site (see see Table 13.5 and Figure 13.1 for details). The site contains no archaeological monuments; however, the MV array cable traverses the zone of notification associated with a ringfort - rath (WX040-004----; CHR 13). A plot labelled Smithy (CHR1) is adjacent to the site. Furthermore, Fair Green (CHR2), townland boundaries (CHR12, parts of CHR8 and CHR14), buildings (CHR3, CHR11, CHR30, CHR31), lime kilns (CHR4, CHR6, CHR7, CHR9, CHR10, CHR19, CHR20, CHR21, CHR22, CHR23), wells (part of CHR1 and CHR11), a mill race (CHR16), a triangulation station (CHR6), and a bridge known as Neighbourly Bridge (CHR8) are depicted within the site on the Ordnance Survey mapping.

13.4.1.1 Enclosures and Ringforts - Rath

Ditched enclosures are seen across the Irish landscape in the form of ringforts and non-circular enclosures. Ringforts, as the name suggests, implies a circular enclosure with a minimum of one ditch and possible accompanying banks. They were generally circular, measuring circa. 24-60 metres in diameter. Early Irish laws stated that circularity was a feature of the model ringfort (Stout 1997). However, with the increase of development, more and more non-circular enclosures are coming to light. Therefore, for the purpose of this discussion, all of the above enclosures will be discussed under the category 'ditched enclosures'. The zone of notification associated with one ringfort – rath (WX040-004----; CHR13) extends within the proposed MV cable route between array area B and A, while a number of other such monuments are located in the environs. This ringfort – rath (WX040-004----; CHR13) is depicted on the OS mapping and visible on aerial imagery, and is described as a raised circular overgrown area measuring 28m by 26m defined by an earthen bank, while another such monument (WX040-003----; CHR33), located in close proximity to the southeast, was identified as a faint cropmark enclosure on aerial photography, measuring 45m in diameter and defined by a fosse.

The majority of early medieval ditched enclosures date from the sixth–ninth centuries AD, and we see a significant decline in their use in the tenth century (O'Sullivan & Nicholl 2010). Though a site in Laytown, Co. Meath, could have a fourth century date (McConway 2002), other sites such as Ballynacarriga, Co. Cork (Noonan 2004) and Raystown, Co. Meath (Seaver 2005; 2016) were probably occupied from the fifth century well into the eleventh century.

Ditched enclosures are generally regarded as enclosed farmsteads, and the defences are thought to have been built to protect against cattle raids (Stout 1997). Some have provided little evidence for structures, suggesting the enclosure was used for storing cattle, known as a bodun, though the majority provide evidence to suggest they were inhabited settlements with houses, farmyards, outbuildings and animals (O'Sullivan & Nicholl 2010). Excavated items retrieved from ringforts are largely of a domestic, craft or agricultural nature (Monk 1995). Some larger sites, such as Raystown, Co Meath, fulfilled many functions; there was evidence for animal husbandry, cereal and grain processing, milling, burial and metallurgy (Seaver 2016).

Ditched enclosures are one of the most common field monuments in Ireland. Most were univallate with one bank and fosse. In many cases, the banks do not survive. There are, however, also bivallate enclosures, for example, Cloonaboy, Co. Mayo (Gillespie 2010), and multivallate enclosures, such as Garranes, Co. Cork (Ó Ríordáin 1942). As mentioned above, while ringforts were generally 24–60m in diameter, most non-circular enclosures were between 50 and 70m in diameter. Ditched enclosures tend to be situated on sloping or well-drained hilly ground with good views (Stout 1997) and they are also usually found in clusters within a townland (Edwards 1990). Evidence from excavations shows that enclosing ditches were, in some cases, allowed to silt-up and had refuse deliberately dumped into them. Layers of slag were dumped into the ditch at Lisleagh, Co. Cork, for example (Monk 1995).

Ditched enclosures usually have an entrance at the southeast. This is to avoid the prevailing cold, westerly and northerly winds that the enclosure would be exposed to (Stout 1997). The entrance passage at Rath II, Ballypalady, Co. Antrim, ranged from 0.76m at the outer end to 1.5m at the inner opening, suggesting it was not intended for keeping large livestock (O'Sullivan & Nicholl 2010). Many sites, like that at Lissachiggel, Co. Louth, had either cobbles or paving stones providing a dry passage into the enclosure. These entrances were known in early Irish literature and legal sources as the 'airdrocht' and were to be kept clean (ibid.). O'Sullivan and Nicholl (ibid.) wrote that it was not unusual to see pathways laid within the interior to steer movement towards a particular direction and the upon entering the site, a person was often persuaded by laid pathways to move directly and immediately to the house doorway. The pathway was meant to be kept clean and dry, and likely ditches and gullies would function as drainage features to keep the area dry.

Early medieval houses within ditched enclosures tended to be circular or round, made of stone or post-and-wattle walls. The roofs were thatched with reeds, turf or straw. According to the eight-century law text *Críth Gablach*, a typical farmer's house was 6–8 metres in diameter. Archaeological evidence shows that the majority were 4–5 metres in diameter, and some were significantly larger, at 6–10 metres (O'Sullivan & Nicholl 2010). As pointed out by McCormick et al. (2011), because of the basket-like construction, any recuts or changes to the early medieval houses are rarely seen in the archaeological record. It was likely that the lifespan of a medieval house would have lasted for just a short period of time (20 to 30 years); with good maintenance, however, a house could have stood for 50 to 60 years (O'Sullivan & Nicholl 2010).

Associated with many enclosures and often found in their environs are fire pits, storage pits, refuse pits, cooking pits and cereal-drying kilns. O'Sullivan and Nicholl (2010) wrote that pits are one of the more enigmatic elements to be found within the enclosure and that their function can be difficult to discern. They suggest that such pits would have been used for a variety of purposes, were probably reused and cleaned-out many times and countless, no doubt, had multiple functions over their lifetime (*ibid.*). According to McCormick et al. (2011), cereal-drying kilns are generally not associated with ditched enclosures, however, there are several examples of sites with associated kilns, such as Johnstown, Co. Meath, Gortygrigane, Co. Tipperary and Camlin, Co. Tipperary.

13.4.1.2 Lime Kilns

Sixteen lime kilns (CHRs 4, 5, 7, 9, 10, 19–29) are depicted on historic mapping within the area under assessment (see Table 13.5). These largely appear on the 1839 OS map, some of which are gone by the time of the 1902 map, while others are still depicted and labelled as L.K.

Lime kilns are furnace-type structures used to produce lime by heating limestone at high temperatures of up to 1000 degrees. The process is known as quicklime or burnt lime, and the product was used in building, agriculture and related purposes. Farm lime kilns were used in the 18th/19th centuries, and these are most common in the countryside. Two types of lime kilns used for agricultural purposes can be distinguished; draw kilns and flare kilns. The former were more popular and burnt limestone in a continuous process, while the latter worked on the basis of a discontinuous batch process. The lime kilns can be between 2–4m high but can reach up to 9m in height. Improved draw lime kilns of 19th-century date had a total height of c. 8m. These were built of stone against a bank of rising ground with an opening at the front and top. While largely 18th/19th-century monuments, the burning of limestone to apply to soil was common practice between the 12th and 17th centuries on a smaller scale (O' Sullivan & Downey 2005).

13.4.1.3 Vernacular Structures

The examined historic mapping also depicts one building (CHR3) and two building clusters (CHR11, 30) on the 1839 OS map, some of which were demolished by the time of the 1902 map, that could represent houses that were abandoned following the Great Famine. Furthermore, a forge/smithy (CHR1) is depicted within the northwest corner of Fair Green (CHR2), in Nash townland. It is indicated as a horseshoe on the 1839 map and is labelled as a Smithy on the 1902 map.

The remains (surface or sub-surface) of any of the buildings depicted on the 1839 map located within the site could represent vernacular structures (see Table 13.5).

The term 'vernacular structures' is used to describe a structure built between 1650 and 1850; however, some structures of early 20th-century date can also be included. The structures represent mostly houses, usually built by the occupants with the help of family and neighbours. They were known as *ernhaus* (hearth house) and had a main cooking hearth. They were rectangular in shape, usually single-story, one room, with a loft; if more rooms were present these would be entered from adjoining rooms. Door(s) and windows were placed along the long

walls, with a fireplace usually set in the middle of the cross walls (O'Reilly 2011). Campbell (1937) identified two house types in Ireland, one with a central hearth and one with a gable heart. Vernacular structures vary regionally and locally.

While the farming landscape across Ireland was characterised by unenclosed open field systems and associated settlements in the early 17th century, during the 18th century clusters of settlements emerged known as clachans. This resulted in the enclosure of fields, with such field systems characterised by small rectangular fields (O'Sullivan & Downey 2008). Some of these clusters of vernacular buildings were labelled, such as 'Knockcarroll' in Nash townland, while others represent a concentration of buildings that could be farmyards or small settlements.

Often associated with these settlements or farmyards are wells and lime kilns. As mentioned above, a lot of lime kilns are depicted on the examined mapping. The symbols used for wells and lime kilns are somewhat similar, however, although wells are often depicted in proximity to clusters of structures that likely represent small settlements/farmyards. These could be springs feeding from waterways, while other could be stone-lined. A single mill is also depicted on the historic mapping within the study area and labelled Shannon's Mill.

13.4.2 Recorded Archaeological Monuments (RMP/SMR Sites)

There are no recorded archaeological monuments within the site. There are six monuments located within a distance of 150m from the nearest site boundary.

Most notably, the proposed MV array cabling traverses the zone of notification associated with a ringfort - rath (WX040-004----). Furthermore, a holy well (WX040-002----), a church (WX035-049001-) and a graveyard (WX035-049002-) are in proximity to the site, but separated from it via a townland boundary in the form of a tributary of the River Owenduff and a Mill Race. The locations of these monuments are recorded c. 25m, c. 50m and c. 70m from the nearest site boundary. Redundant record (WX035-086) and ringfort rath (WX040-003) are located c. 55m and c. 146m from the nearest site boundary.

In addition to the above, there are seventeen monuments located within a 1km radius but at a distance of 400m or greater from the nearest site boundary. There are six ringforts - raths (; WX040-005----; WX040-016----; WX035-048----; WX039-084---; WX040-091---; WX040-068---), a ringfort – unclassified (WX039-017----), a redundant records (WX035-047----), a ritual site – holy well (WX040-006-----), an enclosure (WX040-016001-) a Castle – unclassified (WX040-051-----), two burnt mounds (WX034-070001-, WX034-070002-), moated site (WX034-042----), church (WX035-035001-) within associated graveyard (WX035-035002-) and a field boundary (WX035-085----).

The antiquity of the redundant records (WX035-086----, WX035-047----) could not be confirmed by the Archaeological Survey of Ireland, hence these are now classed as redundant. The SMR files were requested from the National Monuments Archives (NMA). There is a record from 2006 and 2012 in relation to WX035-086----. The 2006 entry states that the monument was visible on aerial imagery taken on 19 July 2006 by Michael Moore and recorded as *enclosure, possible*, but deemed redundant by Moore in the entry from 2012 *due to the images being unclear to confirm antiquity*. There is only one entry for WX035-047---- dated 1988; there is no explanation why the monument was made redundant, it is not listed in the Record of Monuments and Places for Co. Wexford 1995 manual and is labelled/stamped as de-listed on the Wexford RMP Map (1995).

The relevant monuments located within 1km from the site boundary are listed in the table below:

Table 13.1: Record of Monuments and Places and Sites

SMR No	Monument Class	Townland	ITM Easting	ITM Northing
WX035-047----	Redundant record	NASH	677990	620747
WX035-048----	Ringfort - rath	RATHNAGEERAGH	678988	620777
WX035-049001-	Church	NASH	677470	619838
WX035-049002-	Graveyard	NASH	677470	619838
WX035-086----	Redundant record	NASH	677741	620032
WX039-017----	Ringfort - unclassified	DUNMAIN	676525	618671
WX039-084----	Ringfort - rath	DUNMAIN	676575	618410
WX040-002----	Ritual site - holy well	NASH	677464	619770
WX040-003----	Ringfort - rath	NASH	677955	619550
WX040-004----	Ringfort - rath	BALLYGARVAN	678210	619362
WX040-005----	Ringfort - rath	KILBRANEY	679666	619366
WX040-006----	Ritual site - holy well	BALLYGARVAN	679268	618828
WX040-016----	Ringfort - rath	RATHUMNEY	677213	617080
WX040-016001-	Enclosure	RATHUMNEY	677220	617030
WX040-051----	Castle - unclassified	BALLYGARVAN	678488	618637
WX040-068----	Ringfort - rath	BALLYGARVAN	678535	618375
WX040-091----	Ringfort - rath	DUNMAIN	676674	618198
WX034-070001-	Burnt mound	NASH	676416	621466
WX034-070002-	Burnt mound	NASH	676400	621498
WX034-042----	Moated site	TELLAROUGH	676528	622075
WX035-035001-	Church	CARNAGH	677608	622080
WX035-035002-	Graveyard	CARNAGH	677620	622083
WX035-085----	Field boundary	CARNAGH	677863	621845

13.4.3 National Monuments

There are no National Monuments located within the site. One, National Monument No. 229, listed as Rathumney Castle (RMP WX040-028001-) in the Ownership of the Minister (see Table 13.5 in <https://consult.wexfordcoco.ie/en/consultation/wexford-county-development-plan-2022-2028/chapter/chapter-13-heritage-and-conservation>), is located c.1.5km to the south of the site. The monument is also a Protected Structure (RPS Ref. WCC0780) listed in the *Wexford County Development Plan 2022–2028*.

13.4.4 Previous Archaeological Investigations

The site was subject to a geophysical survey (23R0080; Murphy 2025). No features of archaeological significance were identified, however, features of archaeological potential, in particular Anomalies M1–M6 (see details below) were recorded that require further assessment in the form of test trenching.

The current site was not yet subject to test trenching; however, of relevance is an assessment in the form of test trenching (13E0076; McLoughlin 2013) carried out in close proximity to the site, where an enclosure ditch with medieval pottery was identified. The details are outlined below.

13.4.4.1 Geophysical Survey 23R0080 (Murphy 2025)

The site was subject to a geophysical survey on two occasions, with both the eastern (Phase 1) and the western parcels (Phase 2) surveyed under licence 23R0080 (Figure 13.2, Appendix 13.1, and Appendix 13.3).

No clear anomalies of archaeological significance were detected; however, six potential monuments were detected. These include four anomalies recorded in the western parcel (M1–M4) and two in the eastern parcel (M5–M6).

M1–M4 in the eastern parcel include a curvilinear anomaly (M1) noted in the northeast corner of Field 7 that appears to form the southern portion of a small sub-circular enclosure or unrecorded field system; a D-shaped anomaly (M2), also in Field 7, that manifests as an enclosure, and two irregular dipolar anomalies in Field 16 (M3) and Field 1 (M4) that may represent changes in underlying geology or areas of poor drainage (with the potential to contain prehistoric burnt mounds).

M5 and M6 in the western parcel comprise one curvilinear anomaly (M5) noted in Field 3 that appears to represent an enclosure, and an oval anomaly (M6) in the west portion of Field 8, at the location of the proposed substation, possibly representing a ring-ditch or enclosure; both anomalies could also represent changes in topsoil or natural.

In addition, scattered positive responses (?Archaeology) were also recorded that might represent cut features such as pits/postholes, but could also represent iron in the topsoil, while large areas might represent large pits or spreads. The linear features (?Archaeology) that were recorded represent former field boundaries, some of which do not correspond with boundaries depicted on the mapping and could represent historic boundaries or laneways, but could also be associated with recent land use or represent wet ditches. Linear and curvilinear trends could equally be associated with access or recent land use/drainage; tentatively, a curvilinear trend in the western parcel could represent a ploughed-out ring-ditch. Areas of disturbance and geology were also recorded across the site. Some areas of disturbance correspond with features depicted on the OS maps, such as buildings, quarries and kilns. A series of parallel linear anomalies were also recorded throughout the site, these are reflective of agricultural use of the land, representing cultivation furrows.

Below are tables listing the anomalies identified in detail, with the eastern (Phase 1) and western (Phase 2) parcels detailed separately.

Table 13.2: Geophysical survey results – Western Parcel Phase 2

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
M1	?Archaeology	Enclosure ditch	Curvilinear anomaly M1 is situated in the northeast corner of Field 7 and appears to form the southern portion of a small sub-circular enclosure. It measures c. 31m east–west and c. 22m north–south to the northern limit of the survey. This monument may have been truncated, adapted by, or indeed part of the adjoining mill race that is visible on all editions of OS mapping. The anomaly lies on a bend in the mill race, at the point where it turns from a northeasterly direction to a south-southeasterly direction.
M2	?Archaeology	Enclosure ditch	A D-shaped curvilinear in Field 7 possibly represents another small enclosure. The straight side of the D-shaped enclosure runs parallel to the mill race in a southeasterly direction. It measures 32m northwest–southeast and 23m southwest–

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
			northeast. The southern portion of this anomaly falls on the same line as a recorded field boundary that is depicted on both the first edition 6-inch (1839–41) and 25-inch OS map (1902–04). This boundary is not depicted on the last Cassini edition OS map (1922–25).
M3	Trend	Underlying geology / poor drainage?	An irregular dipolar anomaly to the west of Field 16 may represent a change in underlying geology or an area of poor drainage. This anomaly should be assessed during the testing phase to determine its archaeological potential.
M4	Trend	Underlying geology / poor drainage?	An irregular dipolar anomaly to the east of Field 1 may represent a change in underlying geology or an area of poor drainage. This anomaly should be assessed during the testing phase to determine its archaeological potential.
-	?Archaeology	Pits, postholes, cut features or natural geology.	Scatter of positive anomalies that may represent cut features of archaeological significance, such as pits and postholes. They could alternatively represent natural underlying geological features or stone sockets.
-	Former boundary	Linears, former field boundaries	Linear anomalies representing former field boundaries. Some appear to represent buried ditches, while others removed field boundaries; some correspond with boundaries depicted on OS mapping.
-	Cultivation	Linears, agricultural in nature, representing cultivation furrows	A series of parallel linear anomalies was recorded throughout the site. These are mostly aligned north–south and northeast–southwest. They are agricultural in nature and represent cultivation furrows.
-	Magnetic interference/ Modern anomaly	Ground works/made-up ground and metal fencing	Areas of magnetic interference, suggesting modern anomalies.

Table 13.3: Geophysical survey results – Eastern Parcel Phase 1

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
M5	?Archaeology	Curvilinear anomaly that might represent an enclosure/ ring-ditch	Curvilinear anomaly in the north portion of Field 3, faint in nature and could represent part of a small, ploughed-out enclosure or a ring-ditch.
M6	?Archaeology	Oval anomaly that might represent an enclosure/ ring-ditch or recent land use	Oval anomaly in the west portion of Field 8, at the location of the proposed substation. It is faint in nature and could represent part of a small, ploughed-out enclosure or a ring-ditch, but could also be associated with recent land use.
-	?Archaeology	Laneways, ditches or modern drains	Linears traversing Fields 6 and 7 could represent historic laneways but could also be associated with recent land use or represent wet ditches. These do not correspond with former field boundaries/features depicted on the OS mapping.

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
-	?Archaeology	Large pits/spreads or natural geology	Large positive anomalies that might indicate large pits/spreads. The possibility that these are of natural origin cannot be excluded.
-	?Archaeology	Pits, postholes, cut features or natural geology/ iron in topsoil	Scatter of positive anomalies that may represent cut features of archaeological significance such as pits and postholes. Could alternatively represent modern iron objects within the topsoil or natural underlying geological features.
-	Trends	Curvilinear anomaly that might represent enclosure/ring-ditch; ephemeral in nature suggesting a geological origin	A faint, ephemeral curvilinear anomaly in the east portion of Field 3. It might represent the remains of a ploughed-out enclosure or ring-ditch. Due to its ephemeral nature, however, likely to be of geological origin.
-	Trends	Curvilinear and linear anomalies might be agricultural in nature	Curvilinear and linear trends, likely associated with former land use, likely agricultural in nature, might represent drainage or field access and not extend to the natural.
-	Magnetic interference/ Modern anomaly	Groundworks/ made-up and reinstated ground, some correspond with buildings, quarries and kilns depicted on OS mapping	Areas of magnetic interference, suggesting modern anomalies, some correspond with features depicted on OS mapping, such as buildings, quarries and kilns.
-	Former boundary	Linears, former field boundaries	Linear anomalies representing former field boundaries. Some appear to represent buried ditches, while others removed field boundaries; some correspond with boundaries depicted on OS mapping.
-	Cultivation	Linears, agricultural in nature, representing cultivation furrows	A series of parallel linear anomalies was recorded throughout the site. These are mostly aligned north-south and northeast-southwest and are agricultural in nature and represent cultivation furrows.
-	Natural/underlying geology	Changes in natural/ underlying geology	Areas manifesting as changes in natural and/or underlying geology.

13.4.4.2 Archaeological investigations in the environs of the site

The current site was not yet subject to test trenching; however, of relevance is an assessment in the form of test trenching carried out on a plot in proximity to the site, adjacent and to the west of the road, and east of a church (WX035-049001-) and graveyard (WX035-049002-) in Nash townland.

This test trenching included the excavation of 11 trenches under licence 13E0076 (McLoughlin 2013), with archaeological features and deposits uncovered in the majority of the excavated trenches (CHR18; Appendix 13.1, Figure 13.1). Features exposed included pits, postholes, ditches, charcoal spreads, gullies and a curvilinear ditch containing medieval pottery. A large amount of pottery was seen in the upper fill of this curvilinear ditch (C9), which was interpreted as representing either an enclosure ditch associated with the church site to the west, or part of a

large ringfort. The presence of the medieval pottery in the fill suggests it was backfilled in the medieval period. Further mitigation, in the form of excavation and preservation by record, was recommended, but the proposed development did not proceed, and the site is preserved in situ and now in use as an agricultural field.

13.4.5 Record of Protected Structures (RPS) and sites listed in the National Inventory of Architectural Heritage (NIAH)

There are no Protected Structures, as listed in the *Wexford County Development Plan 2022–2028*, located within the site, nor any sites listed in the *National Inventory of Architectural Heritage* (NIAH).

There are a number of known architectural heritage sites located in the environs of the site. These include:

- a farmhouse (RPS Ref. WCC0516) located c. 289m to the east of the site
- Dunmain House (RPS Ref. WCC0883; NIAH Reg. No. 15703938) located c.790 m to the west;
- church/chapel (RPS Ref. WCC1269; NIAH Reg. No. 15704001) located c. 320m to the south;
- Ballygarvan House (NIAH Reg. No. 15704002); located c. 930m to the south;
- a folly-like "apple barn" (RPS Ref. WCC1281; NIAH Reg. No. 15704003), which was part of the Abbey Ville estate, located c. 1m to the southeast
- Caranagh House (RPS Ref. WCC1203; NIAH Reg. No.15703504) located c. 940m to the northeast
- graveyard/cemetery (NIAH Reg. No. 15703505) located c. 850m to the northeast, that is also a monument (WX035-035002-)

13.4.6 Cartographic Sources and Aerial Imagery

Potential archaeological, architectural and cultural heritage features are often marked on historic maps, and they can provide a helpful resource in identifying sites, particularly if they no longer have any above ground remains. Unrecorded archaeological sites can also often be identified in aerial photographs as cropmarks or differential growth in a field, particularly during periods of drought, such as those experienced in the summer of 2018.

13.4.6.1 Cartographic Sources

A review of available historical mapping for the area was carried out to include The Down Survey of County Wexford (1656) and the first (surveyed 1839 – published 1841), third (surveyed 1902 – published 1904) and last, Cassini (1922–25) editions of the Ordnance Survey (OS) maps (now Tailte Éireann).

The 1656 map illustrates the site as within Owenduff Parish (Appendix 13.1, Figure 13.3). The lands are labelled as *Unforfeited Lands*; no detail is given, however it appears that the eastern parish boundary remains unchanged and is delimited by the Owenduff River. The 1811 map (Appendix 13.1, Figure 13.4) gives more detail; Nash is depicted with a T-junction shown, the road leading eastwards is not shown. Two buildings are illustrated and to the east of the junction an area is demarcated at the location of Fair Green. A Bridge is also labelled at the location of Nash Bridge and the stream feeding into the Owenduff River is shown.

For the purpose of this assessment due to level of details shown on the 1839 and 1902 maps, the site was divided into the east and west parcels as well as the substation compound and the route of the underground cable.

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East Parcel

The 1839 OS map depicts several features, including field boundaries, buildings, settlements, a mill with associated mill race and other features, kilns, wells, bridges, gravel pits/quarries, and an area labelled as Fair Green in Nash townland. Some of these are no longer depicted by the time of the 1902 OS mapping, and others are labelled with additional buildings and more details. Fair Green is shown on both OS maps.

The monument, ringfort - rath WX040-004----, is depicted on the 1839 map as consisting of a bank; the 1902 map shows it as an oval field boundary. In a similar manner, a redundant record (WX035-047----) is shown. Both the 1839 and 1902 maps depict an empty field at the location of redundant record (WX035-086----) and ringfort rath (WX040-003----).

The Church (WX035-049001-) and Graveyard (WX035-049002-) in Nash townland, along with St Colman's Well (WX040-002----), have been depicted since the 1839 map. A lime kiln is also indicated in the wall of the graveyard on the 1839 map but is no longer shown by the time of the 1902 map.

A townland stream and the Owenduff River, with several crossings over the waterways, are shown on both OS maps. These include bridges, fords/footsticks and footbridges. A Flag Ford or Footbridge (1839), later labelled as Neighbourly Bridge, is shown over Owenduff River. A mill in Ballygarvan townland, labelled Shannon's Mill, was extended with additional buildings, as shown on the 1902 map and labelled as a corn mill. Some associated features, including sluices, footstick or footbridge are also shown. The 1839 map illustrates a forge within a corner of an area labelled as Fair Green. The forge is indicated with a horseshoe symbol and labelled as Smithy on the 1902 map. Two small settlements are labelled Knockcarroll and Nash, both in Nash townland. The 1839 map also shows some single buildings and a couple of concentrations of structures that could represent farmyards. Most of the single/lone buildings appear not to be shown on the 1902 map, suggesting these were abandoned due to the Great Famine.

Some of the field boundaries depicted on the 1839 map are no longer shown on the 1902 map, while others were added. A few laneways are also shown within the site, usually following the field boundaries.

West Parcel

No buildings are shown within the site on the examined mapping. However, laneways are depicted traversing and adjacent to the site. As noted above, St Colman's Well (WX040-002----) is labelled and depicted on both the 1839 and 1902 maps and this well is connected with a channel to a stream that is also the townland boundary between Nash and Cloonagh, as depicted on the 1839 map. Similarly, both the Church (Site) (WX035-049001-) and Graveyard (WX035-049002-) are depicted and labelled to the northeast of the west parcel. Furthermore, a mill race associated with Shannon's Mill is depicted and labelled on both maps adjacent to the eastern and northern extent of the western parcel. On the 1839 map, a number of kilns are shown within and adjacent this area of the site, with only some depicted and labelled L.K by the time of the 1902 map.

Substation compound and the route of the undergrown cable

No buildings are shown at the location of the substation compound. Both roads (that the underground cable follows) are shown on the 1839 map with some houses, lime kilns and a triangulation station adjacent. The area of the compound is illustrated as consisting of a field (lined with trees along the boundary along the south and east) and minor portions of two fields. A lime kiln is depicted in an area adjacent and to the west with structures shown to the south on the 1839 and the 1902 maps. On the time of the 1839 map, the route of the cable traverses' fields in a north-south alignment as far as the road. By the time of the 1902 map, it appears the

field boundary was realigned and the southern portion of the cable route follows the boundary joining the road just to the east of the Quarry now depicted. On both the 1839 and 1902 maps, the cable route follows the roads footprint westwards and northwards at the junction. On the 1839 map a horseshoe symbol indicating a smithy is depicted within an area labelled as Fair Green. By the time of the 1902 map, more detail is given; a rectangular plot, with two smaller plots with a smithy and a well are shown within the area labelled as Fair Green. At the northmost extent of the site, the route of the cable leaves the road towards east and traverses two fields with an adjacent lime kiln shown on both the 1839 and the 1902 maps; on the latter it is depicted in the corner of the adjacent field and labelled as LK.

13.4.6.2 Aerial Imagery

A review of available aerial photography for the area was also undertaken as part of this assessment. Aerial photographs dating from 1970, from the Cambridge University Collection of Aerial Photography (CUCAP) and from between 1995 and 2018 from Tailte Éireann were assessed, along with Google Earth imagery dating between 2005 and 2023.

For the purpose of this assessment, the site was divided into the east and west parcels and the substation compound and the route of the underground cable. The CHRs, RMPs/SMRs are shown on aerial imagery. (Figure 13.7, Appendix 13.1).

East Parcel

The monument, ringfort – rath WX040-004----, appears overgrown on all available aerial imagery, largely unchanged since the 1995 aerial photograph. Some of the field boundaries depicted on the OS mapping were removed by 1995, and some of the laneways depicted previously are no longer visible, while others remain in use as farm access tracks. The settlement and the area where Shannon's Mill was depicted are now used as farmyards. The mill and associated buildings in Kilbraney are visible in the 1995 aerial photograph, with some buildings to the east of the access demolished by the time of the 1999–2003 aerial photographs. The remains of buildings depicted on the OS mapping can still be seen in the 2022 aerial photograph, albeit roofless; however, the area is overgrown so that more buildings may survive. A new house was built west of the former mill area in 2009.

The remains of the small settlement/farmyard in Nash townland, where a substation is proposed, appear to be still in use in 1995, possibly as animal sheds, with the buildings roofless and in ruins by the time of the 1999–2003 aerial image. This area can still be accessed via the laneway; however, before the 1995 aerial photograph, the portion of the laneway past the houses was removed with a field boundary added. The gravel pit in Nash townland was overgrown by the time of the 1995 aerial photograph, with some groundworks visible in the 1999–2003 aerial image. It was possibly backfilled and reinstated as a field, and a house was built on a plot adjacent and to the east by the time of the 2004–2006 aerial photograph. The river, stream and waterway sections have a broad band of trees growing along them.

Ringfort - rath WX040-003---- was identified from the 1970 Cambridge air photo (CUCAP no.:BDQ083) and a now redundant record (WX035-086----) is visible on the 2006 aerial photograph as the arc of a ditch.

West Parcel

By the time of the 1995 aerial image, some field boundaries had been removed, and other boundaries had been moved. By the 2006–2012 aerial imagery, shrubs were removed from the northwestern portion of the site, while a field in the middle, northeastern and southwestern areas was left to grow over.

Overall, based on the aerial imagery, the fields of the site are long used as arable lands, with some also for pasture. Some portions, particularly adjacent to the waterways, are overgrown

and appear rough ground. While some faint anomalies were noted on the aerial imagery these were primarily linear features corresponding with field boundaries visible on the OS maps and ploughing ridges.

Substation compound and the route of the undergrown cable

By the time of the 1995 aerial image, the substation compound is illustrated as within two fields. Buildings are apparent in the area to the south, the area adjacent and to the west appears overgrown. Some of the field boundaries depicted prior to this are no longer present, however, the cable route follows the footprint of the field boundary northwards as far as the road and is within the footprint of the road. A number of buildings can be seen along the road on the 1995 aerial image and additional buildings were added over subsequent years. The northern extent of the site (at the point where the cable leaves the road towards the east) consists of two grassed fields with the pylon visible on the 1995 image.

13.4.6.3 Aerial Imagery

A review of available aerial photography for the area was also undertaken as part of this assessment. Aerial photographs dating from 1970, from the Cambridge University Collection of Aerial Photography (CUCAP) and from between 1995 and 2018 from Tailte Éireann were assessed, along with Google Earth imagery dating between 2005 and 2023.

For the purpose of this assessment, the site was divided into the east and west parcels and the substation compound and the route of the underground cable. The CHRs, RMPs/SMRs are shown on aerial imagery (Figure 13.7, Appendix 13.1).

East Parcel

The monument, ringfort – rath WX040-004----, appears overgrown on all available aerial imagery, largely unchanged since the 1995 aerial photograph. Some of the field boundaries depicted on the OS mapping were removed by 1995, and some of the laneways depicted previously are no longer visible, while others remain in use as farm access tracks. The settlement and the area where Shannon's Mill was depicted are now used as farmyards. The mill and associated buildings in Kilbraney are visible in the 1995 aerial photograph, with some buildings to the east of the access demolished by the time of the 1999–2003 aerial photographs. The remains of buildings depicted on the OS mapping can still be seen in the 2022 aerial photograph, albeit roofless; however, the area is overgrown so that more buildings may survive. A new house was built west of the former mill area in 2009.

The remains of the small settlement/farmyard in Nash townland, where a substation is proposed, appear to be still in use in 1995, possibly as animal sheds, with the buildings roofless and in ruins by the time of the 1999–2003 aerial image. This area can still be accessed via the laneway; however, before the 1995 aerial photograph, the portion of the laneway past the houses was removed with a field boundary added. The gravel pit in Nash townland was overgrown by the time of the 1995 aerial photograph, with some groundworks visible in the 1999–2003 aerial image. It was possibly backfilled and reinstated as a field, and a house was built on a plot adjacent and to the east by the time of the 2004–2006 aerial photograph. The river, stream and waterway sections have a broad band of trees growing along them.

Ringfort - rath WX040-003---- was identified from the 1970 Cambridge air photo (CUCAP no.:BDQ083) and a now redundant record (WX035-086----) is visible on the 2006 aerial photograph as the arc of a ditch.

West Parcel

By the time of the 1995 aerial image, some field boundaries had been removed, and other boundaries had been moved. By the 2006–2012 aerial imagery, shrubs were removed from the

northwestern portion of the site, while a field in the middle, northeastern and southwestern areas was left to grow over.

Overall, based on the aerial imagery, the fields of the site are long used as arable lands, with some also for pasture. Some portions, particularly adjacent to the waterways, are overgrown and appear rough ground. While some faint anomalies were noted on the aerial imagery these were primarily linear features corresponding with field boundaries visible on the OS maps and ploughing ridges.

Substation compound and the route of the undergrown cable

By the time of the 1995 aerial image, the substation compound is illustrated as within two fields. Buildings are apparent in the area to the south, the area adjacent and to the west appears overgrown. Some of the field boundaries depicted prior to this are no longer present, however, the cable route follows the footprint of the field boundary northwards as far as the road and is within the footprint of the road. A number of buildings can be seen along the road on the 1995 aerial image and additional buildings were added over subsequent years. The northern extent of the site (at the point where the cable leaves the road towards the east) consists of two grassed fields with the pylon visible on the 1995 image.

13.4.7 Site Visit/Walkover Survey

The site was visited by archaeologists on three occasions. In 2022 and 2024 by Jeanne Rochford and Rob Breen and in September 2025 by Byron Jones, all of Archaeological Consultancy Services Unit Ltd (ACSU).

The site was found to consist of both arable and grassed fields (see Plate 1 – 8, Appendix 13.2). It is bounded by the Owenduff River along its eastern extent and is adjacent to regional roads, with local roads present within the site (see Table 13.5 for images) The field boundaries consist of streams, wet ditches and a river, as well as low hedges and mature trees. Access to the fields is mostly via farmers' gates.

The site walkovers also aimed to identify any potential cultural heritage receptors and establish if there are any surface remains of the Cultural Heritage Receptors (see Table 13.5 for images) identified during the examination of cartographic sources and aerial images. In some cases, the areas were too overgrown to verify if surface remains are present (e.g. CHR9, 10, 16, 17). In addition the presence of a post-box was recorded (see CHR30; Table 13.5).

The surface presence of some of the Cultural Heritage Receptors within the site was confirmed during the walkover surveys (CHR1, 11, 19, 22). These have been factored into this assessment. However, the importance of the potential archaeological, architectural and cultural heritage sites identified during this assessment and the site visits can only be conclusively established through further assessment in the form of test excavation.

13.4.8 Topographical Files

The Topographical Files of the National Museum of Ireland were consulted. Several artefacts are listed for the townland of Nash, as detailed in Table 13.4 below. These represent the hoard of copper objects found at Carrickshedoge (Bremer 1926).

Table 13.4: Topographical Files for the townland of Nash

Reg No.	Simple Name	Material	Find Place	Townland	Habitat	Details
RIA1926:7	Axehead	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Flat copper axehead

Reg No.	Simple Name	Material	Find Place	Townland	Habitat	Details
RIA1926:8	Axehead	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Flat copper axehead
RIA1926:9	Axehead	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Flat copper axehead
RIA1926:10	Ingot	Copper	Carrickshedoge, 4 miles S.E. of New Ross	Nash	B16:15	Copper ingot
RIA1926:11	Cake	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Copper cake fragment
RIA1926:12	Cake	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Copper cake fragment
RIA1926:13	Cake	Copper	Carrickshedoge, 4 miles S.E New Ross	Nash	B16:15	Copper cake fragment

13.4.9 Previously Unrecorded Sites/Cultural Heritage Receptors

Based on the information collated on known sites of archaeological significance, alongside previously unrecorded sites identified through historic mapping, aerial imagery, a site visit and desk-based research, there are a total of 37 Cultural Heritage Receptors (CHRs) identified within and immediately adjacent to the site

Five CHRs are recorded archaeological sites. The proposed MV cable (between array area B and A) traverses the zone of notification associated with a ringfort - rath (WX040-004----; CHR 13). The other four are located outside of the red line boundary; a ritual site – holy well (WX040-002----; CHR17) and its associated church (WX035-049001-) and graveyard (WX035-049002-), both recorded as CHR31, a ringfort - rath (WX004-003----; CHR33), and a Redundant record (WX035-086----; CHR34).

In addition, excavation under licence 13E0076 (McLoughlin 2013) of the field adjacent and to the east of the above graveyard (WX035-049002-; CHR31) identified previously unknown archaeological features including pits, postholes, ditches, charcoal deposits, gullies and a curvilinear ditch with medieval pottery; the curvilinear ditch was interpreted as representing either an enclosure associated with the church site to the west or a part of a large ringfort (see Section 13.4.4). This site is recorded as CHR18.

Twenty-one CHRs (or parts thereof) are previously unrecorded sites depicted within the site on Ordnance Survey mapping: an area labelled Fair Green (CHR2), townland boundaries (CHR12, parts of CHR8 and CHR14), one of which (CHR8) incorporates a bridge known as Neighbourly Bridge, buildings (CHR3, CHR11, CHR30), lime kilns (CHR4, CHR5, CHR7, CHR9, CHR10, CHR19, CHR20, CHR21, CHR22, CHR23 and part of CHR27), wells (part of CHR1 and CHR11), a mill race (CHR16), a triangulation station (CHR6), and a small bridge/platform over a stream (CHR15).

Eleven CHRs (or parts thereof) are previously unrecorded sites located directly adjacent to the site, and also depicted on Ordnance Survey mapping. These include a smithy (CHR1) recorded within Fair Green on a plot adjacent to the site (see well as part of CHR1 above), a mill labelled Shannon's Mill (CHR32) is associated with the mill race detailed above, Nash Bridge (CHR14), and eight lime kilns (CHR24–CHR29, CHR35–36), one of which (CHR27) is partly within the site (see above) as well as a triangulation station (CHR37).

Below is a table listing all the CHRs recorded within, adjacent and in immediate proximity to the site:

Table 13.5: Cultural Heritage Receptors

CHR No.	Type	Description	ITM
1	Smithy (non-designated)	Depicted in the northwest corner of the field labelled Fair Green with a symbol of a horseshoe on the 1839 map. By the 1902 map a number of buildings are shown with a well, all within a plot and labelled as a smithy.	677560 619950
			
2	Fair Green (non-designated)	Labelled as Fair Green since the 1839 map. By 1902 a path traverses the field. A Fair Green is a designated area, an open space/field or common area used for markets, livestock fairs, fairs, gatherings/community events. The area forms a part of Fields 4 and 5 subject to geophysical survey, with a trend and magnetic disturbance recorded.	677630, 619888
	No surface remains present. A field.		
3	Structure (non-designated)	An irregular structure/building depicted on the 1839 map, no longer shown by the 1902 map. The geophysical survey detected remains of the associated former plot boundaries associated with the building.	677705, 619898
	No surface remains present.		
4	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. It appears it was used as a benchmark (B.M. 205 3). A magnetic disturbance in the northwest corner of the field was recorded during the geophysical survey.	677689 619971
	No surface remains present.		
5	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map, with a quarry depicted, likely destroying the kiln. The area was not suitable for geophysical survey.	678049 620082
	No surface remains present.		

CHR No.	Type	Description	ITM
6	Triangulation station (non-designated)	Triangulation station depicted on the 1839, no longer shown by the 1902 map, with quarry depicted to the north, likely removing the station. The area was not suitable for geophysical survey.	678075 620037
	No surface remains present.		
7	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. The area was not suitable for geophysical survey.	678586, 619990
	No surface remains present.		
8	Bridge/ Townland boundary (non-designated)	Townland and parish boundary, labelled Flag Ford or Foot Bridge on the 1839 map, over the Owenduff River; the townland boundary between Nash and Kilbraney also the parish boundary. Labelled Neighbourly Bridge on the 1902 map.	678808 619970
			
9	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. Located in the southwest portion of the field, on the north side of the access road. A positive anomaly corresponding with the location of the kiln visible on the geophysical greyscale.	678065 619696
	Possible surface remains present. Area overgrown.		

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CHR No.	Type	Description	ITM
			
10	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. Located on a field boundary, on an access road bend.	678197 619687
	No surface remains apparent. Area overgrown.		
11	Cluster of Structures (non-designated)	The 1839 map shows a cluster of three rectangular buildings with a well and access road depicted. By the 1902 map, a number of buildings were added and a well is shown. The area is overgrown.	678265 619563
	A series of historic farm buildings, including gates. 		
12	Townland boundary	Townland boundary between Nash and Ballygarvan. Tributary to the Owenduff River.	678413 619471
	Heavily overgrown area.		

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CHR No.	Type	Description	ITM
			
13	Ringfort - rath (WX040-004) (designated)	Archaeological monument listed in the Sites and Monuments Record. Depicted on both maps. Defined by an earthen bank. The geophysical survey did not detect any anomalies of archaeological significance. A section of MV cabling is proposed at its northwestern extent.	678210 619362
	Ringfort -rath overgrown with trees. 		
14	Bridge (non-designated)	Nash Bridge depicted and labelled on both the 1839 and 1902 map. It appears it was used as a benchmark (B.M. 135 8). Townland boundary between Nash, Ballygarvan and Cloonagh.	677664 619454
	Double arched stone bridge, ivy-clad parapets, original foundation on the north end. 		
15	Bridge (non-designated)	Small platform bridge over a stream.	677660 619358
	Concrete platform over a wet area.		
16	Mill race (non-designated)	Mill race depicted and labelled on the 1839 and 1902 maps associated with Shannon's Mill (CHR32) to the east.	677545 619497

CHR No.	Type	Description	ITM
	Area heavily overgrown.		
17	Ritual site – holy well WX040-002 (designated)	Archaeological monument listed in the Sites and Monuments Record. Depicted on both the 1839 and 1902 mapping and labelled as St Coleman's Well. Shown as fed by a stream to the west. Recorded as located within the northeast portion of the field, it could not be located during the site visit in 1988, and there was no record of veneration. Likely associated with graveyard and church (WX035-0490001; WX035-0490002; CHR31)	677464 619770
	Heavily overgrown area. Site could not be located.		
18	Enclosure and medieval archaeological activity (non-designated)	Archaeological activity was identified during test trenching under licence 13E0076 to the east of the church and graveyard (CHR31). Features exposed included pits, postholes, ditches, spreads and gullies. One of the ditches was interpreted as an enclosure ditch either associated with the church and graveyard or a ringfort.	677515 619855
	No surface remains present. Now a field.		
19	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown adjacent to and north of an access road to a former farmyard. In an overgrown area, this portion of the field was not suitable for geophysical survey.	677435 619363
	Remains of a lime kiln in the field boundary present.		
			
20	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown at a junction and adjacent to and north and west of an access road.	677151 618975
	No surface remains apparent. Area overgrown.		

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CHR No.	Type	Description	ITM
21	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map, but a building is illustrated across the road. The kiln is illustrated to the east of the access road at a bend.	677337 618990
	No surface remains apparent. Area overgrown.		
22	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown adjacent to and east of an access road.	677435 618719
	A stone wall recorded at the location, could represent remains of the kiln. 		
23	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown adjacent to a field boundary with a slight buckle in the boundary ditch at its location visible up until the 1996–2000 aerial image.	677370 618423
	No surface remains apparent. Area overgrown. 		
24	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. Illustrated outside of the site, to the east of the access road where a slight buckle in the road is visible.	677480 618333
	No surface remains apparent.		
25	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown outside and to the east of the access road, a house was built by the time of the 2006–2012 aerial image.	677493 618490

CHR No.	Type	Description	ITM
	No surface remains apparent. Modern building at the location.		
26	Building and a Lime Kiln (non-designated)	A small farmyard and a lime kiln depicted on the 1839 map. Only one building shown by the 1902 map, kiln no longer depicted. Kiln to the east of the access road, building to the west.	677365 618911
	No surface remains of the kiln, a building in ruin, present. Outside of the site.		
			
27	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. Outside of the site. Based on the 1839 map, it appears to have been built into the wall of the graveyard (CHR31).	677450 619805
	The site could not be located. Area overgrown.		
28	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, no longer shown by the 1902 map. Depicted to the west of the access road.	677372 619974
	No surface remains of the kiln apparent.		
29	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Shown outside and to the south an access road.	677630 619660
	No surface remains of the kiln apparent.		
30	Cluster of Structures (non-designated)	The 1839 map shows two buildings, with additional buildings added by the 1902 map. The area is now a part of a larger modern farmyard.	677530 619950
	Historic farmyard, white washed structures, now outbuildings, with stone arch doors, a weather vane .		

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CHR No.	Type	Description	ITM
		A Victorian post-box set in the wall of one of the buildings was identified during site visit. A plaque on a plinth with the placename Nash written and an anvil symbol.   	
31	Church (WX035-049001) and Graveyard (WX035-049002) (designated)	Archaeological monuments listed in the Sites and Monuments Record. Depicted on both the 1839 and 1902 mapping and labelled. Located outside of the site. Archaeological investigations 13E0076 to the east of the graveyard identified	677470 619838

CHR No.	Type	Description	ITM
		the presence of a ditch, indicating a possible associated enclosure (see CHR18).	
	Graveyard with associated access, gated.		
			
32	Mill (non-designated)	Shannon's Mill complex is depicted on the 1839 map with three buildings and an associated mill race (CHR16) to the south of a tributary to the Owenduff River. Additional buildings shown by the 1902 map, with the mill labelled as 'corn'. Now a part of a farmyard.	678070 619430
	The site is a farmyard. Not within the site.		
33	Ringfort-rath WX040-003 (designated)	Archaeological monument listed in the Sites and Monuments Record. Not depicted on the examined mapping. Visible as a faint cropmark enclosure.	677955 619550
	No surface remains apparent. Grassed field.		
34	Redundant record WX035-086 (non-designated)	Archaeological monument listed in the Sites and Monuments Record, now redundant record located outside of the site. Not depicted on the cartographic sources, but visible as an arc on the 2006 aerial imagery.	677741 620032
	No surface remains apparent. Grassed field.		
35	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, labelled L.K by the 1902 map. Near Pylon, corner of a field	677090, 621353
	No surface remains apparent. Area overgrown.		

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CHR No.	Type	Description	ITM
36	Lime Kiln (non-designated)	Lime kiln depicted on the 1839 map, not shown on the 1902 map, adjacent and west of the road	676977, 621115
	No surface remains apparent.		
37	Triangulation station (non-designated)	Triangulation station depicted on the 1839 map illustrated on the western side of the road, appears to be on a field boundary further west on the 1902 map	677024, 621028
	No surface remains apparent.		

13.5 Characteristics of the Proposed Project

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Project. The information presented is informed by the project design, but it is not a complete description of the Proposed Project. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Project, please refer to Chapter 5 (Description of Development) of the EIA Report. Chapter 5 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant documents in order to define the Proposed Project.

The effect on archaeological and cultural heritage will be during the construction stage. The main source of archaeological effects will be as a result of the groundworks associated with the construction. The groundworks have the potential to impact on both known archaeological features present within the site and any unknown archaeological features that might be present within the site if not appropriately mitigated. If appropriately mitigated at the pre-construction stage there will be no effects during the operational phase.

13.6 Assessment of Potential Effects of the Proposed Project

13.6.1 Do Nothing

In the event that the Proposed Project does not proceed, there will be no disturbance to archaeological features, and the present baselines will remain.

13.6.2 Archaeological Heritage sites

Designated heritage

There will be no direct effects on recorded archaeological monuments. There are no monuments, as listed in the Record of Monuments and Places (RMP) or in the Sites and Monument Record (SMR), located within the site. However, the proposed (underground) MV cable route traverses the zone of notification associated with RMP ringfort – rath WX040-004---- (CHR13), with an indirect, negligible effect on the monument predicted due to the location of the cable trench away from the monument and the presence of an already existing farmers' lane adjacent to the monument.

Non-designated heritage

A potential direct effect on the archaeological resource lies in the uncovering of sub-surface archaeological features during groundworks associated with the Proposed Project and related infrastructure within all undisturbed areas of the site.

The site was subject to a geophysical survey (23R0080; Murphy 2025). While no clear anomalies of archaeological significance were identified, anomalies interpreted as potential monuments (M1–M6) and other anomalies of archaeological potential were recorded and require further assessment.

Should previously unknown archaeological features be present within the site, the Proposed Project will have a direct, negative, permanent and profound or very significant effect on such remains.

13.6.3 Architectural and Cultural Heritage

Designated heritage

There will be no effects, direct or indirect, on recorded architectural heritage as no Protected Structures or sites listed within the National Inventory of Architectural Heritage (NIAH) are located within the site.

Non-designated heritage

Cultural Heritage Receptors (CHR) were identified within and adjacent to the site; these include features depicted on the examined Ordnance Survey mapping, aerial imagery, and as a result of archaeological investigations.

CHRs located within the site include structures that could represent vernacular buildings with associated wells, lime kilns, an area labelled as Fair Green, townland boundaries, a mill race, Neighbourly bridge, and a triangulation station, some of which are depicted since the 1839 map; some of these have no surface expression.

The Proposed Project will have a direct, negative, permanent and profound effect on any upstanding remains of any of the Cultural Heritage Receptors present within the site and any structures identified. Furthermore, should any previously unknown cultural heritage features be present within the site, including those associated with the potential vernacular buildings, kilns and townland boundaries, the Proposed Project will have a direct, negative, permanent and profound or very significant effect on such remains.

13.6.4 Indirect Effects

Indirect effects are those whereby the Proposed Project may have a negative (or positive) effect on the wider archaeological landscape or surrounding architectural and cultural heritage. Indirect effects may include a visual impact on the surrounding archaeological and/or architectural landscape.

The introduction of the Proposed Project to the area will result in no effect on the setting of any Protected Structures as none are present within the site, however the proposed MV cable route traverses the zone of notification associated with a Recorded Monument, a ringfort - rath (WX040-004----; CHR13); however, following the implementation of archaeological mitigation measures and on the completion of the construction phase, the ground will be reinstated, hence there will be no indirect/visual effect.

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13.6.5 Operational Phase

The effect on archaeological and architectural heritage will need to be mitigated prior to the construction phase.

There will be no effect on archaeological and architectural heritage during the operational phase.

13.7 Cumulative Effects

Cumulative effects include the combined effects of multiple developments or activities on a range of receptors, in this case, archaeological monuments and architectural/cultural heritage sites. The potential future proposals in the immediate environs of the site were considered.

The potential future proposals for the lands within the site include the potential to develop an extension to the BESS compound or solar array, with an associated AIS plant/equipment and control building in the undeveloped AIS compound as well as the potential future expansion of land adjacent, both subject to separate planning to follow within three years of a grant of permission for Shelburne Energy Farm.

The projects have the potential to impact on unknown archaeological heritage if present.

In the event of planning for the above projects being consented, all previously identified archaeology common to both the Proposed Project and an extension of the BESS compound or solar array with an associated AIS plant/equipment and control building in the undeveloped AIS compound as identified in this EIAR will have been archaeologically resolved.

The potential future expansion of land adjacent will be subject to archaeological assessment (geophysical survey and test trenching), with any identified archaeology mitigated as a part of the planning process and in consultation with the National Monument Service.

The cumulative effects of the Proposed Project and any potential future project listed above is likely to impact on the landscape character of the surrounding area, which is predominantly rural, pastoral and agricultural. The setting of cultural heritage assets is likely to be indirectly impacted by the construction and indirect impacts will occur.

13.8 Mitigation Measures

13.8.1 Archaeological Heritage

A potential direct effect on previously unknown archaeological heritage lies in the uncovering of sub-surface remains. Accordingly, the following mitigation measures will be carried out subject to the approval of the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH), and further mitigation may be sought by the NMS:

- Archaeological test trenching will be carried out of all undisturbed areas of the site prior to any groundworks commencing and will be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. The trenches will be positioned to target anomalies identified during the geophysical survey (in particular Anomalies M1–M6) and the locations of the relevant CHR sites with no surface expression present that are to be impacted by the proposed works. This test trenching will also include more general testing within the footprint of the Proposed Project (substation, roads, cables, temporary construction compounds, etc.), with additional test trenches excavated within areas that were not subject to geophysical survey. If archaeological features or deposits are exposed, these shall be sufficiently sectioned in order to assess their extent, nature and significance. Once test trenching is complete, further mitigation may include preservation in situ (avoidance),

excavation (preservation by record) and/or monitoring of topsoil stripping by a suitably qualified archaeologist.

- Should any archaeological features, deposits or artefacts be identified during the construction phase of the development, works in that area should be halted and the appropriate authorities informed. The archaeological remains will be preserved *in situ* or by record (excavation) following consultation with the National Monuments Service. Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site that will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place.
- A report is required to be compiled on completion of any archaeological excavation and will be submitted to the relevant authorities.

13.8.2 Architectural and Cultural Heritage

The predicted effects on the known architectural heritage are regarded as being none; no effects on Protected Structures (RPS) or sites in the National Inventory of Architectural Heritage (NIAH) were identified, and no indirect or visual effects on the nearest such site outside the Proposed Project site boundary were noted.

However, the presence of possible vernacular structures with associated wells, lime kilns, Neighbourly Bridge, and townland boundaries depicted since the 1839 OS map, was noted within the site.

Potential direct effects on previously unknown architectural/cultural heritage were therefore identified, and the following mitigation measures will be carried out:

- Should any upstanding remains of the possible vernacular buildings, currently obscured by the overgrowth, be identified, as well as lime kilns and wells across the site, they should be visually assessed and photographed by an archaeologist with built-heritage experience prior to removal. If no above ground remains survive, archaeological test trenching should target this area to identify if there are any sub-surface remains of the site/CHR. This should be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH.
- Should the townland boundaries be impacted, a written and photographic record of the sections to be removed shall be carried out with waded or dive surveys (whichever is applicable) of any crossings of the watercourses proposed.
- The sub-surface remains of features associated with the possible vernacular buildings, such as wells or plot boundaries, may also be present across the site. Accordingly, the archaeological test trenching shall also target such features.

13.9 Residual Effects

The residual impacts are likely to be neutral and none to imperceptible if the mitigation measures are implemented. The table below summarises the residual effects of the Proposed Project on the archaeological, architectural and cultural heritage landscape. Residual impacts are defined as the overall effect of the development on archaeology, architectural and cultural heritage, on the basis of implementing the mitigation measures outlined in this report.

Table 13.6: Residual Effects of the Proposed Project

Potential Effects	Mitigation Strategy	Residual Impacts
Construction Effects		

Potential Effects	Mitigation Strategy	Residual Impacts
Effects on Recorded Monuments - none	No direct effect, as no Recorded Monuments within the site. Indirect visual effect on WX040-004---- however, the site is already compromised with farmer's lane present along the edge of the monument.	None
Effects on previously unknown archaeological, architectural and cultural heritage sites – Overgrowth clearance and topsoil removal associated with development groundworks and service trenches, etc.	Assessment and photographic survey if any upstanding remains of possible vernacular structures, wells, kilns are present when area is cleared of overgrowth. Archaeological test trenching, including targeting geophysical survey anomalies and features identified on historical mapping/CHRs with no surface expression to be impacted. Consultation with the Licensing Section of the National Monuments Service should be undertaken if archaeological sites or features are uncovered. Excavation and recording of any archaeological features identified, thus preserving them by record.	None
Effects on Protected Structures - none	None	None
Effect on townland boundaries/watercourses	Waded or dive survey (whichever is applicable) of any water courses that are also townland boundaries to be carried out under licence.	None
Operational Effects		
None	None	None

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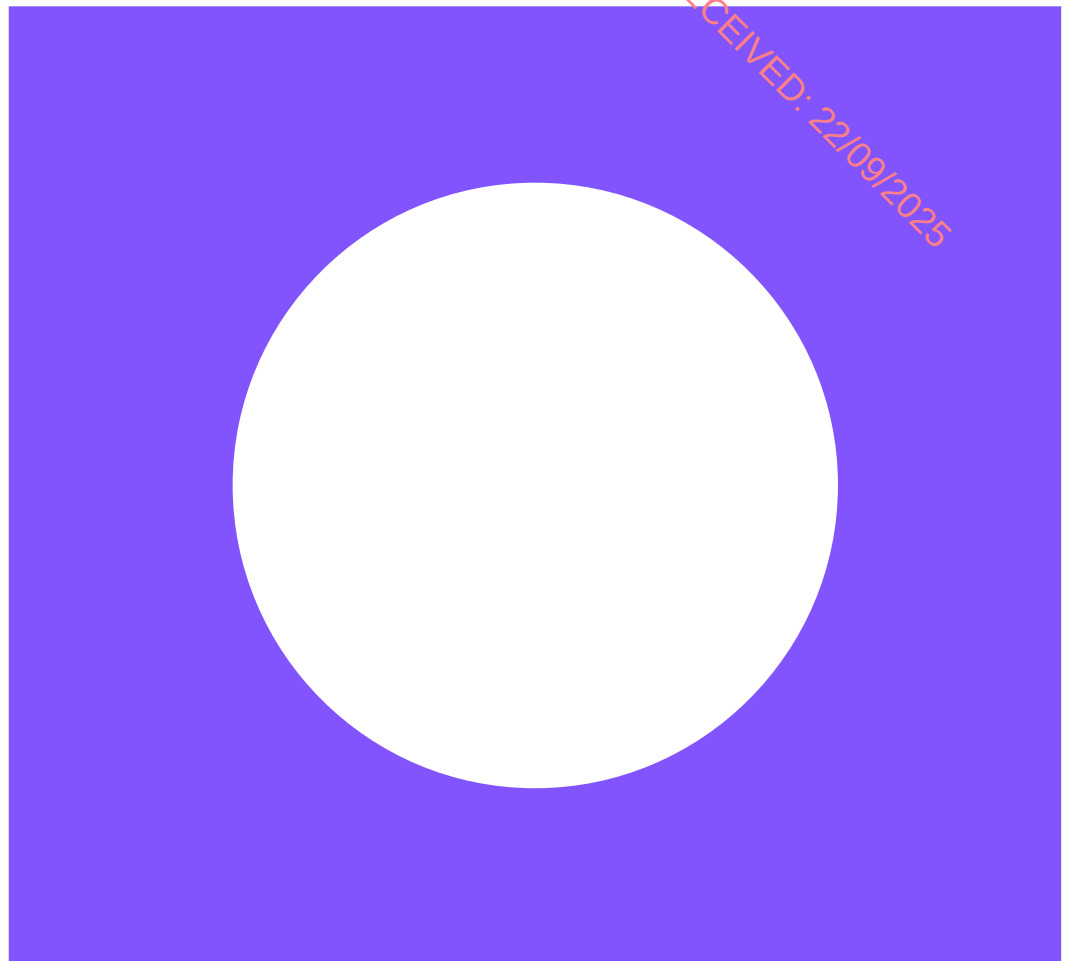
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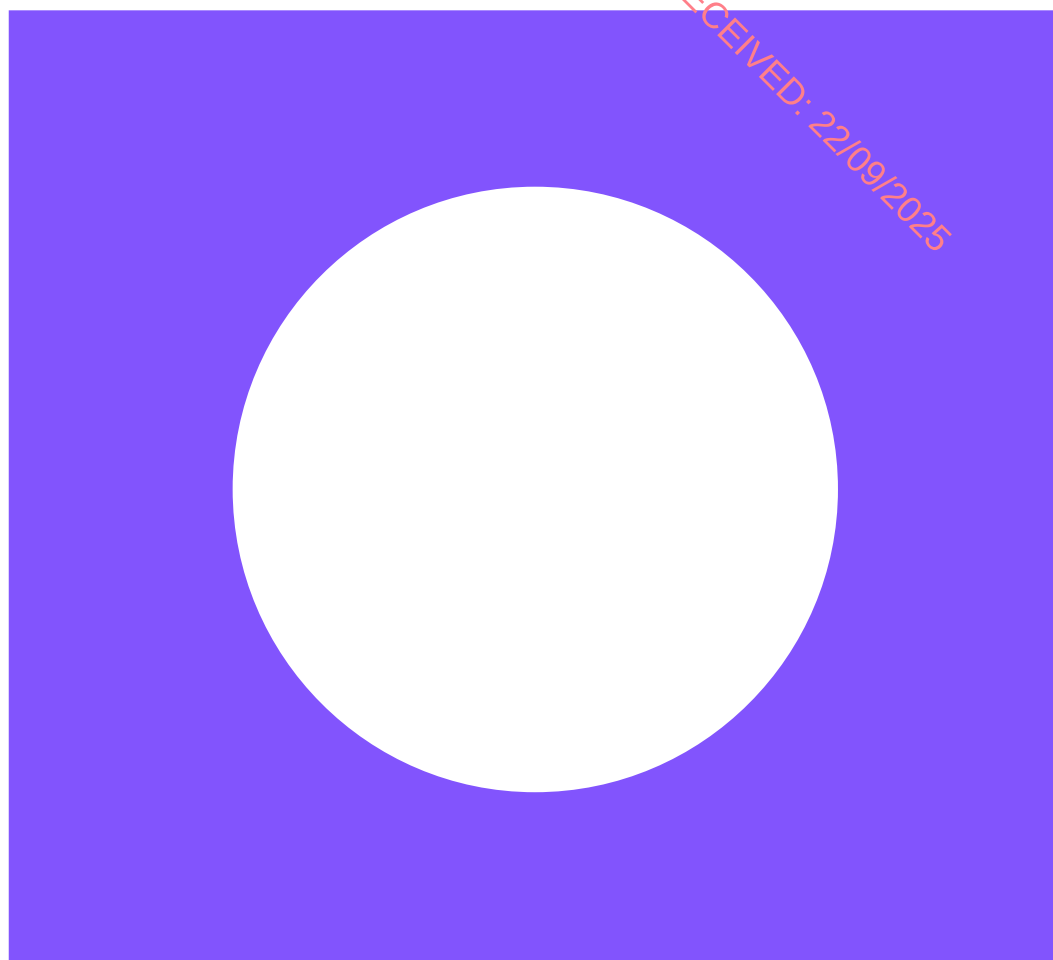
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 14 Roads, Traffic and Transportation

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14 Roads, Traffic and Transportation

14.1 Introduction

This chapter of the EIAR presents an assessment of the likely roads, traffic and transportation effects of the Proposed Project as described in Chapter 5.

This chapter sets out the existing conditions of the receiving environment and details the traffic that is likely to be generated during the construction phase of the Proposed Project, including the movements of construction materials, equipment and personnel to and from site. The assessment considers the effects upon the local, regional and national road network, and identifies measures to reduce network disruption.

Potential roads, traffic and transportation related environmental effects during the *operational* phase of the Proposed Project have also been considered. Due to the negligible volume of road traffic associated with the operation of the Proposed Project, **no significant effects** are anticipated as a result. Consistent with advice set out in Section 2 of the *Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines* (May 2014)¹, a full Traffic and Transport Assessment (TTA) is therefore not warranted in respect of the operational phase.

Cumulative effects associated with committed projects which are likely to generate traffic movements on the public road sections within the Proposed Project study area at the same time as traffic generated by the Proposed Project have also been assessed.

A Workplace Travel Plan is not considered necessary in support of the Proposed Project due to the relatively low number of construction phase personnel (expected to peak at approximately 213 people a day) accessing the site.

14.2 Policy and Guidance

Policies and guidance documents relevant to the assessment of roads, traffic and transportation effects of the Proposed Project are set out in this section.

14.2.1 Policy

Table 14.1 provides a summary of the policies relevant this roads, traffic and transportation Chapter of the EIAR.

Table 14.1: Relevant Roads & Traffic Policies

Document Title	Source and Year	Policy Detail	Relevance to Assessment
Wexford County Council Development Plan (2022 – 2028)	Wexford County Council website, 2022	The Wexford County Development Plan 2022-28 (WCDP 22-28) sets out the strategy that will inform and guide the development of the county over the next six years. The following policies/objectives are of direct relevance: Objective CA01 – “To ensure that the spatial planning of County Wexford provides for a county that is resilient to climate change, encourages	These policies are integrally relevant to the assessment process and have been duly considered unless stated otherwise.

¹ Transport Infrastructure Ireland | Traffic and Transport Assessment Guidelines | PE-PDV 02405 (Released May 2014) available at: <https://cdn.tii.ie/publications/PE-PDV-02045-01.pdf>

Document Title	Source and Year	Policy Detail	Relevance to Assessment
		development along existing transport corridors, enables the decarbonisation of the county's economy and reduces the county's carbon footprint in support of national targets for climate mitigation and adaptation objectives as well as targets for greenhouse gas emissions reductions." Objective CA10 – "To implement, through the County Development Plan and future local areas plans, sustainable settlement and transportation strategies in urban and rural areas including measures to reduce energy demand in response to the likelihood of increases in energy and other costs due to long-term decline in non-renewable resources, reduce anthropogenic greenhouse gas emissions, and address the necessity of adaptation to climate change in particular, having regard to the location, layout and design of new development." Objective CA17 – "To support decarbonisation in the transport sector by facilitating initiatives that promote the use of clean generated electricity biogas, hydrogen and other non-fossil fuels for private and public transportation and provide clean energy and lower carbon fuelling and electric vehicle charging stations and infrastructure at appropriate locations including consideration of electric, hydrogen, compressed natural gas CNG)/biogas." Chapter 8 of the WCDP 2022-2028 details the Transportation Strategy for Wexford County and includes a number of relevant policies/objectives.	
Wexford County Council Local Authority Climate Action Plan 2024 - 2029	Wexford County Council website, 2024	Wexford County Council's Climate Action Plan 2024–2029 outlines a strategic framework to achieve a 51% reduction in greenhouse gas (GHG) emissions by 2030, in line with Ireland's national climate targets. Transport is a major focus area for mitigation efforts. Key actions include sustainable travel initiatives/promotion and Modal Shift.	These policies are integrally relevant to the assessment process and have been duly considered unless stated otherwise
Project Ireland 2040	Government of Ireland website, 2019	The National Development Plan 2021-2030, which makes up part of Project Ireland 2040, includes the Irish Government's strategy for sustainable mobility. Geographically the relevant area is the South-East (Southern Regional Assembly) and is composed of several National Strategic Outcomes (NSO's).	These policies are integrally relevant to the assessment process and have been duly considered unless stated otherwise

Source: Wexford County Council and Government of Ireland

14.2.2 Guidance

This assessment has been carried out in accordance with the principles contained within the following key documents:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency (EPA) (2022)
- Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland (TII) (2014)
- The Institute of Environmental Management and Assessment (IEMA) Guidelines Environmental Assessment of Traffic and Movement (2023)

- Rural Road Link Design, (DN-GEO-03031), TII Publications, TII (2017)²

The *IEMA Guidelines* are intended for the assessment of the effect of road traffic associated with new developments. It is common and established practice that they are applied to energy-related developments and due to the absence of local specific guidance, these guidelines are defined as suitable to assess the construction and operational phases of the Proposed Project.

A brief overview of core guidance documents used for this assessment is summarised in Table 14.2.

Table 14.2: Core Guidance Summary

Document Title	Source & Year	Guidance Summary
Guidelines on the Information to be Contained in Environmental Impact Assessment Reports	Environmental Protection Agency (EPA) (2022)	These guidelines provide advice of best practice, principles and practice of developing an EIAR. Specific reference to transport assessment includes: “Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure.” & “The provision of new access facilities (e.g. links to motorways) or the upgrading of existing facilities (e.g. road widths, bridges and junctions) carried out by other parties can give rise to significant environmental effects”. The importance of a Construction Management Plan is acknowledged in this document. These are often provided to supplement the project description and to set out specific details of the construction plan. While inclusion of full details may not be practicable at pre-consent stage, it should set out the environmental envelope within which the project will be built, including working areas, hours of work, principal construction methods and phases, volumes of materials, traffic and environmental controls.
Traffic and Transport Assessment Guidelines	Transport Infrastructure Ireland (TII) (2014)	The guidelines provide guidance for scoping and developing traffic and transport assessment requirements to support development proposals. The guidelines outline the need for assessment of public transport, walking and cycling networks, rather than singularly focussing on the road network. The focus of these guidelines relates to operational traffic aspects.
The Institute of Environmental Management and Assessment Guidelines: Environmental Assessment of Traffic & Movement	The Institute of Environmental Management and Assessment (IEMA) (2023)	The guidelines provide internationally referable guidance specific to best practice in transport Environmental Impact Assessment (EIA) process and practice.
Rural Road Link Design, (DN-GEO-03031)	TII Publications (2017)	The TII document provides guidance for assessing rural road capacities.

Source: Varies by guidance document.

14.3 Methodology

14.3.1 Approach to Data Collection

A desktop study was undertaken to review likely construction traffic routes and to identify constraints and for any potentially sensitive locations i.e., locations which are likely to be more vulnerable to change in traffic flow or profile, e.g., collision clusters, high footfall areas, and/or areas in close proximity to a school.

Data sources for the desktop study include:

- Automatic Traffic Counts (ATC) commissioned by Mott MacDonald and undertaken by Idaso between 17 - 23 October 2024 and 2 – 8 December 2024

² Rural Road Link Design (DN-GEO-03031) 2023 is the most recent TII publication however it does not include rural road capacities therefore the 2017 revision has been referenced in this Chapter.

- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2021, TII
- TII Traffic Count Data Portal (www.trafficdata.tii.ie)

Data relating to Personal Injury Collisions (PIC) was sought from the Road Safety Authority (RSA) website. However, it is understood that the RSA is in the process of reviewing its collision data sharing policies and procedure and therefore data cannot be shared until this review is complete³.

14.3.2 Approach to Impact Assessment

Predicted construction vehicle movements have been compared to baseline traffic flows to identify if there are likely to be periods where the increase in traffic volume, either all traffic or specifically heavy goods vehicle (HGV) traffic, exceed standard thresholds. Such additional traffic has potential to cause detrimental effects, for example, on driver delay, road safety or community (pedestrian delay, non-motorised user (NMU) amenity, fear and intimidation).

14.3.2.1 Significance

The *IEMA Guidelines (IEMA 2023)* infer two-fold rules that can be used to determine both the scale and extent of the assessment of road traffic as a screening process⁴:

- Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%).
- Rule 2 – Include highway links of high sensitivity where traffic flows have increased by 10% or more

Highway links, in this instance, refer to a section of the road network between two given points. Sensitivity is defined within the *IEMA Guidelines* as any “link or location where it is felt specific environmental or population sensitivities may occur”⁵. While this will vary depending upon the specific receptor, this could – for example – refer to highway links where there are high concentrations of locations such as hospitals, schools or tourist attractions that have the potential to be impacted by changes in traffic flows.

It is acknowledged by the *IEMA Guidelines* that daily variation can vary +/- 10%. Therefore, it is assumed that projected changes in traffic below 10% means no discernible environmental impact.

Where the predicted increase in traffic volume (whether general or HGV) falls short of these thresholds, the significance of the effects can be termed as **not significant**. This means that further assessment is not warranted. Consequently, where the predicted traffic flow increase exceeds thresholds, the effects are considered to be potentially **significant** and accordingly, are assessed in greater detail.

The assessment has clearly identified transport routes which are to be used in connection with the Proposed Project. Quantitative assessments have been undertaken alongside the application of professional judgement to determine whether or not the effects are considered to be of significance. Based on the Rule 1 and 2 of the *IEMA Guidelines*, the predicted significance of the effect was determined considering both the sensitivity of the receiving environment and the magnitude of change against the baseline. As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related

³ Road Safety Authority (RSA) | Road Traffic Collision Data Site (Last Accessed on 19 August 2025) available at: <https://www.rsa.ie/road-safety/statistics/road-traffic-collision-data>

⁴ IMEA Guidelines 2023 | Pg11 - para.2.16-2.21 <https://www.iema.net/media/5mrmquib/iema-report-environmental-assessment-of-traffic-and-movement-rev07-july-2023.pdf>

⁵ eiareiar3 | Pg12 - para 2.21

effects are set out below in Table 14.3. It should be noted that the assessment considers the effects of the % increase in general traffic (HGV + Light Goods Vehicles (LGV) and cars) and also % increase in HGV traffic only based on related baseline traffic flows e.g., % increase in HGVs from existing HGV baseline flow.

The study area is predominately rural in context, featuring dispersed residential properties, and agricultural buildings and land. Therefore the 30% significance threshold has been applied in view of Rule 1 of the *IEMA Guidelines* as set out in Table 14.3.

The thresholds shown in Table 14.3 have been developed based upon the Rule 1 criteria above, as well as the consideration that Major and Moderate effects are significant in the context of *Environmental Protection Agency (EPA) Guidelines*.

Table 14.3: IEMA Guidelines – Effect Significance Matrix

Significance of Effect	Rule 1
Major (Significant)	Traffic flow change is greater than or equal to 60%
Moderate (Significant)	Traffic flow change is greater than or equal to 30% and less than 60%
Minor (Not Significant)	Traffic flow change is greater than or equal to 5% and less than 30%
None (Not Significant)	Traffic flow change is less than 5%

Source: IEMA (2023)

The guidance above does not define thresholds to determine significance associated with driver delay and accordingly, professional judgement has been applied. For driver delay, using terminology outlined for effect significance in Table 14.3, a similar approach has been used, with quantified thresholds (which have been previously and recently utilised to enable assessment of energy projects in Ireland, and importantly, accepted by reviewing authorities) defined and applied as shown in Table 14.4.

Table 14.4: Driver Delay Effect Significance Matrix

Significance of Effect	Increase in Journey Time
Major (Significant)	16 – 20 minutes
Moderate (Significant)	11 – 15 minutes
Minor (Not Significant)	6 – 10 minutes
None (Not Significant)	0 – 5 minutes

Source: Mott MacDonald

The significance of all effects under consideration are linked to the volume and daily intensity of traffic generated by the Proposed Project, therefore it is deemed appropriate to link significance criteria with the scale of the forecast traffic increase. However, the *IEMA Guidelines* state that:

“For many effects there are no simple rules or formulae that define appropriate assessment thresholds and therefore there is a need for interpretation and judgement on the part of the competent traffic and movement expert, backed-up by data or quantified information wherever possible.”⁶

Therefore, professional judgement (led by good practice guidance) has also been applied in the assessment of effects so as to provide more meaningful conclusions in particular where it is not quantifiable by set rules or formulae, particularly in relation to driver delay, the assessment of

⁶ IEMA Guidelines 2023 | Pg15 para 3.12

community (pedestrian delay, non-motorised user amenity) and road safety effects. Information of this nature, gathered from desktop research, where available, in addition to technical knowledge from the wider technical team, has also been used.

Furthermore, where baseline traffic flows are very low, it is possible to derive unrealistic determinations of significance when considered against purely numerical assessment criteria. For example, when traffic flow is very low, it is possible to show relatively large traffic increases and for the road to operate well below capacity. Under the numerical criteria defined above, a 60% increase in traffic volume would represent a major effect, but in reality, the effect is likely to be less significant, given the residual capacity of the road.

The following effect classifications are considered.

- Driver delay;
- Road safety; and
- Community effects (pedestrian delay, severance, NMU amenity, fear and intimidation).

The *IEMA Guidelines* also necessitate the consideration of Noise, Visual Impact, Air Pollution and Dust and Dirt associated with development generated traffic; these topics are addressed in Chapter 11: Noise and Vibration, Chapter 12 Landscape and Chapter 10: Air Quality respectively.

The predicted significance of any potential roads, traffic and transportation-related environmental effects has been determined by considering both the sensitivity of the receiving environment and the magnitude of change against the baseline.

The likely duration of an effect is also a relevant consideration and the Environmental Protection Agency have categorised duration of effects in their *2022 Guidelines*. Potentially of relevance, in respect of the Proposed Project, the categories include:

- Brief Effects = Effects lasting less than a day
- Temporary Effects = Effects lasting more than a day and less than a year
- Short-term Effects = Effects lasting between one and seven years

14.3.2.2 Sensitivity

Subject to guidelines from the IEMA, road links may be highlighted as 'specifically sensitive'. In other words, these portions of road are considered to be more vulnerable to changes in either the profile or volume of flows of traffic.

Within the context of this study and using the *IEMA Guidelines* for reference, the receptors of sensitivity have been defined in Table 14.5 for various road links using professional judgement and the *UK Design Manual for Roads and Bridges (DMRB) LA112* dated January 2020⁷.

Table 14.5: IEMA Guidelines – Receptor Sensitivity

Receptor Sensitivity / Importance	Description
High	• Urban/residential roads without pedestrian/cycle facilities that are used by pedestrians
Medium	• Main vehicular route with pedestrian/cycle facilities provided in a built-up area • Congested Junctions, roads with degree of active frontage

⁷ Standards for Highways | Design Manual Roads & Bridges (DMRB) | LA 112 – Population and Human Health (published January 2020, rev01) available at: <https://www.standardsforhighways.co.uk/search/1e13d6ac-755e-4d60-9735-f976bf64580a>

Receptor Sensitivity / Importance	Description
Low	- National roads or 'N' class roads constructed to accommodate significant HGV volumes, Strategic vehicular route, such as Regional Roads, in a rural setting with pedestrian/cycle facilities provided - Urban road with limited active frontage and pedestrian/cycle facilities provided
Negligible	- Roads with no significant settlements including new strategic national roads or motorways - Rural road with no/pedestrian cycle facilities provided

Source: UK DMRB LA112 / Mott MacDonald

14.3.2.3 Magnitude

The magnitude of change has been calculated as the proportional change in traffic flow anticipated on each public road section within the study area. This calculation compares the forecast development traffic generation against the baseline traffic during the assumed construction years. It is crucial to ensure that professional judgement is applied in tandem with the criteria stated above; particularly when considering numerical (as opposed to percentage) changes in traffic volume.

Additional qualitative criteria have also been employed when assessing magnitude, details of which are provided in Table 14.6. This methodology is of particular importance when considering community effects.

Table 14.6: Magnitude Criteria

Magnitude	Impact
High / Major (Significant)	Where the Proposed Project could be expected to have a considerable effect (either positive or negative) on receptors
Medium / Moderate (Significant)	Where the Proposed Project could be expected to have a noticeable effect (either positive or negative) on receptors
Low / Minor (Not Significant)	Where the Proposed Project could be expected to result in a small, barely noticeable effect (either positive or negative) on receptors
None (Not Significant)	Where no discernible effect is expected as a result of the Proposed Project on receptors (i.e. the effect is insignificant)

Source: Mott MacDonald

As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic-related effects are set out in Table 14.7 and are based on combining the magnitude of the effect with the receptor sensitivity.

Table 14.7: Significance Assessment Matrix

Magnitude of Change	Sensitivity of Receptor			
	High	Medium	Low	Negligible
High / Major (Significant)	Substantial Adverse (Significant)	Substantial Adverse (Significant)	Moderate Adverse (Significant)	Minor Adverse (Not Significant)
Medium / Moderate (Significant)	Substantial Adverse (Significant)	Moderate Adverse (Significant)	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)
Low / Minor (Not Significant)	Moderate Adverse (Significant)	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)	Negligible (Not Significant)
Negligible / None (Not Significant)	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

Source: Mott MacDonald

Significance is categorised as Substantial Adverse, Moderate Adverse, Minor Adverse or Negligible. Effects deemed to be Substantial Adverse or Moderate Adverse are considered to be 'Significant' and effects that are judged to be Minor Adverse or Negligible are considered 'Not Significant'. The same criteria also apply to positive/beneficial impacts.

14.3.2.4 Fear & Intimidation

The *IEMA Guidelines (2023)* include a methodology (set out in paragraphs 3.32 to 3.40) for assessing magnitude of change for fear and intimidation (caused by all moving objects including traffic). Table 14.8 shows the initial assessment for a road section. The score is then combined, and a level of fear and intimidation is determined from Table 14.9.

Table 14.8: Fear and Intimidation Degree of Hazard

Average Traffic Flow Over 18-Hour Day – All Vehicles/hour combined 2-way flow (a)	Total 18-hour Heavy Vehicle Flow (b)	Average Vehicle Speed (c)	Degree of Hazard Score
+1800	+3000	>40mph	30
1200-1800	2000-3000	30-40mph	20
600-1200	1000-2000	20-30mph	10
<600	<1000	<20mph	0

Source: IEMA 2023

Table 14.9: Levels of Fear and Intimidation

Level of Fear and Intimidation	Total Hazard Score (a)+(b)+(c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

Source: IEMA 2023

The magnitude of change of the effect (compared to baseline conditions) is then calculated as shown in Table 14.10.

Table 14.10: Fear and Intimidation Magnitude of Effect

Magnitude of Effect	Change in Step/Traffic Flows (AADT) from Baseline Conditions
High (Significant)	Two step changes in level
Medium (Significant)	One step change in level, but with >400 vehicle increase in average 18 hr AV two-way all vehicle flow; and/or >500 HV increase in total 18 hr HV flow
Low (Not Significant)	One step change in level, with <400 vehicle increase in average 18 hr AV two-way all vehicle flow; and/or <500 HV increase in total 18 hr HV flow
Negligible (Not Significant)	No change in step changes

Source: IEMA 2023

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14.3.2.5 Traffic Forecasting Assumptions

It has been necessary to make a number of assumptions to enable the roads, traffic and transportation assessment to be undertaken. During the COVID pandemic there had been a general trend of reduced motorised traffic on the road, as more people worked from home, travelled on foot and cycled, travelled shorter distances and some shops and services had been closed. Whilst restrictions have been lifted and general trends are moving again it is become difficult to predict when 'normal' travel patterns will resume again and/or how patterns of work will change; it is considered robust and reasonable to proceed on the basis of the pre-COVID traffic growth factor applied to future baseline flows.

14.3.3 Limitations of this EIAR

Full details of construction activities are not available, at time of writing, and it has therefore been necessary to make a number of assumptions to support the roads, traffic and transportation assessment. These assumptions are detailed in Section 14.3.6.

Confirmation of the construction route(s) will be agreed with Wexford County Council (as Local Roads Authority) prior to commencement of construction.

14.4 Receiving Environment

14.4.1 Study Area

The study area for the roads, traffic and transportation chapter is effectively the public road network predominantly proposed to accommodate construction traffic generated by the Proposed Project and the construction and installation of the associated underground cabling.

The primary traffic route in the local area is the N25 which links to regional roads including the R733 and R735. The N25 spans east to west between County Cork and County Wexford.

Based on professional judgement and experience in the assessment of roads, traffic and transportation effects associated with major development projects, no significant effects are anticipated for the N25 (AADT = c.10,000⁸) and accordingly no further assessment for this road has been undertaken and reported upon in this chapter. This is due to the residual capacity and strategic nature of the road and recognising that the Proposed Project is unlikely to result in an intensification of use exceeding 30%⁹ of the existing Annual Average Daily Traffic (AADT) on the N25.

Beyond the study area traffic will subdivide into smaller volumes and professional judgement therefore suggests that effects relating to roads, traffic and transportation across the wider road network beyond the study area are unlikely to be significant and therefore are not reviewed further in this chapter.

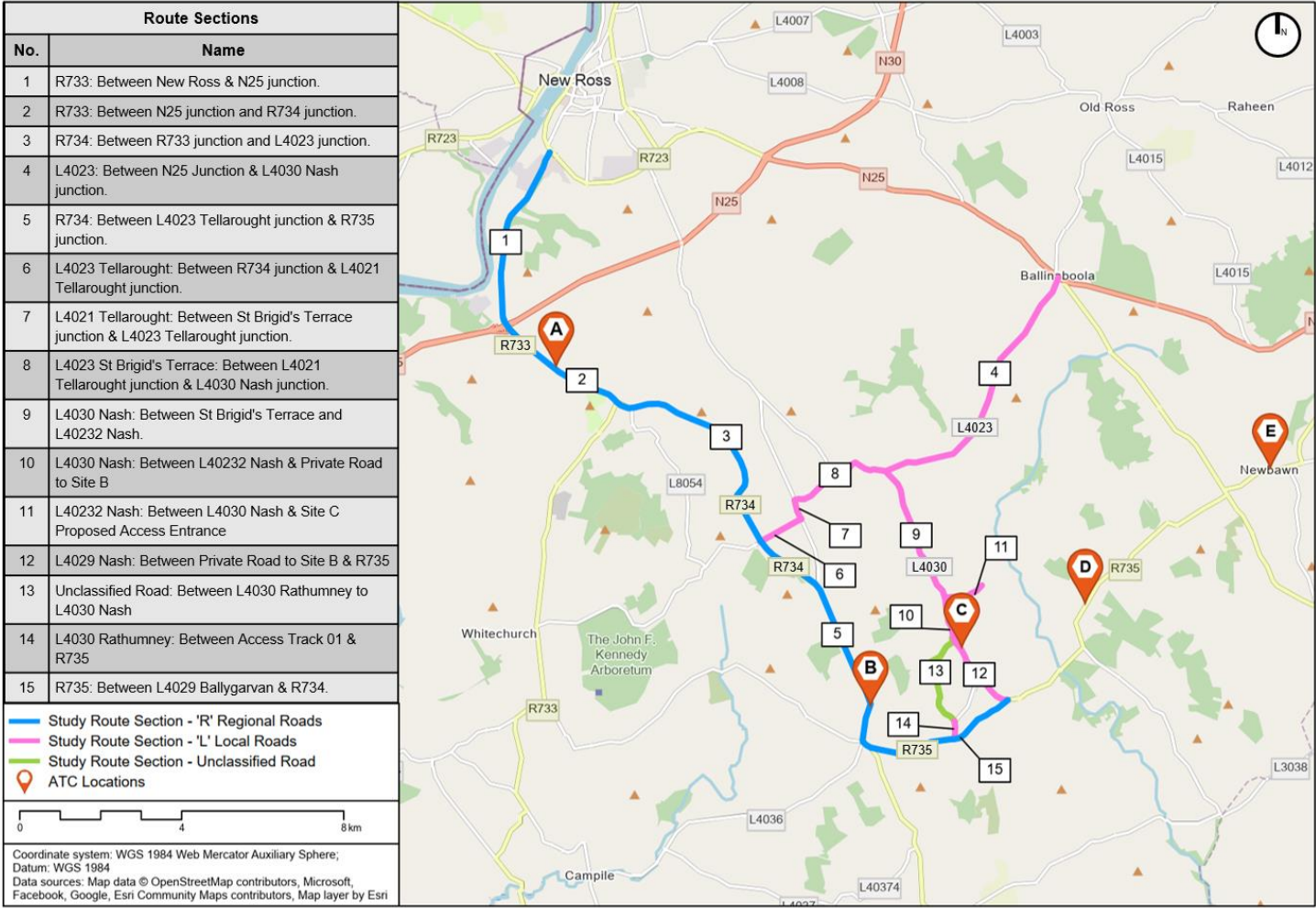
The road network included in the study area was determined on the basis of likely construction access routes and the location of physical construction works, defined in Section 14.3.1. Confirmation of route selection will be agreed with the relevant local authorities/TII.

The key characteristics of the defined public road sections in the study area have been appraised through desktop study and are visualised as set out in Figure 14.1 and Table 14.11. Receptor sensitivity has been outlined using the criteria detailed in Table 14.5.

⁸ TII Traffic Counters (TMU N25 150.0 E, TMU N25 139.0, TMU N25 135.0 E)

⁹ IEMA Guidelines see Section 14.3.3

Figure 14.1: Study Route Sections with ATC Locations Plan



Source: Mott MacDonald

Table 14.11: Road Network and Route Profiles

Road Section		Speed Limit (kph)	Description	Receptor Sensitivity
No.	Name			
1	R733: Between New Ross & N25 junction.	60/80	Single carriageway with occasional ghost islands and laybys adjacent to the N25 and on approach to R733/R723 roundabout at New Ross. Road surroundings predominantly rural with access to residential and agricultural properties. R733 north of N25 serves as link to New Ross. Footway provision between O'Leary International Limited to New Ross. Speed limit reduces from 80kph to 60kph on approach to the R733/R723 roundabout.	Negligible
2	R733: Between N25 junction and R734 junction.	80	Single carriageway section of c. ~2km. Road surroundings predominantly rural with access to residential and agricultural properties. Additional hardstanding adjacent to residential properties before merging with R733. No dedicated active travel provision.	Negligible
3	R734: Between R733 junction and L4023 junction.	80	Single carriageway section of c. ~3.5km. Road surroundings predominantly rural with access to residential and agricultural properties. Several sections of road narrowing east of Slaught where it is surrounded by dense treelines.	Negligible
4	L4023: Between N25 Junction & L4030 Nash junction.	50/60/80	Single carriageway section of c ~ 4.25km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by treelines hedgerows, ditches and masonry walls.	Negligible
5	R734: Between L4023 Tellarought junction & R735 junction.	80	Single carriageway section of c. ~3.75km. Road surroundings predominantly rural with access to residential and agricultural properties. Road flanked by treelines and hedgerows.	Negligible
6	L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	80	Single carriageway section of c ~ 0.75km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by earth embankments, treelines and hedgerows. No dedicated active travel provision.	Negligible
7	L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	50/80	Single carriageway section of c ~ 0.75km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by small embankments, treelines and high hedgerows. Access to Terrerath Community Centre within this section of road, where the speed limit reduces from 80kph to 50kph on approach. No dedicated active travel provision.	Negligible
8	L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	50/80	Single carriageway section of c ~1.7km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by small embankment, treelines and high hedgerows. Speed limit reduces from 80kph to 50kph on approach to Ban Na Cheile.	Negligible
9	L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	50/80	Single track section of c ~2.2km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by treelines and high hedgerows. Speed limit reduces from 80kph to 50kph on approach to Ban Na Cheile. No dedicated active travel provision.	Negligible
10	L4030 Nash: Between L40232 Nash & Private Road to Site B	80	Single track section of c ~0.6km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by dense treelines and high hedgerows, where the ground clearance may reduce within areas of dense treelines. No dedicated active travel provision.	Negligible

Road Section		Speed Limit (kph)	Description	Receptor Sensitivity
No.	Name			
11	L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	80	Single track section of c ~0.6km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by high hedgerows or occasional young or mature tree.	Negligible
12	L4029 Nash: Between Private Road to Site B & R735	80	Single track section of c ~ 1.3km. Road surroundings predominately rural with access to residential and agricultural properties. Road flanked by dense treelines and high hedgerows. No dedicated active travel provision.	Negligible
13	Unclassified Road: Between L4030 Rathumney to L4030 Nash (referred to as L-81411-1)	80	Narrow access track section of c ~1.6km. Road surroundings predominately rural with access to residential and agricultural properties. Various sections of track undulation, where it is flanked by dense treeline, hedgerows and overgrown vegetation.	Negligible
14	L4030 Rathumney: Between Unclassified Road & R735 (referred to as L-81411-1)	50	Single carriageway section of c. ~0.25km. Road surroundings predominately rural with access to residential, agricultural properties and educational establishment. Road flanked by masonry walls, treelines and hedgerows. Access to Gusserane National School within this section of road, where the speed limit reduces from 80kph to 50kph on approach. Footway provision provided on approach to Gusserane National School.	Low
15	R735: Between L4029 Ballygarvan & R734.	50/80	Single carriageway section of c. ~3.5km. Road surroundings predominantly rural with access to residential and agricultural properties on approach to Gusserane with predominant hedgerows either side of edge of road. Speed limit reduces from 80kph to 50kph within Gusserane. No dedicated active travel provision.	Negligible

Source: Mott MacDonald

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14.4.1.1 Existing Traffic Flows

Table 14.12 details the existing traffic flows and capacities on the routes within the study area considered in the assessment.

Existing traffic flows and HGV composition data has been derived from traffic surveys undertaken on roads within or within close vicinity to the study area.

Theoretical capacities for a variety of road types have been determined through a review of TII Publications, '*Rural Road Link Design*' (2017). These capacities are quoted as Average Annual Daily Traffic (AADT).

'*Rural Road Link Design*' (2017) does not provide capacities for rural roads with a typical carriageway width of less than six metres. Based on professional judgement and experience in assessment of roads, traffic and transportation effects it has been assumed that single track roads would have a capacity of c.1250 vehicles AADT (two-way) and narrow access tracks would have a capacity of c.625 vehicles AADT (two way).

Table 14.12: Route Capacities and Existing Traffic Count Data

Road Section	Road Capacity (AADT)	Existing AADT (two way) All Vehicles	Existing HGV proportion
R733: Between New Ross & N25 junction.	8600	7420*	10%
R733: Between N25 junction and R734 junction.	8600	5538	5%
R734: Between R733 junction and L4023 junction.	8600	3890*	6%
L4023: Between N25 Junction & L4030 Nash junction.	5000	1180*	5%
R734: Between L4023 Tellarought junction & R735 junction.	8600	2233	7%
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	5000	530*	9%
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	5000	530*	9%
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	5000	530*	9%
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	1250	310*	6%
L4030 Nash: Between L40232 Nash & Private Road to Site B	1250	313	6%
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	1250	80*	6%
L4029 Nash: Between Private Road to Site B & R735	1250	160	6%
Unclassified Road: Between L4030 Rathumney to L4030 Nash	625	10*	10%
L4030 Rathumney: Between Unclassified Road & R735	5000	160*	6%
R735: Between L4029 Ballygarvan & R734.	8600	530*	9%

Source: Mott MacDonald, Idaso, TII, * = derived/estimated from nearby Idaso or TII counters

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14.4.2 Walking and Cycling

Walking infrastructure is limited in the study area. There is no dedicated cycle infrastructure in the study area.

Footway in the study area is present at the following locations:

- R733 between New Ross and the N25 on both sides of the carriageway adjacent to industrial development.
- L4030 within the settlement of Gusserane on the east side of the carriageway.
- L4023 within the settlement of Ban Na Cheile on the north side of the carriageway.
- L4023 within the village of Ballinaboola close to the junction with the N25.

14.4.3 Public Transport

14.4.3.1 Bus

Six bus services utilise sections of the road network in the study area. Table 14.13 summarises the local services and their associated frequencies.

Table 14.13: Local Bus Routes

Route No.	Operator	Route	Weekday Frequency	Weekend Frequency
370	Bus Eireann	Waterford – Rosslare via New Ross & Wellington Bridge	Four services per day in both directions	Four services per day in both directions
371	Bus Eireann	New Ross to Wexford via Adamstown	One loop service on a Friday afternoon.	None
373	Bus Eireann	New Ros to Wexford via Fethard	One service on a Tuesday morning and afternoon.	None
388	TFI Local Link	Duncormick to Wexford	Ten-eleven services per day in both directions	Same as weekday
392	TFI Local Link	Wellington Bridge to New Ross	Six services per day in either direction. Additional evening service on Friday.	Six services per day in either direction. Additional evening service on Saturday.
399	TFI Local Link	Hook Head – New Ross	Four-Five services per day in either direction. Additional two evening services on Friday	Four-Five services per day in either direction. Additional two evening services on Saturday

Source: bustimes.org, transportforireland.ie, busireann.ie, locallinkwexford.ie

14.4.4 Rail

The closest rail station to the Proposed Project site is Waterford (Plunkett) Station, located 28km away. The station provides approximately hourly services on the Dublin (Heuston) line and additional services on the Clonmel – Limerick Junction line.

14.4.5 Collision Data

No quantitative assessment of road safety was undertaken as recorded as Personal Injury Collision (PIC) data was unavailable at the time of assessment.¹⁰

¹⁰ Road safety data on Road Safety Authority (RSA) website (<https://www.rsa.ie/road-safety/statistics/road-traffic-collision-data>) accessed on 28 August 2025.

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14.5 Likely Significant Effects

14.5.1 Do Nothing

In the event that the Proposed Project does not proceed, traffic and transport in the area will not be impacted.

14.5.2 Construction Phase

Subject to planning approval, construction of the Proposed Project is scheduled to begin in 2027 and is expected to take approximately 21 to 23 months to complete. The intensity of traffic will vary over the course of the construction phase. An indicative construction programme is provided in Section 5.7.5, Chapter 5 of this EIAR.

14.5.3 Working Hours

Construction phase works will take place between the hours of 07:00 to 19:00 (Monday to Friday) and 08:00 to 14:00 (Saturday) subject to agreement with Wexford County Council.

However, there may be instances where extended hours / days are required and should working outside these defined hours / days be necessary, prior agreement with relevant statutory authorities will be sought. The requirement for notification and liaison with any other relevant parties will also be agreed during these discussions with the relevant statutory authorities.

14.5.4 Construction Compounds

Temporary construction compounds are proposed in each Array Area (A, B and C). The main temporary construction compound and laydown area will be located in Array Area A and will include the construction personnel parking area. This temporary construction compound will be utilised during all stages of the construction programme for the Proposed Project.

Further detail regarding construction compounds is provided in Chapter 5 of this EIAR.

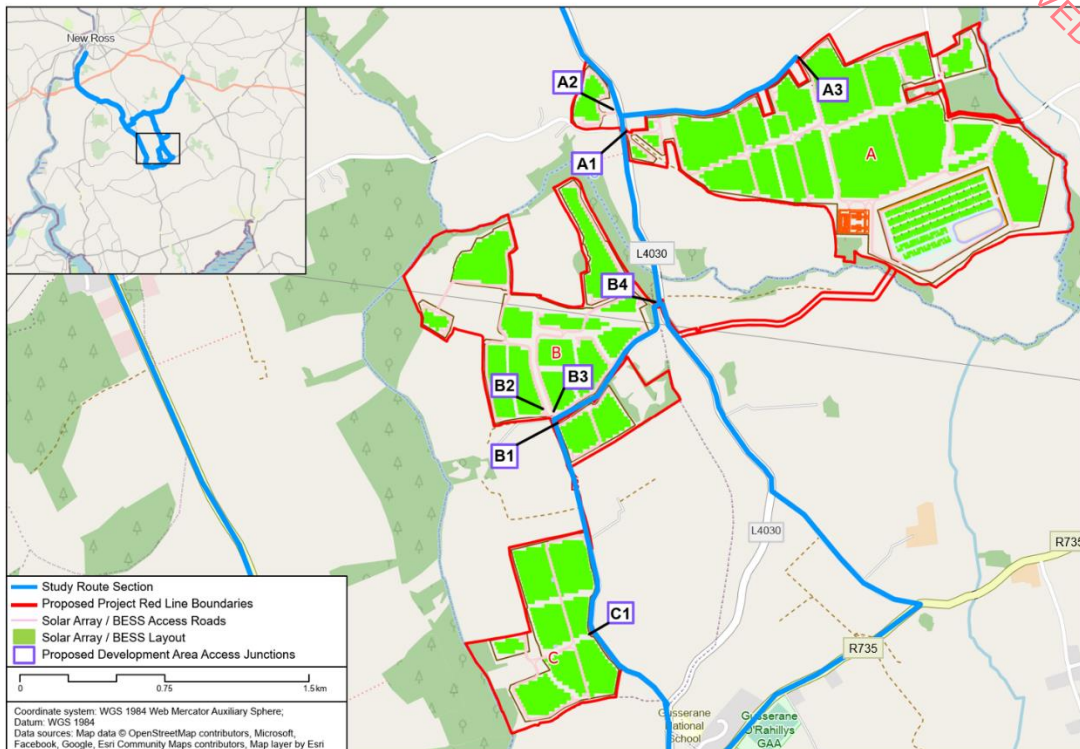
14.5.5 Construction Access

Construction traffic will access the Proposed Project site via the local road network. The main construction access for the Proposed Project will be located in Array Area A and will be access via the L40232.

Array Area B will be assessed from the L4030 and the unclassified road (refer to as L-81411-1) between L4030 Rathumney to L4030 Nash and Array Area C will be assessed solely from the unclassified road between L4030 Rathumney to L4030 Nash (referred to as L-81411-1).

Construction accesses are shown in Figure 14.2.

Figure 14.2: Construction Access



Source: Mott MacDonald, ESRI (see figure for data sources)

Delivery vehicles accessing Array Area C would only do so to/from the north due to the radius of Array Area C access.

Site entrances will have a minimum width of 4.50m with 12.50m turning radius provided to account for HGVs entering the site.

14.5.6 Construction Personnel

As detailed in Chapter 5, the number of construction personnel required during the construction phase is expected to peak at approximately 213 persons.

It has been assumed that construction personnel will travel to site using private passenger vehicles (in some cases accommodating more than one occupant).

A vehicle occupancy rate of 1.25 is assumed and in the robust-case scenario this would equate to a peak daily number of 171 vehicles (342 two-way movements per day) for the construction phase.

Adequate car parking for contractors' vehicles will be provided within temporary contractor's compound in Array Area A.

14.5.7 Cabling and Joint Bays

14.5.7.1 Grid Connection

The proposed grid connection will be established via two 220kV underground cables (UGCs), which link the GIS building to the existing Great Island–Lodge wood 220kV overhead transmission circuit.

The cable route within the Project site will route along access tracks. On the local road network, the cable route will follow the L40232 and the L4030. The final section of each 220kV cable will be above ground, as each cable will connect to a proposed Line Cable Interface Mast, which allows each circuit to connect to the existing Great Island-Lodge wood 220kV overhead transmission circuit providing a “looped-in connection”.

Each 220kV circuit will include four joint bays, and each joint bay will be accompanied by a communication chamber and a link box. The joint bays will be c.8m in length.

Exact joint bay locations are to be confirmed however there are expected to be two joint bays on the L0424, four joint bays on the L4030 and two joint bays on the access tracks within the Project site boundary.

14.5.7.2 Array Cabling

Where crossing roads or other services medium voltage underground array cables from the transformer centres to the proposed substation will be installed in ducts covered in concrete.

There are two parcels of land which comprise part of the overall Array Area A, but which are divided from the main Array Area A by public roads, namely the north-westerly parcel, referred to as parcel 1 in planning drawing titled Overall Site Location Map (drawing number 229101268-MMD-00-XX-DR-E-0100) is separated by the L4030. Parcel 9 to the east is separated from the main Array Area A by the L80591.

Cabling for Array Area B and C will be required to be constructed within the public road, Unclassified Road and L4030, on its route to the proposed 220kV substation compound.

14.5.7.3 Cabling and Joint Bays Summary

Cabling and joint bay works on the L4030 and L40232 as well as cabling between the array areas on the L4030, L80591 and the L81411-1 will require road closures. These are detailed in Section 14.5.10.

Further information regarding the 220kV cable connection and associated joint bays is included in Chapter 5, Section 5.6.3. Further information for array cabling is included in Chapter 5, Section 5.4.3.

14.5.8 Construction Traffic

14.5.8.1 Heavy Good Vehicles (HGV) Volumes

HGV movements have been estimated based on the required on-site works including civils works to prepare the site for construction activities, laying of cabling routes, delivering of components, construction materials and plant. The daily HGV movements will vary across the construction programme, for the purposes of undertaking the assessment of likely significant effects, the worse-case level of daily construction movements has been assumed. This equates to 84 HGVs accessing the site over a 12-hour period (07:00 to 19:00), which would generate an additional 168 HGV movements on the road network accounting for two-way trips. This peak level of HGV movements is only expected to occur for approximately 1.5 months of the total construction period. The forecast average daily HGVs across the construction phase is 23 HGVs (46 two-way HGV movements).

14.5.8.2 Private Vehicles

As described for HGV movements above, the private car and light goods vehicle (LGV) movements associated with transporting construction workers to and from the site during the construction phase has been based on the required construction activities and sequencing of

the construction programme. These private vehicle trips will vary across the construction phase, however, the period of most intensive site activity has been used in the assessment of likely significant effects, to provide a worst-case forecast. This is forecast to equate to 171 car or LGVs accessing the site over a 12-hour period (07:00 to 19:00), which would generate an additional 342 movements on the road network accounting for two-way trips. The forecast average daily car/LGVs across the construction phase is 53 vehicles (106 two-way car/LGV movements).

14.5.8.3 All Vehicles

A summary of the construction traffic generated at each construction phase and the worst-case for assessment is shown in Table 14.14.

Table 14.14: Construction Traffic Summary

Construction Phase	Vehicle Movements (2-way)		
	Cars/LGVs	HGVs	All Traffic
Civils Works – Access Roads	110	56	166
Civils Works – Drainage, cabling and foundations	110	76	186
Installation Works	342	28	370
Worst-case for assessment	342	76	418

Source: Mott MacDonald

At time of writing, the origin of construction vehicle trips is not confirmed. It is expected that HGVs will arrive via strategic road network from the following principal directions:

- New Ross
- Wexford
- N25 (west)
- N30 (north-east)

Car/LGV movements are expected to have more dispersed origins and the following origin directions are expected:

- New Ross
- Wexford
- N25 (west)
- N30 (north-east)
- Local settlements to south of the Proposed Project site.

The following vehicle trip distributions have been assumed:

HGV Traffic

- 30% to/from New Ross direction
- 30% to/from Wexford direction
- 30% to/from N25 (west) direction
- 10% to/from N30 (north-east) direction

Cars/LGV Traffic

- 30% to/from New Ross direction.
- 30% to/from Wexford direction.

- 30% to/from N25 (west) direction.
- 10% to/from N30 (north-east) direction.
- 5% to/from local settlements to south of the Proposed Project site.

Due to the reduced road capacity on Unclassified Road (Between L4030 Rathumney to L4030 Nash) all car/LGVs will be routed to site Array Area A and construction personnel will be transported to site Array Areas B and C by mini-bus at the start and end of shift periods to minimise the number of additional vehicle trips of Unclassified Road.

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14.5.8.4 Abnormal Indivisible Loads

It is anticipated that there will be one abnormal load delivery (for the proposed AIS transformer) during the construction phase of Proposed Project works.

Vehicles transporting an abnormal load must adhere to the maximum weight limits set down by Road Traffic (Construction and Use of Vehicles) Regulations 2003, S.I. 5 of 2003 and the maximum height limit set down in Road Traffic (Construction and Use of Vehicles) (Amendment) Regulations 2008, S.I.366 of 2008. If any of these thresholds are exceeded, then the load is considered abnormal.

Haulage will be scheduled, as far as is reasonably practicable; to occur outside of peak traffic times and the Contractor may be required to arrange a special escort with An Garda Síochána, depending on the size of the loads. Appropriate permits for designated haul routes will be sought and agreed with the Local Authorities during the detailed design phase.

14.5.9 Road Closures

Road sections which are anticipated to require temporary closure due to construction works are described in this section. Similar mitigation would be adopted if any other road sections not described in this section, are identified following further assessment to require temporary road/lane closures.

It has been assumed that around 30-50m of cabling works on road would be completed in a day with an average of 40m per day and that civil works for installing a joint bay on a carriageway would be around eight days per carriageway.

Indicative diversion routes have been assessed assuming that HGVs could safely navigate the narrow local roads. The routes have used the widest road available.

14.5.9.1 L4030 Road Closures

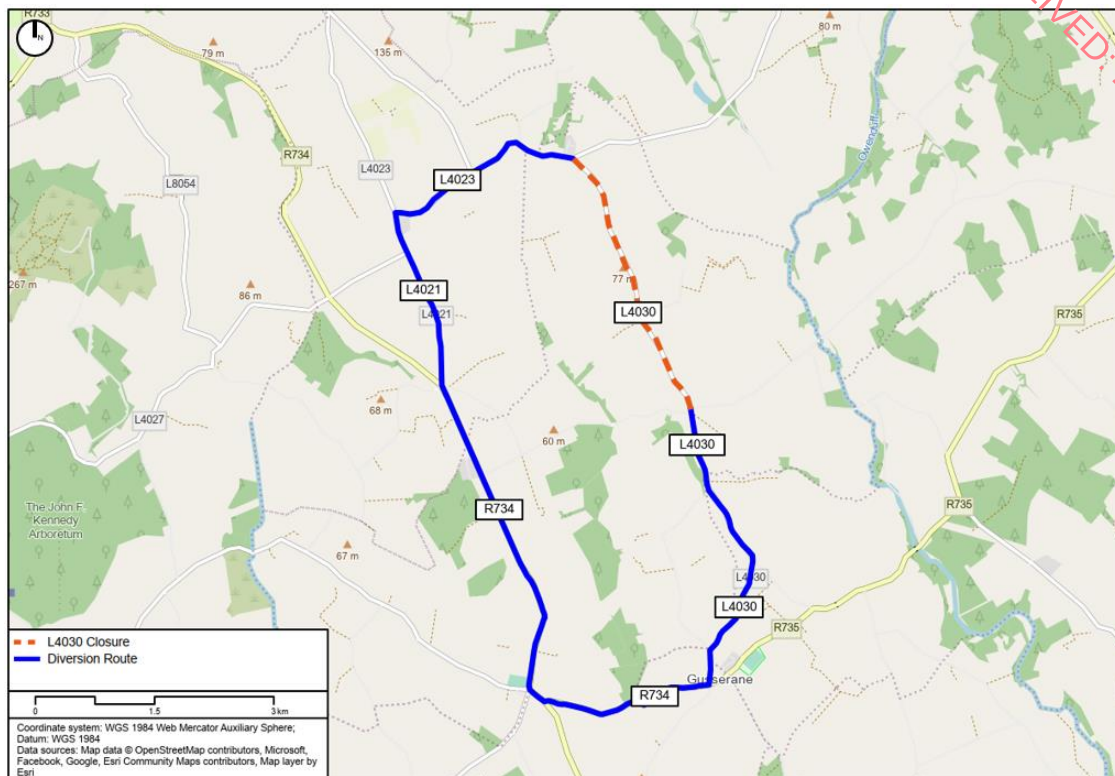
The L4030 between the L40232 and the L4023 will be locally closed (with a rolling road closure) to through traffic for a period unlikely to exceed seven weeks during the civil works (cabling works for the grid connection). It would remain open for local or emergency access. The L4030 may be subject to a shorter duration closure for array cabling works (less than one week) and for electrical works. Some level of driver delay and inconvenience will arise as a result of the road closure of the L4030.

Figure 14.3 shows planned diversion routes due to the temporary closure of the L4030. Whilst it is assumed some vehicles may use this diversion route it is likely that many drivers will utilise other routes.

The additional length of the diversion route would be up to 7.1km and would add approximately eight minutes travel time onto journeys previously utilising the temporarily closed section of the L4030.

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Figure 14.3: L4030 Diversion Route (Both Directions)



Source: Mott MacDonald, ESRI (see figure for data sources)

14.5.9.2 L40232 Road Closure

The L40232 between the L4030 and Array Area A access will be locally closed (with a rolling road closure) to through traffic for a period unlikely to exceed three weeks during the civil works (cabling works for the grid connection). It would remain open for local or emergency access. The L40232 (between the L4030 and Array Area A access) may be subject to a shorter duration closure during the electrical works. Some level of driver delay and inconvenience will arise as a result of the road closure of the L40232 (between the L4030 and Array Area A access).

Figure 14.4 shows planned diversion routes due to the temporary closure of the L40232 (between the L4030 and Array Area A access). Whilst it is assumed some vehicles may use this diversion route it is likely that many drivers will utilise other routes.

The additional length of the diversion route would be up to 11km and would add approximately thirteen minutes travel time onto journeys previously utilising the L40232 (between the L4030 and Array Area A access).

Figure 14.4: L40232 Diversion Route (Both Directions)



Source: Mott MacDonald, ESRI (see figure for data sources)

14.5.9.3 L80591 Road Closure

The L80591 is approximately 3m wide and experiences very low levels of traffic (likely to be fewer than 50 movements per day). This road will be subject to cabling works linking areas in Array Area A across the L80591 carriageway width. These works will likely be undertaken in less than one day.

In order that the L80591 can continue to accommodate local vehicular access, local traffic management arrangements will be implemented as necessary (e.g., temporary steel plates may be placed over open excavations).

14.5.9.4 Unclassified Road Closure

The Unclassified Road (L-81411-1) is approximately 3m wide and experiences very low levels of traffic (likely to be fewer than 20 movements per day). This road will be subject to cabling works linking Array Areas B and C. These works will likely be undertaken in less than five days.

In order that the L-81411-1 can continue to accommodate local vehicular access, local traffic management arrangements will be implemented as necessary (e.g., temporary steel plates may be placed over open excavations).

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14.5.10 Future Baseline Traffic Flow

The *Project Appraisal Guidelines for National Roads Unit 5.3, TII, October 2021*¹¹ has been referenced to predict road network traffic flows in the absence of the Proposed Project.

In line with the guidance, a 'central' traffic growth factor for County Wexford has been applied to the 2025 traffic flows for each road section. Table 14.15 summarises future year traffic growth scenarios without the Proposed Project.

Table 14.15: Future Year Scenario Growth Rates

Future Year Scenario	Growth Rate from 2025	
	LGV/Cars	HGV
2027	1.0136	1.0422
2028	1.0204	1.0633

Source: TII | Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections Table 6.1: Link-Based Growth Rates: Metropolitan Area Annual Growth Rates

Table 14.16 lists forecast future baseline traffic flows factored upwards in accordance with the growth rates indicated in Table 14.15.

¹¹ TII | Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017) (Published October 2021) available at: <https://cdn.tii.ie/publications/PE-PAG-02017-03.pdf>

Table 14.16: Future Baseline Traffic Flow Data

Road Section	2027 Average Daily Traffic Flow		2028 Average Daily Traffic Flow	
	All Vehicles (Two-Way Flow)	HGV Only (Two-Way Flow)	All Vehicles (Two-Way Flow)	HGV Only (Two-Way Flow)
R733: Between New Ross & N25 junction.	7542	771	7603	787
R733: Between N25 junction and R734 junction.	5622	302	5663	308
R734: Between R733 junction and L4023 junction.	3949	229	3979	234
L4023: Between N25 Junction & L4030 Nash junction.	1198	63	1207	64
R734: Between L4023 Tellarought junction & R735 junction.	2267	166	2285	169
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	539	52	543	53
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	539	52	543	53
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	539	52	543	53
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	315	21	317	21
L4030 Nash: Between L40232 Nash & Private Road to Site B	318	20	320	20
L40232 Nash: Between L4030 Nash & Site A Proposed Access Entrance	81	5	82	5
L4029 Nash: Between Private Road to Site B & R735	162	10	164	11
Unclassified Road: Between L4030 Rathumney to L4030 Nash	10	1	10	1
L4030 Rathumney: Between Unclassified Road & R735	162	10	164	11
R735: Between L4029 Ballygarvan & R734.	539	52	543	53
R733: Between New Ross & N25 junction.	7542	771	7603	787

Source: Mott MacDonald. TII,

14.5.11 Assessment of Effects of Construction Phase

The peak movement of construction vehicles is scheduled in year 2027 which is associated with the access road construction during the solar PV civil works stage. This construction stage has therefore been assessed for construction effects on the public road network.

Possible effects associated with the construction works are:

- Driver delay;
- Road safety; and
- Community effects (pedestrian delay, severance, non-motorised users (NMU) amenity, fear and intimidation).

These effects have potential to be caused due to an increased volume of traffic on the construction vehicle routes, however as these vehicle movements will occur during construction operations only, they are categorised to be short term effects, given the construction duration is between one and seven years (estimated to be up to 23 months).

Table 14.17 outlines the change in traffic volume on the public road network within the study area in 2027 and assesses the aligned effect significance in terms of the IEMA thresholds. It should be noted that the effect significance set out below is based purely on the degree of change therefore requires professional judgement (led by good practice guidance) in order to provide meaningful conclusions.

Where baseline traffic flows are low, it is possible to derive unrealistic determinations of significance when considered against purely numerical assessment criteria and it is possible to show relatively large traffic increases yet for the road to operate well below capacity. For example, using the numerical criteria defined in Table 14.3, anything above a 60% increase in traffic volume would represent a major effect, but in reality, the effect is likely to be less significant, given the residual capacity of the road.

Table 14.17: IEMA Threshold Assessment Summary

Road Section	Capacity (AADT)	Baseline 2027 AADT – All Vehicles (Two-Way Flow)	Baseline 2027 AADT – HGV (Two-Way Flow)	Peak Daily Additional Movements – All Vehicles	% Increase – All Vehicles	Peak Daily Additional Movements – HGVs	% Increase – HGVs	Effect Significance of Increase – All Vehicles	Effect Significance of Increase – HGVs
R733: Between New Ross & N25 junction.	8600	7542	771	108	1.4%	23	3.0%	None (Not Significant)	None (Not Significant)
R733: Between N25 junction and R734 junction.	8600	5622	302	234	4.2%	46	15.2%	None (Not Significant)	Minor (Not Significant)
R734: Between R733 junction and L4023 junction.	8600	3949	229	234	5.9%	46	20.1%	Minor (Not Significant)	Minor (Not Significant)
L4023: Between N25 Junction & L4030 Nash junction.	5000	1198	63	175	14.6%	38	60.3%	Minor (Not Significant)	Major (Significant)
R734: Between L4023 Tellarought junction & R735 junction.	8600	2267	166	0	0.0%	0	0.0%	None (Not Significant)	None (Not Significant)
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	5000	539	52	234	43.4%	46	88.5%	Moderate (Significant)	Major (Significant)
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	5000	539	52	234	43.4%	46	88.5%	Moderate (Significant)	Major (Significant)
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	5000	539	52	234	43.4%	46	88.5%	Moderate (Significant)	Major (Significant)
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	1250	315	21	418	132.7%	76	361.9%	Major (Significant)	Major (Significant)
L4030 Nash: Between L40232 Nash & Private Road to Site B	1250	318	20	418	131.4%	76	380.0%	Major (Significant)	Major (Significant)
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	1250	81	5	452	558.0%	76	1520.0%	Major (Significant)	Major (Significant)
L4029 Nash: Between Private Road to Site B & R735	1250	162	10	17	10.5%	0	0.0%	Minor (Not Significant)	None (Not Significant)
Unclassified Road: Between L4030 Rathumney to L4030 Nash	625	10	1	110	1100.0%	76	7600.0%	Major (Significant)	Major (Significant)
L4030 Rathumney: Between Unclassified Road & R735	5000	162	10	17	10.5%	0	0.0%	Moderate (Significant)	None (Not Significant)
R735: Between L4029 Ballygarvan & R734.	8600	539	52	17	3.2%	0	0.0%	None (Not Significant)	None (Not Significant)

Source: Mott MacDonald. IEMA, TII,

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14.5.11.1 Driver Delay

The road sections in the study area where the significance threshold has been met or to be exceeded are:

- L4023: Between N25 Junction & L4030 Nash junction.
- L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.
- L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.
- L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.
- L4030 Nash: Between St Brigid's Terrace and L40232 Nash.
- L4030 Nash: Between L40232 Nash & Private Road to Site B
- L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance
- Unclassified Road: Between L4030 Rathumney to L4030 Nash
- L4030 Rathumney: Between Unclassified Road & R735

These road sections all feature low existing traffic volumes and as such show a relatively large proportional increase which would represent a significant effect. Section 3.20 of the *IEMA Guidelines (2023)* states that driver delay is only likely to be significant when traffic on the network surrounding the development is at, or close to capacity. All road sections and adjoining roads operate below capacity. Therefore, the impact of the Proposed Project on driver delay at the above road sections is assessed to be at worst minor and therefore **not significant** in terms of the *EPA Guidelines (2022)*.

Driver journey times will be affected due to the temporary rolling road closures of L4030, L40232 and Unclassified Road and diversion routes will be required. Driver journey times would also be affected by a temporary road closure on L80591.

Driver delay resultant from road closures is summarised in Table 14.18.

Table 14.18: Driver Delay Resultant from Road Closures

Road Closure	Approximate Driver Delay
Grid Connection	
L4030 between the L40232 and the L4023	8 minutes
L40232 between the L4030 and Array Area A access	13 minutes
Array Connection	
L80591	8 minutes
L4030 - Array A Link	12 minutes
L4030 - Array A to Array B Link	4 minutes

Source: Mott MacDonald

For road closures it is assessed that at worst, any of the lane closures would typically add a maximum of thirteen minutes onto journeys utilising each affected road section.

Using the methodology outlined in Section 14.3 and Table 14.4 unmitigated, the driver delay effect significance would be classified at worst **moderate** and therefore **significant** in terms of the *EPA Guidelines (2022)*.

14.5.11.2 Road Safety

Road collision data for the study area was not available at the time of assessment. An increase in traffic volume is generally associated with a higher risk of road traffic collisions due to more frequent interactions between vehicles, reduced spacing, and increased congestion, all of which can contribute to unsafe driving conditions. However, in this instance, the projected increase in

traffic volumes is minimal. As a result, the corresponding rise in collision risk is considered negligible and unlikely to have a significant impact on overall road safety. This assessment reflects both the scale of the traffic change and the capacity of the existing road network to accommodate it without compromising safety.

Accordingly, based on professional judgement and experience in the assessment of Road and Traffic impacts relation to major development projects, the impact to road safety is considered to be at worst **minor** and therefore **not significant** within the context of the *EPA Guidelines* (2022).

14.5.11.3 Community Effects (Severance, Pedestrian Delay, NMU Amenity, Fear and Intimidation)

Severance

The *IEMA Guidelines* (2023) define severance as 'the perceived division that can occur within a community when it becomes separated by major transport infrastructure'. Severance may result from a road carrying large traffic flows or a physical barrier created by the road itself, and the *IEMA Guidelines* (2023) suggest that consideration is given to the severity of existing severance and how this might be exacerbated by proposed construction traffic generated by a development.

Although the study area does feature routes which could be considered as 'major traffic arteries', as shown in Table 14.17, the roads within the study area will continue to operate notably below theoretical capacity, even with the addition of traffic generated during construction of the Proposed Project. Severance should not occur when there is such a notable level of residual road capacity.

Pedestrian Delay

For similar reasoning, pedestrian delay is not considered to be an existing problem on any of the road sections within Proposed Project study area, nor one that shall be created by the addition of proposed construction traffic to these routes.

NMU Amenity

Non-motorised user (NMU) amenity is broadly defined by the *IEMA Guidelines* (2023) as the 'relative pleasantness of a journey'. The *IEMA Guidelines* (2023) suggest that 'a tentative threshold for judging the significance of changes in pedestrian amenity would be where traffic flows (or its HGV component) are halved or doubled.

The construction of the Proposed Project is predicted to generate increased HGV flows on the roads within the study area, with up to 76 HGV movements per day occurring during the peak construction period (an increase of up to c. 7600% for HGVs on the Unclassified Road: Between L4030 Rathumney to L4030 Nash in year 2027).

On this basis unmitigated, the significance of the effect on NMU amenity, is considered to be at worst **major** and accordingly considered to be **significant** in terms of the *EPA Guidelines* (2022).

Fear and Intimidation

As referenced in Section 14.3, the *IEMA Guidelines* (2023) sets out a methodology for assessing magnitude of change for fear and intimidation (caused by all moving objects including traffic).

Fear and intimidation have been assessed for the peak level of construction traffic in year 2027. Table 14.19 shows the 2027 future baseline assessment and Table 14.20 shows the "with

construction traffic” assessment with a reference to the fear and intimidation magnitude of impact.

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Table 14.19: Fear and Intimidation Assessment – 2027 Future Baseline

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
R733: Between New Ross & N25 junction.	7390 [30]	761 [0]	80kph [30]	60	Great
R733: Between N25 junction and R734 junction.	5504 [30]	302 [0]	80kph [30]	60	Great
R734: Between R733 junction and L4023 junction.	3858 [30]	229 [0]	80kph [30]	60	Great
L4023: Between N25 Junction & L4030 Nash junction.	1167 [10]	63 [0]	80kph [30]	40	Moderate
R734: Between L4023 Tellarought junction & R735 junction.	2222 [30]	166 [0]	80kph [30]	60	Great
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	315 [0]	21 [0]	80kph [30]	30	Moderate

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
L4030 Nash: Between L40232 Nash & Private Road to Site B	311 [0]	20 [0]	80kph [30]	30	Moderate
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	81 [0]	5 [0]	80kph [30]	30	Moderate
L4029 Nash: Between Private Road to Site B & R735	162 [0]	10 [0]	80kph [30]	30	Moderate
Unclassified Road: Between L4030 Rathumney to L4030 Nash	10 [0]	1 [0]	80kph [30]	30	Moderate
L4030 Rathumney: Between Unclassified Road & R735	162 [0]	10 [0]	80kph [30]	30	Moderate
R735: Between L4029 Ballygarvan & R734.	529 [0]	52 [0]	80kph [30]	30	Moderate

Source: IEMA, Mott MacDonald, TII. * Where no average speed data is available, the signed speed limit has been used. Where the speed limit varies along a road section the worst-case speed limit has been used.

Table 14.20: Fear and Intimidation Assessment – 2027 “With Proposed Project Construction Traffic”

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
R733: Between New Ross & N25 junction.	7498 [30]	784 [0]	80kph [30]	60	Great	Negligible
R733: Between N25 junction and R734 junction.	5738 [30]	348 [0]	80kph [30]	60	Great	Negligible
R734: Between R733 junction and L4023 junction.	4092 [30]	275 [0]	80kph [30]	60	Great	Negligible
L4023: Between N25 Junction & L4030 Nash junction.	1342 [20]	101 [0]	80kph [30]	50	Great	Low
R734: Between L4023 Tellarought junction & R735 junction.	2222 [30]	166 [0]	80kph [30]	60	Great	Negligible
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	763 [10]	98 [0]	80kph [30]	40	Moderate	Negligible
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	763 [10]	98 [0]	80kph [30]	40	Moderate	Negligible
L4023 St Brigid's Terrace: Between L4021 Tellarought	763 [10]	98 [0]	80kph [30]	40	Moderate	Negligible

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Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
junction & L4030 Nash junction.						
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	733 [10]	97 [0]	80kph [30]	40	Moderate	Negligible
L4030 Nash: Between L40232 Nash & Private Road to Site B	729 [10]	96 [0]	80kph [30]	40	Moderate	Negligible
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	533 [0]	81 [0]	80kph [30]	30	Moderate	Negligible
L4029 Nash: Between Private Road to Site B & R735	179 [0]	10 [0]	80kph [30]	30	Moderate	Negligible
Unclassified Road: Between L4030 Rathumney to L4030 Nash	120 [0]	77 [0]	80kph [30]	30	Moderate	Negligible
L4030 Rathumney: Between Unclassified Road & R735	179 [0]	10 [0]	80kph [30]	30	Moderate	Negligible
R735: Between L4029 Ballygarvan & R734.	546 [0]	52 [0]	80kph [30]	30	Moderate	Negligible

Source: IEMA, Mott MacDonald, TII. * Where no average speed data is available, the signed speed limit has been used. Where the speed limit varies along a road section the worst-case speed limit has been used.

As shown in Table 14.19 and Table 14.20, the magnitude of impact is negligible (no change) with reference to *IEMA Guidelines (2023)* on all road sections except the L4023 (between N25 Junction & L4030 Nash junction). On the L4023 (between N25 Junction & L4030 Nash junction) the magnitude of the impact is assessed to be low. As set out in Table 14.20 the sensitivity of the receptor is assessed to be 'negligible'. Based on the significance assessment matrix presented in Table 14.7, the short-term effect on fear and intimidation of the Proposed Project is considered to be **negligible** and accordingly **not significant** in terms of the *EPA Guidelines (2022)*.

Community Effects Summary

Overall, based on professional judgement, unmitigated the construction traffic generated by proposed scheme study area could at worst have a **major** effect upon community receptors and is therefore **significant** in the context of the *EPA Guidelines (2022)*.

14.5.11.4 Summary of Effects

A summary of the assessment the construction effects are shown in Table 14.21.

Table 14.21: Summary of Effects

Effect	Significance
Driver Delay	Moderate (Significant)
Road Safety	Minor (Not Significant)
Community Effects	Major (Significant)

Source: Mott MacDonald, IEMA Guidelines, EPA Guidelines

14.5.12 Operation and Maintenance Phase

Vehicle movements during the operational phase of the Proposed Project will primarily involve inspection, monitoring, and routine maintenance. These visits are expected to occur approximately once a week, typically using LGVs only. Given the low frequency of these vehicle movements, it is unlikely that the operation of the Proposed Project will significantly impact the road network.

The Project is not intended to attract visitors, so no additional trips are anticipated beyond regular maintenance. Consequently, the effect of operational and maintenance traffic is expected to be **negligible** and has been excluded from further assessment.

14.5.13 Decommissioning Phase

As presented in Chapter 5, the design life of the Proposed Project is approximately 40 years. No detailed information is available to complete an assessment for the decommissioning. However, the impacts stated for the construction phase should be referred to for the decommissioning phase. Therefore, the impact of the decommissioning phase on Roads, Traffic and Transportation would be aligned with that of the construction phase.

14.6 Cumulative Effects

A number of other proposed developments, some of which are committed in terms of planning, are located close to the Proposed Project. These developments are listed in Table 14.22 with associated commentary regarding their inclusion in the cumulative assessment.

Table 14.22: Other Development (with potential for cumulative traffic and transportation effects)

Planning Authority	Ref.	Development Description	Address	Grant Date	Approx. Distance (km)	Developer	Traffic Management Plan (TMP) Produced?	Included in Cumulative Assessment?	Justification
Wexford County Council	20220900	Permission for a 10-year planning permission for development which will consist of the construction of a solar PV farm	Ballygowny, Killesk	28/09/2022	5km	Ballygowny Solar Farm Limited	Yes (Construction Traffic Data within Environmental Report)	Yes	Project is in close proximity to the Proposed Project and/or affected roads within study area.
Wexford County Council	20241230	Permission for works to uprate the existing Great Island - Kellis 220kV overhead line (OHL).	Townlands of Greatisland, Aclamon, Lacken, Ballywilliam and others	24/03/2025	8km	EirGrid PLC	Yes (Construction Traffic Data within PECR)	Yes	Project is in close proximity to the Proposed Project and/or affected roads within study area. It is noted the construction periods are likely not to overlap pending on the ability of the developer to undertake the proposed works in March-October 2025 or March-October 2026.
Wexford County Council	20250414	Permission for development which will consist of a 10 year permission for the construction of an energy storage facility.	Rosspile, Clongeen	02/07/2025	11km	Leefarns Limited	Not included in application documents.	Yes	Project is in close proximity to the Proposed Project and/or affected roads within study area.

Source: Wexford County Council Planning Application Database

Table 14.23 outlines the cumulative change in traffic volume on the public road network within the study area in 2027, considering traffic generated by both the Proposed Project as well as the additional developments outlined above.

The aligned effect significance, in terms of the IEMA thresholds, has been provided using the process set out in Table 14.3.

It should be noted that the effect significance set out in the table below is based purely on the degree of change as described in Table 14.3 and therefore requires professional judgement (led by good practice guidance) in order to provide meaningful conclusions; particularly in relation to the assessment of community (pedestrian delay, pedestrian amenity / fear and intimidation) and road safety.

Where baseline traffic flows are low, it is possible to derive unrealistic determinations of significance when considered against purely numerical assessment criteria. It is possible to show relatively large traffic increases yet for the road to operate well below capacity. Under the numerical criteria defined above, anything above a 60% increase in traffic volume would represent a major effect, but in reality the effect is likely to be less significant, given the residual capacity of the road.

Further commentary on each of the potential impacts is provided in Section 14.5.11.1 to 14.5.11.3.

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Table 14.23: The Proposed Project and Cumulative Development

Road Section	Road Capacity (AADT)	Cumulative Development Additional Vehicle Movements During Construction Period (Two-way)	% Increase – All Vehicles	Cumulative Development Additional HGV Movements During Construction Period (Two-way)	% Increase – HGVs	Proposed Project + Cumulative Development Additional Vehicle Movements During Proposed Project Peak Construction Period (Two-way)	% Increase – All Vehicles	Proposed Project + Cumulative Development Additional HGV Movements During Proposed Project Peak Construction Period (Two-way)	% Increase – HGVs	Effect Significance of Increase – All Vehicles	Effect Significant of Increase – HGVs
R733: Between New Ross & N25 junction.	8600	116	2%	16	2%	224	3%	39	5%	None (Not Significant)	Minor (Not Significant)
R733: Between N25 junction and R734 junction.	8600	116	2%	16	5%	350	6%	62	21%	Minor (Not Significant)	Minor (Not Significant)
R734: Between R733 junction and L4023 junction.	8600	116	3%	16	7%	350	9%	62	27%	Minor (Not Significant)	Minor (Not Significant)
L4023: Between N25 Junction & L4030 Nash junction.	5000	0	0%	0	0%	175	15%	38	60%	Minor (Not Significant)	Major (Significant)
R734: Between L4023 Tellarought junction & R735 junction.	8600	116	5%	16	10%	116	5%	16	10%	Minor (Not Significant)	Minor (Not Significant)
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	5000	52	10%	12	23%	286	53%	58	112%	Moderate (Significant)	Major (Significant)
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	5000	0	0%	0	0%	234	43%	46	88%	Moderate (Significant)	Major (Significant)
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	5000	52	10%	12	23%	286	53%	58	112%	Moderate (Significant)	Major (Significant)
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	1250	0	0%	0	0%	418	133%	76	362%	Major (Significant)	Major (Significant)
L4030 Nash: Between L40232 Nash & Private Road to Site B	1250	0	0%	0	0%	418	131%	76	380%	Major (Significant)	Major (Significant)
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	1250	0	0%	0	0%	452	558%	76	1520%	Major (Significant)	Major (Significant)
L4029 Nash: Between Private Road to Site B & R735	1250	0	0%	0	0%	17	10%	0	0%	Minor (Not Significant)	None (Not Significant)
Unclassified Road: Between L4030 Rathumney to L4030 Nash	625	0	0%	0	0%	110	1100%	76	7600%	Major (Significant)	Major (Significant)
L4030 Rathumney: Between Unclassified Road & R735	5000	0	0%	0	0%	17	10%	0	0%	Moderate (Significant)	None (Not Significant)
R735: Between L4029 Ballygarvan & R734.	8600	0	0%	0	0%	17	3%	0	0%	None (Not Significant)	None (Not Significant)

Source: Varies by Development

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14.6.1 Driver Delay

The road sections in the study area where the significance threshold has been met or to be exceeded are:

- L4023: Between N25 Junction & L4030 Nash junction.
- L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.
- L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.
- L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.
- L4030 Nash: Between St Brigid's Terrace and L40232 Nash.
- L4030 Nash: Between L40232 Nash & Private Road to Site B
- L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance
- Unclassified Road: Between L4030 Rathumney to L4030 Nash
- L4030 Rathumney: Between Unclassified Road & R735

These road sections all feature low existing traffic volumes and as such show a relatively large proportional increase which would represent a significant effect. Section 3.20 of the *IEMA Guidelines (2023)* states that driver delay is only likely to be significant when traffic on the network surrounding the development is at, or close to capacity. All road sections and adjoining roads operate below capacity. Therefore, the impact of the Proposed Project on driver delay at the above road sections is assessed to be at worst **minor** and therefore **not significant** in terms of the *EPA Guidelines (2022)*.

As described in Section 14.5.11.1 due to road closures associated with the Proposed Project unmitigated, the driver delay effect significance would be classified at worst **moderate** and therefore **significant** in terms of the *EPA Guidelines (2022)*.

14.6.2 Road Safety

The projected increase in traffic volumes is minimal. As a result, the corresponding rise in collision risk is considered negligible and unlikely to have a significant impact on overall road safety. This assessment reflects both the scale of the traffic change and the capacity of the existing road network to accommodate it without compromising safety.

Accordingly, based on professional judgement and experience in the assessment of Road and Traffic impacts relation to major development projects, the impact to road safety of the traffic generated during construction of the Proposed Project coinciding with the construction phases of other developments is considered to be at worst **minor** and therefore **not significant** within the context of the *EPA Guidelines (2022)*.

14.6.3 Community Effects (Severance, Pedestrian Delay, NMU Amenity, Fear and Intimidation)

Severance

As shown in Table 14.23, the roads within the study area will continue to operate notably below theoretical capacity, even with the traffic generated during construction of the Proposed Project coincides with the construction phases of other developments. Severance should not occur when there is such a notable level of residual road capacity.

Pedestrian Delay

For similar reasoning, pedestrian delay is not considered to be an existing problem on any of the road sections within the study area, nor one that shall be created by the addition of the

traffic generated during construction of the Proposed Project together with the construction phases of other developments.

NMU Amenity

Non-motorised user (NMU) amenity is broadly defined by the *IEMA Guidelines (2023)* as the 'relative pleasantness of a journey'. The *IEMA Guidelines (2023)* suggest that 'a tentative threshold for judging the significance of changes in pedestrian amenity would be where traffic flows (or its HGV component) are halved or doubled.

The construction of the Proposed Project together with the construction phases of other developments is predicted to generate increased HGV flows on the roads within the study area, with up to 76 HGV movements per day occurring during the peak construction period.

On this basis unmitigated, the significance of the effect on NMU amenity, is considered to be at worst **major** and accordingly considered to be **significant** in terms of the *EPA Guidelines (2022)*.

Fear and Intimidation

Table 14.24 shows the 2027 future baseline assessment and Table 14.25 shows the "with construction traffic (Proposed Project and Other Developments)" assessment with a reference to the fear and intimidation magnitude of impact.

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Table 14.24: Fear and Intimidation Assessment – 2027 Future Baseline

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
R733: Between New Ross & N25 junction.	7390 [30]	761 [0]	80kph [30]	60	Great
R733: Between N25 junction and R734 junction.	5504 [30]	302 [0]	80kph [30]	60	Great
R734: Between R733 junction and L4023 junction.	3858 [30]	229 [0]	80kph [30]	60	Great
L4023: Between N25 Junction & L4030 Nash junction.	1167 [10]	63 [0]	80kph [30]	40	Moderate
R734: Between L4023 Tellarought junction & R735 junction.	2222 [30]	166 [0]	80kph [30]	60	Great
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	529 [0]	52 [0]	80kph [30]	30	Moderate
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	315 [0]	21 [0]	80kph [30]	30	Moderate

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
L4030 Nash: Between L40232 Nash & Private Road to Site B	311 [0]	20 [0]	80kph [30]	30	Moderate
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	81 [0]	5 [0]	80kph [30]	30	Moderate
L4029 Nash: Between Private Road to Site B & R735	162 [0]	10 [0]	80kph [30]	30	Moderate
Unclassified Road: Between L4030 Rathumney to L4030 Nash	10 [0]	1 [0]	80kph [30]	30	Moderate
L4030 Rathumney: Between Unclassified Road & R735	162 [0]	10 [0]	80kph [30]	30	Moderate
R735: Between L4029 Ballygarvan & R734.	529 [0]	52 [0]	80kph [30]	30	Moderate

Source: IEMA, Mott MacDonald, TII. * Where no average speed data is available, the signed speed limit has been used. Where the speed limit varies along a road section the worst-case speed limit has been used.

Table 14.25: Fear and Intimidation Assessment – 2027 “With Construction Traffic (Proposed Project and Other Developments)”

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
R733: Between New Ross & N25 junction.	7614 [30]	800 [0]	30 [30]	60	Great	Negligible
R733: Between N25 junction and R734 junction.	5854 [30]	364 [0]	30 [30]	60	Great	Negligible
R734: Between R733 junction and L4023 junction.	4208 [30]	291 [0]	30 [30]	60	Great	Negligible
L4023: Between N25 Junction & L4030 Nash junction.	1342 [20]	101 [0]	20 [30]	50	Great	Low
R734: Between L4023 Tellarought junction & R735 junction.	2338 [30]	182 [0]	30 [30]	60	Great	Negligible
L4023 Tellarought: Between R734 junction & L4021 Tellarought junction.	815 [10]	110 [0]	10 [30]	40	Moderate	Negligible
L4021 Tellarought: Between St Brigid's Terrace junction & L4023 Tellarought junction.	763 [10]	98 [0]	10 [30]	40	Moderate	Negligible
L4023 St Brigid's Terrace: Between L4021 Tellarought junction & L4030 Nash junction.	815 [10]	110 [0]	10 [30]	40	Moderate	Negligible

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed* [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
L4030 Nash: Between St Brigid's Terrace and L40232 Nash.	733 [10]	97 [0]	10 [30]	40	Moderate	Negligible
L4030 Nash: Between L40232 Nash & Private Road to Site B	729 [10]	96 [0]	10 [30]	40	Moderate	Negligible
L40232 Nash: Between L4030 Nash & Site C Proposed Access Entrance	533 [0]	81 [0]	0 [30]	30	Moderate	Negligible
L4029 Nash: Between Private Road to Site B & R735	179 [0]	10 [0]	0 [30]	30	Moderate	Negligible
Unclassified Road: Between L4030 Rathumney to L4030 Nash	120 [0]	77 [0]	0 [30]	30	Moderate	Negligible
L4030 Rathumney: Between Unclassified Road & R735	179 [0]	10 [0]	0 [30]	30	Moderate	Negligible
R735: Between L4029 Ballygarvan & R734.	546 [0]	52 [0]	0 [30]	30	Moderate	Negligible

Source: IEMA, Mott MacDonald, TII. * Where no average speed data is available, the signed speed limit has been used. Where the speed limit varies along a road section the worst-case speed limit has been used.

As shown in Table 14.24 and Table 14.25 the magnitude of impact is negligible (no change) with reference to *IEMA Guidelines (2023)* on all road sections except the L4023 (between N25 Junction & L4030 Nash junction). On the L4023 (between N25 Junction & L4030 Nash junction) the magnitude of the impact is assessed to be low. As set out in Table 14.11 the sensitivity of the receptor is assessed to be negligible. Based on the significance assessment matrix presented in Table 14.7, the short-term effect on fear and intimidation of the Proposed Project combined with the construction phases of other developments is considered to be **negligible** and accordingly **not significant** in terms of the *EPA Guidelines (2022)*.

Community Effects Summary

Overall, based on professional judgement, if the construction traffic generated by Proposed Project coincides with the construction phases of other developments unmitigated, there will at worst be a **major** effect upon community receptors and is therefore **significant** in the context of the *EPA Guidelines (2022)*.

14.6.3.1 Summary of Cumulative Effects

A summary of the assessment the construction effects are shown in Table 14.26.

Table 14.26: Summary of Cumulative Effects

Effect	Significance
Driver Delay	Moderate (Significant)
Road Safety	Minor (Not Significant)
Community Effects	Major (Significant)

Source: Mott MacDonald, IEMA Guidelines, EPA Guidelines

14.7 Mitigation and Monitoring Measures

The temporary effects of construction, regardless of the assessed level of significance, will be mitigated through adoption of a Construction Traffic Management Plan (CTMP).

The general purpose of a CTMP is optimise the efficiency and safety of all traffic activities generated by the Proposed Project and thus maintain suitable amenity and safety for local communities and other roads users.

A summary of key CTMP mitigation elements follows and the CTMP is provided in full form in the CEMP which is included in the application documentation:

- The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Wexford County Council, the appointed contractor, TII and/or their Agents and An Garda Síochána as appropriate.
- The CTMP has been developed for the purposes of this assessment and will be further developed as necessary in consultation with Wexford County Council and the Gardai prior to construction commencing. The CTMP will document measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services. The CTMP is a 'live' document and will be developed accordingly, within the parameters assessed in this EIAR.
- During the construction phase, signage will be installed to warn road and recreational route users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.
- Car sharing will be promoted to construction personnel by the contractor during the induction process.

- To reduce the potential for debris being deposited onto the local road network in the construction site accesses and road sections of cable construction, the appointed contractor will ensure that public roads and footways are cleaned and swept during and after the works. This cleansing regime (to be agreed) will minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the nearest public road will be kept clear of debris by monitoring and then utilising a road sweeper where necessary.
- The appointed contractor could employ a number of sub-contractors, and all will fall under the umbrella of the CTMP and will have an obligation to adhere to the Plan; this obligation will form part of the procurement process and will be written into any contract of employment.
- Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures set out in the CTMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors.
- In liaison with ESNB, the appointed contractors will maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction period. This will include circulation of information about ongoing activities; particularly those that could potentially cause disturbance, including due to traffic.
- The appointed contractor will nominate a person to be responsible for the co-ordination of all elements of roads, traffic and transportation during the construction process (Liaison Officer). This person will liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation.
- If the construction phase of any notably sized development(s) appears likely to overlap with the Proposed Project, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction.
- Prior to commencement of construction, and during the construction phase, engagement with the proponents of other developments will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts on traffic are minimised. The specific detail will be developed by the appointed contractor within the parameters assessed in this EIAR.

14.8 Residual Effects

The assessment of post-mitigation effects has been undertaken on the assumption that key measures set out in the CTMP will be developed as appropriate by the appointed contractor and be implemented during the Proposed Project construction phase.

In the context of the *IEMA Guidelines (2023)* and *EPA Guidelines (2022)* there are **no significant** residual roads, traffic and transportation effects predicted during the construction phase following incorporation of measures described within the CTMP; see Appendix A of the CEMP which accompanies the EIAR.

A summary of the residual effects is in Table 14.27.

Table 14.27: Summary of Residual Effects tab

Effect	Significance	
	Before Mitigation	Post Mitigation
Proposed Project		

Effect	Significance	
	Before Mitigation	Post Mitigation
Driver Delay	Moderate (Significant)	Minor (Not Significant)
Road Safety	Minor (Not Significant)	Minor (Not Significant)
Community Effects	Major (Significant)	Minor (Not Significant)
<u>Proposed Project + Cumulative Development</u>		
Driver Delay	Moderate (Significant)	Minor (Not Significant)
Road Safety	Minor (Not Significant)	Minor (Not Significant)
Community Effects	Major (Significant)	Minor (Not Significant)

Source: Mott MacDonald, IEMA Guidelines, EPA Guidelines (2022)

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14.9 References

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

The Institute of Sustainability and Environmental Professionals (ISEP) Guidelines: Environmental Assessment of Traffic and Movement (2023).

Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, Transport Infrastructure Ireland (TII) (2021).

Road Traffic (Construction and Use of Vehicles) Regulations 2003, S.I. 5 of 2003.

Road Traffic (Construction and Use of Vehicles) (Amendment) Regulations 2008, S.I.366 of 2008.

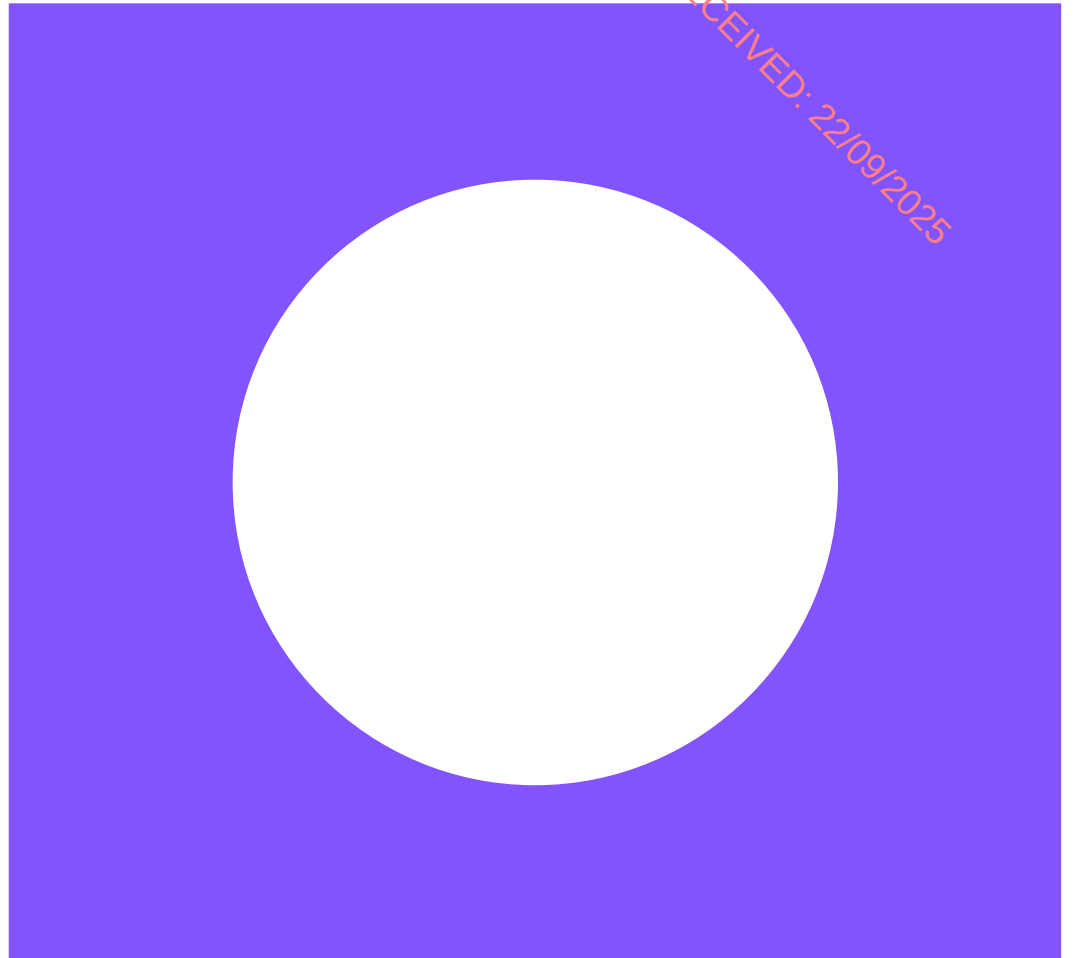
Rural Road Link Design, (DN-GEO-03031), TII Publications, TII (2017).

Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland (TII) (2014).

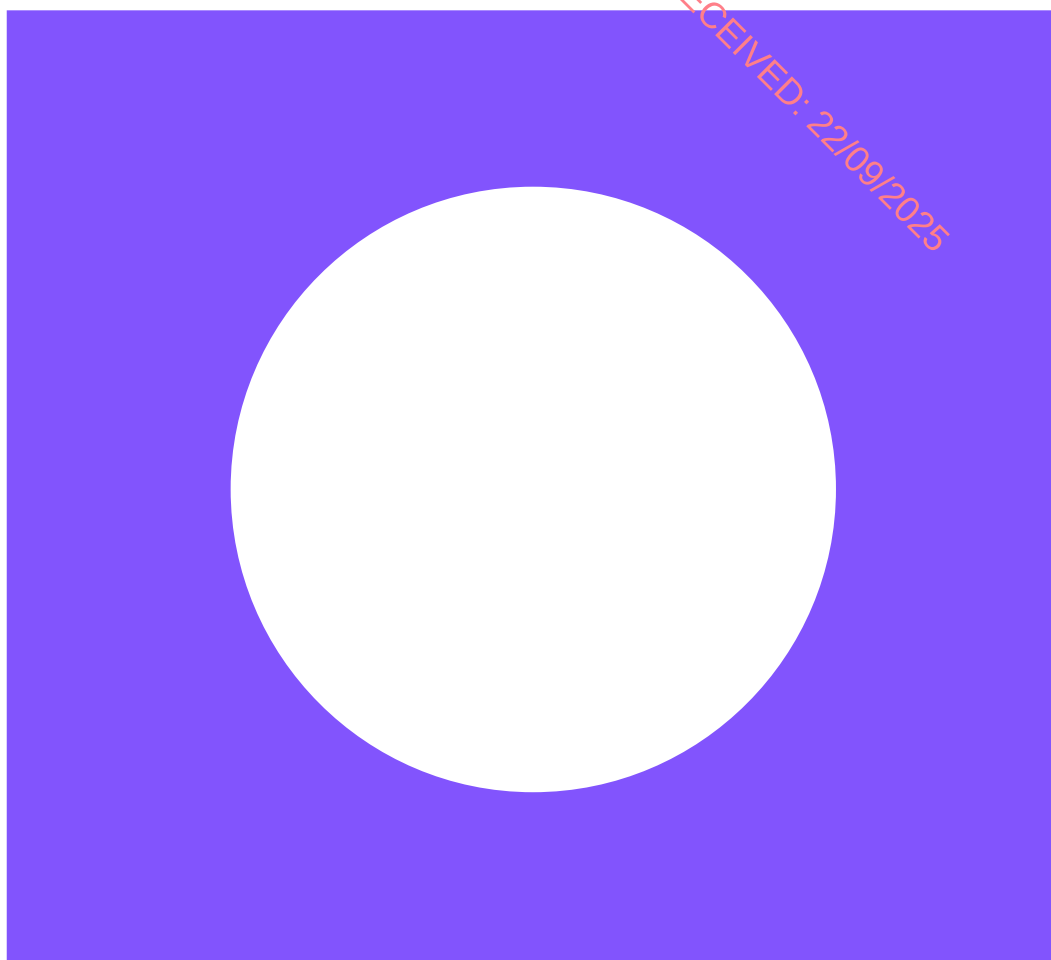
UK Design Manual for Roads and Bridges (DMRB) LA112 Population and Human Health (2020).

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 15 Material Assets and Waste
Management

September 2025

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15 Material Assets and Waste Management

15.1 Introduction

This chapter presents an assessment of the likely significant impacts arising from the Proposed Project as described in Chapter 5 of this EIAR. Likely significant impacts on roads and traffic are discussed in Chapter 14 Roads and Traffic. A Construction Resource Waste Management Plan (CRWMP) is provided as part of the Construction Environmental Management Plan (CEMP) included within Volume 3 of this EIAR.

15.2 Policy and Guidance

This section sets out policies and guidance documents of potential relevance to the Material Assets and Waste Management that have been used to inform this chapter of the EIAR.

15.2.1 Legislation and policies

The following legislation is relevant to this material assets and waste assessment.

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (European Union, 2008) (as amended). Henceforth referred to as the Waste Framework Directive (WFD).
- European Communities (Waste Directive) Regulations 2011 (European Union, 2011) (as amended).
- Directive on the Landfill of Waste 1999/31 European Council (European Union, 1999) (as amended).
- Packaging and Packaging Waste Directive 2019 (European Union, 2024) (as amended).
- Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 (Government of Ireland, 2005) (as amended).
- Waste Management (Facility Permit and Registration) Regulations 2007 (Government of Ireland, 2007) (as amended).
- European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020 (Government of Ireland, 2020) (as amended).
- Waste Management (Collection Permit) Regulations 2007 (Government of Ireland, 2007) (as amended).
- Environmental Protection Agency Act 1992 (Government of Ireland, 1992) (as amended).
- Protection of the Environment Act 2003 (Government of Ireland, 2003) (as amended).
- Environmental (Miscellaneous Provisions) Acts 2011 and 2015 (Government of Ireland, 2011), (Government of Ireland, 2015) (as amended).
- Waste Management Act 1996 (Government of Ireland, 1996) (as amended)
- National Hazardous Waste Management Plan 2021-2027 (Environmental Protection Agency, 2021)
- National waste management plan for a Circular Economy 2024-2030 (Government of Ireland, 2024)

15.2.2 Guidance

The following guidelines are relevant to this assessment.

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022) (hereafter referred to as 'EPA guidelines 2022').
- Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (Environmental Protection Agency, 2021).
- Institute of Environmental Management and Assessment (IEMA) Best practices for material and waste environmental impact assessments (IEMA, 2020) (henceforth referred to as 'IEMA guidance').
- Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities (EPA, 2020).
- Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous (Environmental Protection Agency, 2018).
- Design Out Waste: A Design Team Guide to Waste Reduction in Construction and Demolition Projects (Environmental Protection Agency, 2015).

15.3 Methodology

15.3.1 Approach to Data Collection

The information in Table 15.1 outlines the data sources that have been considered during the production of this chapter of the EIAR.

Table 15.1: Data sources used to inform the Material Assets and Waste Management Chapter of this EIAR

Data source	Date	Data contents
Environmental Protection Agency	2022	Licensed waste facilities
Movement of Materials Information from Mott Macdonald Project Team	2025	Materials required for construction Materials required for operation Expected waste arisings Materials from cut and fill activities
ESB	2007	Open Data Source

Baseline information for the receiving environment was taken from the following sources:

- Construction and demolition waste – Soil and stone recovery/disposal capacity (Update Report 2020) Eastern Midlands region, Connacht Ulster region and Southern region (Government of Ireland, 2020)
- Construction and demolition waste statistics for Ireland (Environmental Protection Agency, 2025)
- Waste Infrastructure in Ireland (Environmental Protection Agency, 2022)
- Analysis of aggregates market in Ireland (SWECO, 2023)
- Essential aggregates – Providing for Ireland's needs to 2040 (Irish Concrete Federation, 2018)
- WEEE statistics for Ireland (Environmental Protection Agency, 2025)
- Forecasting WEEE Arising for Electric Vehicle Batteries and Photovoltaic Panels in Ireland – EPA research report (Johnson, Fallah, Killian, & Fitzpatrick, 2019)
- Irish Quarry Directory (Geological Survey Ireland, 2014)
- Waste Licence Portal (Environmental Protection Agency, 2025)
- Exploration Company Reports – Mineral Locations (Department of Climate, Energy and the Environment, 2025)
- End of Year Report on the Irish Steel Industry (Irish Steel, 2024)

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15.3.2 Approach to Impact Assessment

The construction, operation, maintenance, and decommissioning of any infrastructure can result in environmental effects associated with the consumption and use of material assets and the management of waste that is generated. The impact assessment has been carried out in accordance with the methodology outlined in Chapter 3 EIA Methodology, in line with the requirements set out in EPA guidelines 2022 (Environmental Protection Agency, 2022).

The assessment for material assets and waste generation, and its management, considers the following:

- Types and quantities of materials required to be consumed within the Proposed Project, where known.
- Details of the source or origin of materials, site-won materials (materials arising from excavation activities) to replace virgin materials, materials from secondary or recycled sources, or virgin or non-renewable sources, if known.
- Cut and fill balance (the design team were consulted with regards to cut and fill quantities, the types of materials to be used during construction and the types of wastes likely to be produced)
- Forecast of non-hazardous, hazardous, and inert waste arisings.
- Surplus materials and waste falling under regulatory controls.
- Wastes that require storage on site prior to reuse, recycling and disposal.
- Wastes to be pre-treated on site for reuse within the Proposed Project, if known.
- Wastes requiring treatment or disposal off-site.
- The impacts that will arise from the issues identified in relation to materials and waste.
- Identification of mitigation measures based on identified impacts.
- Conclusion based on the nature and magnitude of impacts.
- The location and description of existing utilities network was sourced from the design team

The categories for describing the significance of effects defined in the EPA guidelines 2022 are outlined in Table 15.2.

Table 15.2: EPA guidance on description of effects

Significance of effect	Details
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment, but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Source: (Environmental Protection Agency, 2022)

Professional judgement based on suitable Ireland-specific and IEMA guidance for the assessment of materials and waste in EIA has been used to assist in the assessment; this is considered to be good practice and applicable in a global setting.

To determine the significance of an effect in this chapter, the EPA guidelines 2022 will be assessed against, and supplemented by, IEMA guidance specifically developed for the assessment of materials and waste in EIA. This will involve the inclusion of measures of the significance of effects based on both sensitivity (Table 15.3) and magnitude (Table 15.4) to provide a more comprehensive assessment.

Table 15.3: IEMA guidance for the sensitivity of material assets use and waste generation

Significance of effect	Description	
Negligible	Material assets	Material assets for the key materials required for the construction and operation of a development: - Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or - Are available, comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*.
	Waste generation	Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): Inert, non-hazardous and hazardous landfill void capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Material assets	Material assets for the key materials required for the construction and operation of a development: - Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or - Are available, comprising a high proportion of sustainable features* and benefits compared to industry-standard materials.
	Waste generation	Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): - Inert and non-hazardous landfill void capacity is expected to reduce minimally: by <1% as a result of wastes forecast. - Hazardous landfill void capacity is expected to reduce minimally: by <0.1% as a result of waste forecasts.
Medium	Material assets	Material assets for the key materials required for the construction and operation of a development: - Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or - Are available, comprising some sustainable features* and benefits compared to industry-standard materials.
	Waste generation	Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): - Inert and non-hazardous landfill void capacity is expected to reduce noticeably, by 1-5% as a result of the waste forecast. - Hazardous landfill void capacity is expected to reduce noticeably: by 0.1-0.5% as a result of waste forecasts.
High	Material assets	Material assets for the key materials required for the construction and operation of a development: - Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or - Comprise little or no sustainable features* and benefits compared to industry-standard materials.
	Waste generation	Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): Inert and non-hazardous landfill void capacity is expected to reduce considerably: by 6-10% as a result of wastes forecast.

Significance of effect	Description
	Hazardous landfill void capacity is expected to reduce considerably: by 0.5-1% as a result of waste forecasts.
Very High	Material assets Material assets for the key materials required for the construction and operation of a development: - Are known to be insufficient in terms of production, supply and stock; and/or - Comprise no sustainable features* and benefits compared to industry-standard materials. Waste generation Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): - Inert and non-hazardous landfill void capacity is expected to reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand. - Hazardous landfill void capacity is expected to reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

Source: (IEMA, 2020) Note: * Sustainable features and benefit could include materials or products that comprise reuse, secondary or recycled content (including excavated and other arisings), support the drive to a circular economy or in some other way reduce lifetime environmental impacts.

Table 15.4: IEMA guidance for the magnitude of impact for material assets use and waste generation

Significance of effect	Description
No Change	Material assets No materials required. Waste generation Based on void capacity: for inert, non-hazardous and hazardous waste, zero waste generation and disposal from the development. Based on landfill diversion: in construction and/or operation, a development is expected to achieve 100% landfill diversion.
Negligible	Material assets No individual material type is equal to or greater than 1% of the regional (or where justified, national) baseline availability. Waste generation Based on void capacity the development will reduce: - Regional (or where justified, national) landfill void capacity baseline for inert and non-hazardous waste by <1%. - National landfill void capacity baseline for hazardous waste by <0.1%. Based on landfill diversion in construction and/or operation, a development is expected to achieve 90-99% landfill diversion.
Minor	Material assets - One or more materials is between 1-5% by volume of the regional (or where justified, national) baseline availability; and/or - The development has the potential to adversely and substantially* impact access to one or more allocated mineral site in their entirety, placing future use at risk. Waste generation Based on void capacity the development will reduce: - Regional (or where justified, national) landfill void capacity baseline for inert and non-hazardous waste by 1-5%. - National landfill void capacity baseline for hazardous waste by <0.1-0.5%. Based on landfill diversion in construction and/or operation, a development is expected to achieve 60-89% landfill diversion.
Moderate	Material assets - One or more materials is between 6-10% by volume of the regional (or where justified, national) baseline availability; and/or - One allocated mineral site is substantially* sterilised by the development rendering it inaccessible in the future.

Significance of effect	Description
	Waste generation Based on void capacity the development will reduce: - Regional (or where justified, national) landfill void capacity baseline for inert and non-hazardous waste by 6-10%. - National landfill void capacity baseline for hazardous waste by <0.5-1%. Based on landfill diversion in construction and/or operation, a development is expected to achieve 30-59% landfill diversion.
Major	Material assets - One or more materials is >10% by volume of the regional (or where justified, national) baseline availability; an/or - More than one allocated mineral site is substantially* sterilised by the development rendering it inaccessible for future use.
	Waste generation Based on void capacity the development will reduce: - Regional (or where justified, national) landfill void capacity baseline for inert and non-hazardous waste by >10%. - National landfill void capacity baseline for hazardous waste by >1%. Based on landfill diversion in construction and/or operation, a development is expected to achieve <30% landfill diversion.

Source: (IEMA, 2020) Note: *Justified using professional judgement based on the scale and nature of the allocated mineral site.

Due to the size and complexity of the Proposed Project and the industry standards highlighted by IEMA guidance, the effect of magnitude will be assessed using the void capacity method.

The overall effect threshold defined by IEMA guidance takes into account both the sensitivity and magnitude of the effect, depicted in Table 15.5.

Table 15.5: Effect threshold defined by the IEMA

		Magnitude of effect				
		No change	Negligible	Minor	Moderate	Major
Sensitivity (or value) of receptor	Very High	Neutral	Slight	Moderate or large	Large or very large	Very Large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Slight	Slight	Moderate	Moderate or large
	Low	Neutral	Slight	Neutral or Slight	Slight	Slight or moderate
	Negligible	Neutral	Slight	Neutral or Slight	Neutral or Slight	Slight

Source: (IEMA, 2020)

Based on this threshold, the descriptors for the overall environmental effects are presented in Table 15.6.

Table 15.6: Environmental impacts based on IEMA effect threshold

Effect	Materials	Waste
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

Source: (IEMA, 2020)

However, not all IEMA categories for significance of sensitivity align with categories outlined in the EPA guidelines 2022. Therefore, a suitable corresponding category from the EPA guidelines has been assigned and detailed in Table 15.7 and Table 15.8.

Table 15.7: Suitable corresponding categories for the sensitivity of effect between EPA and IEMA guidelines

Significance category in IEMA	Significance category in EPA guidelines 2022
Negligible	Negligible
Low	Low
Medium	Medium
High	High
Very high	

Source: Mott Macdonald based on (IEMA, 2020) and (Environmental Protection Agency, 2022)

Table 15.8: Suitable corresponding categories for magnitude of effect between EPA and IEMA guidelines

Significance category in IEMA	Significance category in EPA guidelines 2022
No change	Negligible
Negligible	
Minor	Low
Moderate	Medium
Major	High

Source: Mott Macdonald based on (IEMA, 2020) and (Environmental Protection Agency, 2022)

The corresponding significance category in EPA guidelines will be assessed against the predicted significance of the effect based on professional judgements. A corresponding suitable environmental effect category has been aligned in Table 15.9 between EPA's 2022 predicted significance of effect and IEMA's environmental effect.

Table 15.9: Suitable environmental categories for the EIAR

Effect, by EPA 2022	Effect, by IEMA	Materials	Waste
Imperceptible	Neutral	Not Significant	Not Significant
Not significant			
Slight	Slight		
Moderate	Moderate	Significant	Significant
Significant	Large		
Very Significant	Very large		
Profound			

Source: Mott Macdonald based on (IEMA, 2020) and (Environmental Protection Agency, 2022)

The assessment of effects on material assets and waste generation will encompass effects arising during excavation, demolition, construction and operation phases of the Proposed Project.

Professional judgement will be used to provide an assessment of effects based on several factors, including:

- The availability of the material assets.
- The type of materials required, e.g. primary or virgin materials, manufactured materials, recycled materials.
- The type of waste generated, e.g. inert, non-hazardous or hazardous.

- The availability of suitable facilities within close proximity to the Proposed Project to treat the waste generated.
- Compatibility of the Best Practicable Environmental Option (BPEO) for the waste within the context of the waste hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled, etc.

The potential impacts on the receptors which will be assessed in the EIAR, are listed below:

- The reduced availability of material resources and the subsequent impact on the demand for materials.
- The depletion of non-renewable resources.
- Temporary occupation of waste management infrastructure capacity.
- Permanent reduction in landfill capacity.

Significant environmental effects are more likely to arise from those materials, or wastes, which:

- Are associated with the largest quantities.
- Are primary or virgin materials.
- Have hazardous properties.

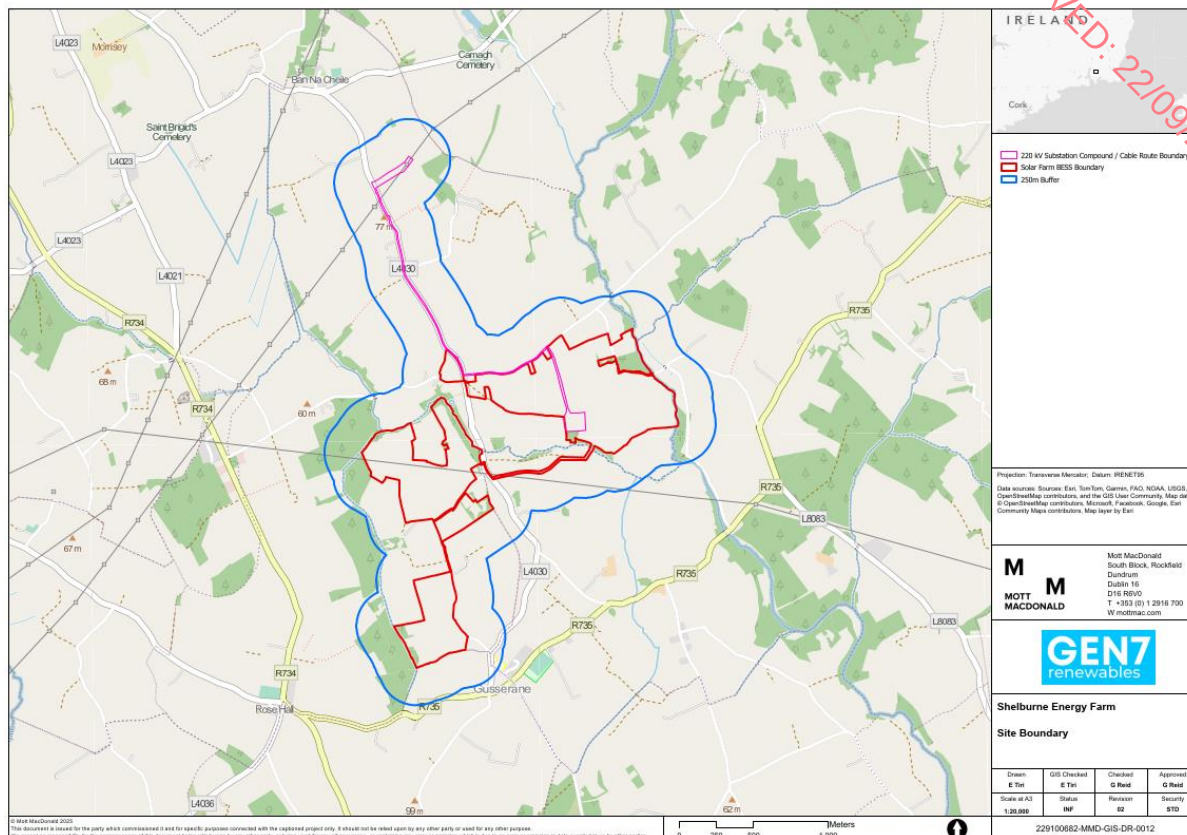
15.3.3 Study Area

Guidance from IEMA has been used to establish the study area.

The study area will be based on the area of the works for the Proposed Project, within the respective planning application boundaries for the Proposed Project (red line - Solar Farm and BESS compound, and the pink line - 220 kV substation compound and 220 kV grid connection), outlined in Figure 15.2. This constitutes the area within which construction materials would be consumed (used, reused and recycled) and waste would be generated. It will be considered the development study area.

The study area also includes a 500m buffer from the respective planning application boundaries. It is used to identify potential key sources of contaminated excavated waste, based on a review of authorised and historic landfill sites. The study area boundary is represented by the blue line boundary in Figure 15.2.

Figure 15.1: Study Area



Source: Mott MacDonald Ireland Limited

As recommended by IEMA guidelines, an expansive study area will focus on feasible sources and availability of construction materials typically required for construction works of this nature and an area sufficient to identify the suitable waste infrastructure that could accept waste arisings generated by the Proposed Project.

The expansive study area for material assets will focus primarily on Ireland but will also include the wider European Union and China for the import of solar photovoltaic (PV) panels (Ryan, Wheatley, & Saba, 2023).

The expansive study area for waste will focus on Ireland. Waste infrastructure availability for recycling and recovery is set to be as close to the Proposed Project as possible, following the Proximity Principle, including permitted landfills and construction and demolition (C&D) treatment facilities within the region of Wexford. However, where there is no regional capacity, national capacity will be considered. If any waste is to be transported for treatment and disposal outside of this study area, it is assumed that alternative permitting and environmental standards are in place.

15.3.4 Limitations of this EIAR

This assessment is based on desktop information. Field surveys were not required for the assessment of material assets and waste management, baseline information and potential impacts are based on publicly available information.

It is possible that some utility services located in proximity to the works may not be identified in this EIAR, however the embedded and additional mitigation detailed and proposed as part of

this EIAR will be implemented when dealing with any such features to ensure that the proposed development will not result in impacts beyond the parameters assessed in this EIAR.

The assessment does not consider the environmental effects of offsite extraction of raw materials, used for prefabricated or offsite manufactured products. These stages of the materials' lifecycles are out of scope of the assessment, due to the range of unknown variables. In most cases, it is assumed that these processes would have already been subject to EIAs in securing consents for the facilities' operation, where said materials were extracted or produced.

The assessment has not assessed the impact of material assets use and waste associated with the manufactured goods required by the Proposed Project as these will be subject to their own separate consenting and regulatory controls at the place of production.

Information on the material assets required for the Proposed Project and their expected waste arisings are based on forecasts for the movement of materials provided by the project team available at the time of submission. These forecasts are likely to be refined and are subject to change as the Proposed Project progresses.

For that reason, forecasts for the required material assets have been made on a reasonable worst-case scenario basis, informed by professional judgement. Based on these figures, it is assumed that 5-10% of the materials brought to site will end up as waste depending on material type, informed by figures outlined in the Royal Institute of Chartered Surveyors (RICS) whole life carbon assessment for the built environment (RICS, 2023).

Information on the permitted capacity of waste management facilities and landfills has been used in the assessment based on current publicly available data. However, it should be noted that the capacity information obtained from the EPA for the sites and regions identified does not necessarily mean that the capacity detailed would be available for use by the Proposed Project (Environmental Protection Agency, 2025).

It is noted that any future changes to this permitted capacity are uncertain, as there is potential for change to permitted capacities, opening of additional waste management facilities and closure of existing ones. It is not currently possible to predict the timeframes for when these waste management facilities will be available/unavailable.

There is potential for adverse environmental effects from material assets use and waste management to be generated through downstream processes such as noise and air pollution from transportation or land contamination. These processes are not addressed here, as they will be discussed separately in the relevant technical chapters, including Air Quality (Chapter 10), Climate (Chapter 16), Noise and Vibration (Chapter 11) and Land, Soils and Hydrology (Chapter 8).

The procurement strategy for the materials required for the construction of the Proposed Project is unknown at this stage. For the purposes of the assessment, it is assumed that, not all material assets will be available to be sourced locally (within County of Wexford), and that the majority would be sourced nationally (within Ireland), and solar panels from the European Union. This will represent the (environmentally) worst-case scenario.

It is assumed that any vegetation waste arisings from general site clearance will be managed according to the Resource and Waste Management Plan (RWMP). This would assume that vegetation waste will be chipped on site or composted in a waste management facility. Waste arisings from packaging material have not been quantified here as it is assumed that the majority of these wastes will be recycled in accordance with the RWMP.

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15.4 Receiving Environment

15.4.1 Built Services

The following utilities infrastructure is located within the study area;

- ESBN (Electricity Supply Board Networks) 220kV transmission circuit – Great Island – Lodgewood 220kV overhead line circuit (the proposed grid connection will connect to the national grid along this existing transmission route)
- ESBN 110kV overhead line circuit (traverses through Array Area B – a buffer exclusion zone has been applied 10m either side of conductor as per ESBN requirements)
- ESBN MV distribution network – 10/20kV overhead lines strung between electricity wooden polesets (these occur within Array Area A -parcel 1 and 5, and Array Area C – running diagonally northwest to southeast through parcel 28, 30, 32)
- A petroleum pipeline (400mm diameter, 4 bar -Medium Pressure pipe) is located in the R735 which will be used as a haulage route, though no construction works are required in this regional road.
- No Gas Networks infrastructure is identified in the study area.
- No potable water / wastewater (Uisce Éireann) infrastructure is identified in the study area, private wells for potable water occur within residential property boundaries.

The existing ESBN MV infrastructure will be required to be relocated to facilitate the installation of solar farm in those areas affected in Array Area A and C. These works will be mutually agreed between all parties prior to commencement of any diversions taking place and will be undertaken by ESB. The relocation of ESB MV poles does not form part of the Proposed Project.

15.4.2 Utility Use

The Contractor will apply to ESBN for a supply during the construction phase. It is anticipated that this will be from the existing 10kV overhead line to the northeast of the Proposed Project. During the operational and maintenance phase the electricity supply will be sized to provide sufficient supply to GIS and AIS station compound and the connection.

Direct connections to water and water infrastructure is not feasible due to their absence within the study area, as such, as discussed in section 5.6.2 of this EIAR, a borehole will be installed to the west of the BESS compound to provide the Project's water requirements (i.e. fire-fighting and welfare purposes - hand washing, toilet flushing etc), and a foul holding tanking will be installed for wastewater collection for welfare services from the substation compound. As the substation compound will generally be 'unmanned', wastewater will only be generated on days that maintenance crews are present on site. It is therefore proposed that wastewater will be collected in proprietary holding tanks which will be periodically emptied by a licensed waste disposal contractor.

A surface water drainage system incorporating SuDS (sustainable drainage systems) features will be constructed to manage the quantity and quality of runoff during rainfall events. Discharge from the substation compound and BESS compound and the associated internal access tracks is proposed to be restricted to pre-development 'greenfield' runoff rates in line with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS Vol. 2 – New Development) which have generally been adopted by Local Authorities across the country.

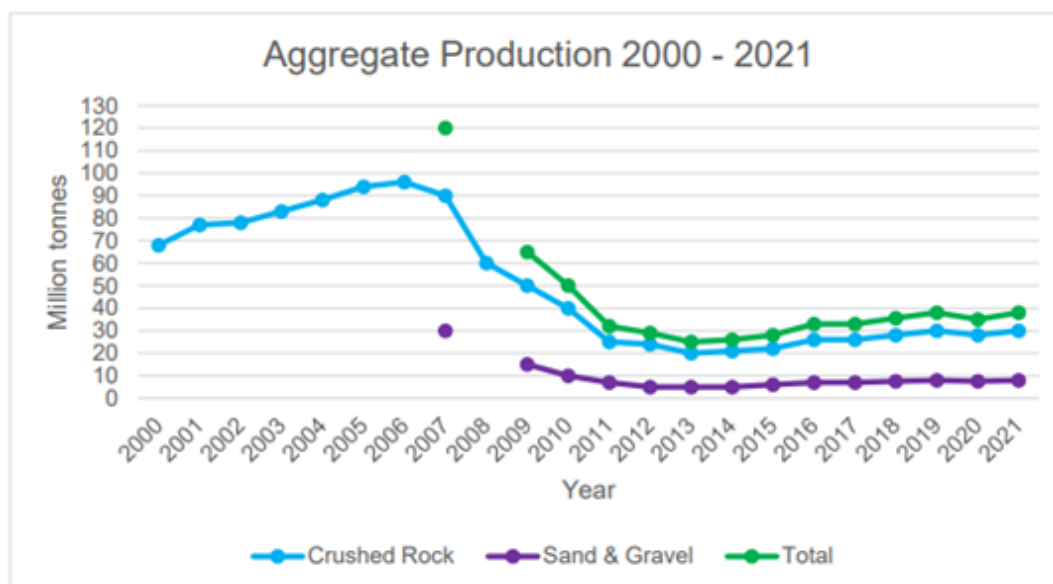
15.4.3 Regional Material Assets

Aggregate materials (such as sand, gravel, sandstone and crushed rock) are the main raw material assets used to make construction products. Three main sources to obtain these aggregates are:

- Land-won (often referred to as natural or primary aggregates) – these are extracted directly from the ground in quarries or pits.
- Marine-dredged – these comprise of sand and gravel dredged from the sea floor.
- Secondary/recycled – secondary aggregates are a by-product from mineral operations or industrial processes, and recycled aggregates are materials produced by treatment of construction and demolition waste.

Information on the demand for key construction materials within Ireland has been used to provide the baseline for material assets. The aggregates demand per capita in Ireland is considered to be double of the average demand in other European countries (SWEEO, 2023). Ireland aggregate production has been steady over recent years, with an estimated annual production of 38 million tonnes as per the most recent available figures from 2021. As outlined in Figure 15.2, approximately nine million tonnes were sand and gravel and the remaining 29 million tonnes were crushed rocks.

Figure 15.2: Tonnes of aggregate production in Ireland 2000-2021



Source: (SWEEO, 2023)

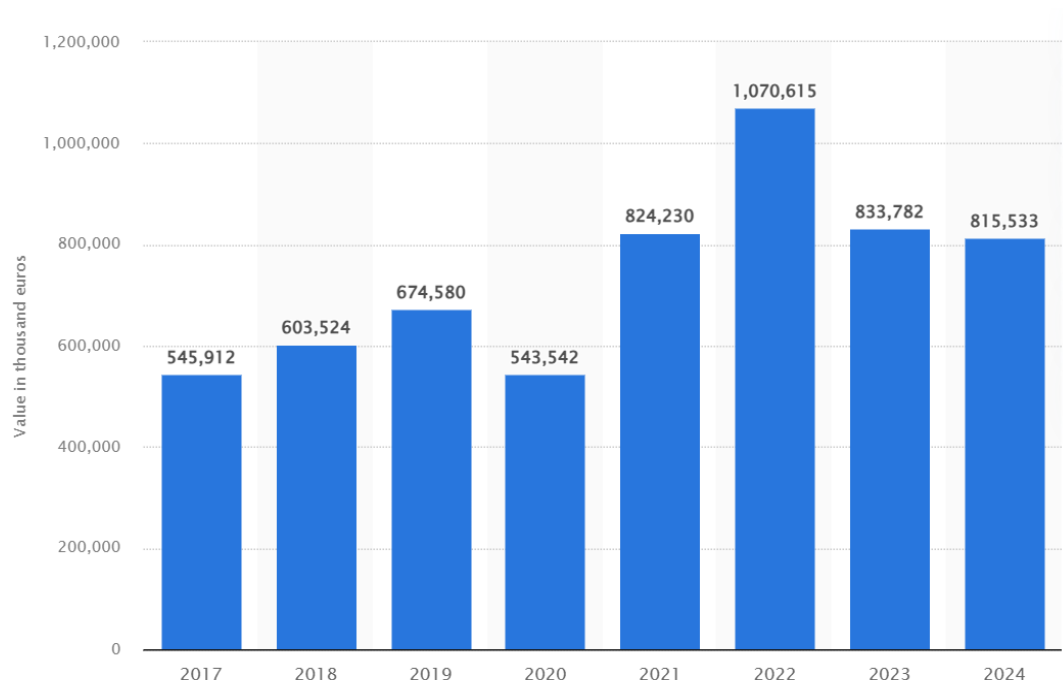
Ireland's natural reserves of high-quality aggregates are considered abundant (Irish Concrete Federation, 2018), and there are approximately 500 active quarries extracting virgin, land-won aggregate materials in Ireland. Additionally, there are at least four facilities that are EPA approved to produce recycled aggregates (SWEEO, 2023). The closest quarry is Ballinrooan Pit (Coarse sand) which is roughly 17km from the Proposed Project (Geological Survey Ireland, 2014).

Steel

There are currently no crude steel manufacturing facilities in Ireland. Since 2021, annual imports of steel have exceeded €800 million, as highlighted in Figure 15.3. According to the End of Year Report on the Irish Steel Industry in 2024, it is expected that demand for steel products in

Ireland will remain high given the growth of industries such as construction and renewable energy (Irish Steel, 2024).

Figure 15.3: Annual value of iron and steel imported by Ireland from 2017-2024



Source: (Statista, 2025)

Photovoltaic Imports

All solar panels in Ireland are imported and amounted to 12.6 million euros in 2020 (Central Statistics Office, 2023). However, some components and ancillary equipment are fabricated and assembled locally (Irish Solar Energy Association, 2024).

Demand for photovoltaic (PV) infrastructure is set to increase in Ireland, as a target for 70% of the national grid to be powered by renewable energy by 2030 has been set by the government. In 2020, there were 63 successful applications for new solar farms through the renewable electricity support scheme alone (EirGrid, 2020).

The only production of PV infrastructure within the expansive study area is within the European Union, but information on overall supply is not readily available. However, there is an established import and distribution network for solar equipment in Ireland, with ongoing collaboration between the industry and government for meeting the goal of being an international leader in solar energy (Irish Solar Energy Association, 2024).

15.4.4 Regional Waste Management

The composition of C&D waste in Ireland is tracked by the EPA. The EPA waste data release (Environmental Protection Agency, 2025) published in August 2025 shows that the quantity of C&D waste generated and collected in Ireland amounted to 9 million tonnes in 2023. The C&D waste comprised the following proportions:

- Soil and stone – 81%
- Concrete, brick, tile and gypsum – 7%
- Mixed C&D waste – 8%

- Metal – 2%
- Segregated wood, glass, plastic and metal – 1%
- Bituminous mixtures – 1%

The EPA notes that most of the C&D waste treated in Ireland was reused as backfill (75%) in 2023 while 12% went for disposal and only 11% of all C&D waste was recycled. The dominance of backfilling as a treatment operation reflects the large proportion of soil and stones in C&D waste (Environmental Protection Agency, 2025).

The WFD requires each Member State of the European Union to achieve 70% material recovery of non-hazardous C&D waste (excluding soil and stones) by 2020. This target is confirmed to be applicable to Ireland through the Waste Action Plan for a Circular Economy (Government of Ireland, 2024). The EPA determined that Ireland achieved 88% material recovery of such waste in 2023 surpassing the 70% target (Environmental Protection Agency, 2025).

C&D waste is recovered at EPA licensed waste management facilities and landfills, and Local Authority permitted sites. The Southern Region Waste Management Plan 2015-2021 indicates that the number of operational landfills across Ireland has been decreasing, and therefore alternative recovery options are required, particularly for C&D waste (Government of Ireland, 2020). It also states that consideration must be taken to recover inert waste as infill material, when appropriate, as part of land uses strategies.

Table 15.10 highlights the waste management facilities available in the closest proximity to county Wexford. There are no hazardous waste treatment facilities or material recovery facilities in Wexford. The closest facilities are located within a 150km radius based in Dublin and given in Table 15.11.

Table 15.10: EPA waste management facilities licenced in County Wexford

Active Licence No.	Facility Type	Name of the Facility	County	Location
W0123-01	Composting/ Anaerobic Digestion	Custom Compost	Co. Wexford	Custom Compost, Ballyminaun Hill, Gorey, Co Wexford, Wexford.
W0016-02*	Landfill	Killurin Landfill Site	Co. Wexford	Newtown Lower, Killurin, Wexford
W0191-02*	Landfill	Holmestown Waste Management Facility	Co. Wexford	Barntown, Wexford, Wexford.
W0220-01*	Waste Transfer Station	Starrus Eco Holding Limited	Co. Wexford	Ramstown, Gorey, Wexford.
W0229-01	Waste Transfer Station	Bord Na Móna Recycling Limited	Co. Wexford	Ballygillane Big/Ballyknockan, St. Helens, Kilrane, Rosslare Harbour, Wexford.
W0258-01	Waste Transfer Station	Murray Waste Recycling Limited	Co. Wexford	Coolatore, Ferns, Wexford.
W0280-01	Soil Recovery Facility	Brownswood Inert Waste Recovery Facility	Co. Wexford	Brownswood, Enniscorthy, County Wexford, Wexford.

Source: (Environmental Protection Agency, 2025) Note: *Waste licence now deemed industrial emissions licence.

Table 15.11: EPA licenced material recovery facilities and hazardous waste facilities closest to the Proposed Project.

Active Licence No.	Facility Type	Name of the Facility	County	Location
W0196-01	Hazardous waste facility*	JFK Ltd.	Co. Dublin	JFK Environmental Limited, John F. Kennedy Industrial Estate, John F. Kennedy Road, Naas Road, Dublin.
W0099-01	Hazardous waste facility*	Safety Kleen Ireland Ltd.	Co. Duublin	Unit 5, Airton Road, Tallaght, Dublin 24, Dublin.
W0261-01	Material Recovery Facility	Starrus Eco Holdings Limited (Cappagh)	Co. Dublin	Cappagh Road, Finglas, Dublin 11, Dublin.

Source: (Environmental Protection Agency, 2025) Note: *Waste licence now deemed industrial emissions licence.

Landfill as a disposal method is considered the last resort for waste management. As of the latest available data for the year 2021, there are only three landfill sites in Ireland which accept C&D wastes, listed in Table 15.12.

Table 15.12: EPA licenced Landfills

Active Licence No.	Facility Type	Name of the Facility	Location	Capacity of C&D waste for disposal/recovery (Maximum tonnes per annum)	Additional notes
W0146-01*	Landfill	Knockharley Landfill Limited	Knockharley Landfill, Knockharley, Navan, (Includes Townlands of Tuiterath & Flemingstown), Meath.	175,000	Capacity for 25,000 tonnes per annum of C&D waste for recovery
W0165-02*	Landfill	Ballynagran Residual Landfill Co. Wicklow	Ballymurtagh Landfill Facility, Ballymurtagh, Ballygahan Upper, Ballygahan Lower, Tinnahinch, Wicklow.	175,000	Capacity of 28,000 tonnes per annum of C&D waste for recovery
W0201-03*	Landfill	Drehid Waste Management Facility Co. Kildare	Inagh Landfill, Ballyduff Beg, Inagh, Clare.	120,000**	No limit for inert waste where used in landfill engineering.

Source: (Environmental Protection Agency, 2022) *Waste Licence now deems industrial emissions licence. **Figure does not include household waste capacity.

Soil Recovery

EPA data as of 2023 shows that 6.4 million tonnes of soils, stones and dredging soils were backfilled and only 56,106 tonnes were recycled (Environmental Protection Agency, 2025). A further 1 million tonnes were disposed of in landfills.

There is good capacity for soil recovery in the southern region. According to the Construction and Demolition waste update report, in 2018 permitted soil recovery facilities in the southern region accepted roughly 204,977 tonnes of waste soils, with 139,808 tonnes accepted in Wexford specifically (Government of Ireland, 2020).

Wexford County has a remaining lifetime capacity for soil recovery of 1.9Mt (Government of Ireland, 2020). The southern region also has the largest local authority authorised capacity in Ireland, with 83 facilities recorded to be operating under certificated of registration for soil recovery as of 2018 (Government of Ireland, 2020). A list of local authority authorised facilities in Wexford are outlined in the RWMP.

Waste Electrical and Electronic Equipment (WEEE)

WEEE has become one of the fastest growing waste streams worldwide. In 2023, Ireland achieved a collection rate of 43.6%, failing to meet the EU target of 65%, having reduced from 63.8% in 2021. This stagnation in collection rates has been partly attributed to the increase in demand for EEE on the market, including decarbonising technologies like solar panels (Environmental Protection Agency, 2025).

A report released in 2024 modelled the potential future waste arisings from solar PV technology in Ireland. The worst-case scenario estimate suggests that commercial waste arisings from solar PV could reach 16,000 tonnes in the year 2050 (Johnson, Fallah, Killian, & Fitzpatrick, 2019).

There are currently no facilities in Ireland capable of processing solar PV panels in Ireland. In the current scenario, PV waste must be transported to Europe and incur expensive recycling fees (Johnson, Fallah, Killian, & Fitzpatrick, 2019).

Hazardous wastes

There are currently no dedicated hazardous waste landfills in Ireland. In 2023, 34,430 tonnes of hazardous wastes were treated at EPA licenced hazardous waste treatment facilities. However, the majority of hazardous wastes are exported. In 2023, 189,298 tonnes of hazardous waste were exported for treatment outside of Ireland under protocols set out in the Basel Convention (Environmental Protection Agency, 2025).

Minerals

There are no mineral sites identified within 500m of the boundary of the Proposed Project.

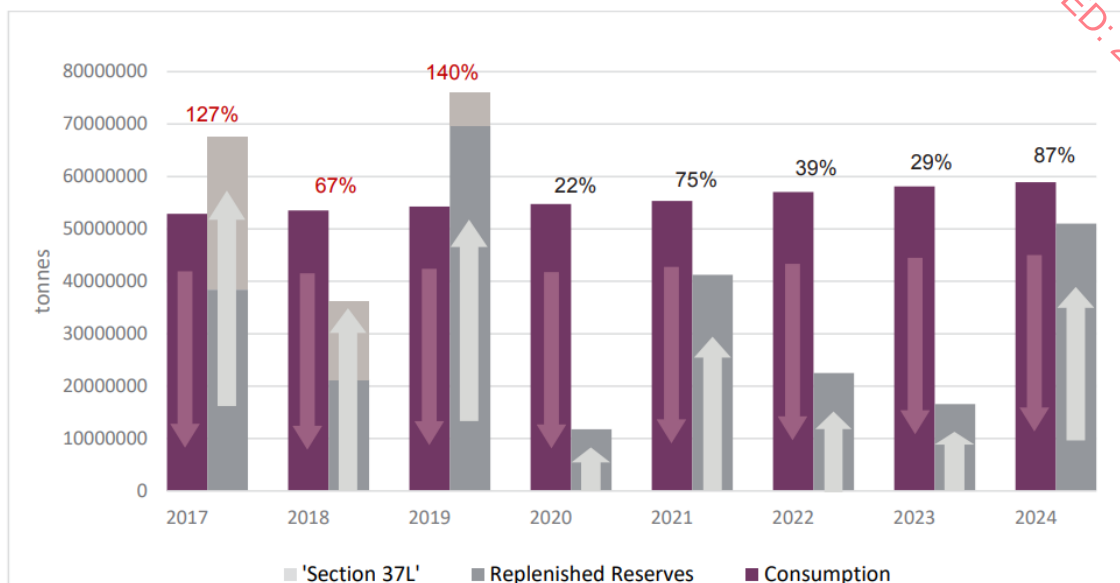
15.4.5 Future baselines for material assets and waste

Future baseline conditions for material assets and waste management have been outlined to provide context on the likely availability of these assets and the capacities of waste management facilities during the construction of the Proposed Project. The current baseline condition has been used for assessment purposes, as the future baseline is a projection based on the current conditions. Consequently, the availability of material assets and capacities in waste management facilities may change over time.

Aggregate Materials

Aggregate materials are considered to be abundant in Ireland (Irish Concrete Federation, 2018). However, increasing demand due to population growth and corresponding growth in the construction industry means Ireland's per capita demand for aggregate based materials are almost twice that of Europe. Replenishment rates for aggregates are detailed in Figure 15.4.

Figure 15.4: Replenishment rates of aggregates in Ireland



Source: (Irish Concrete Federation, 2025)

Currently, replenishment rates have fallen below consumption. Whilst this is unlikely to have an impact in the short or medium term, it could have long term impacts on aggregate reserves in Ireland. However, the introduction of the Quarries and the Planning System 2017-2024 has helped improve system efficiency and can act as a mitigation for the depleting of aggregate reserves in Ireland (Irish Concrete Federation, 2025).

As shown in Figure 15.3, imports of steel have remained steady for the last 5 years. Given Ireland's close relationship with steel producers in Europe, no future shortage in the supply of steel is currently predicted.

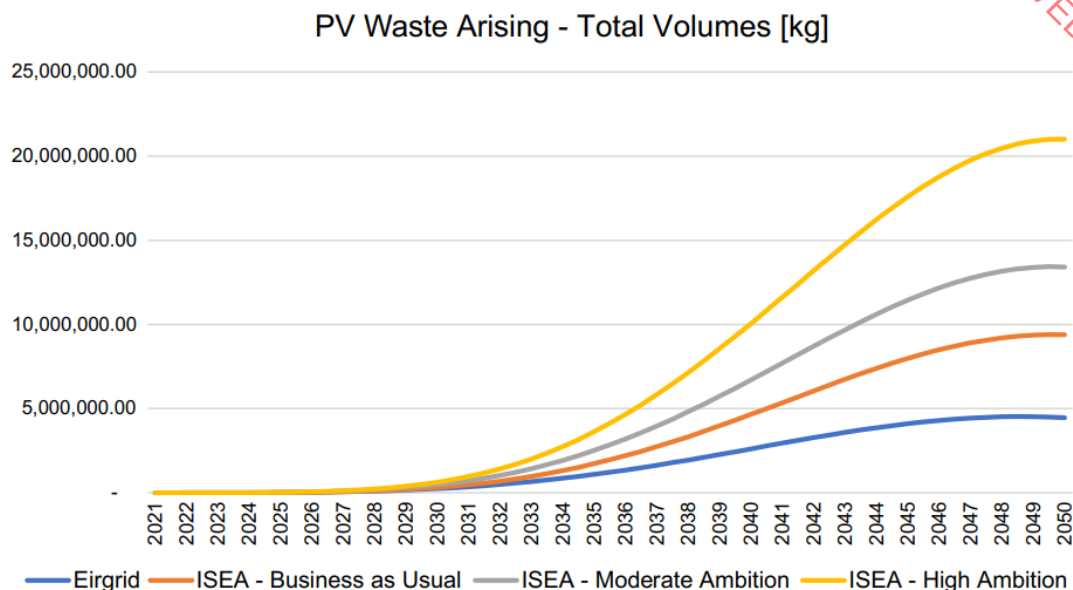
The global transition to renewable energy sources will undoubtedly increase the demand for Solar PV equipment in Ireland. Between 2010 and 2018, the growth rate of PV installations was 36.8%, and this figure is expected to increase with time (Johnson, Fallah, Killian, & Fitzpatrick, 2019). According to figures from Solar Power Europe (Solar Power Europe, 2025) the growth rate of solar power capacity has increased every year since 2015. With this increase in capacity, it is expected that supply of Solar PV infrastructure will remain stable in the short and long term.

Waste

Future changes to waste management capacities are uncertain. It is possible that additional capacity may be available, although it is not currently possible to predict the future timeframes for when new waste management facilities would become available. It is also possible that some of the existing waste management facilities might close or be unavailable during the construction phase of the Proposed Project.

The number of landfills has decreased from 18 in 2008 to just three as of 2021 (Environmental Protection Agency, 2022). There is also not currently any specialised recycling facility in Ireland that can recycle Solar PV equipment. Given the increase in WEEE waste predicted to arise from Solar PV infrastructure shown in Figure 15.5, and the diminishing landfill capacity in Ireland, a future scenario based on current trends would assume an increase reliance on exporting waste (particularly hazardous and WEEE waste) for treatment and disposal.

Figure 15.5: Future PV waste arisings based from worst-case to best-case scenarios



Source: (Johnson, Fallah, Killian, & Fitzpatrick, 2019)

15.5 Likely Significant Impacts

15.5.1 Do Nothing

In the event that the proposed development does not proceed, there would be no potential effects on existing infrastructure, built services and waste. The positive benefits of generating renewable solar energy will not be realised if the Proposed Project is not developed.

15.5.2 Construction Phase

This section outlines the potential impacts relating to material asset use and waste generation during the construction phase. In the case of the Proposed Project, no demolition activities will take place. Therefore, this section will focus on only site clearance, excavation and construction.

The information outlined in this section has been derived from Truck Movement Estimations provided by the Mott Macdonald project team available at the time of writing. It should be noted that specific figures are subject to change as the design and construction process progresses.

15.5.2.1 Utility Services

As noted in section 15.4.1, there are no identified utility services within the study area, with the exception of the MV ESN distribution overhead lines, which will be required to be relocated by ESN prior to the commencement of construction activities for the Proposed Project. These relocation works do not form part of the Proposed Project, as such, there are no other impacts to utility services, there are no likely significant impacts to the receiving environment.

As this relocation works for the MV distribution overhead lines are the responsibility of ESN they will provide prior notification of disruptions to all impacted properties as per their normal operating procedures.

15.5.2.2 Utility Use

During the construction phase temporary construction compounds will be required within each Array Area of the Proposed Project. Welfare facilities will be provided at these locations, and any discharges will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility. Water will be tankered onto site as required. Consequently, significant adverse effects on utility services during the construction phase are not likely.

15.5.2.3 Material assets

No material assets are expected to be required for the site clearance or excavation phases.

For the construction phase, a significant proportion of the material assets required for the Proposed Project are prefabricated and are assumed to be imported from outside of the development study area. It is assumed that these materials have undergone separate consenting and regulatory procedures at the place of origin.

Excavation and site preparation works will generate some resources that can be re-used within the Proposed Project. As well as these site-won materials, the Proposed Project is likely to require a moderate quantity of additional material assets to be imported to site. It will, therefore, have the potential for some adverse environmental impacts through a reduction in the availability of material assets and the depletion of natural resources. A non-exhaustive list of the types of material assets likely to be required during the construction phase is:

- Concrete
- Cement
- Aggregate materials
- Metals

The potential impacts associated with the use of material assets on the receptors include:

- The availability of material assets and the subsequent impact on the demand for materials. Materials will need to be imported to the site as it is assumed the Proposed Project will be unlikely to entirely recover or reuse site-won material.
- The depletion of non-renewable resources. The majority of materials used on the Proposed Project will comprise primary materials as the Proposed Project is unlikely to be able to source all required materials from recycled or secondary materials.
- Impact access to one or more allocated mineral sites.

A summary of the material assets required for the Proposed Project is given in Table 15.13.

Table 15.13: Material assets required during the construction phase

Material asset	Estimated quantity	Additional notes
Primary materials		
Gravel	12,720m ³	Aggregates (Crushed rock)
Tarmac	500m ³	Aggregate based
Concrete	9,950m ³	Aggregate based (Sand and Gravel)
Prefabricated material assets		
Solar PV panels	97,290 no.	PV equipment
PV string inverters	148 no.	PV equipment
Weather stations	4no.	Prefabricated building units
Battery Storage Modules	79no.	Prefabricated building units

Material asset	Estimated quantity	Additional notes
Primary materials		
Acoustic Barrier	1no. 8.5m high	Prefabricated building units
PCU housings	19no.	Prefabricated building units
GIS building casing (shell)	2,295m ²	Prefabricated building units
Control cabinets	60	Prefabricated furniture units
Transformers	17	Modular Electrical Infrastructure
Switchgear	8 bays with sectionalisers	Modular Electrical Infrastructure
33kV switchgear	2 units	Modular Electrical Infrastructure
Current transformers	12no.	Modular Electrical Infrastructure
Voltage transformers	12no.	Modular Electrical Infrastructure
Generator	1no.	Modular Electrical Infrastructure
Disconnectors	6no.	Modular Electrical Infrastructure
Lightning protection	6 lightning poles	Structural support
Cable sealing ends	12no.	Structural support
CCTV poles	176no.	Structural support
Lighting poles	38no.	Structural support
Post insulators	12no.	Structural support
HV cable	17km	Electrical Cables
MV cable	16km	Electrical Cables
LV cable	175km	Electrical Cables
Beams	577m	Metals
Boundary fences	12,248m	Metals (fence)
Substation fences	400m	Metals (fence)
BESS fencing	1,155m	Metals (fence)
Temporary compound fencing	440m	Metals (fence)
Barrier (crowd) control panels	200 no.	Metals (fence)

Source: Mott Macdonald Truck Movement Estimations

A significant quantity of the material assets required for the Proposed Project would typically be classed as aggregate-based bulk materials. The recycled content of the material is unknown at this stage, but best practice would be to use materials with a high proportion of sustainable features compared to industry standard materials, where it is technically and economically feasible to do so.

A summary of the required aggregate-based bulk materials for the Proposed Project is given in Table 15.14.

Table 15.14: Aggregate-based bulk materials required for the Proposed Project

Material	Development	Estimated Quantity (m ³ unless otherwise specified)	Notes
Concrete	BESS (Foundations for Acoustic barrier and containers)	4,530	Aggregate based material imported to site. Assumed to be classed as sand and gravel.
	Substation (foundations)	1,450	
	Solar Plant Transformer Centre Foundations	190	
	MV/LV Cable trench	2,190	

Material	Development	Estimated Quantity (m ³ unless otherwise specified)	Notes
	220kV cable trench (off site)	1,590	
Gravel/Sand	Access tracks	8,090	Assumed to be aggregate based (sand and gravel). Includes sub-base and surface layer.
	Substation (AIS compound)	310	
	MV/LV Cable Trench	4,320	
Tarmac	Access tracks	350	Assumed to be classed as aggregate based.
	Substation (GIS compound)	150	
Total Concrete		9,950	
Total Gravel		12,720	
Total Tarmac		500	
Total aggregate based materials		23,170	

Source: Mott Macdonald project team

Indicative figures for the earthwork volumes that are expected to be required for the Proposed Project are highlighted below. It is expected that 84,180m³ of cut material will arise from the Proposed Project, and a total of 60,030m³ of materials will be required for fill activities, of which 36,860m³ will be sourced from site-won excavated material. Indicative earthwork volumes for both the primary site and the secondary site area are outlined in Table 15.15.

Table 15.15: Estimated cut and fill volumes from excavation activities at the Proposed Project

Material	Development	Cut (m ³)	Fill (m ³)	Notes
Soils (including topsoil, soil and subsoil)	Access tracks	5,965	-	Assumed that none of the cut materials arising from the excavation for the access tracks will be backfilled on site.
	MV/LV Cable Trenches	13,650	6,170	Fill material is backfilled from site-won material. Assumes volume of cables is negligible.
	Drainage	31,470	9,470	Fill material is backfilled from site-won material.
	BESS Platform Levelling	23,540	17,810	Fill material is backfilled from site-won material.
	Substation Platform levelling	5650	1460	Fill material is backfilled from site-won material.
	Grid connection (Off site)	3,905	1,950	Fill material is backfilled from site-won material.
Total Soils		84,180	36,860	47,320m ³ of surplus soils will require removal from site or alternative management.
Total Concrete		-	9,950	As per Table 15.14
Total Gravel		-	12,720	As per Table 15.14
Total Tarmac		-	500	As per Table 15.14
Total Cut/Fill		84,180	60,030	Difference between total cut and total fill (including site-won and imported materials) is 24,150m ³
Total fill material from reused sources		-	36,860	

Source: Mott Macdonald Truck Movement Estimations. *A bulking factor of 1.15 has been applied to the cut factor only.

It is estimated that roughly 36,860m³ of site-won material will be reused in the Proposed Project, particularly for fill activities relating to the cable trenches, drainage and foundations. A surplus figure of 47,320m³ will require either removal from site or alternative management.

Based on the information given in Table 15.14 and Table 15.15, it is expected that roughly 23,170m³ of bulk and concrete material assets are required to be imported to the site, most of it will be mainly comprised of gravel and crushed rock. Assuming densities of 1.52 tonnes/m³ for gravel, 2.5 tonnes/m³ for concrete (Civil's Guide, 2021) and 0.72 tonnes/m³ for tarmac (RF Cafe, 2021) this value equates to roughly 44,569.4 tonnes.

Aggregate materials are considered to be abundant across Ireland. From the most recent data available in 2021 (shown in Figure 15.2), the Irish Concrete Federation estimates that the annual production of aggregate materials in Ireland was 38 million tonnes. It is likely that there will not be any issues regarding stock and supply for aggregate or aggregate based material. It is also estimated that the Proposed Project will require 0.14% of the total aggregate production in Ireland.

For the assessment purpose, it is assumed that all metals required for the Construction phase are steel. The total tonnes of steel required is currently not available, but the Proposed Project is not expected to require significant quantities. The baseline study indicates that availability of steel in Ireland is stable, and given the small quantities required, the impact of the Proposed Project on steel reserves in Ireland is expected to be Negligible.

The baseline study indicates that there are no mineral sites within 500m of the Proposed Project boundary. Hence the Proposed Project will not sterilise or have any impact on access to one or more allocated mineral sites.

It is anticipated that there would be a direct and permanent effect on the availability of material assets and in the depletion of non-renewable resources during the construction phase. Prior to any mitigation measures, based on IEMA's guidelines, the sensitivity of effect is considered Negligible (

Table 15.3), and the magnitude of effect is Negligible (Table 15.4). According to IEMA guidelines, the effect threshold for the Proposed Project would be considered as Slight. Following the method set out in Table 15.9, the equivalent effect threshold according to EPA guidance would be Slight, and the predicted significance of effect, would be Not Significant.

Waste arisings and management

The wastes arising from the construction phase of the Proposed Project are expected to be managed according to the RWMP and the waste hierarchy. Waste is likely to be generated mainly from the site preparation works which may result in the following waste arisings (although the list is not exhaustive):

- Excavated materials.
- Surplus materials from site preparations, excavation and construction.
- Damaged stocks and offcuts.
- Green waste from vegetation clearance.
- Unsorted non-hazardous materials such as timber.
- Debris or rubbish lying on the ground.

The receptors likely to be subject to impacts as a result of waste generation and its management are the surrounding environment and habitats, landfills and other waste management infrastructure. The potential impacts relating to the generation and management of waste on these receptors include:

- Temporary occupation of waste management infrastructure capacity (from treatment of waste) and temporary occupation of land for the storage of waste awaiting transfer off site.
- Permanent reduction in landfill capacity (from disposal of waste).

The amount of waste that will arise during the construction of the Proposed Project will be subject to change as the construction progresses.

There is no demolition activities planned for the Proposed Project. However, there are anticipated waste arisings for the site clearance and excavation phases.

It is expected that vegetation clearance in the form of hedgerow removal will be required to facilitate large site entrances between fields that will allow access tracks to be constructed. No vegetation waste arisings estimate was available at the time of writing, but it is assumed that roughly 60m of hedgerow removal is required. Assuming green waste is properly managed in accordance with the RWMP, it will either be chipped on site or composted in a waste management facility.

As previously noted, it is expected that a large proportion of the material assets required for the Proposed Project will be prefabricated (see Table 15.13). A worst-case scenario estimates that 10% of these materials will end up as waste due to damage, offcuts or surplus. It is expected that any waste arisings from these materials will be recycled in a waste management facility.

It is expected that a significant proportion of waste arisings from the Proposed Project will be soils generated from excavation activities. A summary of waste arising from excavation activities is given in Table 15.16.

Table 15.16: Expected waste arisings from excavation phase of the Proposed Project.

Material	Initial waste arising estimations (m ³)	Retained on site or exported for off site treatment or disposal (m ³)	Reuse within the Proposed Project (m ³)	Type of waste
Soils (including topsoil, soil and subsoil)	84,180	47,320	36,860	Non-hazardous*

Source: Mott Macdonald Truck Movement Estimations *Whilst soils and could potentially be inert, a worst-case scenario has been assumed that deem them as non-hazardous.

Additionally, whilst waste arisings from construction activities have not been quantified yet, expected waste arisings can be estimated based on the quantities of construction materials provided by the project team (Table 15.13). Based on professional judgement, a worst-case scenario would assume that 10% of material assets required from the Proposed Project will become waste due to damages, off-cuts or surplus to requirements.

Table 15.17 summarises the anticipated waste arisings from construction works based on the required material assets. Potential waste arisings from prefabricated material assets outlined in Table 15.13 have not been included in these calculations. It is assumed that the potential waste arisings for these materials in the construction phase will be negligible and any losses incurred will be accounted for at the point of production.

Table 15.17: Total expected waste arisings from construction works assuming a worst-case scenario

Material	Quantity of potential losses (m ³)	Type of waste
Concrete	995	Inert
Gravel	1,272	Inert

Material	Quantity of potential losses (m ³)	Type of waste
Tarmac	50	Non-hazardous*
Total inert	2,267	
Total non-hazardous	50	

Source: Table 15.14. *Assumes that the tarmac does not contain coal tar and can be considered non-hazardous waste as per EPA specifications (Environmental Protection Agency, 2018).

Note: Assumes that 10% of the materials brought to site (Table 15.14) will end up as waste.

Table 15.18 gives a summary of the expected waste arisings from the excavation and construction phases of the Proposed Project with the equivalent value given in tonnes.

Table 15.18: Total expected waste arisings for the construction phase of the Proposed Project in tonnes

Material	Quantity of waste (m ³)	Conversion factor*	Quantity (tonnes)	Type of waste
Concrete	995	0.9	895.5	Inert
Gravel	1,272	1.06	1,348.3	Inert
Tarmac	50	0.9	45	Non-hazardous
Soils (including topsoils, soils and sub-soils).	47,320	1.06	50,159.2	Non-hazardous
Total Inert	2,267	-	2,243.8	
Total Non-hazardous	47,370	-	50,204.2	

Source: Mott Macdonald Truck Movement Estimations *Due to a lack of specific official guidance on density factors for Ireland, conversion factors have been assumed based on UK conversion factors for waste (Scottish Environment Protection Agency, 2014)

It is expected that 2,243.8 tonnes of inert waste and 50,204.2 tonnes of non-hazardous waste will arise during the construction phase of the Proposed Project. It is expected that these wastes will be managed in accordance with the RWMP, with a strong preference for recycling and re-use on site or on alternative schemes.

The 2,243.8 tonnes of inert waste arising from the construction phase will be managed by disposal in landfill. Annual void capacity for waste disposal in landfills accepting C&D waste in Ireland is approximately 470,000 tonnes per year (see Table 15.12). Based on this scenario and the remaining landfill void capacity, it is expected that inert wastes from the Proposed Project will occupy approximately 0.48% of total annual landfill capacity.

For the 50,204.2 tonnes of expected non-hazardous waste arising from the Proposed Project, most of which is expected be classed as soils arising from excavation activities, a worst case scenario assumes that 100% of this material will be exported offsite and disposed of in landfill. Based on annual void capacity of landfills accepting C&D waste in Ireland being approximately 470,000 tonnes, the expected non-hazardous waste arisings will occupy approximately 10.68% of total annual landfill capacity.

It is not expected that the construction phase will produce any hazardous waste arisings. However, as a worst case scenario, it is anticipated that a small quantity of hazardous waste may be generated if prefabricated electrical components are damaged during delivery. Any hazardous waste is likely to be either treated at an Irish facility, EPA licenced facility or exported for treatment and thus not landfilled.

Therefore, prior to any mitigation measures, it is anticipated that the Proposed Project would have a direct and permanent effect on landfill void capacities.

Based on the IEMA's guidelines, for inert waste, the sensitivity of effect would be Low, and the magnitude of effect would be Negligible (Table 15.3 and Table 15.4) and the effect threshold would be Slight (Table 15.5). The equivalent environmental effect categories in the EPA guidelines (Table 15.9) would be Slight and Not Significant.

For hazardous waste, the sensitivity effect would be Negligible, and the magnitude effect would be Negligible (Table 15.3 and Table 15.4) and the effect threshold would be Neutral (Table 15.5). The equivalent environmental effect categories in the EPA guidelines (Table 15.9) would be Slight and Not Significant.

For non-hazardous waste, due to the volume, the sensitivity effect would be Very High and the magnitude effect would be Major (Table 15.3 and Table 15.4) and the effect threshold would be Very Large (Table 15.5). The equivalent environmental effect categories in the EPA guidelines (Table 15.9) would be Profound and Significant.

15.5.3 Operation and Maintenance Phase

Once operational, solar assets require regular maintenance and occasional repair. Given the significant quantity of solar panels used in the Proposed Project, the lifecycle of this equipment must be considered. As highlighted in Chapter 5, the design life of the Proposed Project is 40 years. However, the average life span of solar panels is approximately 25-30 years.

It is most likely that some of the solar panels will be replaced prior to its lifespan as part of the regular refurbishment works. However, assuming a worst-case scenario where 100% of the initial solar panels will have to be replaced between 2050-2055, 97,290 solar panels will end up as waste and require specialist recycling. Additionally, 97,290 new solar panels will require procurement in order for the Proposed Project to remain fully operational.

15.5.3.1 Built Services

The Proposed Project will result in new infrastructure connecting to the existing 220kV Great Island – Lodgewood transmission circuit in the form of a new cable connection. A buffer exclusion zone of 10m wide either side of the existing 110kV transmission circuit has been implemented as per ESN requirements in the represent of safety, maintenance and operations related to the 110kV conductor. No significant adverse operational phase impacts on utilities services are anticipated.

15.5.3.2 Utility Use

The substation compound will require potable water and power, but they will not require excessive utility use to operate. Due to the minimal use and volumes associated the effects are considered to be imperceptible. The substation compound will normally be unmanned, however, up to four operation and maintenance crew will visit the GIS building every month. Due to the minimal use and volumes associated the effects are considered to be imperceptible.

15.5.3.3 Solar/BESS infrastructure

Given the current growth in the green energy market in Ireland (see Section 15.4.5), it is unlikely that there will be issues regarding stock and supply of solar panels in the short-term or long-term future. Small quantities of key construction materials (like aggregate, concrete, steel etc) may also be required. However, the quantity of these materials is expected to be minimal compared to the construction phase.

It is also likely that other electrical equipment, including inverters, CCTV, switchgear, and batteries, will require replacement during the 40-year operational life span of the Proposed Project. However, the quantity of material assets required is expected to be minimal.

So, prior to any mitigation measures and based on IEMA's guidelines, for the operational and maintenance phase, the significance of effect for use of material assets would be similar to that of the construction phase. Based on IEMA guidelines, the effect threshold for the Proposed Project would be considered as Slight (Table 15.5). The equivalent environmental effects based on EPA guidelines (Table 15.9) would be Slight and Not Significant.

15.5.3.4 Waste arisings and management

It is unclear what the environmental impact of this could be at this stage. Currently, there are no specialist photovoltaic recycling facilities in Ireland. However, given the growth of green energy infrastructure in Ireland and the EU more broadly, it is possible that national capacity for management of WEEE arisings from photovoltaic infrastructure could increase in the near future. It is anticipated that all waste arisings from solar panels or other electrical equipment will be recycled to support a circular economy.

A small quantity of waste that is similar to that generated from the construction phase may arise, that are likely to be sent to a waste management facility. So, prior to any mitigation measures, for the operational and maintenance phase, based on IEMA's guidelines, the significance of effect for waste generation and its management would be similar to that of the construction phase. Based on IEMA guidelines, the effect threshold for management of inert, hazardous and non-hazardous waste for the Proposed Project would be considered as Slight (Table 15.5). The equivalent environmental effects based on EPA guidelines (Table 15.9) would be Slight and Not Significant.

15.5.4 Decommissioning Phase

Upon decommissioning after 40 years of operation, the solar panels and BESS units could require recycling or repurposing depending on the operational condition of the units. It is possible that decommissioning would require some additional material assets for temporary access tracks to support the removal of the solar panels.

15.5.4.1 Material assets

Any material assets required for the decommissioning phase are expected to be minimal compared to the construction phase. So, prior to any mitigation measures and based on IEMA's guidelines, for the decommissioning phase the significance of effect for use of material assets would be similar to that of the construction phase. Based on IEMA guidelines, the effect threshold for the Proposed Project would be considered as Slight (Table 15.5). The equivalent environmental effects based on EPA guidelines (Table 15.9) would be Slight and Not Significant.

15.5.4.2 Waste arisings and management

The impacts of the waste arisings from the decommissioning phase are unclear at this stage and could drastically vary depending on technological improvements in photovoltaic recycling over the next 40 years. It is anticipated that all waste arisings from solar panels will be recycled to support a circular economy. Small quantity of waste that are similar to those generated from the construction phase may arise from the decommissioning phase that are likely to be sent to a waste management facility and diverted from landfill.

So, prior to any mitigation measures, for the decommissioning phase, based on IEMA's guidelines, the effect threshold for inert, hazardous and non-hazardous waste generation and its management would be considered as Slight (Table 15.5). The equivalent environmental effects based on EPA guidelines (Table 15.9) would be Slight and Not Significant.

15.6 Cumulative Effects

During the construction phase, eight schemes within 15km of the Proposed Project have been identified as having the potential to result in cumulative effects on material supplies and waste management due to the similar scale of the Proposed Project, types of materials required and waste arisings. These schemes are listed below, with planning application references in brackets:

- Ballmackesy Solar (20160442)
- Tomfarney Solar (20160717)
- Rochestown Solar (20210807)
- Ballygowry Solar (20220900)
- Great Island Grid Development (20230871)
- Greatisland BESS and underground cable (20231294)
- Knockmullin Energy Storage (20240650)
- Great Island - Kellis Overhead line uprate (20241230).

The construction of these schemes could potentially be concurrent with the construction phase of the Proposed Project and could cause cumulative effects due to their close proximity to the site. It could be assumed that some of these schemes will have already been constructed by the time construction begins on the Proposed Project. However, due to the unconfirmed date for commencement of construction, they all remain a consideration in this assessment.

The sensitive receptors which could potentially experience cumulative effects as a result of the use of material resources include quarries and other sources of bulk materials, solar PV infrastructure supplies, and any other finite raw material sources. The potential impacts include:

- Depletion of non-renewable resources
- Impact on national or local demand for materials

The sensitive receptors which could potentially experience cumulative effects as a result of waste generation and management include landfills and other waste management infrastructure.

- Utilisation and depletion of the remaining local landfill capacity.
- Occupation of favourable waste management infrastructure capacity, such as soil recovery facilities.

There is the potential that most of the short-listed eight schemes could have an adverse impact on the capacity of receiving waste management facilities within the expansive study area. It is anticipated that the eight short-listed schemes would all generate waste and require materials during construction phase and that such waste would require treatment and/or disposal at third party waste management facilities. There would also be a significant requirement for materials, particularly during the construction of each of the schemes unrelated to the Proposed Project.

The waste and materials anticipated to be generated or used for these schemes, or the timescales over which waste could be generated and materials required is not known at this time. Therefore, accurate predictions of the expected effects are not possible.

However, it is recognised that the cumulative impacts are likely to be greater than the individual effects of each scheme, although good practice would seek to reuse material on the development sites where possible to reduce waste arisings as far as practicable. All of these schemes are likely to have mitigation measures in place to reduce impacts to the environment, including dust generation and potential mobilisation of contaminants. Mitigation methods will be implemented for the Proposed Project which are detailed in section 15.7.

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15.7 Mitigation and Monitoring Measures

15.7.1 Mitigation Measures

15.7.1.1 Construction Phase

Material assets

Mitigation measures during the construction phase that promote an efficient use of material assets include the following (but are not limited to):

- It is recommended that all suitable excavated materials are reused in the construction of the Proposed Project and in landscaping features, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site.
- Where site-won material is not available or suitable for reuse, secondary or recycled materials would be procured, where available and feasible.
- Where feasible, materials would be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation.
- Temporary stockpiling of fill materials prior to incorporation in the Proposed Project would be avoided where possible, to ensure double handling and damage is minimised and therefore avoidance of waste. However, where required, materials would be stockpiled in accordance with best practice and managed appropriate to limit the likelihood of damage or contamination.
- Pre-cast solar panels and structures will be used, where technically feasible, to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.

Waste arisings

The Proposed project is expected to retain a significant proportion of the waste arising from soil excavation onsite for possible future use. It is recommended that surplus excavation material, if it cannot be used on the Proposed Project or neighbouring schemes, is sent to a soil recovery facility for treatment and diverted from landfill.

In addition to this, waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Mitigation measures for reuse and recycling of waste include (but are not limited to):

- Recycling of inert materials by crushing, blending and subsequent reuse, as an aggregate.
- Providing onsite facilities to separate out waste to enable the recovery of material through recycling.
- Where waste must be taken to a recycling or disposal site, the contractor would ensure that the site has the appropriate permits. In addition, the suitable facility would be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The contractor would identify the closest and relevant treatment and disposal sites.
- Waste arisings sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the Proposed Project site to an authorised site of recovery/disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment.
- All contaminated/hazardous waste (including soil) would be identified for proper management and transferred/disposed of to an adequate waste management facility. These

materials will be stored separately to any non-hazardous material to avoid cross-contamination.

A non-exhaustive list of waste management facilities is provided in Table 15.10. The ability for waste arisings to be deposited at these sites is dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the Proposed Project that may be used.

Best practice would be to minimise the generation of waste as much as possible in accordance with the waste hierarchy principles and to incorporate circular economy principles, wherever it is technically appropriate and economically feasible. The use of the Construction Environmental Management Plan (CEMP) and RWMP will assist in implementing these waste hierarchy and circular economy principles. Therefore, wherever technically appropriate and economically feasible, adequate mitigation measures will be applied to the Proposed Project and potential environmental effects minimised.

15.7.1.2 Operational Phase

The waste hierarchy and circular economy principles would also be implemented throughout the operational phase of the Proposed Project. Mitigation measures for material assets and waste management include (but are not limited to):

- Carry out regular preventative maintenance of solar arrays and associated infrastructure to extend the life-span of materials.
- Delivering any material assets for ongoing operations on a just-in-time basis to avoid storage and double handling that could lead to damage or contamination and increased waste arisings.
- Managing and programming all operations programmes in such a manner as to prevent/minimise waste production. Circular economy principles to be incorporated where feasible.
- Providing onsite facilities to separate out waste streams to enable managing waste as high up in the waste hierarchy as feasible, prioritising the recovery and recycling of material over landfill disposal. In addition, provide clear signage and/or colour coded receptables in designated and easily accessible locations.
- Handling, storing, managing, reusing or recycling waste arisings as close as practicable to the point of origin.
- Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible.
- Ensuring all employees are aware of the best practices to optimise material assets use and minimise waste generation.
- Ensuring clear and effective communications and signage about recycling, waste hierarchy and circular economy.
- Establishing standard operations procedures that are aimed to minimising waste generation.
- Producing an Operational Waste Management Strategy (OWMS) is recommended. A OWMS will help to estimate waste arisings, provide an adequate management strategy, outline opportunities to reduce waste arisings and details on a waste monitor process.

15.7.1.3 Decommissioning Phase

Some of the mitigations that are applicable for the construction and operational phases are also applicable for the decommissioning phase. These include:

- The waste hierarchy and circular economy principles would be implemented throughout the decommissioning phase of the Proposed Project.

- Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible.

15.7.2 Monitoring Measures

During the construction phase, materials and waste arisings will be monitored as outlined in the RWMP. Undertaking monitoring audits on a regular basis will give an indication of where continual improvements to waste management and minimisation can be made throughout the construction phase. The RWMP will be used to measure and monitor the types and quantities of waste taken off site, to ensure that the waste hierarchy is being implemented, where practicable. Environmental management and compliance will also be monitored through the CEMP.

Once the Proposed Project is in the operational phase, the waste management will be supervised by suitable trained staff with knowledge of the waste control procedures, record keeping, maintenance requirements, emergency actions plans and environmental monitoring. Monitoring the performance of the solar equipment regularly will help to schedule reactive maintenance and extend the life span of the equipment. Waste monitoring audits will also be undertaken during the operational phase on a regular basis, which will be recorded.

15.8 Residual Impacts

The Proposed Project will aim to implement the circular economy principles and waste hierarchy throughout the construction, operational and decommissioning phases. It is also anticipated that the Proposed Project will implement mitigation measures outlined in Section 15.7.

During the construction phase, based on EPA guidelines 2022 (Environmental Protection Agency, 2022), the residual effects for materials assets according to the EPA guidelines remains unchanged as Slight and Not significant.

Waste will be managed in accordance with RWMP in order to meet the requirements of the national waste legislation and ensure waste will be managed higher up the waste hierarchy as technically appropriate and economically feasible. Based on EPA guidelines 2022 (Environmental Protection Agency, 2022), for the construction phase, the residual effects for inert and hazardous waste management for sensitivity and magnitude remains unchanged as Slight and Not significant (see Section 15.5.2).

The predicted significance of effect from non-hazardous waste arisings, prior to mitigation for the Proposed Project being classed as Significant is predominantly a result of a worst case scenario being assumed that this material will not be diverted from landfill. It is likely that as the design of the Proposed Project develops, the 50,204.2 tonnes of surplus soils from excavation will be diverted from landfill through retaining the material onsite and/or processing at soil recovery facilities.

According to the C&D report, the national capacity of soil recovery facilities in Ireland is 5,962,800 tonnes (Government of Ireland, 2020). Assuming a scenario where 100% of non-hazardous waste arisings from surplus soils from are diverted to soil recovery facilities, 0.84% of the national capacity for these facilities will be required. Where a worst-case scenario is assumed so that the remaining 45 tonnes of non-hazardous waste arisings from tarmac is expected to end up in landfill, less than 1% of annual landfill void capacity for non-hazardous waste would be required by the Proposed Project.

According to IEMA guidelines, the residual sensitivity effect would be Low and the magnitude effect would be Negligible (Table 15.3 and Table 15.4) and the effect threshold would be Slight (Table 15.5). The residual significance of effect for non-hazardous waste arisings with regard to

the EPA guidelines would be Slight and Not Significant based on the methodology set out in Table 15.9.

It is not anticipated that the operational phase will require large quantities of material assets. Waste generated during the operational phase will be disposed of within the Proposed Project and, therefore, no impact to the national landfill capacity void is expected. Potential replacement of solar panels could lead to waste generation during the operational phase. However, it is expected that these wastes will be managed via specialised recycling pathways and therefore be diverted from landfill. It is expected that residual effects for material asset use in the operational phase would remain unchanged according to the EPA guidelines (Table 15.9) and be Slight and Not significant. Similarly, the residual effects for waste arisings management based on EPA guidelines (Table 15.9) is expected to remain unchanged would be Slight and Not Significant.

Decommissioning is unlikely to require any additional material assets but may produce large quantities of WEEE due to the life span of the solar equipment. It is not possible to accurately predict the potential environmental effects at this stage. Whilst there is currently no recycling infrastructure in Ireland to process WEEE waste arisings from Solar PV equipment, this could change in the future. However, it is expected that these wastes will be managed via specialised recycling pathways (either nationally or abroad) and be diverted from landfill. Therefore, the residual effects for both waste arisings management and material asset use would remain unchanged according to EPA guidelines (Table 15.9) and be Slight and Not Significant.

A summary of the effect threshold and significance of effect based on EPA guidelines for likely significant effects (prior to mitigation) and residual effects (post mitigation) and is given in Table 15.19.

Table 15.19: Summary of expected environmental effects prior to mitigation and residual effects post mitigation according to EPA categories

Activities	EPA Environmental Effects (prior to mitigation)	EPA Residual Impacts (post mitigation)
Material assets		
Material Asset Use - Construction Phase	Slight, Not Significant	Slight, Not Significant
Material Asset Use - Operational Phase	Slight, Not Significant	Slight, Not Significant
Material Asset Use – Decommissioning Phase	Slight, Not Significant	Slight, Not Significant
Waste management		
Inert Waste Management - Construction Phase	Slight, Not Significant	Slight, Not Significant
Hazardous Waste Management - Construction Phase	Slight, Not Significant	Slight, Not Significant
Non-hazardous Waste Management - Construction Phase	Profound, Significant	Slight, Not Significant
Inert, non-hazardous and hazardous Waste Management – Operational Phase	Slight, Not Significant	Slight, Not Significant
Inert, non-hazardous and hazardous Waste Management – Decommissioning Phase	Slight, Not Significant	Slight, Not Significant

Source: Mott Macdonald based on (Environmental Protection Agency, 2022)

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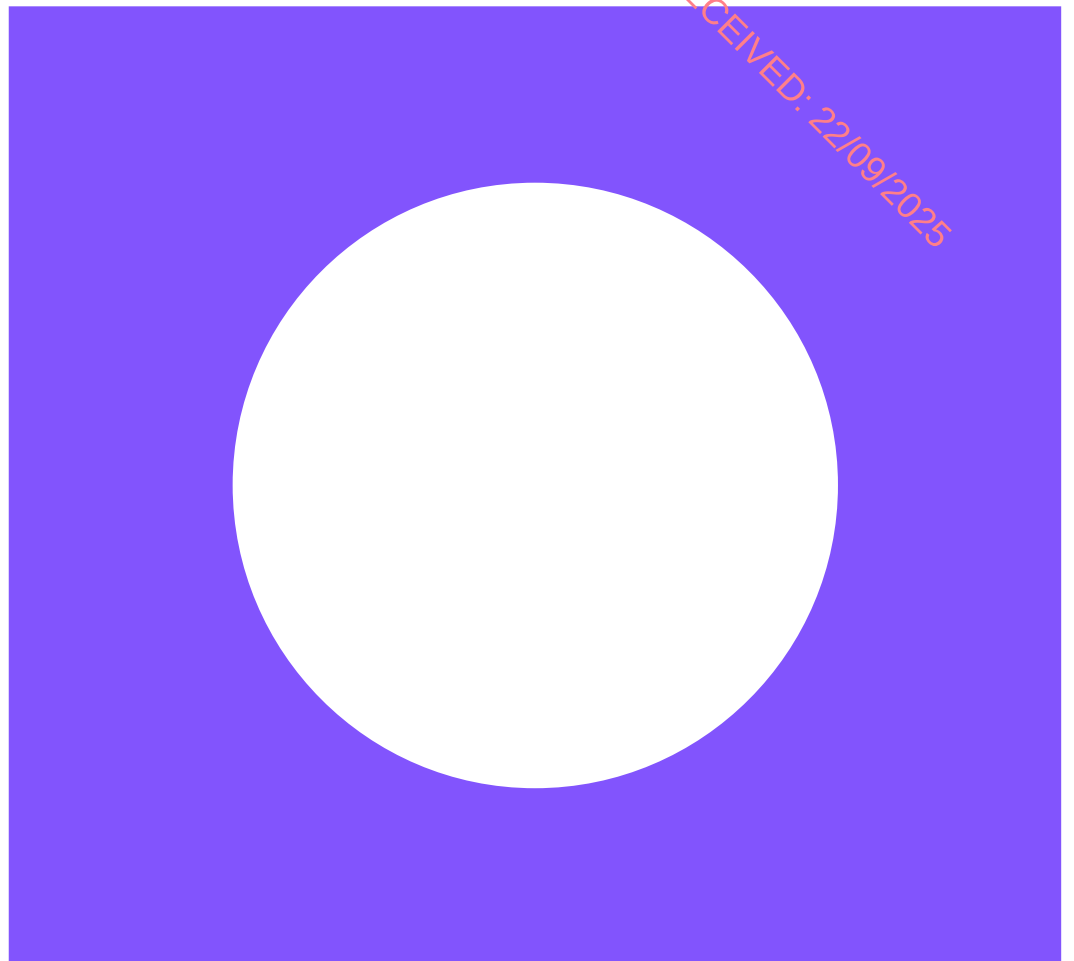
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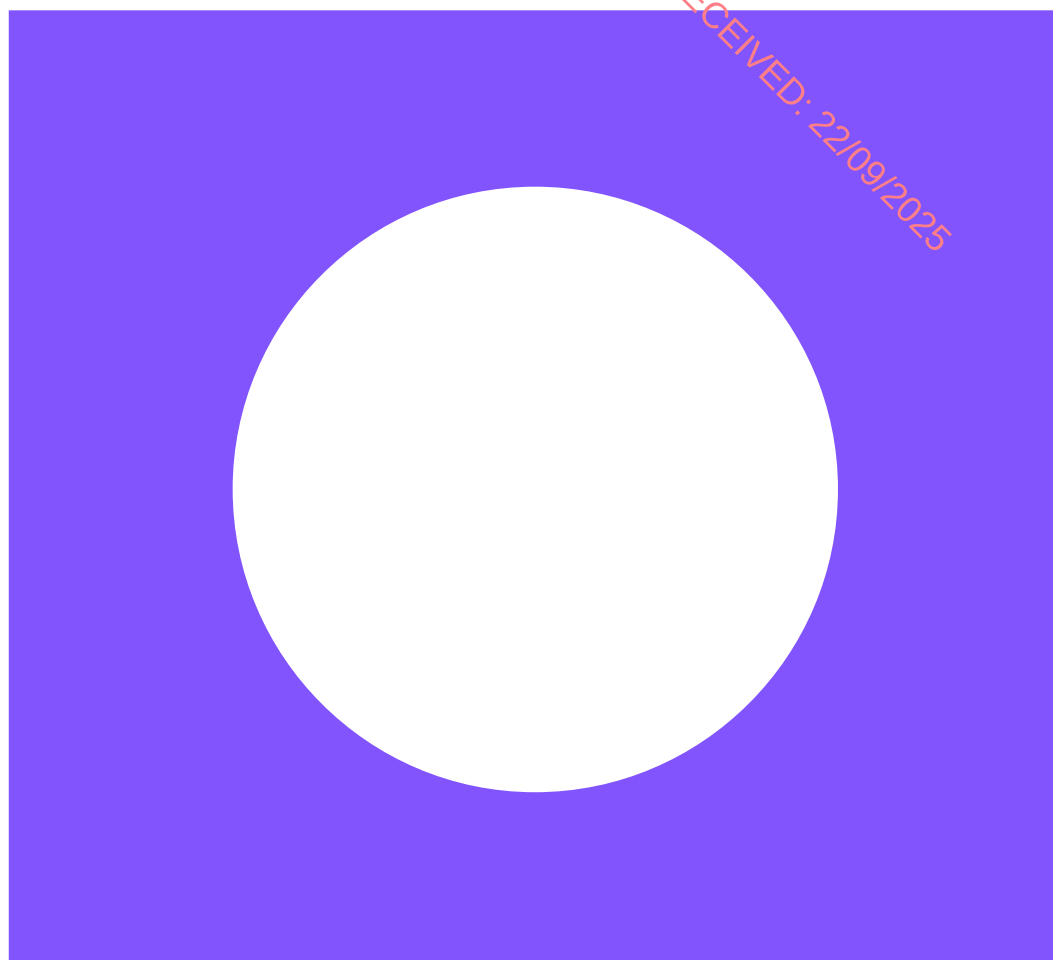
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 16 Climate

September 2025

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16 Climate

16.1 Introduction

This chapter captures the potential effects of the Proposed Project in relation to climate change. Two aspects are considered:

- The effects of the Proposed Project on the climate, or contribution to climate change and;
- The resilience of the Proposed Project to future weather and climate conditions due to climate change.

In relation to the contribution to climate change, the chapter presents a quantitative assessment of the anticipated greenhouse gas (GHG) emissions¹ associated with the Proposed Project and outlines recommended mitigation measures aimed at minimising adverse impacts.

Assessing the resilience of the Proposed Project to climate change is fundamentally different to the remainder of the EIAR assessment and topic chapters, as it assesses the impact of climate change on the Proposed Project receptors, as opposed to the impact of the Proposed Project on the environment. A qualitative assessment of the potential physical climate change risks to the Proposed Project has been undertaken.

16.2 Regulation, Policy and Guidance

16.2.1 GHG Emissions

The Proposed Project responds to the strategic need for enhanced energy infrastructure and security of supply, as identified across applicable policy frameworks. This section summarises relevant planning and energy policy directives and outlines how the Proposed Project aligns with, and supports the achievement of, key policy commitments and objectives.

Due to their heat retention capacity, GHGs contribute to climate change. Since the Kyoto Protocol, their control has been internationally recognised as crucial to limit and regulate global temperature rise. Based on this, national climate objectives prioritise the reduction of GHG emissions in pursuit of a low-carbon economy. In accordance with the updated 2025 Climate Action Plan, Ireland is committed to ensuring secure, cost-effective energy supply while progressing toward Net Zero by 2050².

¹ Greenhouse Gases (GHGs) refer to the seven gases covered by the Kyoto Protocol: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). These are measured in units of carbon dioxide equivalent (CO₂e) which expresses the impact of each gas in terms of the amount of CO₂ that would create the same impact. GHGs are commonly referred to as carbon.

² Climate Action Plan 2025, Government of Ireland, 2025 [online] Available at: [Climate Action Plan 2025 updated cover.pdf](#) [Accessed 22 July 2025].

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16.2.1.1 Regulations

European Regulations

Regulation (EU) 2021/1119 (2021)³

The Regulation (EU) 2021/1119, known as the European Climate Law, states a legally binding framework to achieve negative emissions after 2050, in line with the long-term temperature goals of the Paris Agreement⁴, and integrates climate objectives into EU governance structures to have a reduction of 55%⁵ in net GHG by 2030.

The European Climate Law recognises the importance of a secure energy system and the technological innovation as a driver for achieving the climate neutrality objective. As part of this, BESS is acknowledged as a key enabler for grid flexibility, renewable energy integration and reduction in fossil fuel reliance. In addition, this regulation implicitly supports the solar PV plants expansion to promote an energy system decarbonisation.

Revised Renewable Energy Directive (EU) 2023/2413 (2023)⁶

This revised directive requires a framework establishment to facilitate the uptake of renewables powers purchase agreements as well as storage facilities deployment and relate it with the national climate plans and GHG intensity reduction, until climate neutrality is achieved. This document acknowledges the role of renewable energy in achieving a 55%⁷ GHG emissions reduction by 2030, since the energy sector contributes over 75% of total EU GHG emissions. Framework from this directive has since been transposed into national and regional policies (see 16.2.1.2 Policies).

National Regulations

Nationally Determined Contribution (NDC) (2023)⁸

As a party of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement⁴, Ireland is committed to a legally binding target of at least 55% of GHG emissions reduction by 2030 compared to 1990 levels.

The country reports directly to the UNFCCC regarding national emissions and participates in formal meetings and the annual Conference of the Parties (COP). The national climate targets, policies and plans are built on Ireland's NDC.

16.2.1.2 Policies

European Policies

Energy Roadmap 2050 (2011)⁹

The Energy Roadmap 2050 states the long-term strategy of the European Union to achieve a low-carbon economy by 2050, with a goal of 80-95% GHG emissions reduction compared to

³ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ("European Climate Law") [online] Available at: [Regulation - 2021/1119 - EN - EUR-Lex](#) [Accessed 22 July 2025].

⁴ The Paris Agreement, 2015 [online] Available at: [The Paris Agreement | UNFCCC](#) [Accessed 22 July 2025].

⁵ At least 55% net GHG reduction compared to 1990 levels.

⁶ Directive (EU) 2023/2413 of the European Parliament and of the Council, 2023 [online] Available at: [Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex](#) [Accessed 22 July 2025].

⁷ 55% of GHG emissions compared to 1990 levels.

⁸ NDC Partnership, Ireland, 2023 [online] Available at: [Ireland | NDC Partnership](#) [Accessed 20 August 2025].

⁹ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. Energy Roadmap 2050, 2011 [online] Available at: [LexUriServ.do](#) [Accessed 22 July 2025].

1990 levels. This roadmap recognises the energy sector as the largest contributor to anthropogenic GHG emissions and highlights the importance of a transition to a low-carbon economy since it will reduce fossil fuel dependency. The roadmap acknowledges the importance of energy storage alongside renewable generation.

***RE PowerEU (2022)*¹⁰**

The European Commission launched in 2022 the REPowerEU initiative, in response to the energy crisis following Ukraine-Russia conflict, to end the European Union (EU) dependence on Russian fossil fuels and accelerate the energy transition to clean energy sources. This strategy aims to end the dependence of Europe on fossil fuels by 2030. To make the key goals possible, one of the actions identified is to promote the development of electricity storage capacities as well as renewable energy deployment and diversification.

National Policies

***Integrated National Energy and Climate Plan 2021-2030 (2024)*¹¹**

The Integrated National Energy and Climate Plan is the strategic framework of the country to meet the national energy and climate obligations, which are aligned with the EU priorities in this matter. Climate obligations include GHG emissions reduction target of 42% by 2030 (compared to 2005 levels) and carbon neutrality by 2050, as well as the roadmap of actions to meet Ireland's carbon budgets.

This plan includes the phase-out of coal and peat for electricity generation and implements renewable energy as part of the decarbonisation strategy, based on a long-term vision of net zero emissions by 2050. Specifically, this document states 80% of electricity to come from renewables by 2030, mainly solar and wind.

***Project Ireland 2040 – National Planning Framework First Revision (2025)*¹²**

The National Planning Framework (NPF) is the long-term strategy of Ireland for spatial development and sustainable growth, including the transition to a low-carbon economy through renewable energy, sustainable transport and energy-efficient buildings. National Policy Objective 69 is of special importance to climate change mitigation as it refers to integrating climate action into the planning system.

The long-term vision used for this framework is based on an aggregate reduction of carbon emissions in at least 80% by 2050 compared to 1990 levels throughout electricity generation, built environment and transport sectors.

***National Development Plan 2021-2030 (2021)*¹³**

This plan is designed to address key international challenges, covering climate change, housing, transport and environmental resilience. The National Strategic Outcomes (NSO) 8 states the contribution to carbon emissions reduction and climate adaptation, integrating climate action across all investment priorities to achieve an emissions reduction of 51% by 2030 and net zero emissions by 2050.

¹⁰ REPowerEU, European Commission, 2022 [online] Available at: [REPowerEU](#) [Accessed 22 July 2025].

¹¹ Ireland's integrated National Energy and Climate Plan 2021-2030, 2024 [online] Available at: [irelands-integrated-national-energy-and-climate-plan-2021-2030.pdf](#) [Accessed 28 July 2025].

¹² Project Ireland 2040 National Planning Framework, 2023 [online] Available at: [National Planning Framework First Revision – April 2025 - The National Planning Framework](#) [Accessed 22 July 2025].

¹³ National Development Plan 2021-2030, Government of Ireland, 2021 [online] Available at: [national-development-plan-2021-2030.pdf](#) [Accessed 22 July 2025].

To support this transition to a low-carbon, renewable energy deployment should take place at the same time that investment in grid infrastructure, interconnection and energy storage is promoted.

This plan was reviewed in the National Development Plan Review 2025¹⁴, which highlights the carbon reduction goal of the electricity sector, which consists of the reduction of 75% in emissions by 2030 compared to 2018. Aligned with this, this review outlines the continued focus and commitment of Ireland to climate action and the benefits of the transition to a low carbon economy.

Climate Action Plan 2025 (2025)¹⁵

The Climate Action Plan 2025 redefines the Climate Action Plan 2024, particularly the carbon budgets and sectoral emissions ceilings and their annual monitoring. This plan aims to halve carbon emissions by 2030 and achieve net zero by 2050.

For the electricity sector, the plan highlights the decrease in carbon emissions since 2023 due to the increasing renewable generation and net electricity imports.

The Annex of Actions¹⁶ of this plan includes new high-impact measures for delivery in 2025. These measures aim to promote climate action in the short term and track progress towards carbon reduction targets, and include the acceleration of renewable energy generation.

Ireland's Transition to a Low Carbon Energy Future (2015)¹⁷

This policy sets a framework to guide the transition to a low-carbon energy system by 2030, in alignment with EU climate and energy goals. The vision of this policy considers a carbon reduction between 80% and 90% by 2050, and net zero by 2100, compared to 1990 levels. To make it possible, the promotion of new and smart technologies, increase of renewable energy generation and modernisation of the grid are part of the sectoral focus on energy.

Ireland is committed with addressing any administrative, market or regulatory constraints to the implementation of energy storage, since electricity storage is expected to be crucial in facilitating the deployment of renewable energy such as solar PV plants. Additionally, solar energy is classified as an energy source that is secure, cost effective and competitive to guarantee electricity supply in a low-carbon economy.

Ireland's Long-term Strategy on Greenhouse Gas Emissions Reduction (2024)¹⁸

This strategy outlines Ireland's roadmap to achieve net zero by 2050, based on the EU targets and policies. It sets out sector-specific pathways and policy frameworks and emphasises the importance of energy security in the transition from fossil fuels to clean energy sources.

In the electricity sector the goal is to achieve 80% of renewable generation by 2030 and full decarbonisation by 2050, supported by the increasing implementation of offshore wind farms, scaling up solar generation, and grid modernisation and reinforcement. This should be

¹⁴ National Development Plan Review 2025, Government of Ireland, 2025 [online] Available at: [NDP_Review_document_-_updated_in_use.pdf](#) [Accessed 28 July 2025].

¹⁵ Climate Action Plan 2025, Government of Ireland, 2025 [online] Available at: [Climate_Action_Plan_2025_updated_cover.pdf](#) [Accessed 28 July 2025].

¹⁶ Climate Action Plan 2025 – Annex of Actions, 2025 [online] Available at: [Climate_Action_Plan_2025_-_Annex_of_Actions.pdf](#) [Accessed 28 July 2025].

¹⁷ Ireland's Transition to a Low Carbon Energy Future, Department of Communications, Energy & Natural Resources, 2015 [online] Available at: [Department of Communications, Energy and Natural Resources - Ireland's Transition to a Low Carbon Energy Future - 2015-2030](#) [Accessed 28 July 2025].

¹⁸ Ireland's Long-term Strategy on Greenhouse Gas Emissions Reduction, Government of Ireland, 2024 [online] Available at: [irelands-long-term-strategy-on-greenhouse-gas-emissions-reduction-2024-446f0792-e5b5-4.pdf](#) [Accessed 28 July 2025].

completed with the investment in long-duration storage systems and flexible demand management.

Regional Policies

Climate Action Plan 2024 – 2029 (2024)¹⁹

The Climate Action Plan of the Wexford County Council states the roadmap to reduce carbon emissions in a 51% by 2030, improve energy efficiency by 50% and achieve net zero by 2050, in alignment with the national and European policies and targets. It means that in 2030 the Council should not exceed 2270 tCO_{2e} emitted compared to 7110 tCO_{2e} generated in 2018.

The plan recognises the relevance of local authorities participation in the implementation of national policies at local level and summarises climate responsibilities of the Council, including full responsibility of the Council's greenhouse gas (GHG) emissions and energy consumption, as well as the role in promoting climate action by influencing, coordinating and supporting efforts. In addition, the strategic action areas include the integration of climate action into all policies and plans of the Council.

Wexford County Development Plan 2022-2028 (2022)²⁰

The Climate Action Strategy that is part of this plan includes 21 objectives, all of them with a decarbonisation approach and two of them focused on the reduction of carbon emissions associated only with energy. Chapter 2 "Climate Action" outlines the Climate Action Spatial Planning Strategy, which embeds the Mitigation and Spatial Planning. This planning is focused on reducing GHG emissions through the use of renewable energy sources.

16.2.1.3 Guidance

The Institute of Environmental Management and Assessment (IEMA) published in February 2022 the Guide on Assessing Greenhouse Gas Emissions and Evaluating their Significance²¹, with the aim of assist GHG practitioners with developing GHG emissions assessments, mitigation opportunities, significance estimation based on the Proposed Project effects, and reporting in statutory and non-statutory Environmental Impact Assessments (EIA).

PAS 2080:2023²² standard launched in 2023, was also considered in guiding this assessment. The standard covers the infrastructure and building value chain and incorporates carbon reduction in their whole life. Moreover, this standard helps identify opportunities for carbon reduction, create carbon management strategies and prioritise actions against climate impacts.

16.2.2 Climate Resilience

Resilience of a development to climate change is required in EIAR assessments in Ireland following the transposition of the EU Environmental Impact Assessment (EIA) Directive into Irish Law in 2020²³. This section outlines further regulation, policy and guidance relevant to the assessment of the climate resilience of the Proposed Project.

¹⁹ Wexford County Council Climate Action Plan 2024 – 2029, Wexford County Council, 2024 [online] Available at: [Climate Action Plan 2024-2029 English.pdf](#) [Accessed 28 July 2025].

²⁰ Wexford County Development Plan 2022-2028, Wexford County Council, 2022 [online] Available at: [Chapter 2: Climate Action | Wexford County Council Online Consultation Portal](#) [Accessed 28 July 2025].

²¹ Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance, IEMA, 2022 [online] Available at: [2022 iema greenhouse gas guidance eia.pdf](#) [Accessed 29 July 2025].

²² Guidance Document for PAS 2080 – Practical actions and examples to accelerate the decarbonisation of buildings and infrastructure, ICE, 2023 [online] Available at: https://www.ice.org.uk/media/vm0nwehp/2023-03-29-pas_2080_guidance_document_april_2023.pdf [Accessed 28 July 2025].

²³ EU Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by 2014/52/EU).

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16.2.2.1 Regulations

National Regulations

Climate Action and Low-Carbon Development Act, 2015 (amended 2021)²⁴

The Act was the first piece of legislation following the launch of the National Policy Position. The Act provides the statutory basis for the national transition laid out in the national policy position. It provides arrangements for achieving transition to a low-carbon, climate-resilient and environmentally sustainable economy by 2050. The Act includes the following key elements:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy.
- Mandated the creation of sector level adaptation plans.
- A National Long Term Action Strategy will be prepared every five years.
- Introduces a requirement for each local authority to prepare a Climate Action Plan which will include both mitigation and adaptation measures and be updated every five years.

16.2.2.2 Policy

European Policy

EU Adaptation Strategy (2021)²⁵

Adopted in 2021, the EU Adaptation Strategy aims to reinforce the adaptive capacity and minimise the vulnerability of the EU to climate change. The strategy focuses on four key objectives:

- **Smarter adaptation** – Using better data and tools to guide actions, such as protecting homes, businesses, and farms;
- **Faster adaptation** – Developing solutions to reduce climate risks, enhance protection, and secure water resources;
- **More systemic adaptation** – Addressing climate impacts across all sectors by integrating climate resilience into policies, supporting local actions, and promoting nature-based solutions; and
- **Stepping up international action** – Increasing global support, financing, and cooperation for climate resilience.

In line with the Paris Agreement²⁶ and European Climate Law, this strategy outlines a long-term vision for the EU to become a climate-resilience society by 2050. The strategy integrates international action for climate resilience into its framework.

National Policy

National Adaptation Framework (NAF) (2024)²⁷

Ireland's National Adaptation Framework (NAF), developed by the Department of Communications, Climate Action and Environment provides for an all-government approach to

²⁴ Climate Action and Low Carbon Development Act, Department of the Environment, Climate and Communications, 2021 [online] Available at: <https://revisedacts.lawreform.ie/eli/2015/act/46/revised/en/html> [Accessed 20 August 2025].

²⁵ EU Adaptation Strategy 2021, European Commission, 2021 [online] Available at: [EUR-Lex - 52021DC0082 - EN - EUR-Lex](https://eur-lex.europa.eu/eli/reg/2021/2404/oj) [Accessed 20 August 2025].

²⁶ The Paris Agreement, United Nations, 2015 [online] Available at: [The Paris Agreement | UNFCCC](https://unfccc.int/paris-agreement) [Accessed 20 August 2025].

²⁷ Ireland's National Adaptation Framework, Government of Ireland, 2024 [online] Available at: <https://assets.gov.ie/static/documents/national-adaptation-framework-2024-0fa761a3-84e5-4bcf-ac40-0f91f6431ae8.pdf> [Accessed 19 August 2025]

adaptation and requires the development of local and sectoral adaptation plans. A key goal of this framework is to provide the link between regional actions and EU priorities, while also aiming to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector, and the research community.

It is Ireland's second statutory framework aimed at reducing vulnerability to climate change impacts, replacing the first NAF from 2018 and developed under the terms of the Climate and Low Carbon Development Act. Adaptation actions under this framework range from building adaptive capacity through to policy and finance-based actions. Additional key actions under the framework include:

- Implementing revised governance and reporting arrangements;
- Formalising the status of existing guidelines;
- Formalising long-term operational support for key sectors;
- Facilitating the establishment of regional local authority climate action offices;
- Increasing awareness around climate adaptation and resilience; and
- Integrating climate adaptation into key national plans and policies.

***Electricity and Gas Networks Sector- Climate Change Adaptation Plan (2019)*²⁸**

This is the first sectoral Adaptation Plan for the energy networks (electricity and gas) sector, prepared under the National Adaptation Framework. The Plan focusses on the energy networks (electricity and gas), specifically electricity generation and electricity and gas transmission and distribution infrastructures and interconnectors. The Plan is to be viewed as the first step towards reducing vulnerability and building resilience in the sector. The Plan also:

- Examines the impacts of climate change and weather-related events, both past and projected, on the energy networks.
- Details how the energy sector must prepare for and adapt to new climate conditions.
- Sets a methodology for identifying areas of vulnerability, the steps that can be taken and measures put in place to avoid or minimise future adverse impacts within the sector and to exploit opportunities.

***National Policy on Climate Action and Low Carbon Development, 2013 (amended 2021)*²⁹**

Ireland's first piece of climate action policy on its coherent journey towards a low-carbon, climate resilient and sustainable economy was the Climate Action and Low-Carbon Development National Policy Position, which was launched in 2014. The policy position:

- Recognises the threat of climate change for humanity.
- Anticipates and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.
- Recognises the challenges and opportunities of the broad transition agenda for society.
- Aims, as a fundamental national objective, to achieve transition to a competitive, low-carbon, climate resilient and environmentally sustainable economy by 2050.

²⁸ Electricity & Gas Networks Sector-Climate Change Adaptation Plan, Government of Ireland, 2019 [online] Available from: gov.ie - Electricity and Gas Networks Sector Climate Change Adaptation Plan (www.gov.ie) [Accessed: 20 August 2025]

²⁹ National Policy Position on Climate Action and Low Carbon Development, Department of the Environment, Climate and Communications, 2021 [online] Available at: <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/national-policy-position-on-climate-action-and-low-carbon-development/> [Access 18 August 2025].

The policy position also sets out a high-level roadmap for future climate policy in Ireland, based on the adoption of a series of national plans addressing both climate adaptation and greenhouse gas mitigation efforts in the period to 2050.

Regional Policy

Climate Action Plan 2024 – 2029 (2024)³⁰

The Climate Action Plan of the Wexford County Council sets out how Wexford County Council will be responsible for enhancing climate resilience across its own assets, services and infrastructure. This builds upon the Wexford Climate Change Adaptation Strategy 2019 – 2024³¹ that provides clear actions to guide County Wexford in preparing for, responding to, and adapting to the impacts of climate change.

Wexford County Development Plan 2022-2028 (2022)³²

The Wexford County Development Plan acknowledges climate change as a critical matter and is committed to leading the transition to a climate-resilient economy. Objective CA11 of this Plan states: “To support measures to build resilience to climate change including adaptive capacity, awareness and providing for nature-based solutions and emergency planning and to raise awareness of the role of spatial planning in climate change mitigation and adaptation through the forward planning and development management functions of the Planning Authority.”

16.2.2.3 Guidance

IEMA published the Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2020)³³. This guide notes that assessing the impacts of climate change on a scheme is fundamentally different to the assessment of impacts arising from the scheme, as in other EIA topics. It provides a framework of eight steps to follow for the effective consideration and integration of climate change resilience and adaptation into the EIA process. The climate resilience aspects of this chapter is aligned with the approach set out in this guidance.

Since the IEMA was rebranded to Institute of Sustainability and Environmental Professionals (ISEP), in July 2025, this guidance is now available as ISEP publications. This chapter follows the considerations set out in this guidance.

16.3 Methodology

16.3.1 GHG Assessment

16.3.1.1 Approach to Data Collection

A quantitative approach was taken to complete the GHG assessment for the Proposed Project. The assessment was based on a whole life cycle approach which included before use, use and end-of-life stages of the Proposed Project. This was a high-level estimate based on available

³⁰ Wexford County Council Climate Action Plan 2024 – 2029, Wexford County Council, 2024 [online] Available at: [Climate Action Plan 2024-2029 English.pdf](#) [Accessed 28 July 2025].

³¹ Climate Change Adaptation Strategy 2019 – 2024, Wexford County Council, 2019 [online] Available at: <https://www.wexfordcoco.ie/sites/default/files/content/Wexford-County-Council-Climate-Strategy.pdf> [Accessed 19 August 2025]

³² Wexford County Development Plan 2022-2028, Wexford County Council, 2022 [online] Available at: [Chapter 2: Climate Action | Wexford County Council Online Consultation Portal](#) [Accessed 28 July 2025].

³³ IEMA EIA Guide to: Climate Change Resilience and Adaptation, IEMA, 2020 [online] Available at: <https://www.iema.net/media/mabhqino/iema-eia-climate-change-resilience-june-2020.pdf> [Accessed 19 August 2025]

information provided by the design team and, where necessary, supported by publicly available datasets and benchmark information.

The method for this report was as follows:

- Collect activity data and emission factors available to quantify GHG emissions of the Proposed Project. Where data was not available or sufficient, emissions sources were either approximated using benchmarks.
- Assessment of carbon emissions on a whole life cycle basis. Use of uplift based on professional experience to include electrical components not detailed enough in the current design.
- Consideration of current design as starting point for identification and proposal of possible mitigation measures, using the PAS 2080:2023 principles and carbon reduction hierarchy.
- Report of the above activities and the corresponding findings in this chapter.

The following information and data sources (Table 16-1) have been considered during the production of this chapter.

Table 16-1 Data Sources used to inform GHG Assessment

Data source	Date	Data contents
Environmental Product Declaration (EPD) ³⁴	06/08/2025	EPD for 210 series bifacial dual-glass monocrystalline photovoltaic modules.
Environmental Product Declaration (EPD) ³⁵	06/08/2025	EPD for String Power Inverters SG350HX, SG285HX, SG320HX, SG333HX.
Moata Carbon Portal	06/08/2025	Libraries sourced from National Grid and UK Civil Engineering V2.
ICE Database V4 ³⁶	06/08/2025	Emission factors and densities database for materials.
Environmental Product Declaration (EPD) ³⁷	06/08/2025	EPD for Lithium iron phosphate battery cell (FC-FV5-71H4L4-004L, FC-FX6-71H4L4-013L and FC-FX6-71H4L4-012L).
DESNZ (BEIS) Database 2025 ³⁸	06/08/2025	UK emission factors database for GHG reporting.
IPCC 2006 Database ³⁹	06/08/2025	EFDB emission factors database of the IPCC. Includes land use change emission factor.
Vehicle Movement Calculations	06/08/2025	Estimation of number of trucks movements for construction works, provided by the design team
Road measurements	06/08/2025	Estimation of roads dimensions, provided by the design team.
Chapter 5 – Description of Development	06/08/2025	Chapter of the ESIA that described the technical details of the Proposed Project .

³⁴ Environmental Product Declaration in Accordance with ISO 14025 for 210 Series Bifacial Dual-glass Monocrystalline Photovoltaic Modules, Risen Energy, 2022 [online] Available at: [Data](#) [Accessed 6 August 2025].

³⁵ Environmental Product Declaration, String Power Inverters, Sungrow [online] Available at: [EPD-of-Sungrow-power-inverter Revision0610.pdf](#) [Accessed 6 August 2025].

³⁶ Embodied Carbon – The ICE Database, 2024 [online] Available at: [Embodied Carbon Footprint Database - Circular Ecology](#) [Accessed 6 August 2025].

³⁷ Environmental Product Declaration, Lithium iron phosphate battery cell (FC-FV5-71H4L4-004L, FC-FX6-71H4L4-013L and FC-FX6-71H4L4-012L), CATL, 2024 [online] Available at: [CATL-EPD](#) [Accessed 6 August 2025].

³⁸ Conversion Factors 2025, Department of Energy Security and Net Zero, 2025 [online] Available at: [Greenhouse gas reporting: conversion factors 2025 - GOV.UK](#) [Accessed 6 August 2025].

³⁹ EFDB emission factor database, IPCC Guidelines, 2006 [online] Available at: [EFDB - Basic Search](#) [Accessed 6 August 2025].

Data source	Date	Data contents
Project File & Indicative Programme	06/08/2025	Includes the information request and responses from specialists.
Ireland's Provisional Greenhouse Gas Emissions 1990-2024 ⁴⁰	21/08/2025	States the emissions intensity of power generation in 2024.

16.3.1.2 Approach to Impact Assessment

A quantitative assessment has been undertaken. This assessment is broken down by component and lifecycle stage – including construction and operation.

The ISEP guidance on evaluating significance of GHG emissions in EIA states “in the absence of any significance criteria or a defined threshold, it might be considered that all GHG emissions are significant, and an EIA should ensure the Proposed Project addresses their occurrence by taking mitigating action”. Nevertheless, this guide states significance criteria to determine different levels of significance, depending on the adverse and beneficial effects that the Proposed Project generates over its lifetime.

16.3.1.3 Study Area

GHG emissions are not bound by location and effect the concentration of CO₂e in the global atmosphere, therefore impact assessment is taken based on the activities associated with the Proposed Project, rather than any specific geographical study area.

16.3.1.4 Boundaries

Throughout the assessment, the same boundaries were used across the Proposed Project. Table 16-2 below shows the lifecycle stages captures in the assessment.

Table 16-2 GHG assessment system boundary.

Lifecycle stage			Proposed Project components
Product Stage	A1	Raw Material Supply	Included raw material extraction, transport and product manufacturing for solar PV panels, inverters, transformers, mounting structures, GIS Substation, underground cables, internal tracks, fencing, HV transformer bases, MV transformer bases, lighting poles and batteries.
	A2	Raw Material Transport	Excluded other components, such as closed-circuit television camera (CCTV) system, meteorological stations, fire fighting system, lighting rods, lightning monopoles, drainage, firewater storage tank, joint bays.
	A3	Manufacture	
Construction Stage	A4	Product Transport	Included transport site of components listed in A1-A3.
	A5	Construction	Included installation works of inverter and battery, cut & fill works alongside trucks movements, as well as land use change due to the impact of the Proposed Project construction on the land. Excluded water consumption, and waste resulting from the installation and its transportation to waste processing facilities.
Use Stage	B1	Use	Included for equipment with refrigerants. Excluded for the other components due to lack of data.
	B2	Maintenance	Included for transport required for maintenance.

⁴⁰ Ireland's Provisional Greenhouse Gas Emissions 1990-2024, Environmental Protection Agency, 2025 [online] Available at: [Ireland's Provisional Greenhouse Gas Emissions](#) [Accessed 21 August 2025].

Excluded for the other components due to lack of data.			
End-of-life stage	B3	Repair	Included for inverters and batteries.
	B4	Replacement	Excluded for the other components due to lack of data.
	B5	Refurbishment	
	B6	Operational Energy Use	
	B7	Operational Water Use	Included for inverters and batteries, as well as water consumption. Excluded for the other components due to lack of data.
	B8	User's Utilisation	Included for inverters and batteries. Excluded for the other components due to lack of data.
	C1	Deconstruction	Included for solar PV panels, inverters and batteries.
	C2	Transport of Waste	Excluded for the other components due to lack of data.
	C3	Waste processing	
	C4	Disposal	

16.3.1.5 Calculation approach

The activity data was multiplied by the corresponding emission factor for each activity within the assessment boundaries. This is summarised as:

$$\text{Emissions (kg CO}_2\text{e)} = \text{rate of activity (unit)} \times \text{emission factor (kg CO}_2\text{e /unit)}.$$

Then, the emissions were converted from kilograms of CO₂e to tonnes CO₂e and summed to get the total GHG emissions estimate.

16.3.1.6 Limitations

As the design data is limited as this stage, some data is not available to allow for a quantified assessment of the GHG emissions from all the components of the Proposed Project. Assumptions and exclusions were made to address this gap.

16.3.2 Climate Resilience

16.3.2.1 Defining climate resilience

Climate change is projected to lead to shifts in climatic conditions and the frequency and severity of extreme weather events such as heatwaves, storms, and flooding⁴¹. These events pose risks to the reliability, safety, and performance of various infrastructure. It is therefore

⁴¹ IPCC (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf. [Accessed: August 2025].

important to embed resilience measures into infrastructure to address the physical risks of climate change.

Climate change resilience is defined by the IEMA EIA Guide to Climate Resilience and Adaptation as:

“The resilience of something is a measure of its ability to respond to changes it experiences. If a receptor or a project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes”.⁴²

16.3.2.2 Climate baseline and data sources

The climate risk assessment uses available data on historic and current climate conditions alongside the latest climate projections.

Information on current weather and climate for Ireland is described by the Status of Ireland's Climate, 2020⁴³. The historic climate data was obtained for 1978-2007 from the Met Éireann Rosslare weather station⁴⁴, which is the nearest weather station to the Proposed Project with historical climate averages (approximately 27 miles from the Proposed Project).

Future climate projections were obtained from two sources:

- Nolan, P. and Flanagan, J. (2020)⁴⁵
- World Bank Climate Change Knowledge Portal (CCKP)⁴⁶

Nolan, P. and Flanagan, J. (2020)⁴⁷ provides a set of mid-21st century (2041-2060) high-resolution climate projections for all of Ireland. These projections use a baseline of 1981-2000 and consider two Representative Concentration Pathway (RCP)⁴⁸ emission scenarios. These are RCP4.5, which considers an intermediate carbon emissions scenario that assumes global net zero targets are broadly achieved, and RCP8.5, which represents a precautionary scenario that assumes less successful reductions in global carbon emissions and a higher degree of resultant climate change (RCP 8.5 is known as the 'high emissions scenario').

⁴² IEMA EIA Guide to: Climate Change Resilience and Adaptation, IEMA, 2020 [online] Available at: <https://www.iema.net/media/mabhqino/iema-eia-climate-change-resilience-june-2020.pdf> [Accessed 19 August 2025]

⁴³ Environmental Protection Agency (2021) The Status of Ireland's Climate, 2020. Available from: [Climate Change | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/publications/climate_change/). [Accessed August 2025].

⁴⁴ Met Éireann (2012) 30 Year Averages 1978 – 2007 – Rosslare. Available from: [Rosslare 1978-2007 averages](https://www.meteo.ie/rosslare/1978-2007-averages). [Accessed August 2025].

⁴⁵ Nolan, P. and Flanagan, J. (2020) High-resolution Climate Projections for Ireland – A multi-model ensemble approach. Available from: [Climate Change | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/publications/climate_change/). [Accessed: August 2025].

⁴⁶ World Bank (2022). Climate Change Knowledge Portal. Available from: [Home | Climate Change Knowledge Portal \(worldbank.org\)](https://climateknowledgeportal.worldbank.org/). [Accessed August 2025].

⁴⁷ Nolan, P. and Flanagan, J. (2020) High-resolution Climate Projections for Ireland – A multi-model ensemble approach. Available from: [Climate Change | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/publications/climate_change/). [Accessed: August 2025].

⁴⁸ Representative Concentration Pathways (RCPs) are greenhouse gas (GHG) concentration trajectories adopted by the IPCC for its Fifth Assessment Report (AR5) in 2014. The pathways are used for climate modelling and research; they describe four possible climate futures, dependent on the level of future GHG emissions. The RCPs are labelled after a range of radiative forcing values in the year 2100 (2.6, 4.5, 6.0, and 8.5W/m²). The four pathways are named RCP2.6, RCP4.5, RCP6, and RCP8.5 with RCP2.6 representing the lowest emissions scenario and RCP8.5 the highest emissions scenario.

Climate projections data have also been obtained for County Wessex, where the Proposed Project is located, from the World Bank Climate Change Knowledge Portal (CCKP)⁴⁹. The World Bank CCKP uses data from the Sixth phase of the Coupled Model Inter-comparison Projects (CMIP6) from the Intergovernmental Panel on Climate Change (IPCC). The projections are available under Shared Socioeconomic Pathways (SSPs)⁵⁰ emissions scenarios. This assessment uses the SSP5-8.5 climate scenario, comparable to RCP8.5, to represent a reasonable worst-case scenario as a precautionary approach.

Two time horizons have been chosen: 2040-2059 and 2060-2079, to account for the 40-year operational design life of the Proposed Project. Data from the 50th percentile have been selected, representing a 'as likely as not' scenario. The baseline for the projections is 1995-2014.

Where summer months are described, this includes June, July and August. Where winter months are described, this includes December, January and February.

16.3.2.3 Climate Risk Assessment

A bespoke methodology has been developed for this assessment. The IEMA guide to climate resilience and adaptation (2020)⁵¹ has been used to inform the methodology in terms of selecting the scenarios for climate projections, identifying risks based on their likelihood and consequence of occurrence, and determination of significance.

Receptors at risk from future changes in climate and resultant increased frequency and intensity of extreme weather events have been considered throughout the operational lifetime of the Proposed Project and the various proposed elements. The receptors considered for this climate resilience assessment are listed below:

- PV Modules and panels
- Battery Energy Storage System (BESS)
- Wiring, array cabling and pipes
- Mounting equipment
- Wider plant and security infrastructure (central photovoltaic inverters, transformers, transformer sub-station, plant power controller)
- Road and access tracks
- Drainage
- Agricultural land use / grazing arrangements
- Staff / maintenance workforce

The construction phase of the Proposed Project has been scoped out of the assessment as there are likely to be negligible changes in climate within the timescales of construction between 2027-2030. Potential risks associated with climate change during the operation and maintenance phase of the Proposed Project are identified within this chapter and a significance rating assigned based on the likelihood and consequence of the risks occurring. The assessment identifies vulnerabilities of the design and local environment to climate change and

⁴⁹ World Bank (2022). Climate Change Knowledge Portal. Available from: [Home | Climate Change Knowledge Portal \(worldbank.org\)](https://climateknowledgeportal.worldbank.org/). [Accessed August 2025].

⁵⁰ Shared Socioeconomic Pathways (SSPs) are future climate scenarios presented through five SSPs: SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0 and SSP5-8.5, all of which present different societal development pathways. SSP1-1.9 presents an optimistic scenario with net-zero global emissions and SSP5-8.5 presents a future based on intensified exploitation of fossil fuel resources (a 'high emissions' scenario).

⁵¹ IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation (2020). [Accessed: August 2025].

measures that will be included to provide resilience to future climate and extreme weather conditions.

Risks associated with climate change have been identified using the current and future climate baseline. The risk assessment and determination of significance considers embedded mitigation measures. Embedded mitigation measures were identified through collaboration with the design team and design documents.

Risk in this context is defined as the risk that a weather or climate event occurs and results in an adverse impact. Impacts due to weather and climate typically take two forms: sudden-onset (acute) or slow-onset due to cumulative events over time (chronic). For example:

- the risk of sudden-onset damage to an asset, following a specific weather event such as a storm.
- the risk that asset condition deteriorates below acceptable standards following years of higher temperatures .

A significance rating is then estimated using expert judgement. This is done by quantifying the likelihood of each risk occurring and the consequence of the risk if it were to occur. Secondly, an overall rating determining significance is calculated through multiplication of its likelihood and consequence scores. Definitions of likelihood, consequence and significance ratings are set out in the following sections.

Likelihood

The likelihood of each risk occurring refers to the likelihood that a specified risk, as a result of climate change, should occur as defined in Table 16-3. The evaluation of future likelihood is based on expert judgement, consultation with the design and environmental specialist teams and review of future climate baseline information.

Table 16-3: Definition of likelihood rating

Likelihood category	Description (probability and frequency of occurrence)
Very high	The event occurs multiple times during the lifetime of the project (e.g. approximately annually).
High	The event occurs several times during the lifetime of the project (e.g. approximately once every five years).
Medium	The event occurs limited times during the lifetime of the project (e.g. approximately once every 20 years).
Low	The event occurs once during the lifetime of the project.
Very Low	The event may occur once during the lifetime of the project.

Source: IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation

Consequence

The consequence rating refers to the magnitude of a risk upon an asset. Consequence ratings are defined using the following categories as outlined in Table 16-4. The evaluation of consequence is based on expert judgement.

Table 16-4: Definition of consequence ratings

Consequence	Definition
Very large adverse	Severe acute damage to asset and / or reduction in life expectancy. Major disruption to functionality of asset or interdependent activities / services.

Consequence	Definition
Large adverse	Measurable decrease in asset performance (short-term, acute change or chronic change over longer-term) or lifespan or increase in necessary maintenance frequency and costs following the occurrence of climate risks.
Moderate adverse	Small, measurable adverse impact to asset's performance (acute, or slow onset over time), or small reduction in asset's lifespan due to chronic deterioration (e.g., slight decrease in lifespan of an asset due to increased higher temperatures).
Minor adverse	Small change in asset health or life expectancy.
Negligible	Minimal or undetectable change in asset health or life expectancy.

Source: Developed from IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation

Significance matrix

The significance of each risk is calculated through multiplication of the likelihood and consequence ratings using the significance matrix shown in Table 16-5.

Table 16-5: Significance matrix

		Consequence				
		Very large adverse	Large adverse	Moderate adverse	Minor adverse	Negligible
Likelihood	Very high	Significant	Significant	Significant	Significant	Not significant
	High	Significant	Significant	Significant	Significant	Not significant
	Medium	Significant	Significant	Significant	Not significant	Not significant
	Low	Significant	Significant	Not significant	Not significant	Not significant
	Very low	Not significant	Not significant	Not significant	Not significant	Not significant

Source: Developed from IEMA (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation (2020)

16.3.2.4 Limitations

This chapter considers design information available at the time of assessment.

The baseline for climate considers both current climate and how the climate may change in the future, expressed as the outputs of climate modelling, referred to as projections. Due to the nature of climate change projections, there is unavoidable uncertainty within climate model outputs. Some of these uncertainties are addressed when the models are downscaled to provide higher spatial granularity. Figures for climate variables provided in this report represent possible outcomes and are not predictions.

The climate baseline is based on freely available information available from third parties for reporting purposes including observational data from local weather stations, readily available climate change projections and a range of existing climate change datasets and literature at the time of writing this assessment.

The following limitations should be noted:

- Climate change projections: climate projections are not predictions or forecasts but simulations of potential scenarios of future climate under a range of hypothetical emissions scenarios and assumptions. The results, therefore, from the experiments performed by climate models cannot be treated as exact or factual, but projection options. They represent

internally consistent representations of how the climate may evolve in response to a range of potential forcing scenarios and their reliability varies between climate variables. For a single emission scenario, projections can vary significantly as a function of the model used and how it is applied, so that there is a wide uncertainty band in the results. Scenarios exclude outlying “surprise” or “disaster” scenarios in the literature and any scenario necessarily includes subjective elements and is open to various interpretations. Global projections are generally more certain than regional, and temperature projections more certain than those for precipitation. Furthermore, the degree of uncertainty associated with all climate change projections increases for projections further into the future. Climate models and associated projections are updated on a regular basis, implying changes in the forecasted future climate;

- Validation of information: observational or projection data obtained at the time of writing has not independently verified for this project, including for any inaccuracies or shortcomings in this information. This assessment is relevant to the project information provided and is not intended to address changes in Proposed Project configuration or modifications that occur over time, or modifications made by third parties to the source data in the future. The data is obtained to provide a general ‘sense check’ on the published literature on existing observational and climate projections for the region; and
- Mott MacDonald have not undertaken any climate modelling and rely solely on freely available data on climate projections in this region. Accordingly, any further research, analysis or decision-making should take account of the nature of the data sources and climate projections and should consider the range of literature, additional observational data, evidence and research available – and any recent developments in these.

16.4 Climate Baseline

16.4.1 GHG emissions

According to the Ireland’s National Inventory Report 2024⁵², there have been improvements in electricity production through energy efficiency and changing fuel types (including renewable energy generation). Overall, the trend in emissions from electricity and heat production has been a decrease in emissions over the period 1990-2021. In 2021, GHG emissions from the energy sector increased on 2019 and 2020 totals, due to greater coal combustion and a reduction in natural gas and renewable energy generation.

Ireland is committed to reducing GHG emissions through a faster deployment of renewable energy to replace fossil fuels, providing a flexible system to support renewables and manage electricity demand. This will include phasing out coal and peat in energy generation before 2030. The GHG emissions reduction trend is consistent with the decarbonisation goals as the GHG emissions resulting from electricity decreased by 45% from 2005 to 2020, according to the Ireland Climate Action Plan 2025. This decrease in emissions is linked to greater renewable generation and use of higher-efficiency gas turbines.

The function of the Proposed Project is to generate renewable energy and to store surplus energy generated during low periods of demand and release when demand is greater, supporting the uptake of renewable energy generation. The carbon baseline is therefore taken as the energy sector GHG emissions generated in Ireland in 2022, the most updated data available in the report.

Based on Ireland’s National Inventory Report 2024, in 2022 the energy sector generated 34 Mt CO₂e from which 11 Mt CO₂e come from public electricity and heat production. This data comes

⁵² Ireland’s National Inventory Document, Environmental Protection Agency (EPA), 2024 [online] Available at: [Ireland’s NID 2024.pdf](#) [Accessed: August 2025].

from 15 electricity generating stations and includes the GHG emissions generated from coal, peat, oil, natural gas, and municipal solid waste (MSW) combustion.

16.4.2 Climate resilience

16.4.2.1 Current climate baseline

Ireland's climate is described by the climate averages for 1981-2010 summarised by Met Éireann⁵³. Ireland's climate is dominantly influenced by the Atlantic Ocean and therefore does not suffer from the extremes of temperatures experienced by other countries at similar latitudes. Mean annual temperature generally ranges between 9 degrees Celsius (°C) and 10°C with higher mean temperatures in coastal regions. Summer is the warmest season, followed by autumn, spring and winter. Highest rainfall occurs in the western half of Ireland and on high ground, with rainfall decreasing towards the northeast. Averaged over all of Ireland, mean annual rainfall is 1230 millimetres (mm). The driest seasons are spring and summer with mean rainfall of 260mm and autumn and winter with a mean rainfall of 350mm.

The summary 1981-2010 climate averages show that, averaged over the country, there has been an increase of 5% in rainfall totals between the periods 1961-1990 and 1981-2010 with all seasons showing an overall increase in rainfall. There has also been an increase of 0.5°C in mean annual temperature between the 1961-1990 and 1981-2010 periods. Mean annual minimum and maximum temperatures have also increased by 0.5°C between these periods.

Locally, data from Met Éireann shows the 1978 – 2007 climate averages for Rosslare weather station⁵⁴, as described in Table 16-6.

Table 16-6: Rosslare 1978 - 2007 climate averages

Climate variables	Annual	Summer	Winter
Temperature (°C)			
Mean temperature	10.6	15.1	6.7
Mean daily max	13.1	17.9	8.9
Mean daily min	8.1	12.4	4.5
Rainfall (mm)			
Mean monthly total	75.5	65.5	86.7
Relative humidity (%)			
Mean at 15:00 Coordinated Universal Time (UTC)	78.4	77.1	80.7
Sunshine (hours)			
Mean daily duration	4.3	5.7	2.1
Wind (knots)			
Mean monthly speed	11.1	9.8	12.3
Weather (mean no. of days with...)			
Snow or sleet	0.5	0	1.5
Thunder	0.4	0.6	0.2
Fog	2.8	3.5	1.9

⁵³ Met Éireann (2012) A summary of Climate Averages for Ireland. Available from: [normals_supplement_1_ANNUAL_2010.qxd \(met.ie\)](#). [Accessed: August 2025].

⁵⁴ Met Éireann (2012) 30 Year Averages 1978 – 2007 – Rosslare. Available from: [Rosslare 1978-2007 averages](#). [Accessed: August 2025].

16.4.2.2 Future climate baseline

Climate projections for Ireland from Nolan, P. and Flanagan, J. (2020) are summarised in Table 16-7. As described in the methodology chapter above, two emissions scenarios are presented: RCP 4.5, and RCP 8.5, to provide a range of projections.

Table 16-7: Climate projections for Ireland (Nolan, P. and Flanagan, J. 2020)

Climate variables	Climate projections summary (2041-2060 relative to 1981-2000)	Resultant future climate
Temperature	Mean annual temperature is projected to increase up to 1.2°C and 1.6°C for the RCP4.5 and RCP8.5 scenarios respectively. Summer months are projected to increase up to 1.3°C and 1.8 °C for the RCP4.5 and RCP8.5 scenarios respectively. Winter months are projected to increase up to 1.2°C and 1.6 °C for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience an increase in ambient air temperature across both emission scenarios.
Precipitation	Decreases in precipitation are projected for the summer months with up to an 11% decrease and 17% decrease for the RCP4.5 and RCP8.5 scenarios respectively. Frequencies of heavy precipitation events show notable increases over the year and in the winter and autumn months with projected increases in frequency of up to 19%.	Ireland is projected to experience drier summers and wetter winters across both emission scenarios. Ireland is also projected to see an increase in heavy rainfall events throughout the year.
Heatwaves	Heatwave events are projected to increase with a range of one to eight events for the RCP4.5 scenario and from three to 15 for the RCP8.5 scenario. There is a clear gradient across Ireland where the highest number of heatwaves is projected to occur in the south-east. This is relative to the 1981-2000 baseline which observed one to six heatwaves across Ireland.	Ireland is projected to experience an increase in heatwave events across both emission scenarios with most heatwave events occurring in the south-east.
Frost and ice days	Number of frost days is projected to decrease by 45% and 58% for the RCP4.5 and RCP8.5 scenarios respectively. Number of ice days is projected to decrease by 68% and 78% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in frost and ice days due to rising ambient air temperatures.
Snowfall	Snowfall is projected to decrease with reductions of 51% and 60% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in snowfall events due to rising ambient air temperatures.
Wind speed	Mean 10m wind speeds are projected to decrease for all seasons up to 3.4% and 5.4% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in average wind speeds throughout the year across all emission scenarios.

More locally, climate projections data for County Wexford obtained from the World Bank CCKP are presented in Table 16-8.

Table 16-8: Climate projections for County Wexford

Climate variables	Baseline values (1995-2014)	Projected change under the SSP5-8.5 or high emissions climate scenario (50 th percentile)	
		2040-2059	2060-2079
Mean air temperature (°C)	Annual: 10.42	Annual: +1.14	Annual: +1.92
	Summer: 14.81	Summer: +1.34	Summer: +2.36
	Winter: 6.49	Winter: +0.92	Winter: +1.59
Maximum temperature (°C)	Annual: 12.63	Annual: +1.12	Annual: +1.89

Climate variables	Baseline values (1995-2014)	Projected change under the SSP5-8.5 or high emissions climate scenario (50 th percentile)	
		2040-2059	2060-2079
Minimum air temperature (°C)	Summer: 17.28	Summer: +1.49	Summer: +2.52
	Winter: 8.35	Winter: +0.93	Winter: +1.53
	Annual: 8.2	Annual: +1.0	Annual: +2.0
	Summer: 12.33	Summer: +1.0	Summer: +2.0
Precipitation (mm, then % change)	Winter: 4.62	Winter: +1.0	Winter: +2.0
	Annual: 908mm	Annual: -0.33%	Annual: +0.77%
	Summer: 193mm	Summer: -9.3%	Summer: -16.6%
	Winter: 255mm	Winter: +7.1%	Winter: +13.3%

Source: Climate Change Knowledge Portal, World Bank (2022) Available from: [Home | Climate Change Knowledge Portal \(worldbank.org\)](#)

Projections for County Wexford generally follow the climate trends projected for Ireland. In general, temperatures are projected to increase throughout the year with warmer summers and winters. Precipitation is projected to see small changes on average across the year with larger seasonal variations following a trend of drier summers and wetter winters. The frequency of extreme events across Ireland such as heatwaves and extreme rainfall events are projected to increase substantially while cold-weather related events such as frost and ice days and snowfall may experience large reductions. These projections are in line with climate change trends identified in the observed changes in climate for Ireland between 1981-2010.

The latest climate model projections for Ireland from Met Éireann, using data from the SSP5-8.5 climate scenario, indicate that Ireland's annual constrained wind power is projected to decrease by 3.2–6.2% in the period (2021–2050), 5.1–8.5% in the period (2041–2070), and by 6.9–10.8% by the late 21st century (2071–2100)⁵⁵.

Given the inland location of the Proposed Project, exposure to sea level rise is considered negligible and therefore this climate variable has not been considered in the assessment.

16.5 Likely Significant Impacts

16.5.1 Do Nothing

In the event that the Proposed Project does not proceed, the 'do nothing' effect would be that the baseline conditions would remain. The positive benefits of generating renewable energy will not be realised if the Proposed Project is not developed.

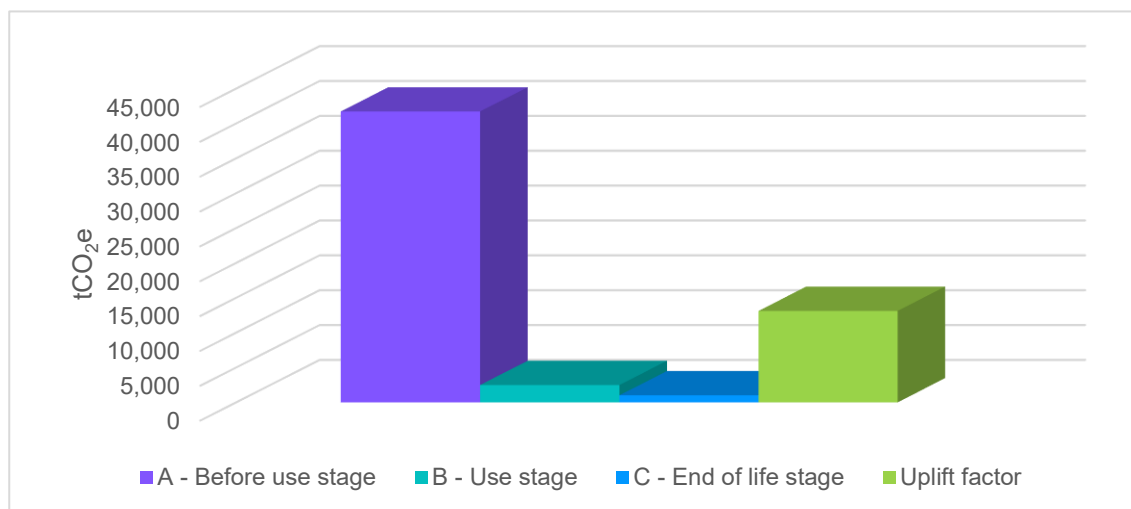
16.5.2 GHG Emissions

Based on the assessment results, the GHG emissions from the Proposed Project are higher during construction phase than in the operation and maintenance and decommissioning phases. Figure 16.1 shows the summary of total emissions by lifecycle stage.

⁵⁵ Nolan, P. (2024) Updated High-resolution Climate Projections for Ireland – A multi-model ensemble approach. Available from: https://www.epa.ie/publications/research/epa-research-2030-reports/Research_Report-471-1.pdf [Access: August 2025].

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Figure 16-1 Total GHG emissions estimated for the Proposed Project



The Proposed Project's emissions are approximately a 0.109% of Ireland's GHG emissions in 2024 and 0.81% of GHG emissions in 2024 from the Irish energy sector, as shown in Table 16-9.

Table 16-9 GHG emissions from Proposed Project compared to 2024 Ireland's GHG emissions.

	tCO ₂ -e	% Ireland emissions	% Energy sector emissions
A - Before use stage	41,717	0.078%	0.58%
B - Use stage	2,488	0.005%	0.03%
C - End of life stage	1,022	0.002%	0.01%
Uplift factor	13,115	0.024%	0.18%
Total	58,341	0.109%	0.81%

16.5.2.1 Construction Phase

The results obtained from the GHG assessment, in lifecycle stages of the construction phase, are represented in Table 16-10. These results are a high-level estimate based on EPDs, benchmarks and information provided by the design team. Refer to inclusions and exclusions described in the previous sections. Carbon hotspots are included in Table 16-11.

Table 16-10. GHG emissions estimated for construction phase

Stage	GHG emissions (tCO ₂ e)	% of total emissions
A1-A3 (product stage)	39,119	67
A4 (product transport)	1,074	2
A5 (construction)	1,524	3
Total (without uplift factor)	41,717	72

Table 16-11 GHG emissions hotspots in construction phase

Component	GHG emissions (tCO ₂ e)	% of total emissions
Solar PV panels (A1-A4)	27,838	48
Transformers (A1-A4)	4,331	7
Mounting structures	3,727	6
Total (without uplift factor)	35,896	25

16.5.2.2 Operation and Maintenance Phase

The results obtained from the GHG assessment, in lifecycle stages of the operation and maintenance phase, are collected in Table 16-12. These results are a high-level estimate based on EPDs, benchmarks and information provided by the design team. Refer to inclusions and exclusions described in the previous sections. Carbon hotspots are included in Table 16-13.

Table 16-12 GHG emissions estimated for operation and maintenance phase

Stage	GHG emissions (tCO ₂ e)	% of total emissions
B1 (use: refrigerants)	112	<1
B2 (maintenance)	0.2	<1
B7 (water use)	1	<1
B1-B8 (use: inverter & battery)	2,374	4
Total (without uplift factor)	2,488	4

The battery EPD stated that battery cells do not require maintenance during use stage. Nonetheless, there is a loss of energy caused by charge and discharge cycles, which is calculated in the EPD and considered for B1-B8 emissions estimation.

The inverter EPD outlines the use & maintenance emission factor calculation (B1-B8), which is built on load electricity used throughout the inverter's service life (25 years). It assumes that inverters are designed to be free of maintenance during the 25 years of operation.

Table 16-13 GHG emissions hotspots in operation and maintenance phase

Component	GHG emissions (tCO ₂ e)	% of total emissions
Inverters (B1-B8)	2,294	3.93
Batteries (B1-B8)	80	0.14
Total (without uplift factor)	2,374	4

Although inverters and batteries were identified as carbon hotspots, there could be other components excluded at this stage for lack of data which may have a significant impact. The uplift factor approximates these components not specified in calculations.

16.5.2.3 Decommissioning Phase

The results obtained from the GHG assessment, in lifecycle stages of the decommissioning phase, are summarised in Table 16-14. These results are a high-level estimate based on EPDs, benchmarks and information provided by the design team. Refer to inclusions and exclusions described in the previous sections. Carbon hotspots are included in Table 16-15.

Table 16-14 GHG emissions estimated for decommissioning phase

Stage	GHG emissions (tCO ₂ e)	% of total emissions
C1-C4	1,022	2
Total (without uplift factor)	1,022	2

Table 16-15 GHG emissions hotspots in decommissioning phase

Component	GHG emissions (tCO ₂ e)	% of total emissions
Solar PV panels (C1-C4)	1,012	2
Total (without uplift factor)	1,012	2

Although solar PV panels were identified as carbon hotspots, there could be other components with significant impact that cannot be estimated at this design stage.

16.5.3 Climate resilience

16.5.3.1 Construction Phase

Climate resilience during construction has been scoped out of the assessment as it is considered that changes to climate in the construction period will be negligible relative to the historical weather baseline. The construction phase is currently programmed for 2027 - 2030, and climate is not anticipated to have noticeably changed from the current day.

16.5.3.2 Operation and Maintenance Phase

This assessment determines the resilience of the Proposed Project to future climate change up to its operational lifetime post-construction of 40 years, to 2070. These changes in climate may result in a range of impacts on the operation and maintenance of the Proposed Project. The assessment is presented in Table 16-16.

Table 16-16: Projected climate change risks

Risk ID	Climate variable	Asset	Climate Impacts	Embedded mitigation	Likelihood	Consequence	Significance rating
RID1	High temperatures	PV modules and panels	Exacerbated temperature extremes and/or sustained high temperatures could decrease the efficiency of the PV modules and panels and reduce operational output. This is due to the peak efficiency of the operating temperatures being exceeded, resulting in a decline in output. This may have knock on impacts in terms of the number of PV modules and panels, and therefore the space required to achieve the required output.	Components have been designed in line with higher temperatures i.e. those typically experienced outside Ireland in hotter climates, as the panels are sold and used internationally, not just in Ireland. Working ranges for PV panels are typically tested for -40°C to 85°C as per IEC 61215 certification. The panels are ground mounted and will be located at a height above the ground, which will allow for ventilation. The Proposed Project is in a rural setting, meaning some natural cooling will occur compared to an urban or tarmacked surface location.	Low	Minor adverse	Not Significant
RID2	High temperatures	Wiring, array cabling and pipes	Increasing temperatures and/or extremes are not anticipated to have a direct impact on underground cabling given it is buried. However, given the potential impacts on efficiency, as detailed in RID1 there may be knock on impacts in terms of more space required within cable troughs to accommodate additional PV modules and panels if required.	The wiring, array cabling and pipes will be buried, therefore inherently less sensitive to change in temperature.	Very Low	Minor adverse	Not Significant
RID3	High temperatures	All assets	Temperature changes may alter the growing season and given the panels are located on a grassed / overgrown area, the vegetation management and maintenance requirements may change.	No mitigation required at this stage. However, there may be a need to alter maintenance schedules in the future.	Medium	Minor adverse	Not Significant

Risk ID	Climate variable	Asset	Climate Impacts	Embedded mitigation	Likelihood	Consequence	Significance rating
RID4	High temperatures, wildfires	Staff / maintenance workforce	Health risk to workers during hot conditions, including heatstroke and risk from wildfires.	Plan maintenance activities during cooler parts of the day such as early morning or evening, as well as during cooler months of the year, with particular consideration to outdoor manual labour. Safety measures in site management plans to be updated throughout operation, with maintenance during heatwaves to be avoided where practicable. Firebreaks and other recommendations to be considered as part of wider site management.	Low	Moderate adverse	Not Significant
RID5	High temperatures, wildfires	All assets	Increased temperatures and/or extreme temperatures have the potential to result in an increased occurrence of wildfires. Wildfires could lead to significant damage of various assets associated with the Proposed Project. Wildfire data was not available for the Proposed Project location at the time of assessment.	Firebreaks and other recommendations to be considered as part of wider site management. It is considered unlikely the PV plant will start fires.	Low	Moderate adverse	Not significant
RID6	Low temperatures	PV modules and panels	Low temperatures could decrease the efficiency of the PV modules and panels. Low temperatures can also damage the inverters, which can have cascading effects on the configuration and plan of the PV modules and panels.	Working ranges for PV panels are typically tested for -40°C to 85°C as per IEC 61215 certification.	Low	Moderate adverse	Not significant
RID7	High / low temperatures, precipitation	PV modules and panels BESS Wiring, array cabling and pipes Mounting equipment	Cyclic wetting and drying may result in soil shrink-swell action, increasing the risk of ground movement including landslip or subsidence. This may damage supporting structures and buried cables, leading to instability and structural damage of built assets.	Inspection and monitoring of the foundations of mounting equipment to ensure a proactive approach to any maintenance requirements.	Low	Moderate adverse	Not significant

Risk ID	Climate variable	Asset	Climate Impacts	Embedded mitigation	Likelihood	Consequence	Significance rating
		Wider plant and security infrastructure Road and access tracks					
RID8	Precipitation, flooding	All assets	As precipitation patterns change, rainfall events may become more intense, including summer storms that may fall following periods of dry, hot weather, leading to localised flash flooding.	Based on assessment from the Flood Risk Assessment (FRA) for the Proposed Project, only some perimeter mesh fencing is in high or medium probability flood risk, with no PV panels or other infrastructure within area of high or medium flood risk. Perimeter mesh fencing is considered highly resistant to flooding; therefore, no further mitigation is deemed necessary. Potential for increased fluvial flood risk and storm events has been addressed by on site drainage and attenuation pond.	Low	Minor adverse	Not significant
RID9	Precipitation	Wiring, array cabling and pipes	Increase in precipitation, in particular extreme precipitation events, may increase the rate of soil erosion, exposing and damaging cables.	Wiring, array cabling and pipes are not within areas of high or medium flood risk, therefore likelihood of extreme precipitation leading to soil erosion in these areas is considered low.	Low	Moderate adverse	Not significant
RID10	Drought	Mounting equipment	Drought events can lead to soils drying out and shrinking, leading to destabilisation of the foundations of mounting equipment.	Inspection and monitoring of the foundations of mounting equipment to ensure a proactive approach to any maintenance requirements.	Low	Minor adverse	Not significant
RID11	Drought	PV modules and panels	Changes in precipitation leading to an increase in the frequency and intensity of drought could result in dust coverage of	Rain in Ireland is typically sufficient for cleaning of the PV panels in the present	Medium	Minor adverse	Not significant

Risk ID	Climate variable	Asset	Climate Impacts	Embedded mitigation	Likelihood	Consequence	Significance rating
			the PV panels and alter maintenance requirements. Dust coverage may also reduce the operational output.	climate. Changes to maintenance and cleaning regimes could be altered in the future if required, including use of water-efficient cleaning techniques such as dry brushing to remove dust and debris from the PV panels.			
RID12	Extreme storms	PV modules and panels BESS Wiring, array cabling and pipes Mounting equipment Wider plant and security infrastructure Road and access tracks	Future projections for winds and storms are uncertain, however, there is potential for the PV panels, modules, mounting and other equipment to be affected by extreme storms, leading to damage or destruction of infrastructure and disruption of output.	Wind loading is considered within the design. Mounting structures are considered to be robust. Implement emergency shutdown procedures to minimise potential damage to buildings infrastructure. Monitoring and shut off systems that can detect severe weather conditions and automatically shut off when necessary. Explore research opportunities to improve localised storms forecasting techniques.	Low	Moderate adverse	Not significant
RID13	Extreme storms	Staff / maintenance workforce	Highly dangerous conditions for workers to be on site during extreme storms, with potential to result in injury or death. Additional risks from lightning due to the presence of electrical equipment such as transformers on site. Risk to staff travelling to and from site.	Safety measures in site management plans to be updated throughout operation, with maintenance activities to be avoided in extreme weather conditions. No maintenance to be carried out during extreme storms, with management plans in place for emergency repairs.	Very Low	Major Adverse	Not significant

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16.6 Cumulative Effects

16.6.1 Other Development

GHG emissions

Due to the nature of GHG emissions, the ultimate receptor is the global climate system. As such, the GHG assessment does not account for cumulative effects, since these emissions do not produce localised or regional climate impacts. Consequently, the climate-related effects of the Proposed Project's emissions would not differ when considered alongside those from other developments.

Climate Resilience

The potential for other developments to contribute to a cumulative increase in flood risk has been considered. Surface water will be managed through Sustainable Urban Drainage Systems (SuDS). Given all other developments are also required to adhere to SuDS planning requirements in relation to flooding, it is unlikely that there will be a cumulative effect on flooding risk in-combination with climate change.

16.7 Mitigation and Monitoring Measures

16.7.1 GHG emissions

16.7.1.1 Mitigation Measures

The Climate Action Plan 2025 states updated carbon budgets and sectoral emissions ceilings, as well as the roadmap to reach net zero GHG emissions by 2050. The Proposed Project contributes to providing renewable energy supply and security of energy supply, which also reduces GHG emissions through moving away from coal and peat-fired power generation towards renewable sources.

It is recommended that emissions reduction measures are put in place as part of the Proposed Project throughout the design stage and onwards, leveraging the ability to effect change to achieve GHG emissions reduction over time. The Construction Environmental Management Plan (CEMP) included in Appendix 5.1 includes the following measures:

- Vehicles with low exhaust emissions to be used and serviced regularly;
- Implementing regular maintenance of construction equipment to ensure it is running efficiently;
- Avoiding engines running unnecessarily;
- Monitoring of vehicles entering the site for noticeable exhaust emissions ;
- Assessing and minimising transport emissions from equipment and materials (i.e. choosing local suppliers or more sustainable transport options).
- Engaging the supply chain to reduce the number of vehicle movements relating to site material.
- Incorporating energy efficiency into the operation of the Proposed Project (e.g. using motion-activated low-energy lighting, building management systems where appropriate).
- Using low-carbon concretes and steel with high recycled content where structurally appropriate, as well as materials with longer durability or reduced maintenance requirements.

- Minimising transport and travel demand during construction by having a travel management plan for site personnel to encourage car-sharing, active travel, use of buses, and prioritise electric vehicles.
- Minimising waste generation and implement circular economy processes including for complex assets such as solar PV panels, avoiding landfilling and waste incineration.

16.7.1.2 Monitoring Measures

To monitor the impact of the Proposed Project it is recommended that the emissions be quantified through a carbon assessment using data such as bills of materials and vehicle fuel usage, and emission factors from industry recognised emission factor databases. This is subject to the availability of data from the Proposed Project.

16.7.2 Climate resilience

16.7.2.1 Mitigation Measures

Construction

Climate resilience during the construction phase of the Proposed Project has been scoped out of the assessment. Any risks arising due to extreme weather events during construction shall be addressed by appropriate measures in the Construction Environmental Management Plan (CEMP). These may include:

- Procedures and precautions will be implemented for areas that may experience flooding, including use of temporary flood defence barriers and preparation of temporary demobilisation plans. These procedures will consider prolonged and intense rainfall events that may lead to staff safety risks or pollution risks where construction materials (e.g. dust, contaminants, metals, or oils) have potential to runoff into watercourses. This will consider likely surface water runoff routes and plans for the protection of plant such as fuel storage and materials stockpiles, and the demobilisation of vehicles and items of mobile plant;
- Workforce health and safety plans and welfare management systems will be put in place by the contractor, including details to be outlined within works plans and task briefs as appropriate. This will consider periods of high temperatures that may lead to risks of heatstroke for construction staff and severe precipitation events that may lead to slips and falls;
- Contingency plans will be in place for situations where flooding leads to restricted site access or key staff being unable to get to work, leading to construction delays;
- Contingency plans will be in place for situations where storms, high winds or flooding lead to loss of mains power supply or communications, and the identification of safety critical risks and construction programme consequences; and
- Include regular monitoring of flood alerts and weather warnings from Met Éireann.

Operation and maintenance

The assessment in Table 16-16 concludes no significant risks were identified due to the embedded mitigation of the Proposed Project. Therefore, additional design measures to enhance resilience are not required.

16.7.2.2 Monitoring Measures

Regular monitoring of the performance and safety of the Proposed Project will allow the ongoing effectiveness of embedded mitigation measures to be assessed, with suitable maintenance to upgrade the measures so that they can adapt to the changing conditions.

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16.8 Residual Impacts

16.8.1 GHG assessment

There will be unavoidable GHG emissions resulting from the construction and operational phases of the Proposed Project since materials, energy and fuel use, and transport will be required. In line with ISEP Guidance, “the goal of the EIA process should be to reduce the Proposed Project’s residual emissions at all stages” and therefore mitigation and monitoring measures (such as those detailed in Section 16.7) are recommended.

It is also important to assess the broader impacts of the Proposed Project, particularly in relation to national GHG reduction policies. The Proposed Project aims to facilitate the generation of energy from a renewable source, and the integration into the energy system through energy storage facilities that can be utilised during periods of lower renewable generation.

Based on Ireland’s emissions intensity of power generation⁵⁶ in 2024 and the GHG emissions per annual estimated yield from for the Proposed Project, the emissions avoided by the Proposed Project are around 25,682 tCO₂e/year, considering an annual estimated yield of 133,930 MWh/year. This estimation is built on an emissions intensity of power generation of 226 kg CO₂e/MWh in 2024 against an emissions intensity of 34 kg CO₂e/MWh from the Proposed Project.

Given the context of the development in supporting Ireland’s climate commitments, the residual effect of Minor Adverse with mitigation is anticipated with no significant effects expected. In line with the ISEP Guidance, minor adverse means that the Proposed Project’s emissions are in-line with good practice design standards and are also in-line with national net zero pathways.

16.8.2 Climate resilience

The climate resilience assessment looked at the resilience of the Proposed Project’s assets to a changing climate. The construction phase was scoped out given there are likely to be negligible effects at this stage as climate will not have changed significantly from the present day. Any impacts arising due to extreme weather events should be considered in measures in the Construction Environmental Management Plan (CEMP).

During the operation of the Proposed Project there is potential for effects as a result of a changing climate. However, following assessment of the likelihood and consequence of these effects, no likely significant residual effects have been identified for climate resilience during operation.

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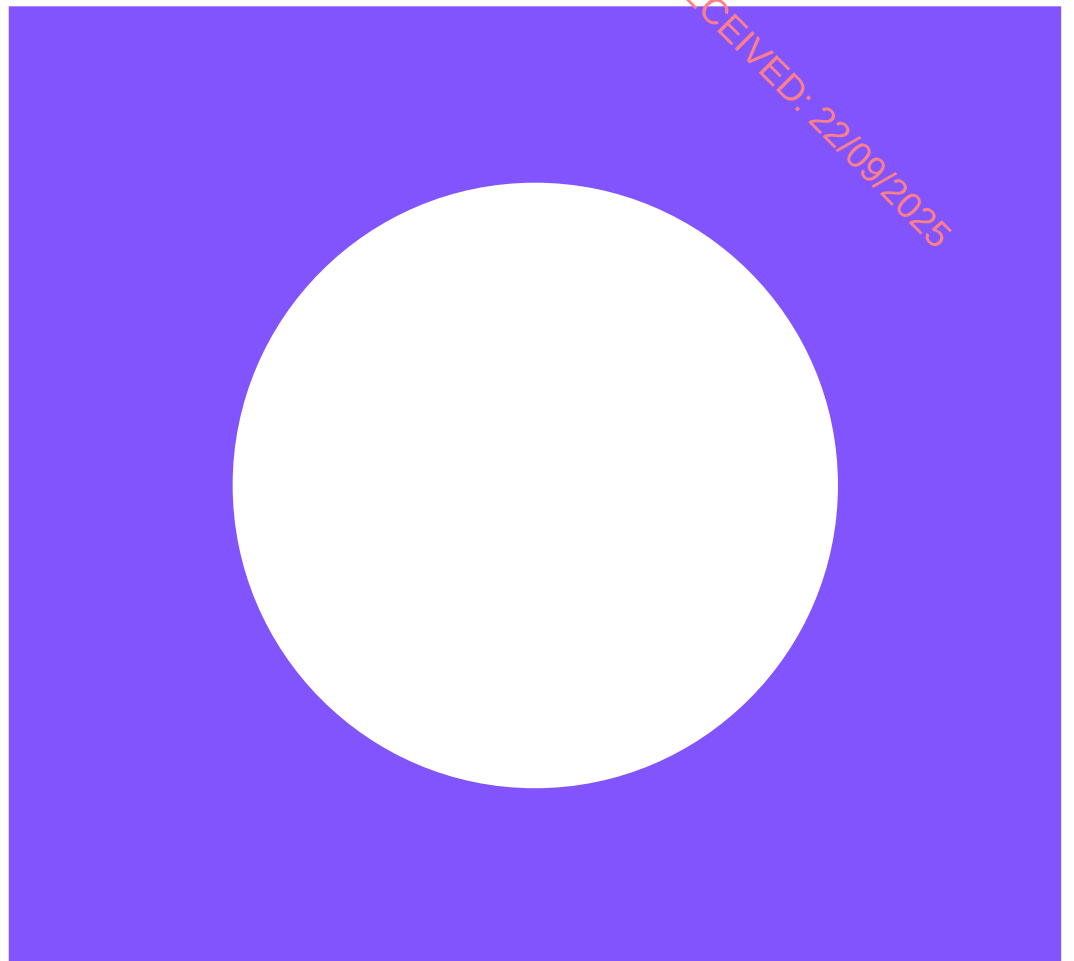
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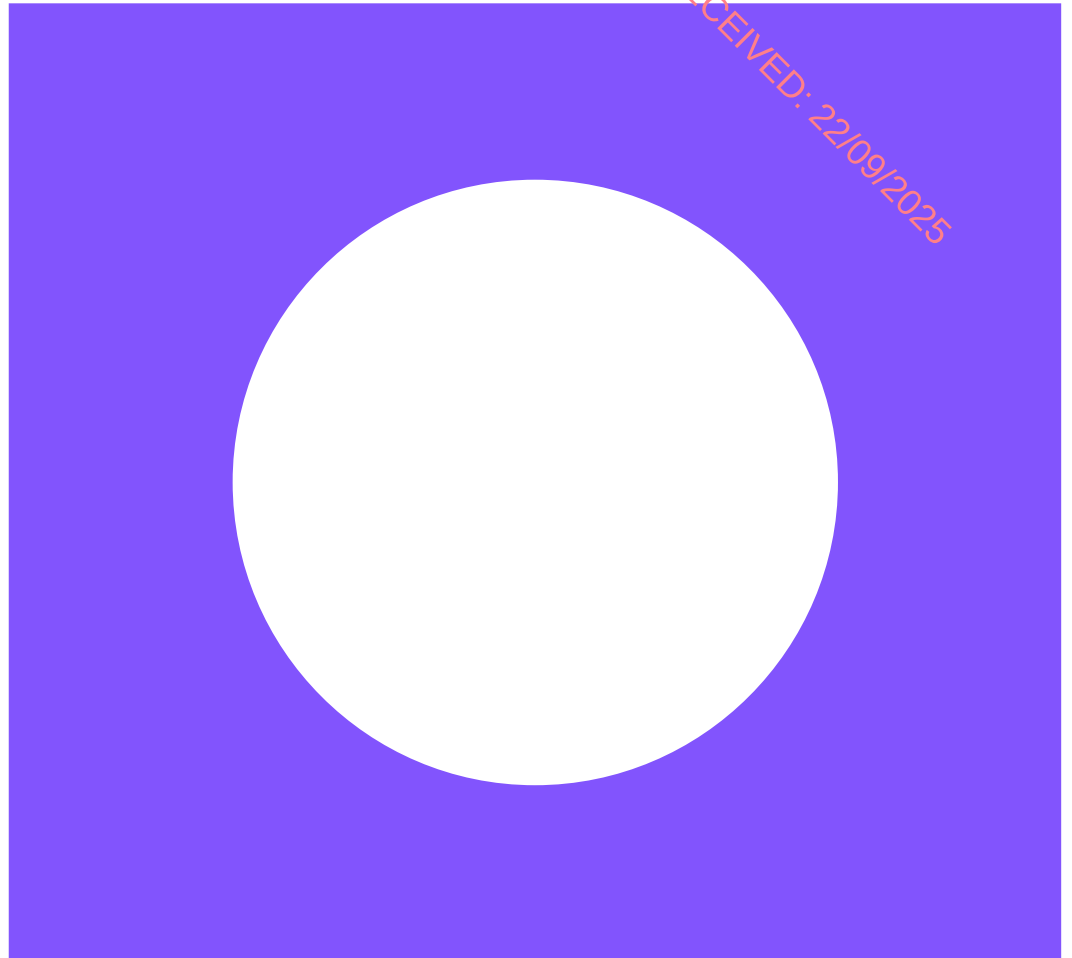
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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 17 Major Accidents and / or Disasters

September 2025

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17 Major Accidents and Disasters

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17.1 Introduction

This chapter considers the potential for significant adverse effects of the Proposed Project on the environment deriving from vulnerability of the Proposed Project to the risks of relevant major accidents and/or disasters. This chapter considers:

- Major accidents and / or disasters that the Proposed Project may be vulnerable to;
- Whether a major accident and / or disaster occurring could result in likely significant adverse environmental impacts, and if so, what these would be; and
- Existing and proposed mitigation measures to prevent or mitigate the likely significant adverse impacts of such events on the environment.

17.2 Policy and Guidance

17.2.1 Legislation

EIA Directive 2014/52/EC requires:

“A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters...”

In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council (13) and Council Directive 2009/71/Euratom (14), or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met”

The SEVESO III Directive 2012/18/EU was transposed into Irish legislation through the Chemicals Act (Control of Major Hazards involving Dangerous Substances), S.I. No. 209 of 2015 (referred to commonly as the ‘COMAH Regulations’); both the Seveso III Directive and the COMAH Regulations outline the legal obligations for operators of industrial establishments where dangerous substances are stored.

The Proposed Project is not categorised as a COMAH¹ establishment under the SEVESO III Directive 2012/18/EU and/or the COMAH Regulations. The Proposed Project does not fall within the consultation zone for any Seveso sites.

Relevant Health and Safety legislation within the State includes:

- S.I. No.10 of 2005 - Safety, Health and Welfare at Work Act (HSWA) (ISB, 2005). Including associated amendments:
- S.I. No. 231 of 2021 - Safety, Health and Welfare at Work (Chemical Agents) (Amendment) Regulations (ISB, 2021).
- S.I. No. 291 of 2013 - Safety, Health and Welfare at Work (Construction) Regulations (ISB, 2013) Including associated amendments:
- S.I. No. 299 of 2007 - Safety, Health and Welfare at Work (General Application) Regulations (ISB, 2007) Including associated amendments:

¹ The acronym stands for Control of Major Accident Hazards

- S.I. No. 13 of 2008 – Chemicals Act (ISB 2008) including associated amendments
- S.I. No. 272 of 2008 - European Communities (Classification, Packaging, Labelling and Notification of Dangerous Substances) Regulations (CLP) (ISB, 2008).
- S.I. No. 699 of 2001 - Safety, Health and Welfare at Work (Chemical Agents) Regulations (ISB 2001) Including associated .amendments:
- S.I. No. 572 of 2013 - Safety Health and Welfare at Work (Biological Agents) Regulations (ISB 2013) Including associated .amendments:

17.2.2 Guidance

The following guidance documents were consulted in order to prepare the risk methodology within this chapter:

- Major Accidents and Disasters in EIA: A Primer (Institute of Environmental Management and Assessment (IEMA), 2020)
- A National Risk Assessment for Ireland 2023 (Government of Ireland, 2023)
- Strategic Emergency Management National Structures and Framework (Department of Defence 2020)
- Guidance on Assessing and Costing Environmental Liabilities (EPA, 2014)
- Department of Housing, Local Government and Heritage (DHLGH) A Framework for Major Emergency Management (DHLGH, 2021)
- A Framework for Major Emergency Management. Guidance Document 1. A Guide to Risk Assessment in Major Emergency Management (DEHLG, 2010)
- Major Emergency Plan 2024 (Wexford County Council, 2024)

For the purpose of this assessment the following definitions, defined in the IEMA document *Major Accidents and Disasters in EIA: A Primer* September 2020), are used:

- **Accident:** something that happens by chance or without expectation.
- **Major Accidents:** Events that threaten immediate or delayed serious environmental effects to human health, welfare and / or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.
- **Disaster:** May be a natural hazard (e.g. earthquake) or a man-made / external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.
- **Risk:** For a risk to arise there must be hazard that consists of a 'source' (e.g. high rainfall); a 'receptor' (e.g. people, property, environment); and a pathway between the source and the receptor (e.g. flood routes).
- **Risk event:** an identified, unplanned event, which is considered relevant to the Proposed Development and has the potential to result in a major accident and / or disaster, subject to assessment of its potential to result in a significant adverse effect on an environmental receptor.
- **Vulnerability:** Describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to the 'exposure and resilience' of the development to the risk of a major accident and / or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.
- **Significant environmental effect** (in relation to a major accident and / or disaster assessment): could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up

and restoration. In addition, a 'Significant' impact resulting from major accidents and / or disasters is identified if it meets the criteria for 'Significant', 'Very Significant' or 'Profound' under the EPA Guidelines.

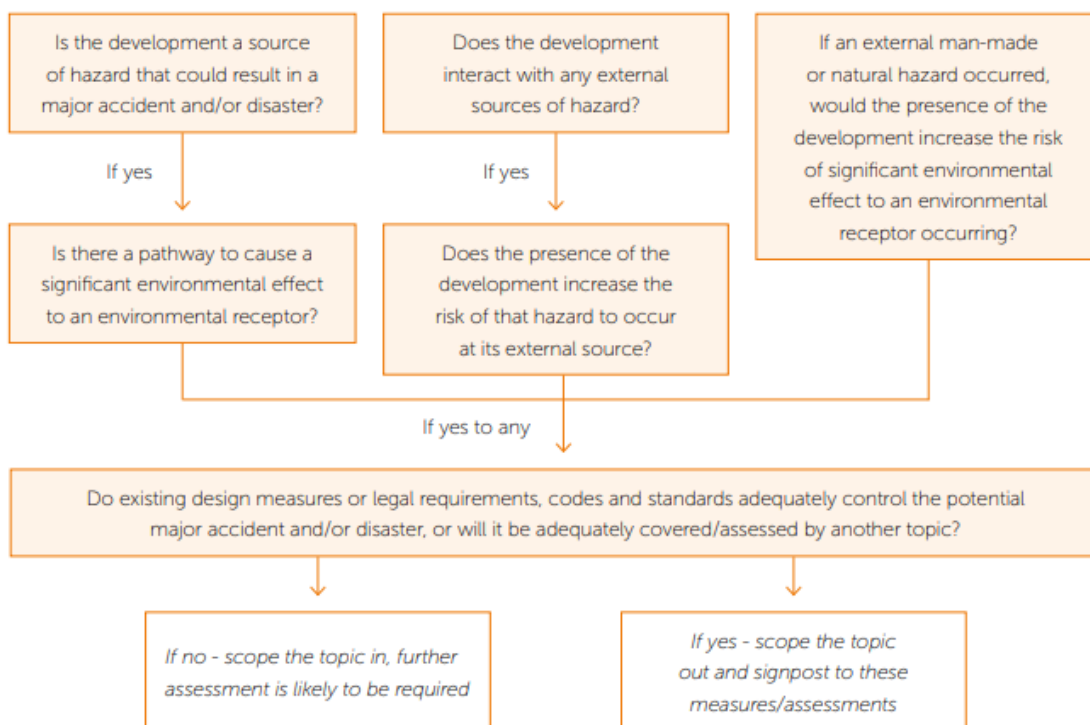
17.3 Methodology

The methodology applied is based on the scoping decision process flow provided in Figure 17.1 Scoping Decision Process Flow within the Major Accidents and Disasters in EIA: A Primer (IEMA, 2020). The potential for source, pathway, receptor linkages is first established having regard to the location, type, context, existing and future constraints and likely receptors relevant to the Proposed Project.

For established linkages, the risks of major accidents and / or disasters are low / unlikely where existing design measures or legal requirements, codes and standards adequately control the potential for major accident and / or disaster, or where such risks are adequately covered/assessed by another topic in this EIAR.

Where required, additional mitigation measures are proposed to manage the identified risks to the environment.

Figure 17.1: Scoping Decision Process Flow



Source: Major Accidents and Disasters in EIA: A Primer (page 11, IEMA, September 2020)

17.3.1 Risk Identification

The identification of potential reasonable and foreseeable risks (i.e. plausible and non-standard) through the lifetime of the project, during construction, operation and maintenance and decommissioning, has been identified in respect of:

- Potential to cause accidents and/or disasters

- Vulnerability to potential accident and/or disasters

17.3.2 Classification

The rating criteria adopted for the assessment follows that used in A Guide to Risk Assessment in Major Emergency Management (DEHLG, 2010). The EPA Guidelines (EPA 2022) state that the risk assessment must be based on a 'worst-case' approach. Therefore, the assigning of ratings assumes that all proposed mitigation measures and safety procedures have failed to prevent the occurrence of a major accident and / or disaster. The rating classification of likelihood and consequence is used within the assessment as detailed in A Guide to Risk Assessment in Major Emergency Management, and as reproduced in Table 17.1 and Table 17.2, and the categorisation of levels of significance are listed in Table 17.3.

Table 17.1: Classification of Likelihood

Rating	Classification	Impact Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years
2	Very Unlikely	Is not expected to occur; no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and/or little opportunity, reason or means to occur. May occur once every 100 to 500 years.
3	Unlikely	May occur at some time; and / or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur. May occur once every 10 to 100 years
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence. Will probably occur once every one year to 10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Table 17.2: Classification of Consequence

Rating	Classification	Impact	Description
1	Minor	Life, Health, Welfare, Environment, Infrastructure, Social	• Small number of people affected; no fatalities and small number of minor injuries with first aid treatment • No contamination, localised effects • <0.5 million euro • Minor localised disruption to community services or infrastructure (<6 hours)
2	Limited	Life, Health, Welfare, Environment, Infrastructure, Social	• Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements • Simple contamination, localised effects of short duration • 0.5 million to 3 million euro • Normal community functioning with some inconvenience
3	Serious	Life, Health, Welfare, Environment, Infrastructure, Social	• Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support.

Rating	Classification	Impact	Description
			- Simple contamination, widespread effects or extended duration 3 million to 10million euro - Community only partially functioning, some services available
4	Very Serious	Life, Health, Welfare, Environment, Infrastructure, Socia	5 to 50 fatalities, up to 100 serious injuries, up to 2,000 evacuated - Heavy contamination, localised effects or extended duration 10 million to 25 million euro - Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare, Environment, Infrastructure, Social	- Large numbers of people impacted with a significant number of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. - Very heavy contamination, widespread effects of extended duration. >25 million euro - Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support

Table 17.3: Levels of Significance

		Consequence of Impact				
Likelihood	5 - Very likely					
	4 - Likely					
	3 - Unlikely					
	2 - Very unlikely					
	1 - Extreme unlikely					
		1 - Minor	2 - Limited	3 - Serious	4 - Very serious	5 - Catastrophic

17.3.3 Limitations of this EIAR

There were no difficulties or limitations encountered gathering the information required to inform this Major Accidents and / or Disasters chapter of the EIAR.

17.4 Receiving Environment

The Proposed Project is located into southwest of County Wexford. the closest town is New Ross, located c.6.5km northwest of the Proposed Project, the village of Newbawn is located c.3km north-northeast of the Proposed Project. The Proposed Project occurs across three townlands to the north of the settlement of Gusserane, namely Ballygarvan, Cloonagh and Nash. The area surrounding the Proposed Project is characterised as rural, agricultural land, with typical rural residential settlement patterns comprising dispersed single dwellings along local road networks.

Eight Major Emergency Management Regions have been established in Ireland, and the Proposed Project is located in the south east region. As part of this national framework of emergency management local authorities are categorised a principal response agency for major emergencies alongside An Garda Síochána and the Health Service Executive. The extant Major Emergency Plan for Wexford Couty Council (dated October 2024) does not identify any sites

which present risk, instead the following are listed as having emergency plans prepared for major accidents;

- Atlantic Industries (trading as Flavour Manufacturing), Wexford, Drinagh, Co. Wexford
- Roche Freight and Warehousing Ltd., Kilrane, Co. Wexford
- Rosslare Europort Emergency Plan
- Waterford Port Emergency Plan
- Local Emergency Plan for Wexford Railway Station (Iarnrod Eireann)
- M11 Motorway Emergency Response Procedure (BAM)

The closest SEVESO site is a Lower Tier establishment, Goulding Chemicals Ltd, Stokestown, New Ross, located approximately 7.1km northwest of the Project site. The closest Upper Tier establishment, Nitrofert Ltd, is located at Raheen Port, New Ross, approximately 8.3km to the northwest of the Proposed Project site.

17.5 Characteristics of the Project

Detail of the receiving environment is contained within Chapter 5 –*Description of Development*.

The following presents an overview of the proposed development having regard to whether or not the proposals present a source of hazard that could result in major accident and / or disaster and / or interacts with external sources of hazard.

A solar farm is not a recognised source of pollution. It has no notable discharges and is not subject to the Industrial Emission Directive nor is it a development activity listed in the First Schedule of the Environmental Protection Agency Act, 1992 (as amended). Should a major accident or natural disaster occur the potential sources of pollution onsite during the construction, operational and decommissioning phases are limited and of low environmental risk.

Similarly, BESS is not subject to any licencing requirements by the EPA, the potential for fire risk has been identified as part of the iterative design process, with an on-site fire-water supply being provided as part of the fire management due to the distance to the nearest mains water supply (located in the town of New Ross). Fire water attenuation has been provided which will in the event of fire be directed to a separate below ground attenuation tank which will store fire water until it can be tankered off site and thereby ensuring no fire water is released to the local environment.

The Irish transmission network and the Proposed Project will be designed, constructed, operated and maintained in accordance with the highest safety standards complying with the provisions of guidelines published by the World Health Organisation (WHO) and the International Commission of Non-ionizing Radiation Protection (ICNIRP).

The Proposed Project is not regulated, connected with or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites. A review of the Upper Tier and Lower Tier establishment (SEVESO) sites in County Wexford² and their respective distances from the Proposed Project was undertaken. No SEVESO establishments are located within 1 kilometre of the Proposed Project, and therefore, the Proposed Development does not fall within the maximum consultation zone for any SEVESO sites.

² https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/List_of_Establishments/
Upper Tier Establishment list dated 06 September 2024, Lower Tier Establishment list dated 03 December 2024

Due to the distance from any SEVESO site the Proposed Project does not interface with any potential emergency service response routes for any SEVESO sites. Therefore, the Proposed Project is not vulnerable to or does not present a risk to any SEVESO sites and no impact is anticipated as a result of the Proposed Project.

17.6 Likely Significant Impacts

Table 17.4 considers the likelihood of significant adverse effects on the environment deriving from the vulnerability of the proposed development to risks of relevant major accidents and/or disasters.

Where sources/interactions and pathways have been established, an assessment is carried out as to whether or not design measures, or legal requirements, codes and standards adequately control the potential major accident and/or disaster. Reference is made to other technical chapters of the EIAR, where appropriate.

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Table 17.4: Likely Significant Effects

Risk ID	Risk Event	Proposed Project Element	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Overall Risk Rating
Construction Phase							
C.1	Severe Weather event	All elements of construction	1	The risk of severe weather is very unlikely when weather conditions recorded over the last 30 years within the area. The works programme for the groundworks part of the construction phase of the Proposed Project will take account of weather forecasts and predicted rainfall in particular and construction will be paused if required.	2	Limited. Potential for injuries. Potential for contamination. Potential localised displacement of a small number of people and short duration and localised effects	Low
C.2	Flooding	All elements of construction	2	The risk of flooding is very unlikely - the Flood Risk Assessment undertaken (Volume 3, Appendix 9.1) confirms that there is no part of the Proposed Project within a fluvial Flood Zone A/B with the exception of perimeter fencing. In the event of flooding, construction works will be halted in areas where fluvial or pluvial flooding, until flood waters recede.	2	Minor. Potential injury for nearby personnel and potential displacement of local residences and business in the event of flooding.	Low
C.3	Major road traffic accident	All elements of construction	2	Movement of construction vehicles debris striking traffic /member of public, moreover where abnormal loads are required for example equipment required for the substation compound.	3	Serious. Potential fatalities and serious injuries.	Low
C.4	Utilities emergency	All elements of construction	3	Confirmatory surveys will be carried out by the Contractor to ensure that the Proposed Grid Connection Route is designed to take into consideration any services and utilities with the road network. As such the risk of a utility emergency occurring during the construction of the Proposed Grid Connection Route is considered very unlikely	2	Limited. Potential for injuries. Potential significant damage to infrastructure and disruption to the road network, for a short duration and localised effects.	Low

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Risk ID	Risk Event	Proposed Project Element	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Overall Risk Rating
C.5	Contamination event – pollution	All elements of construction	3	Fuel spillage during delivery is considered unlikely, as the construction temporary compounds will have designated bunded areas for fuelling and fuel/oil//chemical storage. The CEMP lists the best practice guidance to ensure that accidental spillages are avoided and where they occur the protocol to remediate them.	2	Limited. Potential for injuries. Potential for contamination. Potential localised displacement of a small number of people and short duration and localised effects.	Low
C.6	Exposure to High Voltage	MV and 220kV overhead conductors / LCIMs / 220kV AIS/GIS equipment	1	Construction workers and maintenance staff coming in contact with exposed live conductors.	3	Serious. Potential fatalities and serious injuries. Potential for some minor damage to local infrastructure.	Low
Operation and Maintenance Phase							
O.1	Fire	Risk of fire at substation where electrical equipment and materials are contained. Risk of BESS unit or multiple units igniting an electrical fire. Underground cabling fire risk	2	In the unlikely event of a fire there is limited potential for damage to other elements of the Proposed Project, i.e. a fire within a BESS unit will have no impact on the substation compound, or solar farm, and vice versa. Electrical fire is very unlikely due to the embedded fire suppression system for electrical equipment, where fires do occur these are likely to be localised to that particular item of equipment/plant.	2	Limited. Potential for injuries. Potential for contamination. Potential localised displacement of a small number of people and short duration and localised effects.	Low
O.2	Ground collapse	All elements – electrical failure /operational failure	1	The Proposed Project is located in an area of Low landslide susceptibility; no landslide extents are recorded within the Proposed Project site (Chapter 8 of this EIAR, Section 8.4.2.6).	2	Limited. Potential for injuries. Potential for contamination.	Low

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Risk ID	Risk Event	Proposed Project Element	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Overall Risk Rating
O.3	Flooding	All elements – potential for electrical failure	2	The Proposed Project has been designed to be located outside the fluvial Flood Zone A/B. There is no risk of pluvial flooding due to the local topography.	2	Potential localised infrastructure damage of short duration and localised effects. Limited. Potential for injuries. Potential for contamination. Potential localised infrastructure damage of short duration and localised effects.	Low
O.4	Electricity failure	Electricity failure can be caused by several factors such as extreme weather conditions, failure at the sub-stations or damage to the underground cable along the route.	1	Loss of power supply to the substation compound resulting in disruption to the operation of the GIS/AIS compound.	2	Limited. Potential for injuries. Potential for contamination. Potential localised infrastructure damage of short duration and localised effects.	Low
O.5	Electro-magnetic Fields (EMF)	Substation compound and 220kV grid connection	1	Independent and authoritative international panels of scientific experts have reviewed studies on possible health effects from EMFs. These have concluded, based on the weight of the evidence available, that the power frequency electric and magnetic fields encountered in normal living and working conditions do not cause adverse health effects in humans when properly designed and constructed. These form the basis for guidelines published by the International Council on Non-Ionising Radiation Protection (ICNIRP) with regard to EMF, to which EirGrid and ESB Networks have strict regard in the design and operation of the transmission system.	2	Limited. Potential for injuries. Potential for contamination. Potential localised infrastructure damage of short duration and localised effects.	Low

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Risk ID	Risk Event	Proposed Project Element	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Overall Risk Rating
O.6	Malicious attacks/cyber-attack	GIS substation compound	1	The proposed GIS compound will be operated by EirGrid and will form part of Ireland's electrical transmission grid and could be subject to malicious physical or cyber-attacks. The transmission system will be designed to cater for the sudden loss of supplies, the electricity generated by the solar farm which is provided to the grid can be readily replaced and secured from elsewhere on the grid. The new infrastructure and control systems will be designed to protect against malicious attack and will be in line with the latest standards for new transmission grid infrastructure	2	Limited. Potential for injuries. Potential for contamination. Potential localised infrastructure damage of short duration and localised effects.	Low

17.6.1 Summary of Likely Significant Effects

Significant impacts resulting from major accidents and / or disasters are adverse impacts that are described as ‘Significant’, ‘Very Significant’ or ‘Profound’ under the EPA Guidelines (EPA 2022). Consequently, major accidents and / or disasters risk events that fall within the Amber – Medium risk event Red – High risk event, are considered to present risk of significant impacts and require further mitigation. As detailed in Table 17.4, and as a result of the type of development, distance from any industrial activities, the likelihood of the events occurring and embedded mitigation within the design there is no medium or high-risk accidents or disaster which are predicted to occur during the construction or operation and maintenance phases.

17.7 Cumulative Effects

There are no 'Other Developments' as listed in Table 3.2 of Chapter 3 – EIA Methodology that would result in cumulative significant adverse impacts.

17.8 Residual Impacts

There is no mitigation specific to potential risks from major accident or disasters, therefore no significant adverse environmental effects are likely to occur.

17.9 References

DHLGH (2021). A Framework for Major Emergency Management

DEHLG (2010). A Framework for Major Emergency Management. Guidance Document 1. A Guide to Risk Assessment in Major Emergency Management

Department of Defence (2020). Strategic Emergency Management National Structures and Framework

EPA (2014). Guidance on Assessing and Costing Environmental Liabilities

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

European Commission (2017). Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report

Wexford County Council (2024). Major Emergency Plan of Wexford County Council

Government of Ireland (2023). A National Risk Assessment for Ireland 2023

Health and Safety Authority (2025). Upper Tier Establishments (06.09.2024). [Online] Available at

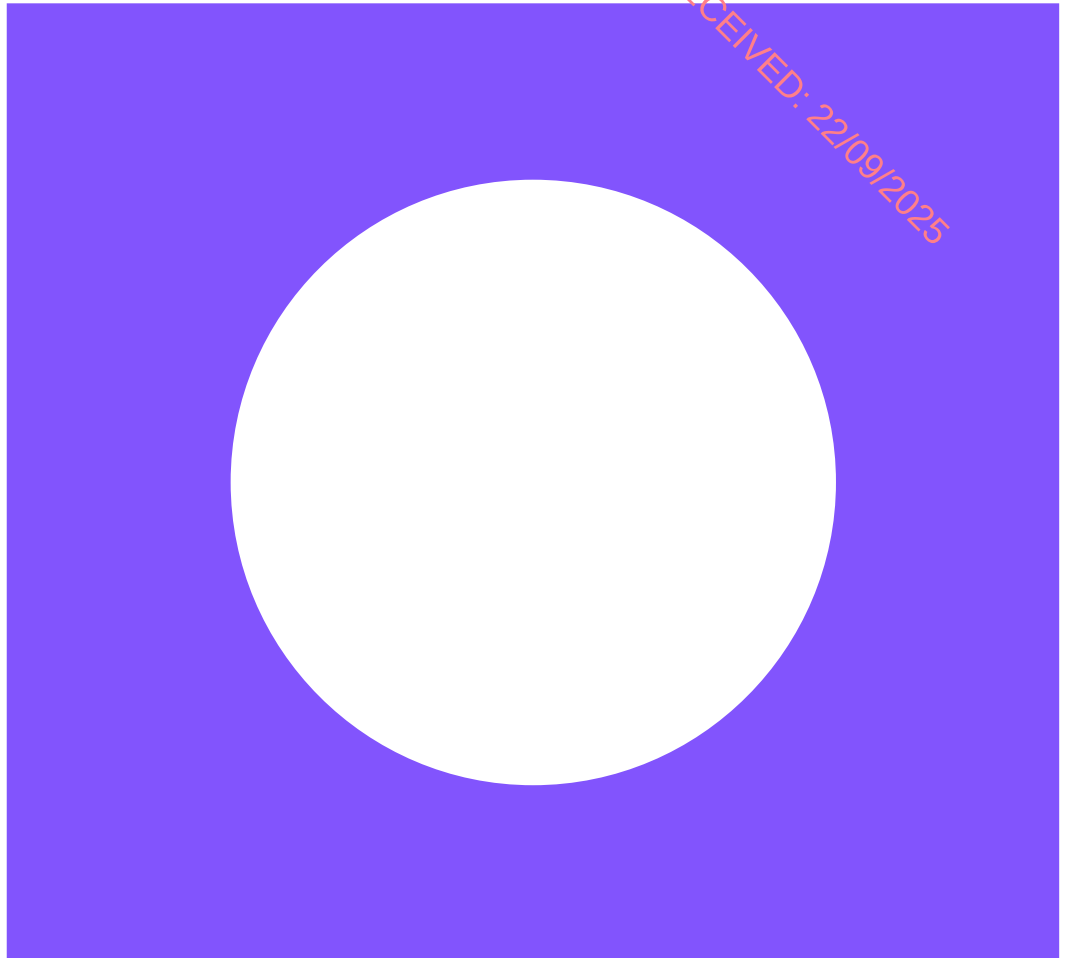
https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/upper_tier_sites_01_02_2024.pdf. Accessed 05 September 2025.

Health and Safety Authority (2025). Lower Tier Establishments (03.12.2024). [Online] Available at

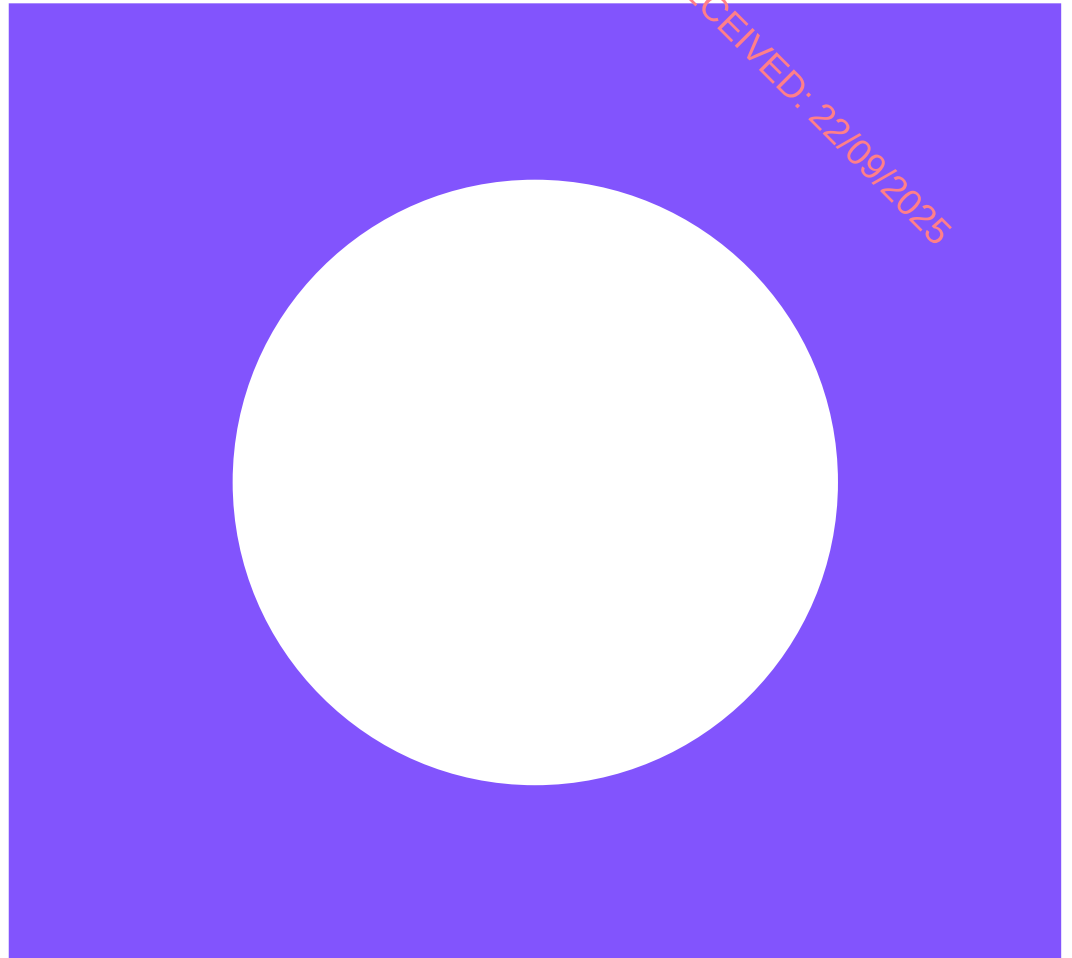
https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/lower_tier_sites_12_02_2024.pdf. Accessed 05 September 2025.

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Chapter 18 Interaction of Effects

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1 Interaction of Effects

1.1 Introduction

This chapter outlines the interactions between the impacts of the Proposed Project identified in this EIAR. The EPA Guidelines 2022 state the following with regards to ‘Interactions Between Effects on Different Factors’.

Aspects of the existing environment likely to be affected by the Proposed Project, during both the construction and operational phases, have been considered in detail in the relevant chapters of this EIAR.

“The interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. For example, where it is established in the Hydrology section that there will be an increase in suspended solids in discharged surface waters during construction, then the Biodiversity section should assess the effect of that on sensitive aquatic receptors. Close coordination and management within the EIA team is needed to ensure that interactions are adequately addressed throughout an EIAR.”

The matrix presented in Table 18.1 has been developed to identify interactions and indirect impacts between environmental topics. Each environmental topic is listed in the first column and the first row of the matrix. In the matrix, a grey or a white square indicates no interaction, while a purple square indicates that a key interaction exists between environmental topics for either or all phases (construction, operation and decommissioning phases). The nature of the environment is such that interactions between all environmental topics are potentially possible and / or may occur to a certain extent for most projects. The purpose of the matrix is therefore to highlight key interactions that are recognised to be specific to this Proposed Project and warranting special consideration.

Key environmental interactions that have been identified in turquoise squares are discussed further in Table 18.2. Each interaction is described in the order of chapters as presented in the EIAR. Cross-references to respective chapters are included for further information.

Table 1.1: Interaction of Effects Matrix

	Population & Human Health	Biodiversity	Land, Soils and Hydrogeology	Surface Water & Flooding	Air Quality	Noise & Vibration	Landscape	Archaeology, Architecture & Cultural Heritage	Roads & Traffic	Material Assets & Climate Waste Management	Major Accidents/ Disasters
Population & Human Health											
Biodiversity											
Land, Soils and Hydrogeology											
Surface Water & Flooding											
Air Quality											
Noise & Vibration											
Landscape											
Archaeology, Architecture & Cultural Heritage											
Roads & Traffic											
Material Assets & Waste Management											
Climate											
Major Accidents/ Disasters											

Table 1.2: Interactions Between Disciplines

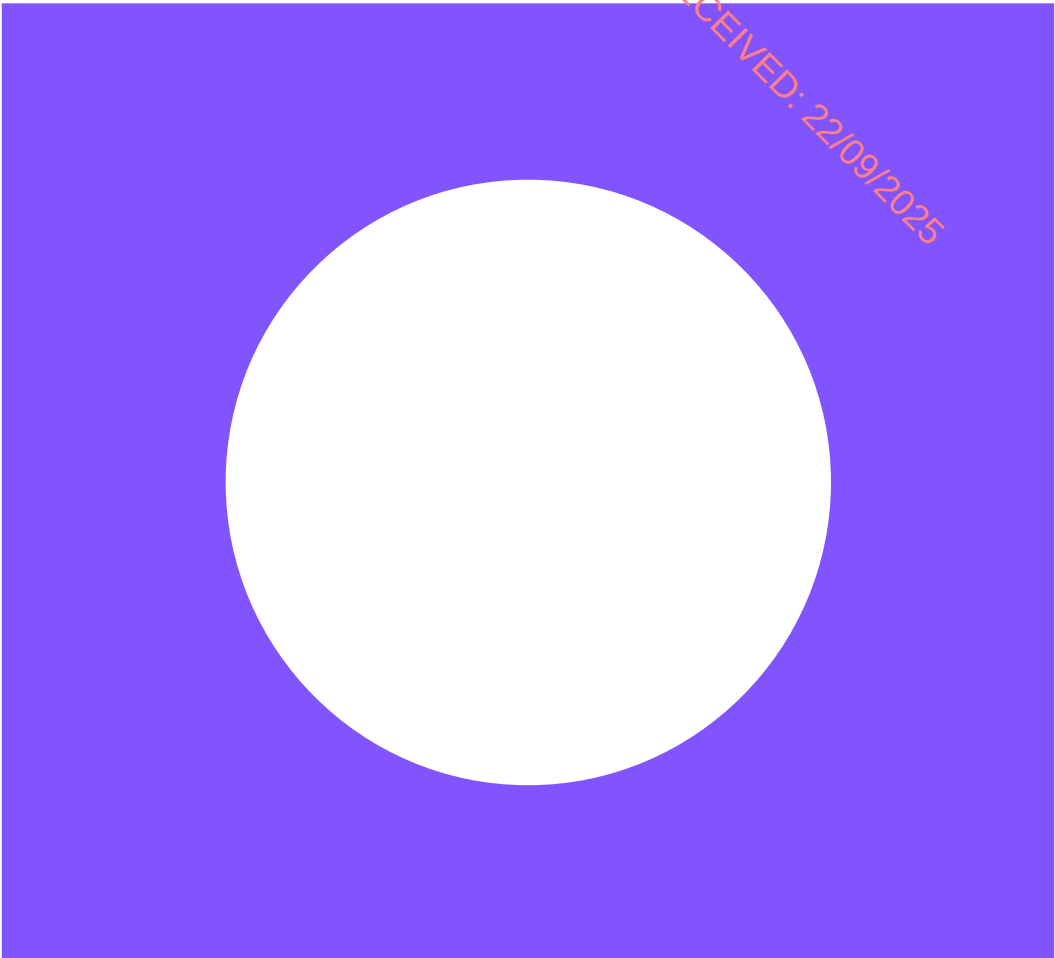
Interaction	Description
Population and Human Health	Land, Soils and Hydrogeology The main interaction between Population and Human Health and Land, Soils and Hydrogeology relates to the potential impact of loss of agricultural land, the solar farm will retain agricultural uses through the implementation of sheep grazing to manage vegetation (grass) growth. The substation and BESS compounds will require recontouring and will result in a loss of agricultural land and usages during all stages of the Proposed Project. Additionally, such earthworks will result in potential for noise disturbance (which is discussed below). Notwithstanding, the overall impact of the loss of agricultural lands and the recontouring of lands required to provide the substation and BESS compounds is imperceptible, as detailed within Chapter 8 Land, Soils & Hydrogeology. Surface water and Flooding The Proposed Project poses no flood risk to the local area (either within or outside the Project site). There is potential for impacts during the construction phase from sediment from the recontouring works required for the substation and BESS compound in the absence of mitigation, the risk of pollution as a result of accidental release of fuel/oil/lubricants has potential to impact surface water quality. With the implementation of mitigation measures presented within this EIAR the impacts are likely to be minimised. Air Quality Impacts on the local community during the construction phase are likely due to increased dust emissions from increased construction traffic, however the effect will not be significant following mitigation. Localised impacts on air quality are found to be negligible with respect to traffic emissions. Once operational, air quality impacts associated with the Proposed Project are not considered to be significant and the impact of additional trains are considered to be negligible and not significant. Noise and Vibration As discussed under Nosie and Vibration below. Landscape Visual impacts associated with the Proposed Project have the potential to impact on population, for example, views of machinery during construction. During the operational phase significant change to views of the landscape are assessed as not significant. Mitigation has been provided in the form of vegetation screening around the boundaries of residential properties directly abutting the solar farm. Overall, the Proposed Project, whilst sizeable, is considered to be well sited in a robust part of County Wexford that is not regarded as highly rare or sensitive at a regional or national level. Indeed, the overall scale and extent of the project will never be fully perceived by surrounding receptors, due to the dispersed nature of the layout combined with the high degree of intervening vegetation. Archaeology, Architecture & Cultural Heritage There are interactions between Population and Human Health and Cultural Heritage due to the importance of archaeology, architectural and cultural heritage in communities. There is potential for unrecorded archaeological to be encountered during the earthworks for the substation and BESS compounds. Where the construction works are undertaken in public roads, no impacts are envisaged. Mitigation measures are detailed within Chapter 13 of this EIAR and the Construction Environmental Management Plan which will ensure that such impacts are minimised. The residual impacts are predicted to be neutral or imperceptible following implementation of mitigation measures. Roads, Traffic and Transportation Driver delay, road safety and community effects (such as pedestrian delay, severance, non-motorised user amenity, fear and intimidation) due to Proposed Project works have potential to be caused due to an increased volume of traffic on the construction vehicle routes, however as these vehicle movements will occur during construction operations only, they are categorised to be short term effects. Driver journey times will be affected due to the temporary rolling road closures of L4030, L40232 and Unclassified Road and diversion routes will be required. Driver journey times would also be affected by a temporary road closure on L80591.The driver delay resultant from the above road closure ranges between 4 minutes and 13 minute. The impact of the Proposed Project on driver delay at the above road sections is assessed to be at worst minor and therefore not significant. A construction Traffic Management Plan accompanies this EIAR, and there are no residual significant effects upon its implementation. Major Accidents and Disasters Chapter 17 Major Accidents and Disasters presents an assessment of whether or not embedded design measures, or legal requirements, codes and standards adequately control the potential major accident and / or disaster. The Proposed Project is not a type of activities which is submit to licencing (pursuant to the Industrial Emission Directive, or, Environmental Protection Agency Act 1992 as amended) to prevent and control pollution to air, water or land. There was no identified 'Other Developments' which could act cumulatively with the Proposed Project to cause or impact risk of a major accident or disaster. There are no likely significant adverse environmental effects. There is no requirement for mitigation measures to specifically address potential impacts or risks of major accidents or disasters due to the type of project (no industrial emission of any emission of scale) and the design and embedded mitigation.
Biodiversity	Land, Soils and Hydrogeology The main interaction between Biodiversity and Land, Soils and Hydrogeology relates to the change in land use, although it retains an agricultural use throughout the solar farm through the application of sheep grazing, there are positive impacts as more intensified farmed areas (Array Area A) will benefit from hedgerow planting. The substation and BESS compounds will require recontouring and will result in a loss of agricultural land and usages during all stages of the Proposed Project, and both compounds will be replaced areas of hardstanding. These recontouring activities have potential to result in some disturbance of flora and fauna adjacent to these earthworks in the absence of mitigation. Notwithstanding, the overall impact of the loss of agricultural lands and the recontouring of lands required to provide the substation and BESS compounds is imperceptible, as detailed within Chapter 8 Land, Soils & Hydrogeology. Surface water and Flooding There is potential for impacts during the construction phase from sediment from the recontouring works required for the substation and BESS compound in the absence of mitigation, the risk of pollution as a result of accidental release of fuel/oil/lubricants has potential to impact surface water quality. With the implementation of mitigation measures presented within this EIAR the impacts are likely to be minimised and no likely significant effects will result from the Proposed Project. Air Quality There is potential for interactions between biodiversity and air quality. There are no ecological designated sites within 50m of potential dust sources of the Proposed Project or from roads to be used by construction traffic, therefore ecological designations are not considered in the construction dust assessment in Chapter 10 Air Quality. Air quality changes such as dust during construction may affect flora and fauna in vicinity of Proposed Project. Across the different construction activities, the level of risk of dust creating nuisance (without mitigation) is predicted to range from 'medium' to 'high risk' as per the IAQM (2024) Guidance. It is anticipated that dust and particulate matter emissions produced during construction activities would be controlled through the implementation of good practice measures which will be documented in a Construction Environmental Management Plan. Noise and Vibration It is considered that there will be an increase in noise levels and impacts on fauna generated from construction activities. Following the implementation of the proposed mitigation measures, these effects will be minimised. The Proposed Project will lead to increases in noise and vibration on ecological receptors; however sound levels will be below levels considered to result in significant adverse effects in the construction or operational and maintenance phases. Landscape The proposed planting reinstatement for the Proposed Project will consist of native species, which is a positive effect on biodiversity. The bolstering of native hedgerows will provide visual screening in addition to the positive biodiversity effect. A total of 15% biodiversity enhancement has been provided through hedgerow, tree planting and retain of marsh habitats.
Land, Soils and Hydrogeology	Population and Human Health The Proposed Project requires recontouring of lands totalling 6.92 hectares as such this will result in impacts such as change of land use from agricultural to utility infrastructure at the proposed substation and BESS compounds, the solar farm will retain agricultural uses through the implementation of sheep grazing to manage vegetation. Notwithstanding, the overall impact of the loss of agricultural lands and the reencountering of lands required to provide the substation and BESS compounds is imperceptible, as detailed within Chapter 8 Land, Soils & Hydrogeology. Biodiversity The proposed recontouring works present a potential risk of sediment entering watercourses adjacent to the Project site. There is a hydrological connection to the Bannow Bay SAC/SPA, however due to the separation distance from the Project site to these designated sites, as assessed in Chapter 7 – Biodiversity the impact to these designated sites is temporary and imperceptible, while the potential for impacts to aquatic and riparian habitat is assessed as temporary and significant due to the potential for significant surface run-off prior to the adoption of mitigation measures. All mitigation measures in relation to silt/sediment control within Chapter 7 Biodiversity and the CEMP will be implemented, as such there are no residual impacts following the implementation of mitigation measures. Surface Water & Flooding The requirement for recontouring lands for the substation and BESS compound will result in a change to the ground levels, however, there is no significant change to the surface water run-off patterns. Given the nature of the surface water design which has embedded mitigation it is expected that there are no adverse or significant impacts on surface water quality during operation and maintenance phase, impacts are likely to be long-term but imperceptible. Air Quality There are interactions in relation to the effects of dust arisings during the construction stage on sensitive receptors and resulting in trackout along local roads from construction vehicles. As stated above, the level of risk of dust creating nuisance (without mitigation) is predicted to range from 'medium' to 'high risk' as per the IAQM (2024) Guidance. It is anticipated that dust and particulate matter emissions produced during construction activities would be controlled through the implementation of good practice measures which will be documented in a Construction Environmental Management Plan.

Interaction	Description
	Landscape The Proposed Project will result in changes to the existing ground levels as an area of 6.92hecateres will be subject to cut and fill activities; notwithstanding, due to the topography of the area. All other representative viewpoints were classified as Slight or less, and in most cases, this is as a result of close and clear views of the proposed solar array in adjacent fields being fully or substantially screened by proposed mitigation screen planting at the road side of the nearest fields. While the GIS building and BESS compound are set well back from the nearest surrounding visual receptors and will be barely discernible, as evidenced in the visual impact appraisal. Archaeology, Architecture and Cultural Heritage The Proposed Project will result in the disturbance of land and soils and therefore has potential to impact on undiscovered archaeological remains. There is no direct impact to any recorded monument. A potential direct effect on previously unknown archaeological heritage lies in the uncovering of sub-surface remains. Accordingly, archaeological test trenching is proposed as a mitigation measure, and will be carried out for all undisturbed areas of the site prior to any groundworks commencing and will be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. Material Assets & Waste Management The Proposed Project will result in the disposal of soils as a result of cut activities, however, excavated material will be re-used on site wherever possible, where this is not possible spoil will be removed from site and sent for disposal at a licensed waste facility.
Surface Water & Flooding	Population and Human Health As discussed above, the Proposed Project, does not result in an increase of flood risk to the surrounding area. Land, Soils and Hydrogeology There is no significant impact from the abstraction of groundwater on surface water flow levels due to the low volume of water needed during the operation and maintenance phase of the Proposed Project, which is typically water requirements for the welfare facilities in the GIS building for a team of four people on a single monthly visit. Roads, Traffic and Transportation There is a chance that construction traffic could accidentally release fuel/oil which could cause a pollution incident if it reaches a watercourse. There are several bridges across watercourses which construction traffic will encounter however there is no potential for likely significant effects from such a pollution event cause by construction traffic. The magnitude of adverse surface water quality impacts in the absence of additional mitigation is expected to be small (localised scale) to moderate, resulting in moderate adverse impacts of temporary duration prior to the implementation of additional mitigation measures. Appropriate mitigation as outlined within Chapter 9 Surface Water and Flooding and within the Construction Environmental Management Plan. Material Assets & Waste Management As discussed above, the Proposed Project, does not result in an increase of flood risk to the surrounding area and therefore there is no impact on material assets (utilities) as a result of the Proposed Project. Climate Extreme weather events are assessed within the Climate chapter including resulting flooding from such events; however, the Flood Risk Assessment has concluded that no part of the Proposed Project is at risk from flooding even when the modelled extents that take in potential effects of climate change are considered, with the exception of the perimeter fencing to the east in priority to the Owenduff River and a single poleset adjacent to the Tellarought River.
Air Quality	Biodiversity Air quality changes on flora and fauna such as dust during construction may affect flora and fauna. Run off from works areas can impact water quality and biodiversity, dust deposition and soiling can impact on biodiversity. Following the implementation of the mitigation measures dust impacts are not predicted to be significant. Consequently, no significant residual dust effects on surface are predicted. Land, Soils and Hydrogeology Dust arising from the excavations works to recontour the BESS and substation compounds has potential to impact air quality. Dust soiling effects are 'Medium' to 'High' risk and PM10 effects are 'Low' risk without mitigation. It is anticipated that dust and particulate matter emissions produced during construction activities and emissions from site plant would be controlled through the implementation of good practice measures set out within the Construction Environmental Management Plan which forms part of this EIAR. These mitigation measures are identified as good practice within the Institute of Air Quality Management's (IAQM) 'Guidance on the assessment of dust from demolition and construction', January 2024. Roads, Traffic and Transportation During the construction phase, it is not expected that there will be any significant effects from construction road traffic on ambient air quality. There is negligible traffic generated by the Proposed Project during the operational and maintenance phase, impacts are low and not significant, and no mitigation is required. Climate Air quality impacts associated with the Proposed Project are not considered to be negligible and not significant as the only air emissions during the operational and maintenance phase relate to limited number of vehicles for essential operations and maintenance activities. The construction phase dust soiling effects are 'Medium' to 'High' risk and PM10 effects are 'Low' risk without mitigation. However, following best practice mitigation specified in the Chapter 10 - Air Quality there will be no residual impacts on dust emissions from construction activities will be negligible.
Noise & Vibration	Population and Human Health As identified in Chapter 11 of this EIAR, the construction phase will generate an increase in noise levels in the vicinity of the Project site which has the potential to cause a nuisance to sensitive receptors in the area. The appointed contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228- 1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and all mitigation measures as detail in Chapter 11 Nosie and Vibration and the CEMP will be implemented. The operational and maintenance phase of the Proposed Project will not generate noise levels above those for daytime, evening or night-time at any receptor due to the inclusion of the acoustic barrier. Biodiversity It is considered that there will be an increase in noise levels and impacts on the local community generated from construction activities. Following the implementation of the proposed mitigation measures, these effects will be minimised. The Proposed Project will lead to increases in noise and vibration to the closest receptors, with minor to moderate increases in noise. Noise and vibration levels will be below levels considered to result in significant adverse effects. Roads, Traffic and Transportation Construction traffic has the potential to result in increases in noise levels at sensitive receptors along haulage routes. On regional roads, R733, R734 and R735, it is forecasted additional movements are calculated to result in increase in the basic noise level between 0.1 to 0.5 dB. The L4023 road between N25 Junction and the L4030 Nash Junction is predicted to have an increase of 1.7 dB. This will have a temporary significant noise impact on the dwellings located alongside this road.
Landscape	Population and Human Health As discussed above. Biodiversity As discussed above. Land, Soils and Hydrogeology As discussed above.
Archaeology, Architecture & Cultural Heritage	Population and Human Health As discussed above. Land, Soils and Hydrogeology Dust arising during construction phase may temporarily and indirectly impact archaeological monuments within ca. 50m of the works, however, there are no monuments within a 50m radius of the substation and BESS compound where earthwork activities will be undertaken, this effect would be not significant. As stated in Chapter 13 – the archaeological mitigation includes the undertaken of archaeological test trenching prior to any groundworks commencing and will be undertaken by an experienced, licence-eligible archaeologist working under licence from the Department of Housing Local Government and Heritage.
Roads, Traffic and Transportation	Population and Human Health As discussed above. There are no significant residual roads, traffic and transportation effects predicted during the construction phase following incorporation of measures described within the Construction Traffic Management Plan. Air Quality As discussed above. Climate (Carbon) There exists a link between construction traffic and the carbon assessment. Transport of construction materials to the Project site is one of the sources for construction-related GHG emissions.
Material Assets & Waste Management	Population and Human Health There is no likely significant impact to the local population during any stage in the lifetime of the Proposed Project as a result of waste management. All waste will be managed in accordance with extant waste management legislation during all phase of the Proposed Project. There is no predicted impact on material assets which would result in likely significant effects. A Construction Resource Waste Management Plan has been prepared, following its implementation there are Land, Soils and Hydrogeology As discussed above. Roads, Traffic and Transportation There is an interaction between resource and waste management and traffic and transport effects during the construction phase of the proposed development. The transportation of resources and waste to and from the Project site has the potential to affect local traffic and transport patterns during the construction phase. Materials will be transported from the construction compound areas, to the various sections of the proposed development and there will also be material requiring transport for disposal, following the excavation of the trenches. A Construction Traffic Management Plan has been produced and will be updated by the appointed contractor. The residual effects on roads and traffic are assessed as not significant.

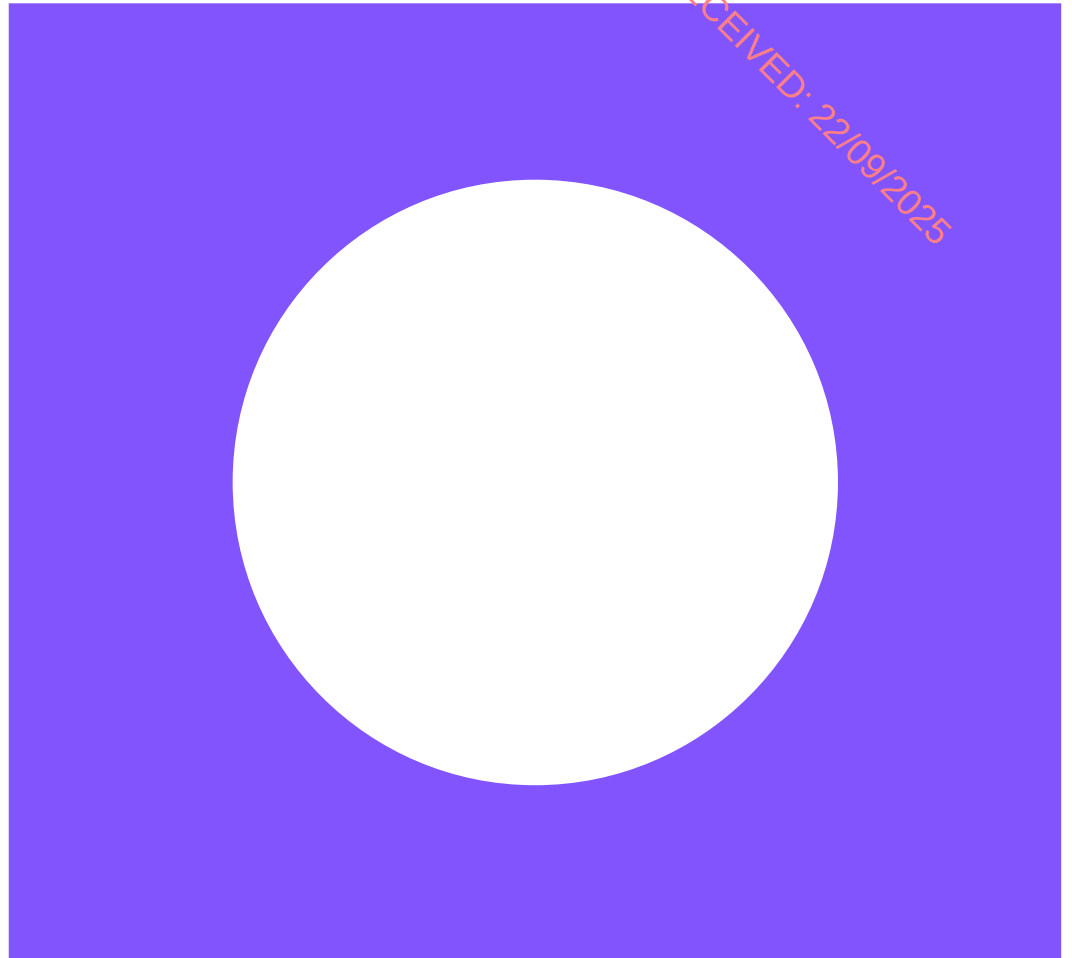
Interaction	Description
	Climate (Carbon) Carbon emissions are associated with embodied emissions from the production of construction materials, and transport of those materials and workers to site. Vehicle and machinery usage (electricity, fuel, and water consumption), including for site clearance and temporary construction compounds will result in carbon emissions. Given the context of the development in supporting Ireland's climate commitments, the residual effect of Minor Adverse with mitigation is anticipated with no significant effects expected. In line with the ISEP Guidance, minor adverse means that the Proposed Project 's emissions are in-line with good practice design standards and are also in-line with national net zero pathways.
Climate	Air Quality As discussed above. Roads, Traffic and Transportation. As discussed above. Major Accidents and Disaster Climatic changes as a result of climate change may result in extreme weather events such as storms, this was assessed as a risk scenario within the climate chapter and within the Major Accidents and Disasters chapter. Within the climate chapter, climate resilience assessed a total of 13 climatic scenarios including extreme storms, and impacts to project infrastructure and workforce, the likelihood of such climate variable occurring was assessed as low and very low respectively, and consequence of occurring was categorised as moderate adverse and major adverse, both resulting in a significance rating of not significant.
Major Accidents/ Disasters	Population and Human Health As discussed above. Climate (Resilience) As presented in Chapter 11 Climate, the resilience of the Proposed Project to future climate change up to its operational lifetime post-construction of 40 years, to 2070, was assessed. The consideration of extreme weather events is assessed with the Climate chapter and Major Accidents/Disaster chapter respectively. The potential changes in climate may result in a range of impacts on the operation and maintenance of the Proposed Project, such as changes in temperature (extreme highs or lows), storms, drought and flooding; however, no likely significant impacts were predicted. Climate resilience during construction has been scoped out of the assessment as it is considered that changes to climate in the construction period will be negligible relative to the historical weather baseline. The construction phase is currently programmed for 2027 - 2030, and climate is not anticipated to have noticeably changed from the current day

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 19 Mitigation and Monitoring

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19 Mitigation and Monitoring

19.1 Introduction

The EIAR takes into account the available results of relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments. The assessments contained in the EIAR have also been co-ordinated with the assessment under Council Directive 92/43/EEC of 21 May 1997 (The Habitats Directive) and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 (Birds Directive) as transposed in the Planning and Development Act 2000 (as amended) and the NIS which has been prepared for this application. The following summary sets out the mitigation controls and other best practice measures identified in relation to the Proposed Project and identifies the means by which those controls and measures will be secured, as laid out in Annex IV(7) of Directive 2014/52/EU. The following are provided: a unique reference number for each item; the section of the EIAR where the mitigation measure is referenced; and the monitoring and mitigation measures, as set out in the EIAR. A contractual obligation will be included within the tendering processes and implemented on appointment of the Contractor to ensure that the proposed works are developed in compliance with the requirements of the CEMP, and the methods, monitoring and mitigation included in this EIAR.

A summary of the mitigation and monitoring is included within the following table.

Table 19.1: Summary of Mitigation and Monitoring Measures

Reference	Phase	Mitigation and Monitoring
Chapter 6 Population and Human Health		
6.1	Construction Phase	To manage changes in access in the construction phase, a Construction Environmental Management Plan (CEMP) has been developed to communicate planned activities and minimise disruption to stakeholders that may be affected by construction activities. This is included in the application documentation.
6.2		A Construction Traffic Management Plan (CTMP) has been developed as part of the CEMP, to optimise the efficiency and safety of all traffic activities generated by the Proposed Project.
6.3		Construction phase works will take place between the hours of 07:00-19:00 Monday to Friday and 08:00-14:00 Saturday, subject to agreement with Wexford County Council and An Coimisiún Pleanála respectively.
6.4		To address risks of exposure to radon, workplace radon tests will be carried out in areas Water quality testing will be undertaken pre-construction, during construction and post-construction for any identified drinking water abstraction sources which may be impacted by construction activities.
6.5		The CEMP includes best practice mitigation to minimise air quality and noise impacts associated with construction vehicles and the construction and operation of the Proposed Project.
6.6		Vegetation removal required as part of site preparation, and any removal of hedgerow, trees or scrub will take place outside of the bird nesting season so as to minimise disruption to local biodiversity, and ensuing effects on population and human health.
6.7		Land clearance works will take place on a phased basis and with consideration of seasonal restrictions e.g. lambing season, harvest seasons, etc., if applicable.
6.8		Where land is used temporarily, it will be reinstated to its previous state after construction.
6.9	Operational Phase	No specific mitigations relevant to the population and human health assessment are proposed during the operation and maintenance phase. In accordance with best practice (as set out in Chapter 10 (Air Quality) emissions will be minimised at source to reduce exposure of effects of operations on receptors.
Chapter 7 Biodiversity		
7.1	Construction Phase	An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. The ECoW will be suitably experienced and will have experience of identifying species rich wet grasslands and marsh habitats to be avoided. The Contractor's ECoW will have stop works authority, in agreement with the Independent ECoW within the Employer's Representative Team.

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Reference	Phase	Mitigation and Monitoring
		The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), and have demonstrable experience in ecological supervision, water quality protection during construction and habitat restoration works. The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised. The ECoW will have stop/ start work authority in particular in relation to water pollution protection measures. The Contractor will provide all necessary method statements to the Contractor's ECoW to demonstrate how mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt fence, silt traps) and ground protection (i.e. bog mats).
7.2		An independent Ecological Clerk of Works (ECoW) will be employed on behalf of the Employer's Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.
7.3		Terrestrial Habitats Semi natural wet grassland and marsh habitat identified in Appendix ++ Habitat Map will be avoided. No machinery will cross these areas, and they will not be used as laydown or storage areas. The site Ecow will mark these areas and/ or outline them to Contractors to ensure they are not impacted.
7.4		Badgers Where applicable following the preconstruction survey. heavy machinery will not be permitted within 30 m of an active badger sett, although lighter machinery may be used within 20 m and light work such as vegetation clearance can generally be undertaken within 10 m of setts (NRA, Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes, 2005). Where avoidance measures and exclusion zones cannot be used, consultation with NPWS will be necessary to permit disturbance (noting that the NPWS does not presently issue derogation licences for badger sett disturbance or destruction but can give authorisation and should be consulted). This assessment assumes that if authorisation is granted then appropriate mitigation and compensation will be provided. During the breeding season (December to June inclusive), none of the above works shall be permitted within 50 m of any active setts.
7.5		Otters In advance of construction works, the Contractor will commission pre-construction confirmatory surveys of IEFs outlined in the EIAR. These surveys will update the findings of the surveys completed to date. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for: • Otter breeding/resting sites within the Zol of the Proposed Project (150 m for breeding sites, where access allows at river crossings); • The Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of the works areas (where access is available from affected landowners) as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to

Reference	Phase	Mitigation and Monitoring
		commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.
7.6		Bats No features likely to support bat roosts requiring removal were identified within potential works areas. Temporary lighting may be required during the construction phase of the works. Any temporary lighting associated with the construction works will be placed strategically by the Contractor following consultation with the ECoW, such that illumination beyond the works area is controlled and kept to a minimum. Lighting will be cowed and directional, to reduce significant light splay. Lighting will be directed away from potential roosts and foraging habitats.
7.7		Breeding Birds Pre-construction nest check surveys will be carried out for breeding birds within hedgerow prior to removal and within farmland prior to construction of access tracks, earthworks, construction of BESS units and substation construction. If nesting activity is observed, then the programme of works will be modified to avoid significant disturbance risk e.g. vehicular movements, exclusion zones and personnel present. The nest area will be monitored until fledging occurs or the nest site becomes inactive after which works can commence. The removal of vegetation which may be used as nesting sites by breeding birds, will be cleared where possible outside of the birds nesting season (1st March to 31st August inclusive). Where vegetation clearance is proposed within the nesting season, a suitably qualified ECoW will conduct pre-construction surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event where pre-construction surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance), and no vegetation clearance may proceed until young have fledged, or nesting has failed. Pre-construction confirmatory surveys will be undertaken no more than 72 hours before clearance, after which repeat surveys will be required if vegetation has not been cleared. The loss of hedgerow will be compensated for by the planting of an equivalent area of hedgerow along the periphery of the Proposed Project site, as outlined in the restoration plan.
7.8		Wintering Birds No specific mitigation is required for wintering birds during the construction phase
7.9		Marsh Fritillary Potential habitat for Marsh Fritillary occurs at the northwest of the site near Fields 15 and 17, Refer to Figure 7.1 (of the EIAR Chapter 7 Biodiversity). These areas include semi natural wet grassland and marsh habitat identified in Appendix ++ Habitat Map.

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Reference	Phase	Mitigation and Monitoring
		These areas will not be used as laydown or storage areas. The site ECow will mark out these areas and/or outline them to Contractors to ensure they are not impacted by machinery.
7.10		Herpetofauna Should works progress within habitat identified as suitable for amphibians during the breeding season (March and April) a pre-construction confirmatory survey for frogs will be undertaken. The Contractor will commission pre-construction confirmatory surveys of amphibians within pond habitat and drainage ditches throughout the site. These surveys will update the findings of the surveys completed to date. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for: Where common frog is recorded within the footprint of the works, any spawn or adult frogs recorded will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat. This will be carried out under license from the NPWS. Should hedgerow removal occur during the hibernation period (October to March), impacts to torpid reptiles must be mitigation. Hedgerow removal should occur by cutting down and raking off the vegetation to allow for the displacement of common lizards.
7.11		Invasive species No schedule 3 listed species were recorded. However, they could establish before construction phase. Prior to works commencing a full confirmatory invasive species survey will be carried out by the contractor's ECoW in accordance with Guidance of Transport Infrastructure Ireland¹. All other surveys will be carried out having regard to guidance of NRA (2009). The pre-construction invasive species surveys will be carried out within the works areas, including compound locations and laydown areas, and along proposed access tracks to identify the presence of all invasive species within and adjacent to works areas. Any additional findings of this invasive species survey will be incorporated into the final CEMP for the works. The measures relating to the Invasive Species will be identified prior to any works commencing. These measures will be regularly reviewed and updated throughout the works to include for any additional invasive species encountered. The Invasive Species Management Plan will set out site-specific and species-specific measures to manage invasive species. It will incorporate the following measures as a minimum: • All machinery will be steam-cleaned prior to entering site • Any stands of invasive species that are recorded within the site will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for, noting the reduced extents for Japanese knotweed based on recent research (Fennell et al., 2018). No works will be carried out within the exclusion zones unless fully supervised by the Contractor's ECoW.

¹ TII (2020) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. Available online: <https://cdn.tii.ie/publications/GE-ENV-01105-01.pdf> [Accessed 11 September 2025]

Reference	Phase	Mitigation and Monitoring
		- The Contractor's ECoW. will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species. - A Check, Clean, Dry protocol will be undertaken with all equipment, machinery and vehicles entering and leaving the application site boundary. - Any fill that is required will be from a licensed facility identified by the contractor.
7.12		Mitigation Against Water Quality Impacts to Surface Water All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for 'Environmental Good Practice on Site' (C741) and 'Control of water pollution from linear construction projects. Technical guidance' (C648). The following shall apply with regard to contractor responsibility: - A waste management plan to ensure that waste generated during the project will be managed in a way that ensures the relevant provisions of the Waste Management Act 1996 and associated amendments and regulations are met, particularly with regard to the use of appropriately permitted Waste Contractors and destinations for waste materials. - A Sediment Erosion and Pollution Control Plan will be implemented for all construction works. This includes measures to manage soil and silt-laden water on site, accidental leaks/spills to ground and water quality monitoring to ensure compliance with environmental quality standards specified in the relevant legislation. The plan for erosion and sediment control will also specifically deal with the potential impacts of material deposition areas during the construction phase of the project; - All construction staff will be properly trained to respond to accidental discharge or leaks and appropriate spill management kits will be in place to allow rapid response on site. An Incident Response Plan will be in place detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous substances or wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident at any point over the proposed working areas. - Prior to commencement of construction, the contractor will prepare method statements for discharge of construction water discharges. Further discussions will take place with the relevant authority to determine the required permit licence agreements to permit the discharge of water during the construction phase to either sewer or to ground. - Under no circumstances will treated water be discharged to a water course without the respective water quality meeting the statutory limits as set under the relevant EU environmental objectives for surface water. - A groundwater monitoring plan will be in place, to provide early warnings and prevent possible impacts on groundwater resource during constructions works and to monitor post construction conditions; - Some of the standard mitigation measures proposed to minimise effects of impacts involved with the proposed construction activities comprise of: - The provision of boundary treatments such as silt fencing and berms will be installed prior to the commencement of any construction works in order to enhance the protection of surrounding environment during the full construction phase. - Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated and controlled area. Furthermore, temporary stockpiles of excavated material will be managed on a site-per-site basis and designated areas will be suitably sized and isolated from open excavations or sensitive receptors.

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Reference	Phase	Mitigation and Monitoring
		- Where possible excavated material will be reused within the project for the construction of embankments, in backfill, for bunding and landscaping requirements. - If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous using an approved classification method. - Excavated contaminated soils will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure no cross-contamination with clean soils elsewhere throughout the site. - If the water table is encountered during excavation works, groundwater management measures (sheet piles installation, dewatering, etc..) will be implemented to provide a dry working environment. Silt fencing will be installed around the works to prevent silt / suspended solid run off. - If a daily abstraction volume higher than 25 m3 is required for dewatering activities, a dewatering / discharge permit should be obtained (with specific mitigation measures specified in the permit). If possible, any abstracted water, if of suitable quality, should be discharged back into the same waterbody. There will be regular checks on the treatment system as well as continuous monitoring equipment to measure, but not limited to, pH, temperature, conductivity, Total Suspended Solids and Totals Dissolved Solids. - A programme of water quality monitoring (groundwater and surface water) will be implemented by the Contractor. The CEMP contains a water quality management plan which will be further developed by the Contractor, prior to any construction on site. In the event that parameters are breached during the construction period, additional mitigation will be implemented to ensure that water quality is not adversely affected by the works. - Potential impacts resulting from the Proposed Project are reduced due to the programme of works being carried out within the dry season. During the dry season, in the majority of locations, groundwater will not be encountered. However, if groundwater will be encountered, which is likely during maximum recorded groundwater level conditions, the appropriate mitigation measures will be carried out as described above. - A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works. - No instream works are proposed. Any works in the vicinity of drains (no fisheries importance) or watercourses will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016). - The IFI Biosecurity Protocol for Field Survey Works² will be complied with. The applicant should provide a detailed biosecurity plan to prevent the spread of invasive species, including a protocol disinfect plant, equipment and PPE and the facilities in place to allow for same in particular machinery from other sites will be cleaned and disinfected before they commence work on the site. - In the case of a warning of a flood event, plant and materials vulnerable to flooding in 'at risk' construction compounds will be relocated to parts of the compound that are considered to be not at risk of flooding. The following mitigation measures will be implemented prior to commencement and throughout the duration of the construction works:

² [research biosecurity biosecurity for fieldsurveys 2010.pdf](#)

Reference	Phase	Mitigation and Monitoring
		- Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed and ruts will be created that will act as miniature rivers where dirty water will flow. - Tracking beside streams will be avoided to avoid damage to the bankside. - Geotextile or timber matting will be used on soft ground, and in all protected areas - A buffer zone of 10m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works. - The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable. - Re-instatement method statements will be subject to approval by the EnCoW. - Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided. - The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses. - In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed. - All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations; - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces; - Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces; - All tanks and drums will be bunded in accordance with established best practice guidelines; and - Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works. - Works will not be carried out during extreme rainfall or high flow events. An early flood warning system will be set up to allow the removal of plant and material from construction areas located in Flood Zones A and B in the event of a flood warning. The duration of works within Flood Zone A and B will be minimised to reduce the potential of impact. - Temporary works will be designed so as not to increase flood risk elsewhere from overland flow, by limiting excavated lengths and providing suitable drainage provision. - Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW. - Any instream works will be conducted during the period July – September to avoid effects on fisheries, or otherwise agreed with IFI.
7.13		Silt Control Measures - Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses. - Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.

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Reference	Phase	Mitigation and Monitoring
		- Silt fences must be installed in the working areas and not at the watercourse. - Access routes will be delineated such that an appropriate set back distance from watercourses is maintained. Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site. - Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained. - Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.
7.14		Silt Fences - Silt fences will be installed downslope of the area where silt is being generated on disturbed ground. - To be effective the silt curtain must contain the area where silt is generated and must terminate on high ground (i.e. an elevated area not in the watercourse). - Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh. - The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals. - Once installed the silt fence will be inspected by the Environmental Clerk of Works regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains. - The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately. - Two lines of silt curtain / fence will be installed, where considered necessary, by the EnCoW. - Any build-up of sediment along the fence boundary will be removed daily. - Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW. - The silt fencing must be left in place until the works are completed (which includes removal of any temporary ground treatment). - Silt fences will not be removed during heavy rainfall. - The silt fence will not be pulled from the ground but cutaway at ground level and posts removed. - A record of when it was installed, inspected and removed will be maintained by the EnCoW.
7.15		Silt Traps The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply: - Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low. - Silt traps will be made of terram or similar material, not mesh. - The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides. - The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.

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Reference	Phase	Mitigation and Monitoring
		- The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it. - Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth. - Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom. - In sensitive areas a series of silt traps will be placed in the drain. - The silt trap will not be pulled from the ground but cutaway at ground level and posts removed. - A record of when it was installed, inspected and removed will be maintained by the EnCoW.
7.16		Stockpiling Material - All excavated material will be stored a minimum of 50m from rivers and any drainage ditches hydrologically connected to the watercourse. - Silt fences or gravel drains will be positioned around the stockpiles to prevent surface water run-off. The silt fences and gravel drains will be regularly inspected and maintained. - Stockpiled material, comprising soil, earth, stone etc. will be covered in order to prevent surface water run-off.
7.17		Concrete - The pouring of concrete will be required for foundation works. No pouring of concrete will be undertaken at the stormwater outfall location. - No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck. - Quick setting concrete mixes will be used to reduce the risk of contaminated runoff to the nearby watercourses. - Where concrete pours are to take place instream, they will only take place within an isolated, dry, works area. - Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour, and remain off until concrete has hardened negating a runoff risk; and such that the discharge will not result in a change in pH of +/-0.5 units. - The Contractor's EnCoW will ensure that covers are available for freshly poured concrete to avoid wash off in the event of rain. - Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal. - The Contractor will schedule concrete works during relatively dry weather conditions (i.e. when there are no active Met Eireann yellow, orange or red warnings) to reduce the elevated risk of runoff. - Concrete trucks will be washed down within a designated wash down area within the construction compound only and will be washed into appropriately sized containers which shall be inspected for defects in advance. Where the container is defective it shall not be used. Concrete trucks will be washed down in a sealed mortar bin/skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area.

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Reference	Phase	Mitigation and Monitoring
		- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from waterbodies. - Wet concrete operations adjacent to waterbodies will be avoided where possible.
7.18		Hydrocarbons - A spill response plan should be in place and all employees and site staff made aware of it to mitigate impacts of any potential spills or leaks. - Where mobile equipment is required, e.g. generators, these will be housed in a suitably sized bund/plant nappy such that any leaks/spills are intercepted. All mobile equipment used at the proposed discharge outfall will be stored within a plant nappy. - All chemicals and hydrocarbons (oils, fuels and lubricants etc) should be stored in containers of up to 110% capacity to ensure there is a reduced risk of overflow spill and should be stored an absolute minimum of 10m from any watercourses and/or drains. If more than 200 litres of any oil type are to be stored on site, this must be stored in oil storage containers including drums and intermediate bulk containers (IBCs). All chemicals and hydrocarbons are to be stored within a bunded area, within the construction compound. All hand-held equipment and generators will be stored on site in appropriately sized bunds when not in use. - Fuelling and lubrication of plant and equipment will be restricted to the construction compound site only. No refuelling will be permitted to occur within 10m of watercourses, waterbodies or drainage ditches. - All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Acts 1996, as amended. - Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment. - Welfare/hygiene facilities will be located within temporary construction compounds a minimum of 50m from any watercourse/drainage ditch. - All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No water will be discharged into any watercourses or drainage ditches.
7.19		Silt Fences - Silt fences will be installed throughout the scheme, around stockpiles of material and around the designated vegetated areas where groundwater will be discharged. - Silt fences will be installed in advance of any ground disturbance. - The silt fences must be positioned to allow an appropriate working area within the site. Where possible the silt fences will be positioned above areas prone to flood. - The silt fences will have the following design features: - the geotextile fabric will be entrenched at least 100mm into the ground with the ends upturned inward towards the works; - the fence posts will have a maximum spacing of 2m to prevent sag on the fence; and - the geotextile fabric will be anchored to the fence posts as opposed to wrapped.

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Reference	Phase	Mitigation and Monitoring
		- Daily inspection of silt fences will be carried out by the Contractor to assess the effectiveness of the measures, to carry out maintenance, and to determine if there has been any damage/breach to the control measures. The silt fences will also be inspected immediately following heavy rainfall or strong winds (equating to a yellow weather warning). Where repair is necessary, this will be carried out immediately and may require replacement of any damaged/degraded material. - Accumulated silt will be removed regularly from the base of silt fences and will be removed offsite. Silt will not be permitted to build up such that it reaches half the height of the fence or exceeds 15cm in height (whichever is the lesser value). Note commercially available fences will show a maximum height which should not be exceeded. - Silt fences will remain in place until the disturbed areas within the sites have been reinstated and revegetated. - Silt fences will only be removed during dry weather.
7.20		Dewatering Any water ingress associated with the compound excavation will be removed to facilitate suitable working conditions. The water will be over pumped and treated via a filter bag before being discharged within a vegetated area located north of the construction compound. Silt fences will be installed around the vegetated area to ensure there is no runoff of sediment laden surface water. Any contaminated water unsuitable to be discharged to ground will be removed and disposed of offsite.
7.21		Mitigation of Dust Effects Dust emissions during the construction phase of the Proposed Project is unavoidable throughout the scheme as a degree of dust will be generated from ground works. As such this is an unavoidable impact which is expected to occur but should impose minimal risk of impacts with suitable mitigation: - Development and implementation of a Dust Management Plan (DMP) for the site prior to commencement of works, this plan is to be agreed upon and all site staff aware of it's measures and adhere to them. - Carry out regular site inspections to monitor compliance with the DMP, record inspection results and update of log. - Ensure suitable dust suppression is carried out at times when certain construction activities which may increase dust generation is being carried out as well as during days where dust generation may be increase i.e. hot dry days. - Revegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. - Communication and Site Management - Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager / engineer or the site manager. - Display the head or regional office contact information. - Develop and implement a dust management plan (DMP), which may include measures to control other emissions, approved by the Local Authority.

Reference	Phase	Mitigation and Monitoring
		– Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken. – Make a complaint log available to the planning authority, when requested. – Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the logbook. • Monitoring – Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested. – Increase frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. – Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction. • Preparing and maintaining the site – Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible. – Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. – Avoid site runoff of water or mud. – Keep site fencing and barriers clean using wet methods. – Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. – Cover, seed or fence stockpiles to prevent wind whipping. • Operations vehicles / machinery and sustainable travel – Ensure all vehicles switch off engines when stationary – no idling vehicles. – Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable – Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Operations – Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction. – Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate.

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Reference	Phase	Mitigation and Monitoring
7.22		The Site Manager will oversee implementation of mitigation and deliver toolbox talks and preconstruction confirmatory ecology surveys, as appropriate. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented and impacts to IEFs are minimised and avoided where practical. The Site Manager will also ensure any disturbance licenses are arranged if any significant findings are determined from confirmatory pre-construction surveys outlined above. The Site Manager will seek advice on mitigation measures and oversee implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised. The Developer's Environmental Manager will ensure measures are appropriate. An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) and have demonstrable experience in ecological supervision. The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised. All monitoring reports will be provided to the Employer's Representative team and to the local authority or other parties where required by condition. An independent Environmental Clerk of Works (EnCoW) will be employed on behalf of the Employers Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.
7.23	Operation Phase	The perimeter fencing for the Proposed Project will have mammal gates installed at regular intervals (small mammal gates every panel (between posts) and large mammal passes every tenth panel) to allow the mammal access points to ensure species such as foxes, badgers, rabbits, hares etc. have unfettered movement throughout the solar farm. The surface water drainage pond will be maintained and managed as wetland feature for biodiversity enhancement purposes. The emergency storage pond for possible storage of fire water will be maintained as per manufacturers specification and any effluent will be removed and treated off site in a suitable waste management facility. There will be no discharges to groundwater or surface waters draining the site.
Chapter 8 Land, Soils and Hydrogeology		
8.1	Construction Phase	Design and embedded mitigation measures are specified in Table 8.11 (of EIAR Chapter 8 Land, Soils and Hydrogeology). A Construction Environmental Management Plan (CEMP) will be prepared, included within the planning application, and implemented

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Reference	Phase	Mitigation and Monitoring
		during the construction phase in consultation with the Planning Authority. This will specify the range of measures to avoid and minimise impacts that may occur in construction. This requires the appointed contractor to have in place appropriate consents for works that could affect groundwater and to implement specific measures to protect nearby receptors. Key CEMP measures of relevance to soils geology and hydrogeology will include; • Fuel storage – bunded tanks to prevent spillages and designated fuelling areas with spillage control; • Chemical storage – all potentially polluting chemicals will be stored in secure weatherproof enclosures with spill kits; • Concrete to be brought to site by covered truck, with wet concrete operations adjacent to watercourses avoided; • Concrete truck wash watering/cleaning will be undertaken off-site if possible; • Failing concrete washout being carried out offsite a concrete washout management plan will be developed prior to construction by the appointed contractor; • All concrete wash water generated on site will be collected; • The site will be kept secure to prevent vandalism which can lead to pollution from stored liquids escaping and entering drains; • Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations; • Silt control measures will be used to control run-off generated from activities on site and prevent it from entering nearby waterbodies; and, • A dewatering management plan will be developed by the contractor before construction work commences. All construction activities, including construction traffic, will be managed through the site Construction Environmental Management Plan (CEMP), which will set out key mitigation measures for, and monitoring of, potential impacts from traffic. • Should dewatering be required any discharges will be treated to remove contaminants and silt and disposed of in accordance with EPA requirements. • Bentonite Breakout procedure will be developed. • An appropriately qualified person will be present on-site during construction to identify visual and olfactory evidence of contamination during excavation. • Any contaminated ground will be characterised according to generic screening criteria and dealt with via a bespoke remediation strategy or a materials management plan. • Any waste arising will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations. • In addition to the above, a pre-construction confirmatory survey of wells and groundwater abstractions will be undertaken. • Should dewatering be required, water level monitoring will be undertaken pre-construction, during construction and post-construction for groundwater abstractions which may be impacted by dewatering. A dewatering license will also be obtained for any dewatering operations over 25m³/d, in line with EPA regulations and EU law Invalid source specified.. • Water quality testing will also be undertaken pre-construction, during construction and postconstruction for any identified drinking water abstraction sources which may be impacted by construction activities.

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Reference	Phase	Mitigation and Monitoring
		- To address risks of exposure to radon, workplace radon tests will be carried out in areas of high risk, as required by S.I. Regulation 66 of S.I. No. 30 of 2019 Invalid source specified.. Radon barriers are also to be installed in areas where a high radon risk have been identified. The following mitigation measures will be implemented to address residual risk to soils, landslide risk and risk of contaminant migration (as summarised in Section of 8.8the EIAR): - Soil Management Plan – based on recognised best management practices to minimise the loss of soil quality during handling. This will include a suitable soil survey within the area of permanent land take to inform on the soils sensitivity to handling and its potential for reuse on or off site; - Where groundwater seepage poses a risk to excavation stability, additional measures (such as dewatering) will be used to mitigate these risks. - A suitably designed drainage system will be installed to divert water away from the landslide risk zones. A phase of ground investigation prior to construction will include an assessment of shallow groundwater quality within the superficial deposits (if present) and shallow bedrock. This will identify existing contamination and inform any requirement of remediation (as outlined in the CEMP detailed above).

Chapter 9 Surface Water Surfaces and Flooding

9.1	Construction Phase	The following mitigation measures will be implemented prior to commencement and throughout the duration of the proposed works. These measures will also be incorporated into the Construction and Environmental Management Plan (CEMP), which the Contractor will develop based on the CEMP which accompanies this application. - A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed by the Contractor prior to commencement of works. - Confirmatory pre-construction surveys will be carried out and seasonal constraints will be confirmed in agreement with IFI and National Parks and Wildlife Service (NPWS) and Wexford County Council, as appropriate. - Works will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016) including the programming of instream works within the period July to September. - The IFI Biosecurity Protocol for Field Survey Works³ will be complied with. - In the case of a warning of a flood event, plant and materials vulnerable to flooding in 'at risk' construction compounds will be relocated to parts of the compound that are considered to be not at risk of flooding.
9.2		The following mitigation measures will be implemented prior to commencement and throughout the duration of the works:

³ <file.html> (fisheriesireland.ie)

Reference	Phase	Mitigation and Monitoring
		- Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed, and ruts will be created that will act as miniature rivers where dirty water will flow. - Tracking beside streams will be avoided to avoid damage to the bankside. - Geotextile or timber matting will be used on soft ground, and in all protected areas - A buffer zone of 15m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works. - The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable. - Re-instatement method statements will be subject to approval by the EnCoW. - Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided. - The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses. - In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed. - All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations; - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces; - Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces; - All tanks and drums will be bunded in accordance with established best practice guidelines; and - Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works. - Works will not be carried out during extreme rainfall or high flow events as determined by the EnCoW. An early flood warning system will be set up by the appointed Contractor to allow the removal of plant and material from construction areas located in Flood Zones A and B in the event of a flood warning. The duration of works within Flood Zone A and B will be minimised to reduce the potential of impact. - Temporary works will be designed so as not to increase flood risk elsewhere from overland flow, by limiting excavated lengths and providing suitable drainage provision. - Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW. - Any instream works will be conducted during the period July – September to avoid effects on fisheries or otherwise agreed with IFI.
9.3		Silt Control Measures - Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses. - Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.

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Reference	Phase	Mitigation and Monitoring
		- Silt fences will be installed in the working areas and not at the watercourse. - Access routes will be delineated such that an appropriate set back distance from watercourses is maintained. Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site. - Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained. - Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.
9.4		Silt Fences - Silt fences will be installed downslope of the area where silt is being generated on disturbed ground. - To be effective the silt curtain will contain the area where silt is generated and will terminate on high ground (i.e. an elevated area not in the watercourse). - Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh. - The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals. - Once installed the silt fence will be inspected by the Environmental Clerk of Works regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains. - The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately. - Two lines of silt curtain / fence will be installed, where considered necessary by the EnCoW. - Any build-up of sediment along the fence boundary will be removed daily. - Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW. - The silt fencing will be left in place until the works are completed (which includes removal of any temporary ground treatment). - Silt fences will not be removed during heavy rainfall. - The silt fence will not be pulled from the ground but cutaway at ground level and posts removed. - A record of when silt fences were installed, inspected and removed will be maintained by the EnCoW.
9.5		Silt Traps The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply: - Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low. - Silt traps will be made of terram or similar material, not mesh. - The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides. - The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.

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Reference	Phase	Mitigation and Monitoring
		- The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it. - Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth. - Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom. - In sensitive areas a series of silt traps will be placed in the drain. - The silt trap will not be pulled from the ground but cutaway at ground level and posts removed. - A record of when it was installed, inspected and removed will be maintained by the EnCoW.
9.6	Operational and Maintenance Phase	Mitigation for stormwater is embedded in the design, described in section 9.5.3.1, and includes that surface water runoff will flow through a silt trap chamber and oil/fuel interceptor and conveyed to the underground fire water retention tank before discharging to the existing drainage. As wastewater from the GIS building foul holding tank will be tankered and removed off site, no mitigation is required.
Chapter 10 Air Quality		
10.1	Construction Phase	During the construction phase, construction activities associated with the Proposed Project are predicted have at worst, a 'medium' to 'high' risk for dust soiling effects and 'low' risk for human health impacts from construction activities with no mitigation in place. It is anticipated that dust and particulate matter emissions produced during construction activities and emissions from site plant would be controlled through the implementation of good practice measures which will be documented in a CEMP, which is a live document that will be regularly reviewed.
10.2		- Communication and Site Management - The appointed Contractor will develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This will be the environment manager / engineer or the site manager. - Display the head or regional office contact information. - The Contractor will develop and implement a dust management plan (DMP) as part of the updated CEMP, which will include measures to control other emissions, approved by the Local Authority. - Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken. - Make a complaint log available to the planning authority, when requested.

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Reference	Phase	Mitigation and Monitoring
		– Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the log book. • Monitoring – Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. – Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested. – Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Preparing and maintaining the site – Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. – Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. – Avoid site runoff of water or mud. – Keep site fencing, barriers and scaffolding clean using wet methods. – Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as stated below. – Cover, seed or fence stockpiles to prevent wind whipping. • Operations vehicles / machinery and sustainable travel: – Ensure all vehicles switch off engines when stationary – no idling vehicles. – Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable. – Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). – Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Operations – Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction. – Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate. • Waste management

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Reference	Phase	Mitigation and Monitoring
		– Avoid bonfires and burning of waste materials. • Mitigation specific to earthworks – Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. – Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. – Only remove the cover in small areas during work and not all at once. • Mitigation specific to construction: – Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Mitigation specific to track out: – Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. – Avoid dry sweeping of large areas. – Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. – Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. – Record all inspections of haul routes and any subsequent action in a site log book. – Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. – Access gates to be located at least 10 m from receptors where possible.
10.3		Monitoring Measures At all times, these mitigation measures will be strictly monitored and assessed by the Site Manager. Site inspections will be carried out and an inspection log will be made available to the local authority when requested.
Chapter 11 Noise and Vibration		
11.1	Construction Phase	No specific noise mitigation measures are proposed for the construction phase. However, in accordance with best practice, noise emissions should be minimised at source to minimise the exposure site personnel to noise from construction. The site will be required to operate in line with noise conditions stated in the applicable IE licence, which will include measures to limit, manage and monitor noise emissions in line with Best Available Techniques if appropriate. The CEMP will be implemented during the construction phase to minimise any construction noise and vibration impacts and in consultation with local councils. The Contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to): • setting limits for the control of noise and vibration from construction activities

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Reference	Phase	Mitigation and Monitoring
		- the provision of mitigation measures required whilst adopting best practicable means - noise or vibration monitoring where disturbance is reported as required. A comprehensive noise and vibration monitoring protocol will also be implemented. As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction. To control vibration from the use of compactors, it is recommended that the equipment is selected such that the vibration levels are as low as possible, with lower amplitude of drum vibration magnitude and maximising the vibrating roller drum width. Before the works with potential vibration impacts commence, the residents should be given prior notification. Monitoring Measures No specific monitoring measures are proposed for the construction phase.

Chapter 12 Landscape

12.1	Construction Phase	The main mitigation by avoidance measure employed in this instance is the siting of the Proposed Project in a sparsely populated lowland plateau landscape relatively free of vantage points from which the proposals could be viewed. The location is also within the Development Plan "Areas of Consideration". In addition to mitigation by avoidance measures, retention of existing hedgerow boundaries within and around the site aids visual screening, and maintains the existing field pattern. In this respect, the proposed solar farm is not perceived to impose itself on the existing landscape pattern. In addition to retaining the existing hedgerows within around the site, it is also proposed to bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants in order to ensure dense and consistent screening of the site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network prior to the construction phase, thus allowing for any growth in the period between a grant of planning permission and construction of the development. Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height. This height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected hedgerows that require densification. Refer to the Landscape Mitigation Plan drawings in Appendix 12.2. It is also proposed to plant new sections of hedgerows in some localised parts of the site, whilst additional screen planting measures area also proposed in the surroundings of some of the nearest local residential receptors. Indeed, once fully established, these new and bolstered areas of native planting will further screen and soften the development from surrounding local receptors, whilst also reinforcing the existing ecological corridors within the site and surrounding landscape. As can be seen by the mitigation-based ZTV in Figure 12.8 (of EIAR Chapter 12 Landscape), the combination of consolidated and proposed 3-4m high hedgerows and localised areas of screen planting will further reduce the potential for visual impacts within the

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Reference	Phase	Mitigation and Monitoring
		surrounding area. Whilst the DSM visibility mapping highlights the potential for residual visibility, this will often be in the form of brief views of less than 20% of the proposed panel area. The installation method for these types of solar panels and mounting frames is undertaken using local piling to reduce the impact deriving from construction to facilitate the long-term use of the field as farmland. Panels are constructed using small-scale machinery causing very limited effect to the existing grass surface. This process is akin to timber post fence construction, whereby the post is driven a short length into the ground. This ensures that the fields' general green characteristics can be retained or quickly redressed following construction. All new cabling within the site will be buried underground. The proposed perimeter 3m stock proof fence will be set to the inside of the site boundaries. This will be maintained throughout the operational phase of the development to ensure access is prevented for both stray farm animals and human trespass. However, a small gap at the base of the fence will allow wild fauna to continue passage throughout the site. An un-grazed margin between deer fencing and the solar panels will be left for biodiversity enhancement measures. When feasible, ancillary structures such as inverters, transformer cabins and other plant will be coloured in green or muted shades to help blend them in with the surrounding countryside. Low intensity sheep grazing is anticipated to be the main land use under and beside the proposed panels, to ensure that the areas of shorter swards and scrub will be managed. The proposed layout allows sufficient width between module rows for pastureland to be productive. Upon completion of construction, the area temporarily affected by the construction process, which includes one construction compound areas will be re-seeded with agricultural grassland species. Wherever possible, the on-site access roads utilise the existing farm tracks and follow existing topography in order to minimise ground disturbance, alteration of physical landscape character and visual intrusion. Reinstatement of temporary construction areas, construction compounds and cable trenches to the preconstruction conditions will be carried out at the end of the construction phase. Restoration of any areas disturbed during the construction process will be undertaken on construction completion by appropriate grass seeding to return a green characteristic. The decommissioning of the site will involve the removal of all solar panels and associated fencing, storage and operation facilities. The site will be fully restored to agricultural use through reseedling of appropriate grass species to reflect the grass sward mix in the immediate vicinity. Any site access tracks not required for on-going agricultural purposes will be excavated and top-soiled in order to reinstate them to productive agricultural use. The site will be fully restored to agricultural use in accordance with a detailed restoration plan. Existing hedgerow field boundaries, which will have been maintained and reinforced with additional planting during the construction and operational phases, will remain intact following the restoration phase. Indeed, due to the supplementary planting proposed as part of the landscape mitigation the field boundaries are likely to be more consistent and consolidated than they are at present.
Chapter 13 Archaeology, Architecture and Cultural Heritage		
13.1	Construction Phase	Archaeological Heritage

Reference	Phase	Mitigation and Monitoring
		A potential direct effect on previously unknown archaeological heritage lies in the uncovering of sub-surface remains. Accordingly, the following mitigation measures will be carried out subject to the approval of the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH), and further mitigation may be sought by the NMS: - Archaeological test trenching will be carried out of all undisturbed areas of the site prior to any groundworks commencing and will be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. The trenches will be positioned to target anomalies identified during the geophysical survey (in particular Anomalies M1–M6) and the locations of the relevant CHR sites with no surface expression present that are to be impacted by the proposed works. This test trenching will also include more general testing within the footprint of the Proposed Project (substation, roads, cables, temporary construction compounds, etc.), with additional test trenches excavated within areas that were not subject to geophysical survey. If archaeological features or deposits are exposed, these shall be sufficiently sectioned in order to assess their extent, nature and significance. Once test trenching is complete, further mitigation may include preservation in situ (avoidance), excavation (preservation by record) and/or monitoring of topsoil stripping by a suitably qualified archaeologist. - Should any archaeological features, deposits or artefacts be identified during the construction phase of the development, works in that area should be halted and the appropriate authorities informed. The archaeological remains will be preserved <i>in situ</i> or by record (excavation) following consultation with the National Monuments Service. Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site that will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place. - A report is required to be compiled on completion of any archaeological excavation and will be submitted to the relevant authorities.
13.2		Architectural and Cultural Heritage The predicted effects on the known architectural heritage are regarded as being none; no effects on Protected Structures (RPS) or sites in the National Inventory of Architectural Heritage (NIAH) were identified, and no indirect or visual effects on the nearest such site outside the Proposed Project site boundary were noted. However, the presence of possible vernacular structures with associated wells, lime kilns, Neighbourly Bridge, and townland boundaries depicted since the 1839 OS map, was noted within the site. Potential direct effects on previously unknown architectural/cultural heritage were therefore identified, and the following mitigation measures will be carried out: - Should any upstanding remains of the possible vernacular buildings, currently obscured by the overgrowth, be identified, as well as lime kilns and wells across the site, they should be visually assessed and photographed by an archaeologist with built-heritage experience prior to removal. If no above ground remains survive, archaeological test trenching should target this area to identify if there are any sub-surface remains of the site/CHR. This should be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. - Should the townland boundaries be impacted, a written and photographic record of the sections to be removed shall be carried out with waded or dive surveys (whichever is applicable) of any crossings of the watercourses proposed.

Reference	Phase	Mitigation and Monitoring
		The sub-surface remains of features associated with the possible vernacular buildings, such as wells or plot boundaries, may also be present across the site. Accordingly, the archaeological test trenching shall also target such features.
Chapter 14 Roads, Traffic and Transportation		
14.1	Construction Phase	The temporary effects of construction, regardless of the assessed level of significance, will be mitigated through adoption of a Construction Traffic Management Plan (CTMP). The general purpose of a CTMP is optimise the efficiency and safety of all traffic activities generated by the Proposed Project and thus maintain suitable amenity and safety for local communities and other roads users. A summary of key CTMP mitigation elements follows and the CTMP is provided in full form in the CEMP which is included in the application documentation: • The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Wexford County Council, the appointed contractor, TII and/or their Agents and An Garda Síochána as appropriate. • The CTMP has been developed for the purposes of this assessment and will be further developed as necessary in consultation with Wexford County Council and the Gardai prior to construction commencing. The CTMP will document measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services. The CTMP is a 'live' document and will be developed accordingly, within the parameters assessed in this EIAR. • During the construction phase, signage will be installed to warn road and recreational route users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic. • Car sharing will be promoted to construction personnel by the contractor during the induction process. • To reduce the potential for debris being deposited onto the local road network in the construction site accesses and road sections of cable construction, the appointed contractor will ensure that public roads and footways are cleaned and swept during and after the works. This cleansing regime (to be agreed) will minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the nearest public road will be kept clear of debris by monitoring and then utilising a road sweeper where necessary. • The appointed contractor could employ a number of sub-contractors, and all will fall under the umbrella of the CTMP and will have an obligation to adhere to the Plan; this obligation will form part of the procurement process and will be written into any contract of employment. • Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures set out in the CTMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors.

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Reference	Phase	Mitigation and Monitoring
		• In liaison with ESNB, the appointed contractors will maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction period. This will include circulation of information about ongoing activities; particularly those that could potentially cause disturbance, including due to traffic. • The appointed contractor will nominate a person to be responsible for the co-ordination of all elements of roads, traffic and transportation during the construction process (Liaison Officer). This person will liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation. • If the construction phase of any notably sized development(s) appears likely to overlap with the Proposed Project, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction. • Prior to commencement of construction, and during the construction phase, engagement with the proponents of other developments will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts on traffic are minimised. The specific detail will be developed by the appointed contractor within the parameters assessed in this EIAR.

Chapter 15 Material Assets and Waste Management

15.1	Construction Phase	Material Assets Mitigation measures during the construction phase that promote an efficient use of material assets include the following (but are not limited to): • It is recommended that all suitable excavated materials are reused in the construction of the Proposed Project and in landscaping features, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site. • Where site-won material is not available or suitable for reuse, secondary or recycled materials would be procured, where available and feasible. • Where feasible, materials would be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation. • Temporary stockpiling of fill materials prior to incorporation in the Proposed Project would be avoided where possible, to ensure double handling and damage is minimised and therefore avoidance of waste. However, where required, materials would be stockpiled in accordance with best practice and managed appropriate to limit the likelihood of damage or contamination. • Pre-cast solar panels and structures will be used, where technically feasible, to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.

Reference	Phase	Mitigation and Monitoring
15.2	Construction Phase	Waste arisings It is recommended that surplus excavation material if it cannot be used on the Proposed Project or neighbouring schemes that it is sent to a soil recovery facility for treatment. In addition to this, waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Mitigation measures for reuse and recycling of waste include (but are not limited to): • Recycling of inert materials by crushing, blending and subsequent reuse, as an aggregate. • Providing onsite facilities to separate out waste to enable the recovery of material through recycling. • Where waste must be taken to a recycling or disposal site, the contractor would ensure that the site has the appropriate permits. In addition, the suitable facility would be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The contractor would identify the closest and relevant treatment and disposal sites. • Waste arisings sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the Proposed Project site to an authorised site of recovery/disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment. • All contaminated/hazardous waste (including soil) would be identified for proper management and transferred/disposed of to an adequate waste management facility. These materials will be stored separately to any non-hazardous material to avoid cross-contamination. A non-exhaustive list of waste management facilities is provided in Table 15.10 (of EIAR Chapter 15 Material Assets and Waste Management). The ability for waste arisings to be deposited at these sites is dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the Proposed Project that may be used. Best practice would be to minimise the generation of waste as much as possible in accordance with the waste hierarchy principles and to incorporate circular economy principles, wherever it is technically appropriate and economically feasible. The use of the Construction Environmental Management Plan (CEMP) and RWMP will assist in implementing these waste hierarchy and circular economy principles. Therefore, wherever technically appropriate and economically feasible, adequate mitigation measures will be applied to the Proposed Project and potential environmental effects minimised.
15.3	Construction Phase	Monitoring Measures During the construction phase, materials and waste arisings will be monitored as outlined in the RWMP. Undertaking monitoring audits on a regular basis will give an indication of where continual improvements to waste management and minimisation can be made throughout the construction phase. The RWMP will be used to measure and monitor the types and quantities of waste taken off site, to ensure that the waste hierarchy is being implemented, where practicable. Environmental management and compliance will also be monitored through the CEMP.
15.4	Operational Phase	Once the Proposed Project is in the operational phase, the waste management will be supervised by suitable trained staff with knowledge of the waste control procedures, record keeping, maintenance requirements, emergency actions plans and environmental monitoring. Monitoring the performance of the solar equipment regularly will help to schedule reactive maintenance and extend the life

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Reference	Phase	Mitigation and Monitoring
		span of the equipment. Waste monitoring audits will also be undertaken during the operational phase on a regular basis, which will be recorded.
15.5	Operational Phase	The waste hierarchy and circular economy principles would also be implemented throughout the operational phase of the Proposed Project. Mitigation measures for material assets and waste management include (but are not limited to): • Carry out regular preventative maintenance of solar arrays and associated infrastructure to extend the life-span of materials. • Delivering any material assets for ongoing operations on a just-in-time basis to avoid storage and double handling that could lead to damage or contamination and increased waste arisings. • Managing and programming all operations programmes in such a manner as to prevent/minimise waste production. Circular economy principles to be incorporated where feasible. • Providing onsite facilities to separate out waste streams to enable managing waste as high up in the waste hierarchy as feasible, prioritising the recovery and recycling of material over landfill disposal. In addition, provide clear signage and/or colour coded receptacles in designated and easily accessible locations. • Handling, storing, managing, reusing or recycling waste arisings as close as practicable to the point of origin. • Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible. • Ensuring all employees are aware of the best practices to optimise material assets use and minimise waste generation. • Ensuring clear and effective communications and signage about recycling, waste hierarchy and circular economy. • Establishing standard operations procedures that are aimed to minimising waste generation. • Producing an Operational Waste Management Strategy (OWMS) is recommended. A OWMS will help to estimate waste arisings, provide an adequate management strategy, outline opportunities to reduce waste arisings and details on a waste monitor process.
15.6	Decommissioning Phase	Some of the mitigations that are applicable for the construction and operational phases are also applicable for the decommissioning phase. These include: • The waste hierarchy and circular economy principles would be implemented throughout the decommissioning phase of the Proposed Project. • Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible.
Chapter 16 Climate		
GHG emissions		
16.1	Construction Phase	Mitigation Measures

Reference	Phase	Mitigation and Monitoring
		The Climate Action Plan 2025 states updated carbon budgets and sectoral emissions ceilings, as well as the roadmap to reach net zero GHG emissions by 2050. The Proposed Project contributes to providing renewable energy supply and security of energy supply, which also reduces GHG emissions through moving away from coal and peat-fired power generation towards renewable sources. It is recommended that emissions reduction measures are put in place as part of the Proposed Project throughout the design stage and onwards, leveraging the ability to effect change to achieve GHG emissions reduction over time. The Construction Environmental Management Plan (CEMP) included in Appendix 5.1 includes the following measures: • Vehicles with low exhaust emissions to be used and serviced regularly; • Implementing regular maintenance of construction equipment to ensure it is running efficiently; • Avoiding engines running unnecessarily; • Monitoring of vehicles entering the site for noticeable exhaust emissions ; • Assessing and minimising transport emissions from equipment and materials (i.e. choosing local suppliers or more sustainable transport options). • Engaging the supply chain to reduce the number of vehicle movements relating to site material. • Incorporating energy efficiency into the operation of the Proposed Project (e.g. using motion-activated low-energy lighting, building management systems where appropriate). • Using low-carbon concretes and steel with high recycled content where structurally appropriate, as well as materials with longer durability or reduced maintenance requirements. • Minimising transport and travel demand during construction by having a travel management plan for site personnel to encourage car-sharing, active travel, use of buses, and prioritise electric vehicles. • Minimising waste generation and implement circular economy processes including for complex assets such as solar PV panels, avoiding landfilling and waste incineration.
16.2		Monitoring Measures To monitor the impact of the Proposed Project it is recommended that the emissions be quantified through a carbon assessment using data such as bills of materials and vehicle fuel usage, and emission factors from industry recognised emission factor databases. This is subject to the availability of data from the Proposed Project.
Climate Resilience		
16.3		Mitigation Measures Climate resilience during the construction phase of the Proposed Project has been scoped out of the assessment. Any risks arising due to extreme weather events during construction shall be addressed by appropriate measures in the Construction Environmental Management Plan (CEMP). These may include:

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Reference	Phase	Mitigation and Monitoring
		- Procedures and precautions will be implemented for areas that may experience flooding, including use of temporary flood defence barriers and preparation of temporary demobilisation plans. These procedures will consider prolonged and intense rainfall events that may lead to staff safety risks or pollution risks where construction materials (e.g. dust, contaminants, metals, or oils) have potential to runoff into watercourses. This will consider likely surface water runoff routes and plans for the protection of plant such as fuel storage and materials stockpiles, and the demobilisation of vehicles and items of mobile plant; - Workforce health and safety plans and welfare management systems will be put in place by the contractor, including details to be outlined within works plans and task briefs as appropriate. This will consider periods of high temperatures that may lead to risks of heatstroke for construction staff and severe precipitation events that may lead to slips and falls; - Contingency plans will be in place for situations where flooding leads to restricted site access or key staff being unable to get to work, leading to construction delays; - Contingency plans will be in place for situations where storms, high winds or flooding lead to loss of mains power supply or communications, and the identification of safety critical risks and construction programme consequences; and - Include regular monitoring of flood alerts and weather warnings from Met Éireann.
16.4		Monitoring Measures Regular monitoring of the performance and safety of the Proposed Project will allow the ongoing effectiveness of embedded mitigation measures to be assessed, with suitable maintenance to upgrade the measures so that they can adapt to the changing conditions.

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