FEHILY TIMONEY

DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

CAPPAKEEL SOLAR FARM 110KV SUBSTATION AND GRID CONNECTION

Natura Impact Statement

Prepared for:

Perigus Energy Ireland Midco Limited

Perigus Energy

Date: **September 2026**

Document No:

P23226-FT-XX-XX-RPT-PL-0003

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APPROPRIATE ASSESSMENT SCREENING REPORT

REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT

User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
0	For Issue	KOR/KB	MVP/MT	RM/JH	22/09/2026

Client: Perigus Energy Ireland Midco Limited

Keywords: Appropriate Assessment (AA), AA Screening, Article 6(3) of the Habitats Directive, Natura Impact Statement (NIS), European (Natura 2000) sites, Cappakeel Solar Farm

Abstract: Fehily Timoney and Company is pleased to submit this Natura Impact Statement to Laois County Council to inform them in carrying out their statutory obligations relating to the Habitats Directive requirement for Appropriate Assessment for plans and projects seeking consent. Appropriate Assessment is required under Article 6 (3) of the Habitats Directive for any project or plan that may give rise to significant effects on a European (Natura 2000) site.

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1. INTRODUCTION

Fehily Timoney and Company (FT)[1] was commissioned by Perigus Energy Ireland Midco Limited to prepare an Appropriate Assessment Screening Report and Natura Impact Statement (NIS) for the development of a 110kV Substation within the townland of Morett Co. Laois, providing a grid connection to the national grid for the permitted Cappakeel Solar Farm via a loop in/loop out connection (hereafter referred to as the 'Proposed Development'). Consent for the solar farm was granted by Laois County Council on 18th September 2025, (Pl. Ref. 2560148), section 34 of the PDA, with consent for the solar farm granted by ACP on 17th February 2026 (Ref No.: PL-500061-LS).

This report presents an examination of whether the Proposed Development is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is based on best available scientific knowledge. This report has been prepared to inform the competent authority in completing their statutory obligations in relation to Appropriate Assessment, as required by Article 6(3) under Council Directive 92/43/EEC (Habitats Directive).

1.1 Legislative Context

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) provides legal protection for habitats and species of European importance. The Directive requires that where a plan or project is likely to have a significant effect on a European Site, while not directly connected with or necessary to the nature conservation management of the site, it will be subject to 'Appropriate Assessment' to identify any implications for the European site in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

> *"6(3) Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

The competent authority must carry out a screening for appropriate assessment to assess, in view of best scientific knowledge, if the Proposed Development, individually or in combination with another plan or project is likely to have a significant effect on a European site. If it cannot be excluded, on the basis of objective information, that the proposed project, individually or in combination with other plans or projects, will have a significant effect on a European site, an appropriate assessment of its implications for the European Site(s) in view of the Site's conservation objectives is required to be carried out.

The provisions of Article 6(3) do not apply where the proposed plan or project is 'connected with or necessary to the management of the site'. In this case, the proposed project is not directly connected with or necessary to the management of any European site(s).

[1] Details on the contributors to this report are provided in Appendix 1.

1.2 Methodology

1.2.1 Guidance

The assessment was conducted in accordance with the following guidance:

- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Commission Notice (2021) Brussels, 28.9.2021 C(2021) 6913 final (European Commission, 2021).
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009, updated 2010) (Environment Heritage and Local Government, 2009).
- Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission (2019). Brussels, (2019/C 33/01). OJ C 33, 25.1.2019.
- Interpretation Manual of European Union Habitats. Version EUR 28. (European Commission, 2013)
- OPR Practice Note PN01 Appropriate Assessment Screening for Development Management, (Office of the Planning Regulator, 2021).

1.2.2 Process

The process of determining the likelihood of significant effects from a Proposed Development on European sites is an iterative process centred around a Source-Pathway-Receptor model. In order for an effect to be established, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism is sufficient to conclude that a potential effect cannot occur.

- Source(s) – e.g., pollutant run-off, noise, removal of vegetation, etc.;
- Pathway(s) – functional link, or ecological pathway e.g., groundwater connecting to nearby qualifying wetland habitats; and,
- Receptor(s) – the qualifying habitats and species of European sites and ecological resources supporting those habitats/species.

In the context of this report, a source is any identifiable element of the Proposed Development that is known to interact with the receiving environment. A receptor is the Qualifying Interests (QI)[2] for an SAC or Special Conservation Interests (SCI)[3] for an SPA or an ecological feature that is known to be utilised by the QI/SCI. In practice, the term Qualifying Interests also applies to SCIs (and is used in this document for simplicity). A pathway is any connection or link between the source and the receptor.

[2] SACs are areas designated under the Habitats Directive to conserve habitats listed in Annex I of the Directive and plant and animal species listed in Annex II. Collectively these are referred to as the 'Qualifying Interests' or 'QIs' of the SAC.
[3] SPAs are sites classified under the Birds Directive to protect rare or vulnerable bird species listed in Annex I to the Directive as well as regularly occurring migratory species and wetlands. Wetland habitats that support internationally important populations of migratory birds may be coastal or inland. Collectively, these species and habitats are referred to as the 'Special Conservation Interests' of the SPA.

The assessment commences with a description of the project, along with a description of the receiving environment and the associated sources for impacts to the receiving environment. All elements of the project are presented including the project location and existing baseline environment. The type of impacts that are likely due to the project (Source) are identified having regard to the spatial and temporal scale of the project, resource requirements and likely emissions. These sources are then used to define the zone of influence (ZoI) of the Proposed Development as detailed in Section 4.2.

The European Commission Notice (2021) on the 'Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC', states that in identifying European sites (Natural 2000 sites), which may be affected by the project, the following should be identified:

- Any European sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;
- Any European sites within the likely zone of influence of the plan or project. European sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g., water) and various types of waste, discharge or emissions of substances or energy;
- European sites whose connectivity or ecological continuity can be affected by the plan or project.

The ZoI of a Proposed Development is therefore the geographical area over which it could affect the receiving environment in a way that could have potential effects on the QI/SCI of a European site. The OPR (2021) practice note states that the ZoI must be established on a case-by-case basis using the Source-Pathway-Receptor (S-P-R) framework and not by arbitrary distances (such as 15 km). Section 3.2 sets out the detailed rationale for the identification of relevant European sites within the ZoI based on the sources of impacts arising from the proposed project. Subsequently, an assessment is undertaken with respect to potential connectivity (Pathways) to European Sites and their qualifying interests/special conservation interests are identified.

The potential for in-combination effects with other plans and projects is examined in Section 3.3, having regard to the identified impacts of the project along the ecological pathways identified to European sites.

In Section 3.4 the likelihood of significant effects of the European Sites within the ZoI is examined having regard to the sensitivity of the site with pathways for impacts associated with the project on its own and in combination with other plans and projects.

Having regard to the European Commission Communication on the Precautionary Principle (European Commission, 2021) the:

> *"absence of scientific evidence on the significant negative effect of an action cannot be used as justification for approval of this action. When applied to Article 6(3) procedure, the precautionary principle implies that the absence of a negative effect on Natura 2000 sites has to be demonstrated before a plan or project can be authorised. In other words, if there is a lack of certainty as to whether there will be any negative effects, then the plan or project cannot be approved."*

Where significant effects are determined to be likely, or where there is uncertainty regarding the likelihood of significant effects, the Proposed Development will be required under law to be subjected to Appropriate Assessment.

The Natura Impact Statement as presented has been developed to address these requirements so as to present sufficient and up to date information to allow the Competent Authority to give full consideration of all elements contributing to the site integrity and allowing identification of potential adverse effects, mitigation measures and residual effects.

The European Commission Notice (2019): 'Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' prescribes the content of the Appropriate Assessment and notes the following:

- It must be ensured that the Appropriate Assessment addresses all elements contributing to the site's integrity as specified in the site's conservation objectives and Standard Data Form, and is based on the best available scientific knowledge in the field;
- The information required should be up to date;
- The Appropriate Assessment should also include a comprehensive identification of all the potential effects of the plan or project likely to be significant on the site, taking into account in-combination and other effects likely to arise as a result of the combined action of the plan or project under assessment with other plans or projects;
- It should apply the best available techniques and methods to assess the extent of the effects of the plan or project on the integrity of the site(s).

This AA Screening and NIS is based on best scientific knowledge and has utilised ecological expertise. In addition, a detailed online review of published scientific literature was conducted. This included a detailed review of the National Parks and Wildlife Website including mapping and available reports for relevant sites and in particular sensitive qualifying interests/special conservation interests described and their conservation objectives.

1.2.3 Desktop Assessment

A desk study was carried out to collate available information on the existing natural environment at the Proposed Development location. This comprised a review of the following publications, data and datasets:

- Environmental Protection Agency (EPA) (on-line map-viewer including the Appropriate Assessment Tool)[4];
- Department of Housing, Planning, and Local Government- EIA Portal;
- National Parks and Wildlife Service – online European site network information, including site conservation objectives[5];
- National Parks and Wildlife Service – Information on the status of EU protected habitats and species in Ireland (including Article 17 and Article 12 Reports)[6];
- National Parks and Wildlife Service - Flora (Protection) Order 2022 Map Viewer;
- National Biodiversity Data Centre[7]

4 https://gis.epa.ie/EPAMaps/ Accessed 05/02/2025
5 www.npws.ie Accessed 05/02/2025
6 https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e Accessed 05/02/2025
7 www.biodiversityireland.ie Accessed 05/02/2025

- Consented Cappakeel Solar Farm Planning Application (Ref No.: PL-500061-LS) and Associated documents – Ecological Impact Assessment (EcIA)

1.2.4 Field surveys

An ecological walkover survey was carried out on the 9th October 2025 within the Proposed Development. Of the surveys carried out on 9th October 2025, the following are relevant for Appropriate Assessment (i.e. have a relationship to European Sites as a potential special conservation interest/ qualifying interest of European sites or a habitat / species that can support a special conservation interest/ qualifying interest) and are included here as information relied upon in this NIS:

1.2.4.1.1 Habitats

The habitats within the Proposed Development were identified and classified according to 'A Guide to Habitats in Ireland' (Fossitt, 2000). The flora species present in each habitat type was recorded using the DAFOR scale.

The habitats within the study area were identified and classified according to Fossitt (2000). The plant species present in each habitat type were recorded. All species were readily identifiable during the field surveys, which were completed during the appropriate botanical season. Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2019). Botanical species were assessed in accordance with their occurrence on the Flora (Protection) Order 2022 and The Ireland Red List No. 10: Vascular Plants. Other species records were assessed according to the Irish Red Data Lists. Habitats were assessed with respect to Annex I habitat criteria.

Invasive plants, including species listed on the Third Schedule to the Habitats Regulations, and other species which can negatively impact biodiversity were recorded and mapped during the habitat survey.

1.2.4.1.2 Otter

All field sightings and field signs observed were recorded using FieldMaps, such as tracks, trails, droppings, resting places or other marking signs. Survey techniques followed the following best practice guidance:

- NRA (2009) 'Ecological Surveying Techniques for Protected Flora and Fauna During the Planning of National Road Schemes'
- NRA, (2008). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes
- JNCC (2004) 'Common Standards Monitoring Guidance for Mammals'
- Reid (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76

1.2.4.1.3 Avifauna

Bird species observed along with grid connection route were noted during the ecological site walkover on 9th October 2025 and during the culvert inspection on 29th January 2026.

1.2.4.1.4 Aquatic ecology

A river habitat survey (RHS) was undertaken on the 9th October 2025 along 1km stretch the Dunrally Stream that flows north of the field containing the substation. Survey methodology followed the UK Centre for Ecology and Hydrology guidelines, and River Habitat Survey (RHS) data collected used RAPID 3.0 software[8]. The following criteria were assessed: the substrate type, water depth, flow velocity, instream vegetation, and fishery habitat suitability.
On 29th January 2026, a RHS was undertaken at the stream flowing below Bridge 1.

1.2.4.1.5 Survey Limitations

- Grid connection route surveys conducted from the public road as access to third party lands was not permitted.
- Habitat surveys were conducted in October which lies outside the optimal season (April – September).
- River Habitat survey carried out at Bridge 1 along the grid connection were conducted two days after (29th January 2026) a nationwide heavy rainfall Storm Chandra which would have resulted in exceptionally high/fast river levels.

[8] Rapid 3.0 software. UK Centre for Ecology & Hydrology. Available at: https://www.ceh.ac.uk/services/rapid-21-software (Accessed: 07 March 2025).

2. DESCRIPTION OF THE PROJECT

2.1 Project Background

The Proposed Development consists of a 110kV electrical substation and associated works within the townland of Morett Co. Laois, which will connect the permitted Cappakeel Solar Farm to the national grid via the adjacent Cushaling-Portlaoise 110kV overhead line within the site boundary, and connection to the Coolnabacky 110kV substation via an underground tail fed connection to provide a circuit between the Cushaling-Portlaoise 110kV line and the Coolnabacky 110kV Substation traversing the townlands of Derrytrasna, Park Or Dunamase, Aghnahily, Dysart, Coolnacarrick, Heathlodge, Ballygormill North, Ballinlough, Killenny, Raheen, Money Upper, Lamberton Demesne, Greatheath, Cremorgan, Ballygormill South, Carrigeen, Greatheath, Hophall, Ballycarroll, Morett and Powelstown, Co. Laois. Planning permission for this component is sought from An Coimisiún Pleanála under section 182A of the PDA.

This will provide connection to permitted energy generating part of the main Cappakeel Solar Farm which consists of solar panels and associated infrastructure, as noted earlier. Included in the planning application is an underground Internal Network cable (Medium Voltage [MV], 33kV) between the West (A), Centre West (B), Centre (C), Centre East (D) and East (E) Parcel of the proposed solar farm to provide the electrical link between the solar farm and the proposed 110kV substation situated in the West Parcel. Consent for the solar farm was granted by Laois County Council on 18th September 2025, under Pl. Ref. 2560148, section 34 of the PDA, with consent for the solar farm granted by An Coimisiún Pleanála on 17th February 2026 (Ref No.: PL-500061-LS). As part of the Proposed Development, the proposed 110kV Substation and loop in/loop out connection to the Cushaling-Portlaoise 110kV Overhead line located within West Parcel (A), within the townland of Morrett. The Cushaling - PortLaoise 110kV OH transmission line runs in a north/south axis c. 415m East of the proposed on-site 110kV substation.

This report relates to the 110kV substation and the 2 no. connections via the Over Head (OH) connection to the Cushaling-Portlaoise 110kV line, and the underground tail-fed connection to the Coolnabacky 110kV Substation within the public road. All component have been determined by ACP pursuant to consultations undertaken in accordance with Section 182A of the PDA to fall under the remit of ACP as Strategic Infrastructure Development (SID).

2.2 Proposed Development

The proposed site boundary for the SID application will constitute the construction of a 110 kV Substation and 'Loop In-Loop Out' (LILO) connection to the existing Cushaling-Port Laoise 110kV Overhead line, and an underground tail fed connection within the public road to the Coolnabacky 110kV Substation and associated works, which will include the following:

Full details on the Construction Methodology provided by TLI is outlined in Appendix 2.

- A 110kV substation occupying 1.80 hectares, comprising:
- Transmission System Operator (TSO) compound with electrical equipment, transformer sub-compound, bus bars sub-compound, cable chairs and substation building of 437.5m² (25m x 18m), which will be enclosed by palisade fencing 2.6 m high containing an area of 1.22 hectares;
- One 110kV transformer within the Independent Power Producer (IPP) compound, and the provision of an area for a second transformer if future connection is required;
- TSO expansion area enclosed by palisade fencing 2.6m high at 0.90 hectares;

- Operators compound (with switch room building, electrical equipment and rainwater collection system) enclosed by palisade fencing at 0.43 hectares. The proposed operators control building will have a gross floor area of 403.5m2;
- Perimeter protection area of post and rail fencing at approximately 1.40 hectares;
- 13no. lightning mast to a height of 18m;
- 1 No. telecom pole to a height of 23m.
- New entrance to the L-7815 local road from West Parcel (A) shared with the proposed solar farm.
- A minimum width of 4.5m and a maximum width of 10.9m access road corridor (1.183m long).
- Underground cable corridor of c. 348m in length and provision of 2 no. 21m high mast structures linking the proposed substation to the adjacent existing Cushaling-Portlaoise 110kV Overhead line.
- Associated construction works and drainage infrastructure.
- Underground Grid Connection (UGC) of a single 110kV circuit comprising:
- 6 no. ducts in an excavated trench to accommodate 3 no. power cables, 2 no. fibre communications cables and 1 no. earth continuity conductor (ECC)
- 20 no. joint bays,
- Cable to run predominantly within the public road for a distance of c. 14.9km along the L-7815, L-3813, L-7830, L-7832, R-426 public roads, with a total of c. 12.56km within the public road, c. 2.4km on private land. Works within the private land will be contained within the existing internal tracks.

The proposed site boundary (red line) for the proposed 110kV substation and compound and underground tail fed connection, as indicated in the accompanying drawings, measures c. 22.70 hectares, and includes the elements shown above.

2.2.1 110kV Substation Details

The proposed 110kV substation and loop in/loop out connection to the Cushaling-Portlaoise 110kV Overhead line is located within West Parcel (A) of the permitted solar farm, situated within the townland of Morett. Consent is now being sought through the submission of an SID application to ABP, under section 182A of the PDA for this part of the solar farm project.

The proposed 110kV substation will provide a LILO grid connection for the now permitted Cappakeel Solar Farm to the national grid via the existing Cushaling - PortLaoise 110kV OH transmission line, which runs in a north/south axis c. 415m east of the proposed 110kV substation.

Connection agreements to the Irish National Grid require the developer to permanently hand over the substation to the Transmission Service Operator (TSO), which will be Eirgrid. Part of the substation will be retained by the operator which acts as the collection point for the energy generated from the solar panels (West (A), Central (C)and East Parcels (E)) and energy brought to the substation via the internal network cable. A further requirement of Eirgrid when taking charge of the TSO area of 110kV substations is to keep lands adjacent to the substation free from development so to accommodate future expansion.

As the proposed 110kV substation will form part of the national grid transmission network and may be used by Eirgrid to support additional transmission network infrastructure, the development consent being sought as Strategic Infrastructure Development (SID) through Section 182A of the Planning and Development Act 2000 (as amended), is for permanent provision of the substation and its associated development components, with a final electric design determined by Eirgrid requirements. Below in Figure 2.1, we provide the EirGrid 110kV Station Design Standard which shows what elements need to be constructed for the solar farm and those which are for future (in red).

As per Eirgrid requirements, all substation doors will be steel construction for safety and security purposes.

A level compound area will be created using cut and fill methods. The substation compound and drainage will be marked out by a qualified engineer. A drainage system will be excavated and installed around the compound area. Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material will be stored separately and temporarily on adjacent berms for later use during reinstatement works. A layer of geotexile material will be laid over the footprint of the compound. Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface. Each layer will be compacted using a vibrating roller. Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase. The construction of a substation compound circa 17,750m², comprising of approx. 437.5m² single storey 110kV substation control building, a 403.5m² IPP building and associated outdoor electrical equipment, including 1 no. 110kV transformer, associated internal access track, 2.6m high station perimeter fencing and concrete post and rail property boundary fence will be built.

Adequate lighting will be installed around the compound on the lighting masts. Lightning protection masts of approximate height 18m will be installed to protect the station from direct lightning strikes.

2.2.1.1.1 Security Fence

Palisade fencing will be erected around the TSO and Operators compounds for security/protection reasons. It will be c. 2.6m high standard metal palisade fence. The position of the security fence allows for an electrical insulation area around the substation equipment for safety. Separate security gate access is provided for access to the main TSO Compound and the Operators Compound. A low post and rail fence of is proposed outside the palisade fence to define the substation property and encloses the perimeter protection area. An area of landscaping is proposed outside the fenced areas.

2.2.1.2 Substation Access Road

Appropriate access, in accordance with Transport Infrastructure Ireland (TII) standards, can be provided for via a new site entrance to the 'West Parcel' (A) of the permitted Cappakeel Solar Farm via an existing site entrance from the L7815 local road. Further links are available within the permitted solar farm with the R445 approximately 450m north-west of the existing access point and provides a proposed haul route. Alternative access points are available from the L78151 local road, which runs directly south of the overall site between Morett and Killone.

Hedgerow maintenance may be required periodically to ensure the desired sightlines are maintained, however, public access is considered safe and suitable for the proposed traffic movement, and no public safety or obstruction to traffic flow is anticipated.

2.2.1.3 Mast Structures and Cable Corridor

End masts will be located on the existing Cushaling - PortLaoise 110kV OH transmission line in order to loop the proposed substation into the electricity transmission system. Mast sites are scanned for underground services such as cables, water pipes. For each leg of the two no. masts (8 legs in total) a foundation circa. 4.3m x 4.3m x 3m deep is required. The formation levels (depths) will be checked by the onsite engineer. The excavated material will be temporarily stored close to the excavation and excess material will be used as berms along the site access tracks.

To aid construction, a concrete pipe is placed into each excavation to allow operatives level the mast at the bottom of the excavation. The frame of the reinforcing bars will be prepared and strapped to a concrete pipe with spacers as required. The reinforcing bars will be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each mast will then be assembled next to the excavation. Concrete trucks will pour concrete directly into each excavation in distinct stages. A final pour for the mast is the encasing of the mast leg which will be finished 300mm over finished ground level. Mast foundations will be backfilled one leg at a me with the material already excavated at the location. The backfill will be placed and compacted in layers.

An earth mat consisting of copper or aluminium wire will be laid circa 400mm below ground around the mast. This earth mat is a requirement for the electrical connection of the equipment on the mast structure. Once the base section of each mast is completed and the concrete sufficiently cured, it is ready to receive the mast body. A hardstand area for the crane will be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate. A physical barrier (Heras Fence Site Boundary) will be put in place to restrict plant from coming too close to the OHL. The mast will be constructed lying flat on the ground beside the recently installed mast base. The conductor will be moved off centre using a stay wire and weights to anchor the stay wire to ground. The mast section will be lifted into place using the crane and guide ropes. The body sections will be bolted into position. The conductor will be centred over the masts and held in place. Once the conductor is secured at both ends it is then cut and attached onto each mast. The section of conductor in between the two masts will be removed and utilised as connector wire for the new masts. Down dropper conductors (for electrical connections, insulators, surge arrestors), shackles and all associated accessories required for transition from line to cable will be installed on the interface masts.

2.2.2 Grid Connection Details - UGC Construction

The UGC will be primarily contained within the public road, and will consist of a single 110kV UGC circuit, which will be installed predominantly within the public road network. A small section of the UGC will be installed within existing private tracks (1.2km) The grid connection works will consist of the installation of 6 no. ducts in an excavated trench to accommodate 3 no. power cables, 2 no. fibre communications cables and 1 no. earth continuity conductor (ECC). The fibre communication cable will allow communications between the proposed Cappakeel Solar Farm 110kV Substation and Coolnabacky 110kV Substation. See Appendix 2 for full details.

The UGC to Coolnabacky 110kV Substation will consist of 3 no. 160mm diameter HDPE power cable ducts, 2 no. 12mm diameter HDPE communications duct and a 125mm Earth Continuity Conductor duct to be installed in an excavated trench between the proposed solar farm substation and the Coolnabacky 110kV Substation on access road.

2.2.2.1 Trenching/Ducting

Trenching and ducting works will be carried out using a structured, step-by-step methodology in accordance with project specifications and design drawings as provided in Appendix 2.

This will include excavation, installation of ducts within a Cement Bound Granular Mixture B (CBGM B), placement of protection measures, and progressive backfilling and reinstatement appropriate to the surface type. All ducts will be cleaned, tested, and prepared for cable installation, with works subject to inspection where required. For concrete and asphalt/bitmac road sections, carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with local authorities The following will be applied during trenching/ ducting activities:

- All existing underground services along the grid connection route will be identified and confirmed prior to the commencement of construction works.
- At watercourse crossings, the Contractor will adhere to all environmental control measures set out in the Planning and Environmental Report, the Construction Environmental Management Plan (CEMP), and applicable best-practice construction methodologies.
- Where the cable route intersects with culverts, the culverts will be retained in situ where feasible. Ducting will be installed either above or below the culvert to maintain minimum separation distances, in accordance with EirGrid and Uisce Éireann specifications.
- Where culvert removal is required to facilitate duct installation, a method statement will be prepared detailing measures such as temporary damming and over-pumping of water around the work area. This will be agreed with relevant stakeholders in advance. Upon completion, culverts will be reinstated to their original levels and dimensions. The Contractor will liaise with Inland Fisheries Ireland (IFI) prior to undertaking such works. Full details on methodology that would be required for damming and reinstatement are detailed in Appendix 2.
- Excavated material will be temporarily stockpiled on-site for reuse during reinstatement. Stockpiles will not exceed 2 m in height and will be located at least 50 m from surface water features.
- Suitable excavated material will be reused for trench backfilling.
- Earthen (sod) banks will be carefully excavated, with surface sods stored separately for reuse during reinstatement.
- The excavated trench will be dewatered if required, from a sump installed within the low sec on of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.
- Grass reinstatement will be undertaken either through reseeding or by replacing retained grass turves, as appropriate.
- No more than a 100 m section of trench will be open at any one time. A subsequent section will only be excavated once reinstatement of the preceding section is substantially complete.
- The excavation, installation, and reinstatement of a typical 100 m trench section will take approximately two days.
- Where cable installation occurs within roadways, temporary reinstatement may be undertaken to allow larger sections of road to be permanently reinstated in a single phase.
- Following duct installation, cable pulling between joint bays will typically take one day. Cable jointing operations will take approximately one week per joint bay location.

Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraint such as existing services, to indicate the precise location of the UGC. These markers will be metallic plates in accordance with ESBN and EirGrid standards. Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions. Corrosion proof aluminium triangular danger sign, with 700 mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker post shall also be placed in the event that burial depth is not to standard. Si ng of marker posts to be dictated by ESBN as part of the detailed design process.

2.2.2.2 Management of Excess Trench Material

All excavated material will be temporarily stored adjacent to the trench prior to re-use in the trench reinstatement (where applicable). Stockpiles will be restricted to less than 2 m in height. Excavated tar from the public road network will be transported off site by an appropriately authorised waste collector and disposed of at an appropriately licenced waste facility.

2.2.2.3 Storage of Plant and Machinery

All plant, machinery and equipment will be stored on site within the UGC works area or within the temporary construct on compound to be located nearby to the proposed substation. Oils and fuels will be stored in an appropriately bunded area within the temporary construction on compounds.

2.2.2.4 Joint Bay Construction

Prior to the commencement of construction, areas around the perimeter of each joint bay required for heavy vehicle access will, where necessary, be protected using a geocomposite surface (e.g. Terram® or similar) in combination with stone aggregate to minimise ground disturbance. Any roadside drains within the temporary works area will be temporarily culverted.

Where ground levels slope towards a watercourse, or where there is a risk of sediment runoff, silt fencing in combination with straw bales will be installed between the works area and nearby watercourses or drainage features.

Excavated material will be stored in close proximity to the excavation and reused for reinstatement. Any additional soil temporarily stockpiled on-site will be located a minimum of 15 m from the nearest watercourse on level ground. These stockpiles will be enclosed with silt fencing at the base and regularly inspected by a designated competent person. Where evidence of sediment escape is identified, additional silt fencing and straw bales will be installed in accordance with environmental control measures.

Where dewatering of joint bays is required, water will be discharged to a suitable percolation area where ground conditions permit. In saturated conditions, a settlement tank will be utilised to remove suspended solids prior to discharge, in line with environmental protection requirements.

Joint bay locations are located at a minimum distance of 150m from Dunrally stream. All concrete will be poured directly into the excavated joint bay.

2.2.2.5 Existing Water-crossings

The cable will traverse three existing water crossings. These are detailed further below and in full in Appendix 2. Where the cable route intersects existing watercourses, a detailed Construction Method Statement will be prepared by the Contractor in advance of works commencing. This method statement will be subject to approval by the relevant Local Authority and environmental agencies.

Crossings at existing culverts will be undertaken using either an undercrossing or an overcrossing method, depending on the depth and characteristics of the watercourse.

2.2.2.5.1 Bridge 1 Overcrossing – Open Trench Installation

This bridge is located between JB-16 & JB-17, along the L-3813 local road (ITM Coordinates: Eastings – 653458.0289, Northings – 701493.2993).

To facilitate the installation of the UGC trench, the existing road level will be raised by approximately 0.11 m. As a consequence of this raised roadway, the bridge parapet walls will also require adjustment. This will be achieved through the installation of extended handrails to ensure that safety and design requirements are maintained in proportion to the new road level.

All works will be carried out in accordance with the requirements of the relevant Local Authority and Transport Infrastructure Ireland (TII) specifications.

The proposed road raise will ensure that the ducting can be installed at a minimum depth of 0.45 m below the finished road surface, in compliance with EirGrid Specification XDC-CBL-STND-H-006, Sheet 002, Rev 00. The indicative arrangement for the raised road section is shown in Drawing No. 300100925-DR-515, which should be read in conjunction with this Outline Construction Methodology (OCM).

2.2.2.5.2 Culvert 1 Undercrossing – Open Trenching

The proposed undercrossing of this concrete pipe culvert is located between Joint Bay (JB) 17 and Joint Bay (JB) 18 along the L-3813 local road (ITM Coordinates: Eastings – 653505.7679, Northings – 701923.8520).

Where feasible, the existing culvert will be retained in situ, and the ducting will be installed beneath the culvert to maintain the required minimum separation distances in accordance with EirGrid specifications.

2.2.2.5.3 Culvert 2 Undercrossing – Open Trenching

The proposed undercrossing of this precast culvert is located along the L-3813 local road between Joint Bay (JB) 17 and Joint Bay (JB) 18, approximately 245 m northeast of Culvert 1 at ITM Coordinates: Eastings – 653671.0769, Northings – 702079.9106.

Where feasible, the existing culvert will be retained in situ, and the ducting will be installed beneath the culvert to achieve the required minimum separation distances, in accordance with EirGrid specifications.

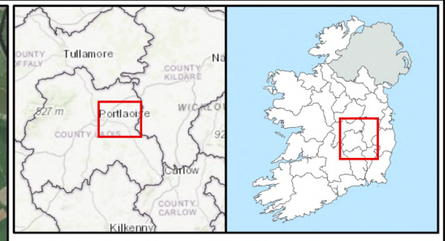
2.3 Operational Life

Once completed, the Proposed Development will be transferred to EirGrid, and will form a part of the National Transmission Network and therefore will operate in a perpetuate state.

World Topographic Map: Esri, HERE, Garmin, FAO, USGS
World Imagery: Microsoft, Vantor
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Path: R:\Map Production\2023\P23-226\Workspaces\PreApp_SID\PreApp_SID_Figures\PreApp_SID_Figures.aprx





Legend

- SID Boundary
- Associated Solar Farm

TITLE:	Site Location		
PROJECT:	Cappakeel Solar Farm		
FIGURE NO:	2.1		
CLIENT:	Ørsted Ireland Midco Limited		
SCALE:	1:50,000	**REVISION:**	0
DATE:	26/11/2025	**PAGE SIZE:**	A3

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3. Existing Environment

The Proposed Development is located wholly outside of any SAC or SPA boundary. During field surveys, no habitats within the study area corresponded to Annex I habitats. No protected or rare plant species were recorded within the Proposed Development.

3.1 Habitats

The UGC will be within road and as such wholly within buildings and artificial surfaces (BL3). This is the dominant habitat within the Proposed Development followed by improved agricultural grassland (GA1) which is the dominant habitat covering the lands in which the proposed substation is located. Hedgerows and treelines border agricultural fields within the proposed substation lands and are the dominant habitats bordering the UGC, running parallel to roads. The surrounding environs is dominated by agricultural land with Treelines (WL2) and managed Hedgerows (WL2) alongside the road verges and field boundaries. There was no Annex I habitat within the Proposed Development. The Proposed Development and its ZoI does not contain estuarine habitats or any indicators that correspond with Annex I habitats 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation or 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

There is fen located immediately west of the grid route within the pNHA The Great Heath of Portlaoise (000881) (Figure 5 3). This habitat is also outlined in The Great Heath of Portlaoise (000881) Site Synopsis . The existing road is raised ~75cm above the fen. This habitats appears to be fed by an interaction between calcareous springs and surface water as it slopes towards a small stream flowing immediately south of the habitat. This habitat is dominated by purple moorgrass Molinia caerulea and also contains Black bog rush (*Schoenus nigricans*), soft rush (*Juncus effusus*), hard rush (*Juncus inflexus*), Molinia sp., Devil's bit scabious (*Succisa pratensis*), sharp flowered rush (*Juncus acutiflorus*) and heather (*Calluna vulgaris*).

There were some 6410 Molinia meadows on calcareous, peaty or clayey-silt laden soils positive indicator species including Carex nigra/panicea, jointed rush Juncus acutiflorus, J.articulatus, water mint Mentha aquatica and purple moorgrass Molinia caerulea. While this doesn't meet the criteria for 6410 Molinia meadows type habitat (at least seven positive indicator species), there is potential for it to develop into this habitat. However, this is not associated with any SAC or SPA and therefore does not require further assessment within this Appropriate Assessment.

3.2 Otter

The stream below Bridge 1 provides suitable habitat for foraging /commuting otter (*Lutra lutra*) but no signs of activity were recorded during the field survey (29th January 2026). Despite locally suitable habitat, otter are less likely to commute through the agricultural drains downstream of Bridge 1. No evidence of mammals was recorded along the grid route itself. Otter is a named QI associated with the River Barrow and River Nore SAC (002162) located 11.2km downstream of the substation.

3.3 Avifauna

There are several species listed under Annex I of the EU Birds Directive including golden plover (*Pluvialis apricaria*) in 2km grid square S59H, peregrine (*Falco peregrinus*) in S59J, red kite (*Milvus milvus*) and N50G.

According to Cappakeel Solar Farm Planning Application (Ref No.: PL-500061-LS) EcIA a number of incidental bird sightings were recorded within the solar farm land parcels including species buzzard (*Buteo buteo*), bullfinch (*Pyrrhula pyrrhula*), blackbird (*Turdus merula*), stonechat (*Saxicola rubicola*), dunnock (*Prunella modularis*), house sparrow (*Passer domesticus*), robin (*Erithacus rubecula*) and wren (*Troglodytes troglodytes*).

The red listed species yellowhammer was recorded as 'confirmed breeding' in a tilled field located alongside a hedgerow (654266.136 702894.858 ITM coordinates), situated 5m S of the proposed substation field. A kingfisher was recorded flying along the Dunrally stream to the north of the substation. The hedgerows and treelines within the substation field are of value to passerine species for breeding, roosting and foraging. The combination of hedgerows and arable land provides habitat for yellowhammer, which was common throughout the surrounding area. Raptors such as buzzard (and potentially kestrel) hunt over the agricultural grassland, though this habitat is generally considered to be of low value.

3.4 Aquatic ecology

The UGC lies within the Barrow Water Framework Directive (WFD) catchment (ID_14). Waterbodies traversing/within the Proposed Development are classified as depositing/lowland rivers (FW2). The DUNRALLY STREAM_010 (IE_SE_14D050200) runs in an easterly direction, north of the substation (5.4m from the development footprint). This watercourse was classified as Moderate-Good Quality with Q value of 3-4 recorded in 2023 at the nearest national monitoring site RS14D050100 (1.95km downstream of the proposed substation. Instream siltation was noted at this station at the time of survey. The River Barrow and River Nore SAC (002162) is another 2.6km downstream (total 11.2km downstream from substation). Results from the field RHS conducted along the 1km stretch of Dunrally stream N of the substation indicate substrate predominantly consisted of fine sediment with gravel dominant and some large boulder like slabs. The stream adjacent to agricultural fields is largely vegetated with water stagnant or not visible. The stream is 2m wide, with a south bank height of 3m and north bank height of 7m. Instream vegetation included fools watercress (*Helosciadium nodiflorum*), floating sweet-grass (*Glyceria fluitans*), watermint (*Mentha aquatica*) and water-cress (*Nasturtium officinale*).

A small unnamed stream is located below Bridge 1 along the UGC at 653460.9, 701487.3 ITM coordinates. Although this stream ultimately reaches the Dunrally stream ca. 1km downstream, there are several barriers to fishery migrations including a small weir located where the river meets the graveyard to the east of the bridge. From there the unnamed stream flows northeasterly into small agricultural drains before reaching the Dunrally stream. There is evidence of channel realignment and deepening on the side with the graveyard. The stream was notably dug out deeper on the graveyard side potentially to reduce groundwater level and prevent flooding of the graveyard. The dominant substrate was gravel and sand with boulders constituting 2% and cobble 10% of the substrate.

White-clawed Crayfish

NBDC hold records of white-clawed crayfish (*Austropotamobius pallipes)* in the Dunrally stream at monitoring stream RS14D050200 located 5.07km downstream of the substation (most recently in 2017). The Dunrally Stream is within the Barrow catchment which is affected by crayfish plague.

The habitat within the 1km stretch of surveyed Dunrally stream does not provide suitable substrate and/or refuges for white-clawed crayfish (*Austropotamobius pallipes*). However, NBDC hold records of white-clawed crayfish (*Austropotamobius pallipes*) in the Dunrally stream at monitoring stream RS14D050200 located 5.07km downstream of the substation (most recently in 2017). The Dunrally Stream is within the Barrow catchment which is affected by crayfish plague.

Freshwater Pearl Mussel

The Proposed Development is not located within a freshwater pearl mussel catchment.

Lamprey

Results from the field RHS conducted along the 1km stretch of Dunrally stream N of the substation indicate suitability for juvenile lamprey within fine sediment. Brook Lamprey (*Lampetra planeri*) and River Lamprey (*Lampetra fluviatilis*) are named QIs associated with The River Barrow and River Nore SAC (002162) located 11.2km downstream of the substation.

Salmonids

Atlantic salmon (*Salmo salar*) was recorded within the River Barrow at the Rosnamullane_A site (NRSP20R_14_1746_176A_a) located 8.4km downstream of the substation (IFI's "WFD Rivers Ecological Status 2008 to recent"). Suitable habitat was not recorded within the Dunrally stream north of the proposed substation.

There is an unmapped watercourse that flows from the Rich fen and flush (PF1) habitat, underneath the Proposed Development through a culvert into a modified channel which flow through field drains for approximately 1 km before discharging into the Dunrally Stream. Fish are unlikely to migrate up through these drains despite some locally suitable salmonid habitat with good gravel substrate recorded. As such, suitable salmonid habtiat was not recorded within the Proposed Development or the ZoI.

4. SCREENING FOR APPROPRIATE ASSESSMENT

4.1 Introduction

This section of the report examines if the Proposed Development is likely to have a significant effect upon European sites, either alone or in combination with other plans or projects.

4.2 Establishing the Zone of Influence

The OPR (2021) AA Screening practice note states that the Zone of Influence (ZoI) must be established on a case-by-case basis using the Source-Pathway-Receptor model. The S-P-R model has been used to identify the ZoI to ensure that relevant European sites are identified. The S-P-R model minimises the risk of overlooking distant or obscure effect pathways, while also avoiding an over reliance on buffer zones (e.g. 15 km), within which all European sites should be considered. This approach follows the DoEHLG (2009 rev 2010) guidance on AA which states that:

> *"For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects".*

As detailed in section 1.2.2, in order for an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur. The potential impacts of the Proposed Development are set out in Section 2.3 of this report. The impact is essentially the 'source' in the S-P-R model.

These impacts may be very localised and confined to the Proposed Development site with no potential connectivity to a European site and therefore no potential for effects. Alternatively, where an ecological or functional pathway exists they may give rise to a potential effect to a Qualifying Interest of a European site. This section of the report identifies the potential pathways to European sites emanating from these potential sources of impact.

4.2.1 Likely Effects on the Receiving Environment

The likely significant effect of the Proposed Development on the receiving environment are as follows:

- Accidental sedimentation during the construction phase can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Artificial noise, vibration and lighting during construction can have disturbance/displacement effects on fauna.
- Construction activities will cause generation of dust which could be deposited on adjacent habitats Deposition on plant surfaces can reduce photosynthesis, and impair plant growth. Dust entering watercourses can increase turbidity and sedimentation, reducing light penetration and affecting aquatic plants, invertebrates, and fish spawning grounds

The published documents referred to as a guide for determining the zone of influence (ZoI) of the potential biophysical changes in the environment from the Proposed Development are set out hereunder.

In terms of the ZoI of construction works in proximity to the Dunrally stream, regard is had to (Stephanie Lachance, 2008) which found that downstream of culverts, the elevated fine-sediment accumulation from construction persisted for distances up to c. 1.5 km before returning to upstream background conditions. This is considered in terms of increased risk of sedimentation during the construction phase causing a likely effect on the structure and function of the habitat at the stream and within 1.5km downstream.

During the construction period, there will be an increase in human activity in the locality of the project which can cause disturbance / displacement of animals which can range from high (response to noise / visual stimuli) to low (unlikely to cause response) and can depend on the sensitivity of individual species to the stimuli. In terms of disturbance / displacement responses during construction, the following guidelines / studies are referred to:

- NatureScot Research 'Disturbance Distances Review: An Updated Literature Review of Disturbance Distances of Selected Bird Species' (Goodship, N.M and Furness, R.W, 2022) - a general Zoi of 1km is adopted, but reviewed on a species level as appropriate;
- Transport Infrastructure Ireland Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (CC-ENV-01104) (TII, 2006 republished 2025) - a ZoI of 150m is adopted.

Table 4-1: Identification of European Sites within the Zone of Influence of the Proposed Development

European Site (Code)	List of Qualifying Features	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
River Barrow and River Nore SAC (002161)	Mudflats and sandflats not covered by seawater at low tide [1140] Otter (*Lutra lutra)* [1355], Reefs [1170] Salicornia and other annuals colonising mud and sand [1310] Estuaries [1130] Freshwater pearl mussel (*Margaritifera margaritifera*) [1029] Petrifying springs with tufa formation (*Cratoneurion*) [7220] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] White-clawed crayfish (*Austropotamobius pallipes*) [1092] Nore Pearl Mussel (*Margaritifera durrovensis*) [1990] Twaite shad (*Alosa fallax*) [1103] Sea lamprey (*Petromyzon marinus*) [1095] European dry heaths [4030] Desmoulin`s whorl snail (*Vertigo moulinsiana*) [1016] Atlantic salmon (*Salmo salar*) [1106]	***UGC Route:*** 11.2km instream distance via the Dunrally Stream	Hydrologically connected European Sites	Construction of the Proposed Development may impact surface water quality due to sediment run off due to construction works adjacent to the Dunrally Stream. As mentioned in section 4.2, a ZoI for the effects of sedimentation has been established as within 1.5km downstream from the source. Juvenile habitat has been identified within the Dunrally stream and therefore susceptible to sedimentation resulting in a significant effect on lamprey QI species. There is also suitable otter commuting/foraging habitat within the Dunrally stream and downstream ZoI. As such there is a pathway for potential effects to these QI species do to construction phase related sedimentation. Within reference to section 3.1, the QI habitats associated with this SAC are not within this ZoI and as such there is no pathway for effect on QI habitats. The Proposed Development and ZoI is not within a freshwater pearl mussel or Nore pearl mussel catchment and therefore there is no pathway for effect on this QI. No Desmoulin Whorl Snail *Vertigo moulinsiana* within the Proposed Development and within the 1.5km downstream ZoI. With reference to section 3.4, there was no white-clawed crayfish or salmonids habitat or records within the Proposed Development or ZoI and as such no pathway for effects exists.	Y

European Site (Code)	List of Qualifying Features	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Brook lamprey (*Lampetra planeri*) [1096] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] River lamprey (*Lampetra fluviatilis*) [1099] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Killarney fern (*Trichomanes speciosum*) [1421]				
Slieve Bloom Mountains SPA (004160)	Hen Harrier (*Circus cyaneus*) [A082]	14.6	Mobile Species	This SPA is further than the maximum foraging distance of the SCI Hen Harrier (max. 11.7km) from the Proposed Development site (SNH 2016; Irwin et al. (2012). There is no suitable habitat to support hen harrier within the Proposed Development or the 500m Proposed Development. As such, there is no pathway for disturbance effect.	N

4.3 Summary of S-P-R Assessment

In identifying European sites which may be affected by the Proposed Development, the following is concluded:

- The River Barrow and River Nore SAC (0002162) is within the ZoI outlined above and has hydrological connectivity that may result in QI species associated with this downstream SAC (in the absence of mitigation measures) being affected during the construction phase of the Proposed Development. As such there, is SPR connectivity and this EU site will be considered further.

4.4 Assessment of Likely Significant Effects

This section of the report explains the metrics used when assessing if the potential effects (previously identified) are likely to results in significant implications for European sites.

The European sites with evident pathways for potential effects arising from the sources for impact from the Proposed Development - either alone or in combination with other projects or plans - are:

- River Barrow and River Nore SAC (002162)

This European sites and its QI habitats and species, as set out in Table 4-1 are now examined for the potential for likely significant effects in view of the sites' conservation objectives, noting that these European sites have valid and up to date site-specific conservation objectives in place as follows:

- NPWS (2025) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 2. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage

The EC (2021) guidance document notes that assessing the significance of effects on Natura 2000 sites, the potential for effects is considered in relation to the sensitivity of habitat and species and the nature of the Proposed Development. These sites are assessed for the potential of likely significant effects through both indirect and direct pathways as well as in combination effects from existing projects and policies/plans. The following criteria were considered for assessing significance of effects on River Nore and River Barrow SAC (EC, 2021):

- Degree of habitat loss (absolute, relative), changes in habitats structure;
- Risk of species populations' displacement, level of disturbance, reduction of species home range, feeding area, refuge areas, alteration of favourable condition for breeding;
- Importance of the habitats and species affected, e.g. representativeness, local variety;
- Importance of the site (e.g. limit of distribution area for certain habitats and species, stepping stone, important for ecological connectivity);
- Disruption or alteration of ecological functions;
- Changes to key ecological features of the site (e.g. water quality).

These criteria are considered in determining significance of effect relative to the pathway for effect (see Table 3-1) and the sensitivity of the European sites qualifying interests / special conservation interests to the effects of the impacts (see Table 4-2).

Table 4-2: Description of likely significant effects on the European sites within the Zone of Influence of the Proposed Development

Site Name (Site Code)	Criteria for assessing potential changes that may occur at a European site, which may result in effects on the function of the site:[26]	Likely Significant Effect
River Barrow and River Nore SAC (002162)	***Habitat Degradation*** There is a pathway for the release of excess sediment to the Dunrally watercourse, which supports mobile qualifying interest (QI) species and is hydrologically connected to the downstream SAC (c. 11.2 km in-stream). Construction activities associated with the Proposed Development within a minimum distance of 5 m of the watercourse—present a risk of sediment runoff with potential to adversely affect water quality and aquatic habitat. This could result in a reduction in habitat quality for mobile lamprey and otter associated with the River Barrow and River Nore SAC downstream. This is a temporary, significant, negative effect on aquatic species. Therefore, likely significant effects on the SAC cannot be excluded at this stage.	Yes
	Species populations' displacement, level of disturbance, reduction of species home range, feeding area, refuge areas, alteration of favourable condition for breeding There is potential for disturbance to juvenile lamprey (QI) within the Dunrally stream due to construction required for the Proposed Development. This is a temporary, significant, negative effect on aquatic species. Therefore, likely significant effects on the SAC cannot be excluded at this stage.	Yes
	Changes to key ecological features of the site (e.g. water quality) There is potential for a temporary reduction in water quality in EU site via the Dunrally stream due to increased sedimentation. Reduced water quality can harm QI aquatic species through direct mortality (e.g. exposure to toxins or low oxygen) and by degrading habitats and reducing food availability. This is a temporary, significant, negative effect on aquatic species. Therefore, likely significant effects on the SAC cannot be excluded at this stage.	Yes

[26] Taken from the EC (2021) Guidelines

Site Name (Site Code)	Criteria for assessing potential changes that may occur at a European site, which may result in effects on the function of the site:[26]	Likely Significant Effect
	Disruption or alteration of ecological functions Potential impacts on water quality could result in a temporary disruption or alteration of ecological function within the Dunrally Stream and downstream EU site, through short-term reductions in habitat quality for aquatic species. This may lead to minor, localised effects on fish populations; however, given the limited spatial extent and temporary duration of the works, these changes would not interfere with key ecological processes or population viability. Consequently, there would be no meaningful cascading effects through the food web (including on otter via fish prey availability), nor any measurable effect on catchment-scale abundance of Qis such as salmon or lamprey. This effect is temporary and not significant in terms of ecological function.	No

4.5 Summary of Effects

It was established that one European site, River Barrow and River Nore SAC (002162) occurs within the Zone of Influence of the Proposed Development.

Construction activities associated with the Proposed Development —including within a minimum distance of 5 m of the watercourse—present a risk of sedimentation and disturbance with potential to adversely affect water quality and aquatic habitat. Consequently, there is potential for deterioration in water quality, degradation of aquatic habitats, and increased disturbance, which could result in a significant adverse effect on Qualifying Interest (QI) aquatic species.

4.6 Screening conclusion

In accordance with Article 6(3) of the Habitats Directive, Part 5 of the Birds and Natural Habitats Regulations, Part XAB of the Planning and Development Acts, relevant case law, this AA Screening Report has assessed the Proposed Development and its potential to significantly affect European sites. The assessment concludes that the Proposed Development, individually or in combination with other plans or projects, is likely to have significant effects on the River Barrow and River Nore SAC (002162) .

Therefore, this Natura Impact Statement (NIS) has been prepared to assess the implications of the Proposed Development, individually and in combination with other plans and projects, for the integrity of the River Barrow and River Nore SAC (002162) .

5. NATURA IMPACT STATEMENT

5.1 Introduction

This Natura Impact Statement (NIS) has been prepared to support the competent authority (An Coimisiún Pleanála) in carrying out their appropriate assessment of the Proposed Development. The conclusions presented in this NIS are intended to enable the competent authority to ascertain whether the Proposed Development (alone or in combination with other plans or projects) will adversely affect the integrity of the European sites, in view of the site(s) conservation objectives, with a potential for Source-Pathway-Receptor connectivity to the Proposed Development. Measures are identified to mitigate adverse effects on the integrity of European Sites.

An appropriate assessment involves the following steps:

- Collecting information on the Proposed Development and on the European site (upon which it has been determined that there is potential for likely significant effects);
- Assessing the implications of the project in view of the European site's conservation objectives, individually or in combination with other plans or projects;
- Ascertaining whether the project, individually and in combination with any other plans and projects, is likely to have adverse effects on the ecological integrity of the European site;
- Considering mitigation measures (including their monitoring) to avoid or reduce impacts to a level where they will no longer adversely affect the integrity of the European site.

Information on the Proposed Development in presented in Section 2. of this report. A description of the baseline environment is presented in Section 3. and the potential impacts are set out in the AA screening and discussed in further detail below.This Natura Impact Statement (NIS) has been prepared in support of the Appropriate Assessment of the Proposed Development to be undertaken by the competent authority. The NIS considers whether the potential impacts of the Proposed Development will adversely affect the integrity of the River Barrow and River Nore SAC with respect to the European site's conservation objectives.

5.2 Assessment of the effects of the Proposed Development on the integrity of Natura 2000 Sites

This section of the report sets out the potential effects of the Proposed Development (either alone or in combination with other projects or plans) on the integrity of the River Barrow and River Nore SAC with respect to the conservation objectives of the site and its structure and function. The focus is on demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the River Barrow and River Nore SAC should the Proposed Development proceed. Where this is not the case, adverse effects must be assumed.

The Appropriate Assessment screening could not exclude the possibility of likely significant effects on the qualifying interests of the River Barrow and River Nore SAC (002162). The reasoning is detailed below:

- Construction activities associated with the Proposed Development —including within a minimum distance of 5 m of the watercourse—present a risk of sedimentation and disturbance with potential to adversely affect water quality and aquatic habitat within a 1.5km downstream ZoI. Consequently, there is potential for deterioration in water quality, degradation of aquatic habitats, and increased disturbance, which could result in a significant adverse effect on Qualifying Interest (QI) aquatic species.

5.2.1 The River Barrow and River Nore SAC

The description of the River Barrow and River Nore SAC is quoted in the (NPWS, 2024), Conservation Objectives (NPWS. 2025) and Natura 2000 Standard Data Form (NPWS, 2020).

> *"This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlington, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore.*
>
> *Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore."*

The Dunrally stream runs north of the Proposed Development , where it flows north of the substation in an easterly direction before reaching the SAC approximately 11.2km downstream.

The River Barrow and River Nore SAC is designated for the following habitats and/or species on Annex I/II of the EU Habitats Directive:

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Reefs [1170]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- European dry heaths [4030]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*) [1016]
- Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029]

- Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*) [1090]
- White-clawed Crayfish (*Austropotamobius pallipes*) [1092]
- Sea Lamprey (*Petromyzon marinus*) [1095]
- Brook Lamprey (*Lampetra planeri*) [1096]
- River Lamprey (*Lampetra fluviatilis*) [1099]
- Twaite Shad (*Alosa fallax fallax*) [1103]
- Salmon (*Salmo salar*) [1106]
- Otter (*Lutra lutra*) [1355]
- Killarney Fern (*Trichomanes speciosum*) [1421]

The existing threats and pressures that are affecting the River Barrow and River Nore SAC are set out in the Natura 2000 Data Form and are presented in Table 5-1.

Table 5-1: Threats and Pressures listed for the River Barrow and River Nore SAC cross referenced to the current (2019-2024) codes and descriptions

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
B07	**Other forestry activities**	M	B
[PB26]	[Other forestry activities, excluding those relating to agro-forestry]		
[PB18]	[Use of other pest control methods in forestry (e.g. physical plant protection)]		
[PB23]	[Physical alteration of water bodies for forestry (including dams)]		
[PB25]	[Forest plantations for renewable energy production]		
[PB26]	[Other forestry activities, excluding those relating to agro-forestry]		
A04.01.01	**Intensive cattle grazing**	M	I
[PA07]	[Intensive grazing or overgrazing by livestock]		
C01.03	**Peat extraction**	M	O
[PC05]	[Peat Extraction]		
D03.01	**Port areas**	L	I
[PE03]	[Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging)]		

[28] A guide to cross reference codes from prior reporting periods to the 2019-2024 reporting period as obtained from https://cdr.eionet.europa.eu/help/natura2000
[29] A guide to cross reference codes from prior reporting periods to the 2019-2024 reporting period as obtained from https://cdr.eionet.europa.eu/help/natura2000

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
[PF15]	[Modification of coastline, estuary and coastal conditions for built-up areas]		
F02.03	**Leisure fishing**	L	I
[PG01]	[Marine fish and shellfish harvesting causing reduction of species/prey populations and disturbance of species (professional)]		
[PG07]	[Freshwater fish and shellfish harvesting (recreational)]		
B02.01.01	**Forest replanting (native trees)**	L	B
[PB02]	[Conversion from one type of forestry land use to another]		
I01	**Invasive alien species.**	M	I
[PI01]	[Invasive alien species of Union concern]		
[PI02]	[Other invasive alien species (other than species of Union concern)]		
E02	**Industrial or commercial areas**	L	O
[PD05]	[Development and operation of energy production plants (including infrastructure)]		
[PF01]	[Conversion from other land uses to built-up areas]		
[PF02]	[Construction or modification (e.g. of housing and settlements) in existing built-up areas]		
[PF13]	[Drainage, land reclamation and conversion of wetlands, marshes, bogs, etc. for built-up areas]		
[PF17]	[Active abstraction of water for built-up areas]		
A02.01	**Agricultural intensification**	H	B
[PA02]	[Conversion from one type of agricultural land use to another (excluding drainage and burning)]		
[PA06]	[Mowing or cutting of grasslands]		
[PA07]	[Intensive grazing or overgrazing by livestock]		
[PA12]	[Harvesting of crops and cutting of croplands]		
C01.01.01	**Sand and gravel quarries**	L	B

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
[PC01]	[Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell)]		
J02.12.02	**Dykes and flooding defense in inland water systems**	H	I
[PF14]	[Modification of flooding regimes, flood protection for built-up areas]		
[PL04]	[Development and operation of dams (mixed or unknown drivers)]		
A10.01	**Removal of hedges and copses or scrub**	L	I
[PA04]	[Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.)]		
J03.02.01	**Reduction in migration or migration barriers**	M	I
[PD02]	[Hydropower (dams, weirs, run-off-the-river and respective infrastructure)]		
[PE01]	[Roads, paths, railroads and related infrastructure]		
[PF16]	[Construction or development of reservoirs and dams for built-up areas]		
[PL04]	[Development and operation of dams (mixed or unknown drivers)]		
F02.01.02	**Netting**	L	I
[PG01]	[Marine fish and shellfish harvesting causing reduction of species/prey populations and disturbance of species (professional)]		
[PG06]	[Freshwater fish and shellfish harvesting (professional)]		
[PG13]	[Bycatch and incidental killing (due to fishing and hunting activities)]		
F01.01	**Intensive fish farming, intensification**	L	I
[PG19]	[Marine aquaculture generating marine pollution]		
[PG23]	[Other activities related to aquaculture and extraction or cultivation of biological living resources not referred to above]		
[PG20]	[Freshwater aquaculture generating pollution to surface or ground waters (including marine)]		

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
[PG23]	[Other activities related to aquaculture and extraction or cultivation of biological living resources not referred to above]		
H01	**Pollution to surface waters**	H	B
[PK01]	[Mixed source pollution to surface and ground waters (limnic and terrestrial)]		
[PK02]	[Mixed source marine water pollution (marine and coastal)]		
J02.02.01	**Dredging/ removal of limnic sediments**	M	I
[PL06]	[Physical alteration of water bodies (mixed or unknown drivers)]		
F02	**Fishing and harvesting aquatic resources**	M	O
[PG01]	[Marine fish and shellfish harvesting causing reduction of species/prey populations and disturbance of species (professional)]		
[PG03]	[Marine fish and shellfish harvesting activities causing physical loss and disturbance of seafloor habitats]		
[PG06]	[Freshwater fish and shellfish harvesting (professional)]		
[PG07]	[Freshwater fish and shellfish harvesting (recreational)]		
[PG09]	[Management of fishing stocks and game]		
[PG13]	[Bycatch and incidental killing (due to fishing and hunting activities)]		
J02.05.02	**Modifying structures of inland water courses**	H	I
[PA21]	[Active abstraction of water for agriculture]		
[PL06]	[Physical alteration of water bodies (mixed or unknown drivers)]		
M01	**Abiotic changes (climate change)**	M	I
[PJ01]	[Temperature changes and extremes due to climate change]		
[PJ03]	[Changes in precipitation regimes due to climate change]		
[PJ04]	[Sea-level rise due to climate change]		
[PJ10]	[Change of habitat location, size, and / or quality due to climate change]		

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
[PJ14]	[Other climate related changes in abiotic conditions]		
B02	**Forest and plantation management & use**	M	B
[PB02]	[Conversion from one type of forestry land use to another]		
[PB03]	[Introduction and spread of new species for forestry purposes (including GMOs)]		
[PB04]	[Abandonment of traditional forest management]		
[PB06]	[Logging or thinning (excluding clear cutting)]		
[PB07]	[Removal of dead and dying trees (including debris)]		
[PB08]	[Removal of old trees (excluding dead or dying trees)]		
[PB09]	[Clear-cutting, removal of all trees]		
[PB06]	[Logging or thinning (excluding clear cutting)]		
[PB14]	[Forest management reducing old growth forests]		
[PB18]	[Use of other pest control methods in forestry (e.g. physical plant protection)]		
J02	**Changes in water bodies conditions**	M	B
[PA22]	[Drainage for use as agricultural land]		
[PA23]	[Physical alteration of water bodies (including dams, channels, etc.)]		
[PA21]	[Active abstraction of water for agriculture]		
[PL01]	[Abstraction from groundwater, surface water or mixed water (mixed or unknown drivers)]		
[PL02]	[Drainage (mixed or unknown drivers)]		
[PL04]	[Development and operation of dams (mixed or unknown drivers)]		
[PL05]	[Modification of hydrological flow (mixed or unknown drivers)]		
[PL06]	[Physical alteration of water bodies (mixed or unknown drivers)]		
J02.06	Water abstractions from surface waters	M	I
[PA21]	[Active abstraction of water for agriculture]		

Original Code [current code[28]]	Threats and Pressures [current description 29]	Rank*	Location**
[PC01]	[Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell)]		
[PC04]	[Coal mining]		
[PC05]	[Peat extraction]		
[PC12]	[Abstraction of surface and ground water for resource extraction]		
[PD02]	[Hydropower (dams, weirs, run-off-the-river and respective infrastructure)]		
[PD13]	[Abstraction of surface and ground water for energy production (excluding hydropower)]		
[PE03]	[Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging)]		
[PF17]	[Active abstraction of water for built-up areas]		
[PG17]	[Active abstraction of water bodies for aquaculture]		
[PL01]	[Abstraction from groundwater, surface water or mixed water (mixed or unknown drivers)]		
[PL06]	[Physical alteration of water bodies (mixed or unknown drivers)]		
B05	**Use of fertilizers (forestry)**	M	B
[PB16]	[Application of natural or synthetic fertilisers in forestry]		
K01.01	**Erosion**	H	I
[PM07]	[Natural processes without direct or indirect influence from human activities or climate change]		

***RANK: Medium (M), High (H), Low (L)**

****LOCATION relative to the SAC: Inside (I), Outside (O), Both (B)**

Table 5-2: Summary of the potential occurrence of qualifying interests in watercourses connected to the Proposed Development site and the River Barrow and River Nore SAC

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
1130 Estuaries	To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC.	These Qualifying Interests are marine habitats and occur at least 80 km downstream of the Proposed Development. Given the location, nature and scale of the Proposed Development and the 1.5km ZoI for sedimentation outlined in section 4.2, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the catchment and its water contribution at the river before reaching these habitats. Therefore, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
1140 Mudflats and sandflats not covered by seawater at low tide	To maintain the favourable conservation condition of the Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC.		
1310 Salicornia and other annuals colonising mud and sand	To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the River Barrow and River Nore SAC.		
1330 Atlantic salt meadows (*Glauco-Puccinelietalis maritimae*)	To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC		

[30] NPWS (2025) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 2. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
1410 Mediterranean salt meadows (*Juncetalia maritimi*)	To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC		
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and *Callitricho-Batrachion* vegetation	To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in the River Barrow and River Nore SAC.	This habitat is not within the Proposed Development of ZoI and as such will not be affected by sedimentation associated with the construction phase. Therefore, the Proposed Development does not have the potential to adversely affect this QI, in view of their Conservation Objectives.	No
4030 European dry heaths	To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC	This is a terrestrial habitat and not recorded within the Proposed Developments or within the River Barrow downstream of the Dunrally stream. Therefore, this habitat will not be subjected to sedimentation or associated with the Proposed Development. As such, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC.	This habitat is not within the Proposed Development of ZoI and as such will not be affected by sedimentation associated with the construction phase. Therefore, the Proposed Development does not have the potential to adversely affect this QI, in view of their Conservation Objectives.	No

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
7220 Petrifying springs with tufa formation (*Cratoneurion*)	To maintain the favourable conservation condition of Petrifying springs with tufa formation (*Cratoneurion*) in the River Barrow and River Nore SAC	There is one recorded location of this QI habitat with the SAC located within the River Nore ca.53km S (direct distance) of the Proposed Development. This is not situated downstream of the Proposed Development and as such, there is no hydrological pathway for effects. As such, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	To restore the favourable conservation condition of Old oak woodland with *Ilex* and *Blechnum* in the River Barrow and River Nore SAC	There was no record of this QI habitat on site during the survey and the nearest occurrence is 44.8km km away (instream). As there is no habitat removal or fragmentation of this habitat type and terrestrial nature of this habitat, there is no pathway for effects. As such, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*	This habitat is located approximately 18.3km (in-stream distance) downstream from the Proposed Development. This is outside the ZoI and therefore, the Proposed Development does have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
1016 *Vertigo moulinsiana* (Desmoulin's Whorl Snail)	To maintain the favourable conservation condition of Desmoulin's whorl snail in the River Barrow and River Nore SAC.	This species was recorded 72 km downstream from the Proposed Development. Given the location, nature and scale of the Proposed Development, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the catchment and its water contribution at the river before reaching these habitats.	No

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
		As such, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	
1029 *Margaritifera margaritifera* (Freshwater Pearl Mussel)	To restore the favourable conservation condition of the freshwater pearl mussel (*Margaritifera margaritifera*) in River Barrow and River Nore SAC	There are three freshwater pearl mussel populations within the SAC; Ballymurphy, Mountain and Nore. The Mountain population is the closest to the Proposed Development. While the confluence of the Mountain-Barrow is located ca.78km downstream of the Proposed Development, according to the CO, this population is confined to the Mountain River, a tributary of the Barrow River and is distributed from just upstream of its confluence with the Kiledmond River down to where the Mountain joins the main channel of the Barrow River. As such there is no pathway for hydrological effects. Therefore, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
1092 Austropotamobius *pallipes* (White-clawed Crayfish)	To maintain the favourable conservation condition of white-clawed crayfish in the River Barrow and River Nore SAC	Considering the closest record of white-clawed crayfish (*Austropotamobius pallipes)* in the Dunrally stream is outside the ZoI of 1.5km, at monitoring station RS14D050200 located 5.07km downstream of the Proposed Development, there is no potential to adversely affect this Qualifying Interests, in view of their Conservation Objectives.	No
1095 *Petromyzon marinus* (Sea Lamprey)	To restore the favourable conservation condition of sea lamprey in the River Barrow and River Nore SAC	Sea lamprey tend to remain in the estuaries, transitional waters and main river stems (King, JL; et al, 2011). As per the CO, this species is limited to the lower reaches of the SAC, with artificial barrier preventing juveniles for accessing spawning areas. Given the location, nature and scale of the Proposed Development, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the catchment and its water contribution at the river before entering these lower reaches of the SAC.	No

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
		Therefore, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	
1096 *Lampetra planeri* (Brook Lamprey)	To restore the favourable conservation conditions of brook lamprey in the River Barrow and River Nore SAC	Juvenile habitat has been identified within the Dunrally stream and therefore susceptible to sedimentation resulting in a significant effect on lamprey QI species. This QI is sensitive to habitat disturbance/degradation- accidental pollution or sedimentation from works adjacent to watercourses can degrade aquatic habitats and have indirect impacts on this QI. Particularly, there is potential for disturbance to soft sediment juvenile habitat. As such, the Proposed Development does have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	Yes
1099 *Lampetra fluviatilis* (River Lamprey)	To restore the favourable conservation conditions of river lamprey in the River Barrow and River Nore SAC	Juvenile habitat has been identified within the Dunrally stream and therefore susceptible to sedimentation resulting in a significant effect on lamprey QI species. This QI is sensitive to habitat disturbance/degradation- accidental pollution or sedimentation from works adjacent to watercourses can degrade aquatic habitats and have indirect impacts on this QI. Particularly, there is potential for disturbance to soft sediment juvenile habitat. As such, the Proposed Development does have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	Yes
1103 *Alosa fallax fallax* (Twaite Shad)	To restore the favourable conservation condition of twaite shad in the River Barrow and River Nore SAC	This species is known to spawn at St. Mullins, Co. Carlow (c. 83km in-stream distance from Proposed Development). There is a weir which blocks further migration upstream. Given the location, nature and scale of the Proposed Development, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the catchment and its water contribution at the river before entering these lower reaches of the SAC.	No

Qualifying Interest Code	Conservation Objective[30]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Signficant Effect
		Therefore, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	
1106 *Salmo salar* (Salmon)	To restore the favourable conservation condition of salmon in the River Barrow and River Nore SAC	Considering the closest record of Atlantic salmon (*Salmo salar*) suitable habitat was outside the 1.5km ZoI, recorded at the Rosnamullane_A site (NRSP20R_14_1746_176A_a) located 8.4km downstream of the Proposed Development (IFI's "WFD Rivers Ecological Status 2008 to recent"), there is no potential to adversely affect this Qualifying Interests, in view of their Conservation Objectives.	No
1355 *Lutra lutra* (Otter)	To restore the favourable conservation conditions of otter in the River Barrow and River Nore SAC	While no resting or breeding sites for otter were recorded during the site visit, it is assumed that otter use the Dunrally Stream for commuting and foraging. Sedimentation of watercourses can adversely affect fish and aquatic invertebrate populations, which constitute the primary prey base for otters. Therefore, the Proposed Development has the potential to adversely affect these Qualifying Interests in the context of their Conservation Objectives.	Yes
1421 *Trichomanes speciosum* (Killarney Fern)	To maintain favourable conservation condition of Killarney Fern in the River Barrow and River Nore SAC	This is a rare terrestrial species associated with Old oak woodlands. The closest record is over 75 km away from the Proposed Development. There was no record of this species or suitable habitat within the Proposed Development. Given the distance to the nearest known population, the absence of suitable habitat and the nature of Proposed Development, there is no potential for the Proposed Development to adversely affect this QI in view of its Conservation Objectives. There is no potential for adverse effects on this QI species	No

5.3 Assessment of Adverse Effects on Site Integrity

In Section 5.2 of this NIS, potential likely significant adverse effects of the Proposed Development on the integrity of the River Barrow and River Nore SAC were identified. In accordance with EC Guidance (European Commission, 2021), the identification of these effects was focussed on and limited to the Conservation Objectives of the European sites concerned. Table 5-3 below provides a detailed analysis and evaluation of the adverse effects identified in Section 5.2.

Table 5-3: Conservation Objectives and Targets for relevant Qualifying Interests with potential for adverse effects on the Integrity of the River Barrow and River Nore SAC

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
Brook Lamprey *Lampetra planeri*	To restore the favourable conservation condition of Brook Lamprey	Distribution	% of river accessible	Access to all water courses down to first order streams	The Proposed Development does not involve instream works and therefore will not affect this attribute. As such, there is no potential for adverse effects.	N/A	No potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.
		Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Accidental pollution or sedimentation can degrade aquatic habitats during construction works within 5 m of the Dunrally and indirectly impact juvenile lamprey and reduce survival and development. Therefore, there is potential for the Proposed Development to adversely affect these attributes.	Short term	There is potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.
		Juvenile density in fine sediment	Juveniles/ m^2	Mean catchment juvenile density of brook/river lamprey at least 2/m^2			
		Extent and distribution of	m^2 and occurrence	No decline in extent and			

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		spawning habitat		distribution of spawning beds			
		Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive			
River Lamprey *Lampetra fluviatilis*	To restore the favourable conservation condition of River Lamprey	Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	The Proposed Development does not involve instream works and therefore will not affect this attribute. As such, there is no potential for adverse effects.	N/a	No potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.
		Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	Accidental pollution or sedimentation can degrade aquatic habitats during construction works within 5 m of the Dunrally and indirectly impact juvenile lamprey and reduce survival and development.	Short term	There is potential for the Proposed Development to affect this attribute either alone or in-combination with
		Juvenile density in fine sediment	Juveniles/ m^2	Mean catchment juvenile density of brook/river			

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
				lamprey at least 2/m^2	Therefore, there is potential for the Proposed Development to adversely affect these attributes.		other plans or projects exists.
		Extent and distribution of spawning habitat	m^2 and occurrence	No decline in extent and distribution of spawning beds			
		Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive			
Otter *Lutra lutra*	To restore the favourable conservation condition of Otter	Distribution	Percentage positive survey sites	No significant decline	The Proposed Development does not involve instream works and therefore will not affect this attribute. As such, there is no potential for adverse effects.	NA	No potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds	The Proposed Development will not affect extent of terrestrial habitat along riverbanks. The Proposed Development avoid removal of vegetation and loss of riparian habitat. Therefore, there is no potential for adverse effects.	NA	No potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.
		Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 857.7ha	The Proposed Development will not result in the removal of marine, freshwater (river or lake) habitat, so there is no potential for adverse effects.	NA	No potential for the Proposed Development to affect these attributes either alone or in-combination with other plans or projects exists.
		Extent of fresh water (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 616.6km			

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Extent of fresh water (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha			
		Couching sites and holts	Number	No significant decline	No couching sites or holts were recorded within the study area of the Proposed Development. Therefore there is no potential for adverse effects.	N/a	No potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects exists.

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Fish biomass available	Kilograms	No significant decline	Accidental pollution and sedimentation can lead to changes in water quality which can reduce prey availability for otter. Therefore, there is potential for the Proposed Development to adversely affect this attribute.	Short term	There is potential for the Proposed Development to affect this attribute either alone or in-combination with other plans or projects.

5.3.1 Summary of Potential Adverse effects

A potential for adverse effects due the Proposed Development have been identified on the following QI species/habitats of the River Barrow and River Nore SAC:

- Sea Lamprey
- Brook Lamprey
- River Lamprey
- White-clawed crayfish
- Atlantic Salmon
- Otter
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incal nae, Salicion albae

5.4 Consideration of in-combination Effects with other plans or projects

Article 6(3) of the Habitats Directive requires that:

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives".*

It is therefore required that the likely significant effects of the Proposed Development be considered in-combination with any other plans or projects within the zone of influence.

The consideration of in-combination effects with other plans or projects, focused on the sources of impacts identified for the Proposed Development in section 2.3 and ecological pathways identified in section 3.2.

5.4.1 Plans

The Laois County Development Plan 2021 – 2027 was adopted on 25th January 2022 and came into effect on the 8th March 2022.

The Plan is supportive of renewable energy developments subject to proper planning and sustainable development. This includes Appropriate Assessment as well as the preparation of an Ecological Impact Assessment and biodiversity enhancement measures.

The Proposed Development will contribute to the renewable energy goal of Laois County Council which is in accordance with the Laois County Development Plan.

Considering the sources for effects from the Proposed Development identified in Section 4.3 and the nature of the plan identified above - there is potential for the Proposed Development (unmitigated) to have in-combination effects with the above plan.

5.4.2 Cappakeel Solar Farm

Potential in-combination surface water effects arise with the permitted solar farm development (ACP Ref. 500061), which includes the construction of two clear-span bridges, one located approximately 350 m upstream of suitable lamprey spawning habitat. Along with construction activities associated with the Proposed Development—including installation of steel masts, underground cabling, and substation infrastructure (trenching, excavations, and concrete works) within a minimum distance of 5 m of Dunrally Stream—construction of the permitted solar farm could cumulatively increase the risk of pollutant release and habitat degradation within the receiving watercourse. Consequently, there is potential for deterioration in water quality, degradation of aquatic habitats, and increased disturbance, which could result in a significant adverse effect on Qualifying Interest (QI) aquatic species.

5.4.3 Other Projects

A planning search to assess other developments within the same water catchment and within the local disturbance zone were assessed.

A total of 430 planning applications were identified within the Barrow_050 14_17 Sub-Catchment. These were predominantly single dwelling developments, alterations or extensions.

As shown in Table 3-2, there were 32 larger developments. Natura Impact Statements (NISs) were prepared for 11 of these and were found to not have a significant effect on local hydrology and downstream River Barrow and River Nore SAC with appropriate mitigation measures applied. The remaining applications 21 were found to not have a pathway for effects on local hydrology.

5.5 Mitigation

Mitigation is prescribed in accordance with mitigation by avoidance as a first approach. Where this is not feasible, measures to prevent impacts from giving rise to adverse effects should be adopted (e.g. management of surface water runoff). Where impacts cannot be avoided 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).

5.5.1 Mitigation by Avoidance and Design

A process of 'mitigation by avoidance', as informed by constraints assessment, was undertaken during the design of the Proposed Development with the objective of avoiding/ minimising the potential for adverse effects on European sites.

A Project Ecologist/ECoW will be appointed for the duration of the Proposed Development to supervise the construction. All mitigation will be implemented in full.

5.5.2 Mitigation for the sediment runoff

Along with the water quality mitigation set out in the CEMP, the following mitigation measures are proposed during cabling works construction:

- Weather warnings will be monitored, and no construction will take place during extreme events to mitigate against potential flooding.

- Mitigation measures will be provided where surface water flows may be temporarily prevented from reaching gullies during trench excavation. Mitigation measures will include the provision of temporary over ground surface water channels using sand bagging for example to divert flows to downstream gullies.
- Trenches will be excavated during dry periods where possible in short sections and left open for minimal periods, to avoid acting as a conduit for surface water flows.
- Any excavated material will be used in the reinstatement of the cable trenches subject to approval. Surplus material will be removed from the site to an appropriate licenced facility. There will be no stockpiling of excavated material.
- All excavated soil material will be managed on site in accordance with the CEMP.
- Silt fencing will be provided around any exposed areas to prevent the ingress of suspended solids into adjacent watercourses. In particular, silt fencing will be provided for the length of the Dunrally stream that traverses the boundary of the proposed substation. These mitigation measures will prevent surface water contamination and will prevent subsequent flows of contaminated water into watercourses. Silt fences will be established downslope along the perimeter of source areas of contaminated runoff. Silt fences will be installed close to source (as opposed to close to receptor). Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh or terram. The base of the silt fence will be bedded at least 15- 30 cm into the ground. Once installed the silt fence will be inspected regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains and periodically thereafter. The integrity of the silt fencing will be checked daily by the ECoW and after poor weather conditions (rain or wind) and any failures rectified immediately. Any build-up of sediment along the fence will be removed as deemed necessary by the ECoW and in accordance with manufacturers requirements. 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 it was installed, inspected and removed will be maintained by the ECoW.
- A temporary berm (i.e., polypropylene bag, filled with clean pea gravel grade or rectangular straw bales) will be placed along the edge of the track to prevent loose material being dislodged or washed into the waterbody. Double silt fencing will be placed upslope of the buffer zone on each side of the water body. The silt fencing will have removable "gates" as required to allow access of excavator while maintaining ease of replacement overnight or during periods of heavy rainfall. The silt fencing will be extended at least 10m upstream and downstream of the crossing location.
- Daily visual inspections of drains and streams will be performed during the construction period to ensure suspended solids are not entering the streams and rivers alongside the work area, to identify any obstructions to channels, and to allow for appropriate maintenance of the existing roadside drainage regime. Water quality in the nearby downstream drains and watercourses will be monitored in real time for turbidity. Where turbidity equals or exceeds 28 Nephelometric Turbidity Units (NTU) the works will be stopped and an investigation into cause carried out and measures taken as appropriate.
- There will be no storage of material/equipment, excavated material or overnight parking of machinery inside the 20m buffer zone of watercourses.
- Bog mats will be used underneath the excavator inside the 20-meter vegetative buffer zone to prevent soil erosion and potential water quality impacts from localised surface water runoff.
- Temporary storage of excavated overburden from the diversion channel will be undertaken outside of the 20m buffer on flat ground or within a local hollow.

- A containment berm will be placed downslope of the excavated material which in turn will be surrounded by secondary silt fence protection to prevent saturated soil from flowing back into the water body.
- The silt fencing will be left in place and maintained until the disturbed ground has re-vegetated.
- There will be no batching or storage of cement allowed at the stream crossing. There will be no refuelling allowed within 100m of the stream crossing. All plant will be checked for purpose of use prior to mobilisation at the stream crossing.
- The waterproofing spray system will only be carried out during calm, dry weather periods (little to no breeze) to prevent drift of airborne substances or runoff towards the river.
- Consultation with the NPWS will be carried out as species protected under the Wildlife Act, EU Habitats Directive and the EU Freshwater Fish Directive occur within the river water bodies which the site drains into.
- Oils/hydrocarbons will be stored in a designated secure bunded area in watertight containers, preventing washout or disturbance of containers.
- Any generators stored in the compound will be bunded to 110% capacity.
- No fuel or oils will be stored within 50m of any watercourses or other surface water feature.
- Any temporary spoil heaps will be more than 10m away from trenches, drains and watercourses. The heaps will be surrounded by silt fences and preferably placed in a well vegetated area. Compact the surface of any stored soil or spoil heaps and keep their height to less than 2m.
- Surplus soil that is spread within the site will be deposited at least 50m away from watercourses, rolled and re-seeded with a certified native grassland seed mix. In heavy rainfall spoil heaps must be covered with geotextile to prevent erosion when not in use.
- Any surplus material will be transported off site and disposed of at a fully authorised soil recovery facility.
- Stockpiles will be restricted to less than 2m in height. Store all materials separately in bunded, safe areas greater than 50m from a watercourse and 10m from a drain which will be subject to approval by the site manager and ecological clerk of works (ECoW). Any surplus material will be transported off site and disposed of at a fully authorised soil recovery facility.

Joint bay locations are located at a minimum distance of 147m from Dunrally stream. Nonetheless, during the installation of joint bays where ground levels slope towards a watercourse, or where there is a risk of sediment runoff, silt fencing in combination with straw bales will be installed between the works area and nearby watercourses or drainage features to prevent sediment migration.

5.5.3 Mitigation for Accidental Spills and Leaks

Construction vehicles will be refuelled off-site, wherever possible. This will primarily be the case for road vehicles such as vans and trucks. Refuelling of mobile plant during construction will be carried out by mobile fuel tanks equipped with pressure relief valves, built-in vents, handles for easy transportation, pumps, hoses and meters to facilitate fuel transfer operations. Any additional fuel containers and for smaller equipment (such as generators, lights etc.) used on site will be positioned on appropriately sized plant nappy/bund and stored within additional secondary containment e.g. bund for static tanks or drip trays for smaller mobile containers. Taps/nozzles for fuels and storage containers for oils will be fitted with locks to ensure their use is controlled. Only designated trained and competent operatives will be authorised to refuel plant on site.

All tank and drum storage areas will, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the aggregate volume of all other substance which could be stored within the bunded area.
- The purpose of this requirement is to ensure that any potential leaks, spills, or other releases from tanks or drums are effectively contained within the bunded area, preventing any environmental contamination or harm. The bunded area acts as a secondary containment system, providing an additional layer of protection against accidental releases and facilitating proper clean-up and mitigation measures.
- All plant and equipment will be in good working order, checked regularly and maintained when necessary and a maintenance log maintained.
- Fuels, lubricants and hydraulic fluids will be carefully handled to avoid spillage, properly secured and provided with appropriate type of spill containment kits in case of incident.
- All spill-kits will be inspected on a weekly basis by the EnCoW to ensure they are maintained as fit for purpose.
- Welfare / hygiene facilities will be located within the construction compounds only.
- All water from vehicle wheel washes will be removed from site and disposed of in line with Waste Legislation.

5.5.4 Mitigation for Concrete works

- Precast concrete will be used wherever possible for the structural elements such as foundations for LILO masts, substation foundations and joint bays during the construction phase. On-site batching will not be permitted. Concrete will instead be transported to the Site by concrete truck.
- Concrete pour is required for the installation of joint bays, laying of 110kV masts foundation and substation foundations. Concrete works are at a minimum setback distance of ca .100m from surface watercourses.
- Temporary storage of cement-bound materials (if required) will take place on designated hardstanding areas only, with no direct drainage to surface waters. These areas will be appropriately bunded, for example using sandbags and geotextile sheeting or silt fencing, to contain any potential runoff and prevent environmental contamination.
- All pouring operations will be continuously supervised to prevent accidental spillages outside the excavation. Only concrete chutes will be washed out on site at a designed impermeable (lined) washout area at the site compound; there will be no concrete wash out of trucks. The residual liquids and solids from concrete wash-out will be disposed of off-site at an appropriate licensed waste facility.
- Additionally, the formwork and site preparation works will contain the concrete in an enclosed, excavated area. For watercourse crossings requiring concrete works, these works will be carried out under dry works conditions, as discussed further below in relation to 'Works in or Adjacent to Waters'.
- The acquisition, transport and use of concrete will be planned fully in advance of commencing works such that volumes are minimised, the route to and through the Site is predetermined so as to aim to avoid drains and watercourses, and wash down areas are appropriately located. Additionally, all concrete works will be supervised at all times by the Developer's appointed EcOW.

- No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately.
- Concrete trucks will not be washed out on Site. Where chutes, hoppers/skips and equipment (e.g. vibrating wands) associated with concrete works need to be washed down this will be done into a sealed mortar bin / skip with the appropriate capacity and which has been examined in advance for any defects. The location of wash down areas will be set back as far as practically possible from any drain or watercourse, and a minimum of 50m. This requirement will be communicated to all on-site personnel and to each concrete truck driver prior to entering into the works area. Washout areas / mortar bins will be sized such that they are capable of withstanding an unexpected heavy rainfall event without overtopping and they will be covered when not in use.
- Concrete washing will be contained and managed. Waste concrete slurry, washings and supernatant will be allowed to settle/dry and will be taken to a licensed waste facility for disposal.
- Any shuttering / formwork installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting, foams or other sealing products at joints.
- Pouring of concrete into standing water within excavations will not be undertaken. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the treatment train and buffered surface water discharge systems in place.
- Concrete works will be scheduled during dry weather conditions to reduce the elevated risk of runoff and will avoid foreseen sustained rainfall (any event longer than 4-hour duration) and/or any foreseen intense rainfall event (>3mm/hour), and do not proceed during any yellow (or worse) rainfall warning issued by Met Éireann.
- It will be ensured that suitably sized covers are available for freshly poured concrete to avoid wash off in the event of rain.
- The ECoW will continually monitor the pH of any watercourse during concrete works in or adjacent to a watercourse or drain. Should any change in pH +/-0.5 be detected, concrete works will immediately be ceased. Steps will then be taken to identify the entry point to the drain or watercourse and appropriate measures will be implemented to prevent further escape to the environment. The ECoW should consult CIRIA C532 to consider the most appropriate measure.
- Spill kits will be readily available at the location of concrete works and will be appropriate for the containment and control of concrete spills and/or runoff.
- The Community Water Officer for the Western Region, National Parks and Wildlife Services and Inland Fisheries Ireland will be notified immediately of any concrete spills / runoff into a watercourse.

5.6 Conclusion

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the Proposed Development which, by itself, or in combination with other plans or projects, may affect the relevant European Sites have been considered.

The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development on the integrity of the relevant European sites.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the Proposed Development will not adversely affect the integrity of any European site.

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FEHILY TIMONEY

DESIGNING AND DELIVERING
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APPENDIX 1

Statement of Authority

Kate O'Regan - Kate is a Project Ecologist with three years' experience in consultancy with FT. She holds a first-class BSc. in Zoology and first-class MSc in Marine Biology from University College Cork. Since joining Fehily Timoney, Kate has prepared Appropriate Assessments and Ecological Impact Assessments for waste facilities and road improvement schemes along with ornithological chapters and collision risk models for renewable energy projects. Kate has previous experience in data management, statistical analysis, mapping and technical report writing. Kate has also completed a wide range of site work including habitat, ornithological, bat, freshwater aquatic, intertidal, subtidal, insect and mammal surveys.

Madeleine Van Der Poel - Maddy holds an M.Sc. (Hons) in Forestry and Nature Conservation from Wageningen University in the Netherlands and has six years of postgraduate experience. She is a Senior Ecologist with Fehily Timoney, with experience in both terrestrial and freshwater ecological assessments. She has prepared Biodiversity chapters for EIARs and completed numerous Appropriate Assessments for large infrastructure projects.

Mike Trewby BSc PGDip MCIEEM - Mike has worked as an Associate Director at Woodrow Sustainable Solutions Ltd and is a highly experienced ecologist with more than 20 years of field research and ecological assessment experience, specialising in ornithology, ecological survey methodologies, and environmental monitoring. Recognised as one of Ireland's leading experts in chough ecology, he has played a significant role in research, conservation management, and the designation of Special Protection Areas (SPAs), while also undertaking extensive work on raptors, seabirds, breeding waders, bats, mammals, and other protected species. Mike combines strong technical expertise with proven project management skills, delivering complex ecological assessments, ornithological impact studies, Appropriate Assessment documentation, stakeholder engagement, and Ecological Clerk of Works services across a wide range of infrastructure and renewable energy projects.

Yumi Mihara - Yumi is a Senior Ecologist working as part of the Energy and Environment Team at Fehily Timoney and Company. Yumi has specialised in botany, with over 8 years' experience working in ecological consultancy section across Japan and Ireland. She holds a MSc in Environmental Science from Hokkaido University with a focus on Plant Physiology and a BSc in Environmental Science from Tokyo University of Agriculture with a focus on Habitat Classification via Phytosociological Methods.

She has practical field survey skills in botany, including rare/protected/invasive plant survey, habitat classification and mapping and relevé survey in diverse habitats such as subalpine mountains in Japan, and heathlands, raised bogs, calcareous grasslands, coastal cliffs and urban areas in Ireland. She has also prepared reports on Appropriate Assessment Screening (AA), Natura Impact Statements (NIS), Ecological Impact Assessment (EcIA), Hedgerow Appraisal and Invasive Species Management Plans (ISMP) in Ireland.

Danny Franklin - Danny holds a B.Sc. (Hons) in Zoology, University College Cork (UCC) and a M.Sc (Hons) in Wildlife Conservation and Management, University College Dublin (UCD). He has four years postgraduate experience and is a Project Ecologist with Fehily Timoney. Danny has three years of ecological consultancy experience in the forestry industry preparing Appropriate Assessment documents as part of the Forestry Service licencing process.

Shannon Burke - Shannon is a Project Ecologist on the Energy and Planning team at Fehily Timoney and Company. She holds a BSc (Hons) in Plant Biology and a PhD in Environmental Biology from University College Dublin. She has researched a variety of environmental topics, including plant physiology, biological invasions, and wetland ecology. Her PhD research focused on the carbon stocks and sequestration rates of Irish coastal wetlands. Shannon has extensive knowledge in terrestrial, coastal, wetland, and freshwater ecology and has completed a wide range of fieldwork nationwide including soil, habitat, macroinvertebrate, and ornithological surveys. She is also experienced in laboratory work, desk-based studies, and teaching.

Shannon has developed strong skills in mapping, data management, statistical analysis, and report writing through her PhD. She is an experienced technical writer, having published in several scientific journals and completing a PhD dissertation.

Shannon specialises in plant identification, habitat classification, and freshwater invertebrate ecology, with additional experience in invasive species, ornithology and bats. Since joining FT, she has honed these skills through ecological surveys, Appropriate Assessment Screening reports, Ecological Impact Assessment reports, and Natura Impact Statements.

Jason Cahill – Jason holds a degree in B.Sc. (Hons) in Field Biology with Wildlife Tourism, Institute of Technology Tralee (now MTU). He has four years postgraduate experience and is a Project Ecologist with Fehily Timoney. Jason has experience in various field surveys including bird, bat, mammal, habitat, invasive species, and freshwater surveys. He also has experience undertaking Appropriate Assessments and Environmental Impact Assessments for developments including wind farms, solar farms, and various urban developments. Jason has worked as an Ecological Clerk of Works on a large-scale infrastructure development and several smaller projects.

Rita Mansfield - Rita holds a BSc. (Hons) in Applied Ecology and a H. Dip Environmental Protection and Pollution Control. Rita is a Principal Ecologist and Associate Director with 20 years' experience as a technical ecology lead within the environmental and planning services sector. She specialises in statutory consent and environmental assessment for large scale public infrastructure projects in the energy, water (including flood relief schemes) and transport sectors. She is a qualified ecologist with responsibility for environmental impact assessment, planning applications (conventional and strategic infrastructure development), Appropriate Assessment, foreshore licensing, and stakeholder engagement for large scale plans and projects in Ireland, including for wind energy developments. Rita has undertaken and managed a wide range of ecological field assessments including mammal, herpetofauna, bird, fishery, invertebrate and habitat assessments. Rita has held numerous licences under the Wildlife Act and Habitats Directive for disturbance to species which included mitigation (e.g. construction of artificial otter holt, bat exclusion). Rita has provided advice on ecological / environmental design to various private and public sector clients.

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APPENDIX 2

Planning Search within Barrow_SC_050 14_17 Sub-Catchment of planning applications received in the last 5 years

An Coimisiún Pleanála Applications

ACP Case Number	Development Description	Decision Date	Ecological Impact
309349	Monasterevin Bridge Remediation Works, Monasterevin, Co. Kildare	22/07/2021	NIS
310427	Removal of vegetated sand and gravel deposits from the river at Ballymanus Bridge outside Stradbally, Co. Laois	09/12/2021	NIS
310430	Repair and replacement of the stone pitched flooring of the western arch of the Inch Bridge on L7950 across the Stradbally River	18/05/2022	NIS
313867	Silt/Gravel deposits removal using mini excavator and vacuum excavator at N80 Bridge.	27/06/2023	NIS
317590	Retention for onsite facilities and permission for new boundary wall.	19/03/2024	EIAR and NIS not required
318550	Construction of ball stop nets and all associated works at the existing driving range.	18/06/2024	EIAR and NIS not required
319947	Amend planning permission Reg. Ref. 17532 to consist of: Replacement of permitted Distribution Network Operator (DNO) substation with an Air Insulation Switchgear (AIS) substation, construction of an underground cable to provide a tail fed connection to the permitted 400kV Coolnabacky Substation (An Bord Pleanála Case Ref. PL11.VA0015) and all associated site development works. A Natura Impact Statement accompanies this application.	08/01/2025	NIS
321259	Construction of 5 dwelling houses; new site entrance and access road; the demolition/removal of derelict farm buildings and ancillary services and all associated site works.	23/10/2025	No impact
321383	Proposed rehabilitation works on Pass Bridge, Passlands, Monasterevin, Co. Kildare	04/03/2025	NIS
322153	a) Retain Dwelling as Constructed & (b) Permission to Complete/Finish Dormer Dwelling Construction with Effluent Treatment System & Percolation Area and all associated site works.	04/07/2025, 01:00	No impact

ACP Case Number	Development Description	Decision Date	Ecological Impact
500706	Solar Farm. A co-located Battery Energy Storage System (BESS) park. Natura Impact Statement submitted with this planning application. The development is covered by the provisions of the (RED III) Renewable Energy Directive III (Directive (EU) 2023/2413).	In Process	Not Available
500151	Proposed uprate of the existing 110 kV Overhead Line (OHL) and the replacement (""restringing"") of the existing overhead line circuit conductor with a new higher capacity conductor and all associated site works. NIS has been submitted with this application.	In process	Not available
500061	10-year permission and 40-year operational life for a solar farm on 5 no. land parcels. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and accompanies this planning application.	In process	Not available

Laois and Kildare County Council Planning Applications

Application Number	Development Description	Decision Date	Ecological Impact Identified
2460296	The demolition of an existing 558.6 sqm mink processing building and equipment storage shed. The demolition of this building includes the disposal of asbestos from the roof (hazardous waste No. 17 06 05 of the European Waste Catalogue). Construction of a new 630.8 sqm portal frame cattle shed, re-purposing of an existing surface water attenuation tank for clean surface water & bovine effluent separately (the surface water attenuation tank was previously granted permission for removal under planning reg. no. 23/60152), Construction of a new 348.9 sqm portal frame feed store,1235.3sqm three bay silage pit, construction of 374.5 sqm dungstead, all associated drainage and site works. Ballymanus House, beside this site, comprises entry 604 on the Record of Protected Structures forming part of the Laois County Development Plan.	22/07/2024	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
2460339	Extend and modify an existing 1514.7m2 agricultural building to include; Construction of an 88.9m2 single story extension, Elevational changes and removal of all existing cladding (including asbestos cladding); the provision of two new loading bay doors. This element of the works includes the disposal of asbestos from the roof and walls (hazardous waste No. 17 06 05 of the European Waste Catalogue), Alteration of the existing ground levels to provide a new dock leveler to facilitate convenient loading and un-loading of goods, New internal access roadway to include 10 additional parking spaces and approx. 1080sqm of additional hard standing area. Foul and surface water drainage including a new effluent holding tank and all associated site works. Ballymanus House, beside this site, comprises entry 604 on the Record of Protected Structures forming part of the Laois County Development Plan.	02/08/2024	NIS
2560049	New commercial vehicle testing centre with associated signage, new site boundary wall, new entrance, and all associated site works. The proposal includes additional change of use of existing buildings to (1) workshop ancillary to test center (2) cafe and (3) 3 no. shop units	03/09/2025	Screened out
2560359	install a new wastewater treatment system and all associated site works	08/08/2025	Screened out
2460366	Alter previously approved Planning ref. 17/147 for a retirement village on a site at Tierhogar, Killenard, Co.Laois. Alterations to the Medical Consulting rooms and dispensary, gym, bistro / restaurant, the removal of the Swimming Pool and the provision of a new stand alone sub-station along with all associated Site Works.	15/08/2024	Screened out
2560628	Erect a 24 metre high lattice tower with antennas, dishes and associated telecommunications equipment, including equipment cabinets at	04/02/2026	Screened out

Application Number	Development Description	Decision Date	Ecological Impact Identified
	ground level all enclosed by security fencing together with access track		
2228	construct new entrance to farmyard including constructing bridge over the Crooked river and all associated and necessary site works	18/10/2022	NIS
22615	Restore to agricultural lands of a disused Sand & Gravel Pit. The works will comprise of the importation, compaction and contouring of approx. 77,000 tonnes of uncontaminated soil and stone arising from construction projects under a Waste Facility Permit	03/08/2023	Screened out
22695	Develop 6 serviced sites including six septic tanks and percolation areas, vehicle & pedestrian entrances, boundary treatments and all associated site works and services	06/11/2023	Screened out
2560302	Proposed uprate of the existing 110 kV Overhead Line (OHL) between the existing Cushaling 110 kV substation in the townland of Ballykilleen, Co. Offaly and the existing Portlaoise 110 kV substation in the townlands of Clonminam and Kylekiproe, Co. Laois. The Cushaling – Portlaoise 110 kV OHL is approximately 41.6 km long and comprises 17 no. steel lattice tower structures and 193 no. wooden pole structures. The Proposed Development works across the functional area of Co. Kildare will comprise: 1. The replacement ("restringing") of the existing overhead line circuit conductor with a new higher capacity conductor including installation of a new fibre communication connection; 2. The replacement of 2 no. steel towers and their foundations; 3. The replacement of steel members at 1 no. tower; 4. Full tower painting required at 1 no. location; 5. Shear block remedial works (raise and cap) at 1 no. tower location; 6. The replacement of wooden poles only at 8 no. locations; 7. The replacement of wooden poles and crossarm at 3 no. locations; 8. The replacement of crossarm only at 4 no. locations; 9. The replacement of existing danger notices at various locations, as required; 10. The replacement of hardware and fittings, such as insulators, insulator hardware, earthwire hardware and anti-climbing guards at various locations, as required; 11. The replacement of suspension clamps, vibration dampers and compression	02/09/2025	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	assemblies at all locations, as required; 12. All associated temporary site development works to gain access to the existing structures including clearance of vegetation, disassembly and reassembly of gate posts/piers and removal and reinstatement of existing fencing; and 13. Other temporary associated		
2460005	amend planning permission Reg. Ref. 17532 to consist of: Replacement of permitted Distribution Network Operator (DNO) 110kV substation and all associated infrastructure (Glass Reinforced Polyester (GRP) Cabinet, monitoring house, storage shed, auxiliary transformer and WC) with an Air Insulation Switchgear (AIS) 110kV substation comprising a single-storey control building (c. 6.28m height and c. 133.7sqm) within a palisade-fenced compound (c. 2.6m height and c. 1,779.8sq.m) and all associated electrical infrastructure and apparatus, and realignment of permitted solar arrays. The proposed development will consist of: Construction of a new vehicular entrance and access track connecting to permitted internal vehicular tracks; Construction of an underground cable (c. 160m length) to provide a tail fed connection to the permitted 400kV Coolnabacky substation (An Bord Pleanála Case Ref. PL11.VA0015); and, All ancillary site development works, including lighting, drainage, temporary construction compound and on-site parking to serve the operational and maintenance needs of the substation.	21/05/2024	NIS
2360368	Erect flood light stanchions and flood lighting to football pitch number 2. Permission is also sought to illuminate existing walking track and all associated site works.	01/11/2023	
2560831	Construct a Soiled water / Slurry lagoon and associated site works (This application is within the curtilage of a protected structure Ref RPS600 Ballykilcavan House).	11/02/2026	Documents unavailable

Application Number	Development Description	Decision Date	Ecological Impact Identified
2560148	develop at this site within the Townlands of Morett, Killone, Cappakeel, Rossmore and Raheennahown north, Co. Laois. The development will consist of a 10-year permission and 40-year operational life for a solar farm on 5 no. land parcels as described herein: West Parcel (A) (Morett townland), Central West Parcel (B) (Morett & Cappakeel. townlands), Centre Parcel (C) (Morett & Cappakeel. townlands), Centre East Parcel (D) (Cappakeel townland) and East Parcel (E) (Rossmore townland). The total site area for the proposed development is c. 249 hectares and consists of the following; c. 1,796,838sq. metres of solar photovoltaic panels on ground mounted steel frames; 44 no. hardstandings for electrical skids and storage; underground power and communication cables and ducts; c. 22,753m. of boundary security fencing; c. 12,915m. of new and existing internal access tracks including 2 no. open span bridge crossings; associated drainage infrastructure; 5 no. site entrances which include the upgrading of 2 no. access points onto the L3930, 1 no. new access point onto the L7815 local road and 2 no. new access points onto the L3930 local public road; 5 no. temporary construction compounds; landscaping and biodiversity enhancement measures and all associated site services and works. Installations of internal network cable comprise trenching for an underground medium voltage electrical cable and associated joint bays and infrastructure, for a distance of approximately 7,189 metres in length along the solar farm lands including 4 no. Horizonal Directional Drilling points to traverse the Dunrally stream and the local roads L3930, L3901 and L3817. A separate planning application will be made to An Bord Pleanála as part of a Strategic Infrastructure Development (SID). This will include the provision of a 110kV substation with electrical control building and ancillary electrical infrastructure,	18/09/2025	EcIA/NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	associated compound with palisade fence which is to be located in the West Parcel (A) in the townland of Morett. The substation will connect to the national grid via. A LILO grid connection onsite. This planning application will be lodged with An Bord Pleanála in due course. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and accompanies this planning application.		
2560147	for works associated with the proposed uprate of the existing 110 kV Overhead Line (OHL) between the existing Cushaling 110 kV substation in the townland of Ballykilleen, Co. Offaly & the existing Portlaoise 110 kV substation in the townlands of Clonminam & Kylekiproe, Co. Laois. The replacement ("restringing") of the existing overhead line circuit conductor with a new higher capacity conductor incl. installation of a new fibre communication connection; Replacement of 8 no. steel towers & their foundations; Replacement of steel members at 1 no. tower; Full tower painting required at 3 no. locations; Shear block remedial works (raise & cap) at 6 no. tower locations; Replacement of wooden poles only at 15 no. locations; Replacement of wooden poles & crossarm at 5 no. locations; Replacement of crossarm only at 14 no. locations; Replacement of existing danger notices at various locations, as required; Replacement of hardware and fittings, such as insulators, insulator hardware, earthwire hardware and anti-climbing guards at various locations as required; Replacement of suspension clamps, vibrations dampers and compression assemblies at all locations as required; All associates temporary site development works to gain access to the existing structures including clearance of vegetation, disassembly & reassembly of gate posts/piers & removal & re instatement of existing fencing; other temporary associated & ancillary development works required for the purpose of the existing circuit, including temporary items, such as; guard poles, construction compounds (located in the townlands of Bracklone, Tullaghan, Morett,	30/09/2025	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	Clonaddodoran and Kyletalesha), clearance or management of vegetation, installation of silt traps, silt fences, stone tracks, ground protections mats & watercourse crossings. No additional structures are proposed along the existing circuit. Structure 203,which will be relocated approx. 101m back towards structure 202 due to its existing position on top of a gravel mound & there being potential for subsidence of the gravel in the long term. No alteration to the nature, extent, alignment, character, or voltage of the existing electricity infrastructure is proposed. In addition, works to support this uprate also include the Cushlaing-Portlaoise 110KV bay lead-in conductor uprate at the Portlaoise 110KV station. A Natura Impact Statement (NIS) has been submitted with this application. Full description of all works within Site Notice.		
2460277	Construct a five meter high ball wall with fence enclosure and adjoining astroturf playing area.	12/07/2024	Screened out
2460658	Construct a bridge over the Bauteogue River (Stradbally River) to link up the existing forestry roads (Bridle Paths) and access for the Electric Picnic and access to the rest of my farmland which is within the curtilage of a protected structure, Stradbally Hall, RPS No. 414 and NIAH no 12900432 .	20/08/2025	NIS
2560047	Revise plans of ball wall and astroturf playing area previously granted 24/60277 which consists of the revised layout of the proposed ball wall along with revised layout of adjoining astroturf playing surface	26/03/2025	Screened out
2360116	for the development of a Water Sports Hub comprising of (a) a single storey building with classroom, office, changing rooms/ toilets, kitchenette, drying room, workshop and external storage/ covered areas (b) A wastewater treatment system and percolation area (c) 2no. Equipment storage containers (d) all associated site works including a floating pontoon to River Barrow, paths, parking and boundary treatments.	18/12/2023	AA Screening but concerns raised by DHLGH
23298	the construction of a new 48m long x 24m wide and 12m high straw store and agricultural storage	27/09/2023	Screened out

Application Number	Development Description	Decision Date	Ecological Impact Identified
	shed; Retention of as-built variations to a previous Grant of Planning Permission (P.A. Ref: 19/1078) including: extended gluten free grain store and its associated equipment and prefab grain testing room and all other associated site excavation, infrastructural and site development works above and below ground		
2460637	amend granted permission application ref: 21/643 and subsequent granted permission application ref: 22/342. The proposed minor amendments consist of minor alterations to house types D1 & D2 including a redesign of the internal layout, external elevations and roof arrangement of the houses which occur at 5, 6, 10 & 11 The Avenue, 2, 3, 6 & 7 The Green, 5, 6, 9 & 10 The Links, 7, 8, 10, 11, 16 & 17 The Chase, Millers Hill, Killenard, Co Laois; and all associated site works	17/12/2024	Screened out
21148	commercial building to accommodate two auction rooms, a shop/showrooms, offices toilet block, canteen/coffee shop, restoration workshop and storage area, also to install a septic tank and percolation area , all associated and necessary site works using existing access road and full planning permission for signage	12/08/2021	Screened out
22650	raise existing agricultural land levels with inactive or inert soil/subsoil class D1 material totalling 12080 cubic meters of fill using existing adjusted entrance for use to improve the existing agricultural land use and all associated site works	19/09/2023	Screened out
2360252	erect 8 no. 20m high Floodlights to main pitch, Existing Floodlights to be re-located to southern pitch area, New Astro-Turf area, Wellbeing Seating Area to rear of Clubhouse and to include all associated site works.	24/08/2023	Screened out
2460688	Erect a 24m lattice telecommunications support structure on a 1.2 metre high raised foundation (providing an overall height of 25.2 metres) together with associated antennas and dishes and to remove the existing 15 metre lattice telecommunications structure with antennas (providing an overall height of 16.96 metres). The proposed development is all enclosed within an existing compound	10/01/2025	Screened out

Application Number	Development Description	Decision Date	Ecological Impact Identified
2292	erect 19 No. single storey older peoples & persons with limited mobility housing units consisting of 4 No. blocks or terraced buildings comprising 13 No. one bedroom units & 6 No. two bedroom units. The development also includes the provision of a new access road & pedestrian access leading to a public road and for alterations to adjoining shop access including realignment of footpath along public road at proposed entrance. Also to provide carparking spaces, bin storage enclosure, site lighting and revised site boundary treatments. To connect to council mains, sewage & storm sewers with associated siteworks and for temporary construction compound to remain in situ for a period of 2 years to facilitate construction works	12/12/2022	
2133	construct an astroturf pitch with flood lighting, fencing and all associated site works	19/05/2021	Screened out
2460596	erect a 24m lattice telecommunications support structure on a 1.2 metre high raised foundation (providing an overall height of 25.2 metres) together with associated antennas and dishes and to remove the existing 15 metre lattice telecommunications structure. The proposed development is all enclosed within an existing compound.	03/12/2024	Screened out
24357	for the development of a solar panel array consisting of up to c.94kWp (c.414m2) of solar panels fixed to metal frames and anchored to the ground, cable ducts and all associated works, as revised by Significant Further Information consisting of a Flood Risk Assessment and an Appropriate Assessment with Natura Impact Statement	23/04/2025	NIS
2560237	amend the solar farm permitted under Laois County Council Reg. Ref. 17/532 and consists of a revised solar PV panel arrangement and maximum height of panels up to 3.2 metres; a reconfigured internal access route network; reduced number of MV transformers; provision of string inverters; revised CCTV arrangement; a spare parts storage container; weather stations; monitoring house; toilet facilities; and all other ancillary works associated with the development above and below ground including security fencing and gates, cabling, landscaping and drainage works. It is	16/06/2025	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	sought to increase the maximum export capacity of the solar farm to 80 MW and to increase the operational life of the solar farm from 30 to 40 years from the date of commissioning. A Natura Impact Statement (NIS) will be submitted to the Planning Authority with the application.		
2460012	the development to Emo Court House, a protected structure (RPS 412A), under Part IV of the Planning and Development Act 2000, consists of the conservation of the roof structures and facade fabric as follows: Conservation of the Michael Scott designed roof structure, including reinstatement of the original south elevation, installation of new zinc roof deck closely following the original design, renewal of flat roof structures and the conservation of existing steel windows. Renewal of the natural copper to the 19th-century dome. Reinstatement of original roof pitches and profiles to the east and west wing roofs, along with the renewal of all natural slate and subsidiary roof coverings. Installation of two automatic opening vents to the east wing and central flat roofs. Conservation of facade fabric includes repairs to high-level stonework, including decorative stone cornices, corbelling, friezes and column capital. Installation of a new lead weathering over the parapet and projecting stone cornices. Repair of the semi-circular balustrade over the eastern elevation, along with removal of inappropriate cementitious render and conservation of chimney stacks	08/03/2024	Screened out

Application Number	Development Description	Decision Date	Ecological Impact Identified
2360152	develop as follows: (a) the demolition & removal of 74 no. existing mink farm related buildings including all associated foul & surface water facilities comprising of: -30 number Type A Mink House structures, each of which vary in length between 25.6m & 119.8m & which each measure 3.6m in width & 2.5m in height, providing a total floor space of 12,494 sqm. -24 number Type B Mink House structures, each of which vary in length between 34.8m & 68.9m & which each measure 3.6m in width & 2.5m in height providing a total floor space of 6831.5 sqm -6 number Type C Mink House structures, each of which vary in length between 106.6m & 113.8m & which each measure 4.25m in width & 2.8m in height providing a total floor space of 3415.8 sqm -7 number Type D Mink House structures, each of which vary in length between 108.2m & 120.5m & which each measure 8.3m in width & 3.2m in height providing a total floor space of 7746.2 sqm -4 number Type E Mink House structures, each of which are 120.4m long & which each measure 3.6m in width & 2.6m in height providing a total floor space of 2408 sqm -1 no. staff facilities building providing a floor area of 22.7 sqm -2 no. existing storage buildings providing a total floor area of 118.4 sqm All of these existing buildings contain a total floorspace of 33,036.6 sqm. The demolition element of this development includes the disposal of asbestos from the roof of the existing buildings (hazardous waste No. 17 06 05 of the European Waste Catalogue) (b) the removal of structures ancillary to the mink farm comprising of:	31/01/2024	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	- 1 no 40ft shipping container - 4 no. animal feed silos with an overall capacity of approx. 1008 m3 (c) the modification & re-purposing of 3 no. existing mink farm related buildings comprising of: -An existing 558.6 sqm mink processing facility which will have its roof raised by 3m & be re-purposed for the housing of cattle -An existing 278.3 sqm storage shed which will have its roof raised by 1.2m & be re-clad with fiber cement cladding & be re-purposed for the storage of farm machinery -An existing 1403.2 fridge building & attached loading bay which will have it's existing asbestos cladding removed & be re-clad with fiber cement cladding (d) importation of inert topsoil to restore the original ground level of the site following removal of the aforementioned buildings & all associated site works. Ballymanus House, beside this site comprises entry 604 on the Record of Protected Structures		
22125	deforest lands comprising 8.86 hectares for the conversion to agricultural land	09/06/2022	NIS EcIA no significant effects after mitigation
21643	the proposed development consists of the following: 79 no residential units comprising of : 20 no. 3 bed semi-detached houses, 36 no. 4 bed semi-detached houses, 14 no. 4 bed detached houses, 4 no. 3 bed end terraces, 3 no. 2 bed mid terraces, 2 no. 3 bed bungalows. A new vehicular entrance from the L3171 Killenard Road. A separate pedestrian / cycle access from the L3171 Killenard road. Public realm landscaping including shared public open spaces, public seating, children's play area (200sq m.) and public lighting. Provision of all associated surface water and foul	20/12/2021	NIS

Application Number	Development Description	Decision Date	Ecological Impact Identified
	drainage services and connections ancillary to the development, as well as all associated site development works. A Natura Impact Statement (NIS) accompanies this application		
2430	develop as follows: the subject site comprises part of the walled gardens associated with Stradbally Hall and is bound to the south by an access track, and to the north by the walled gardens associated with Stradbally Hall. The proposed development is located within the curtilage of Stradbally Hall, which is a protected structure (RPS No. 414). The proposed development consists of the following: •Creation of an opening in the southern wall of the walled garden. •Construction of an ESB substation building, with a gross floor area of c. 28 sq.m, and with a height of c. 3 metres. •The substation building will accommodate client and medium voltage switchrooms, and will be clad in stone in keeping with the adjoining existing wall. •All associated and ancillary works.	11/04/2024	Screened out
2460108	construct 5 nr. detached, split-level, dormer dwelling houses (including 4 no. with single-storey, rear returns and side car-ports), a new site entrance and access road off the existing cul-de-sac road to the east off the Killenard Road L3171, the demolition/removal of existing derelict farm buildings, a landscaped pedestrian link from the L3171, proposed new boundaries, landscaping, a shared green area, related and ancillary services and all associated site-works	10/22/2024 12:00:00 AM	Screened out

FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX 3

TLI Construction Methodology

OUTLINE CONSTRUCTION METHODOLOGY

Cappakeel Solar Farm 110 kV

Grid Connection and Substation

Revision:	Author:	Checked:	Approved:	Date:	Notes:
00	BG & TOC	KC	ER	01.12.2025	Issued for Information
01	BG & TOC	KC	ER	19.12.2025	Issued for Information
02	BG & TOC	KC	ER	08.01.2026	Issued for Information
03	BG & TOC	KC	ER	10.03.2026	Issued for Planning
04	BG & TOC	KC	ER	20.03.2026	Issued for Planning

Accreditations:
Background mapping licence: CYAL50510216 © Tailte Éireann – Surveying.

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List of Abbreviations

Abbreviation	Definition
BGL	Below Ground Level
ECC	Earth Continuity Conductor
EIA	Environmental Impact Assessment
ESBN	Electricity Supply Board Networks
GNI	Gas Networks Ireland
HDD	Horizontal Directional Drilling
HV	High Voltage
JB	Joint Bay
UGC	Underground Cable
IPP	Independent Power Producer
OHL	Overhead Line

1 Introduction

1.1 Background

TLI Group ("the Consultant") were engaged by Orsted Onshore Ireland Midco Limited ("the Client") to identify and analyse potential 110kV loop in options available for the Cappakeel Solar Farm Project, which is currently being developed by Orsted ("the Developer") and will connect the Tail-fed Substation into the existing Cushaling – Port Laoise 110kV Overhead line (OHL).

The Consultant was engaged by the Client to identify and analyse potential 110kV grid connection options available for the proposed Cappakeel Solar Farm Substation to the Coolnabacky 110 kV Substation.

Coolnabacky 110 kV is a new substation located to the south-east of Portlaoise at Coolnabacky, designed to accommodate both voltage levels. For the Cappakeel project, this substation will be referred to as Coolnabacky 110 kV Substation.

This project will have an estimated Maximum Export Capacity (MEC) of 170 MW.

1.2 Purpose of this document

The purpose of this document is to outline and explain the construction techniques and methodologies which will be implemented during construction of the 110kV EirGrid standard substation and the loop-in grid connection from the existing Cushaling – Port Laoise 110kV line to the substation, it will also explain the implementation of the Cappakeel Solar Farm grid connection to the Coolnabacky 110 kV Substation.

The 110kV loop-in grid connection will consist of constructing two masts and a new standard EirGrid loop in substation. The Cappakeel Substation will be connected via 2 no. 110kV UGC circuits to the 2 no. mast structures that will intersect with the existing Cushaling – Port Laoise 110kV line. The OHL works will consist of the installation of 2 no. masts and terminating the existing phase conductors on those masts.

The Underground Cable (UGC) grid connection will consist of a single 110kV UGC circuit, which will be installed predominantly within the public road network. The UGC works will consist of the installation of 6 no. ducts in an excavated trench to accommodate 3 no. power cables, 2 no. fibre communications cables and 1 no. earth continuity conductor (ECC). The fibre communications cable will allow communications between the proposed Cappakeel Solar Farm 110kV Substation and the Coolnabacky 110 kV Substation access road.

This document is intended to be used as an aid to understand the methodologies to be employed during construction and should be read in conjunction with all other specialist reports and drawings which accompany the planning application. In addition, this document is in outline form only and will be revised and updated prior to the commencement of any construction activities. Detailed method statements will be prepared in respect of each aspect of the development.

For the purposes of the planning application, this document should be read in conjunction with the Planning and Environmental Report (Chapters Dev. Description / Policy etc, Environmental Impact Assessment (EIA), Traffic and Transport, Noise and Hydrology), Construction and Environmental Management Plan (CEMP), Natura Impact Statement (NIS), Archaeology Report, Landscape and Visual Impact Assessment (LVIA), Glint and Glare and Flood Riak Assessment Report (FRA).

2 Proposed Grid Connection Route Summary

2.1 Loop-in grid connection route summary

The loop-in grid connection route is approximately 348 m in length, as described in Table 1 and showing in Figure 1 below:

Ref	Section Description	Route Length (approx.)
Section 1 Tower 156A – Substation	Installation of one 110 kV Steel Line Cable Interface Mast Type 1493ET with shield wire to be connected as UGC to the Cappakeel Substation.	195 m
Section 2 Tower 157A – Substation	Installation of one 110 kV Steel Line Cable Interface Mast Type 1493ET with shield wire to be connected as UGC to the Cappakeel Substation.	153 m
Total		**348 m**

Table 1: Loop-in Grid Connection Route Section Summary

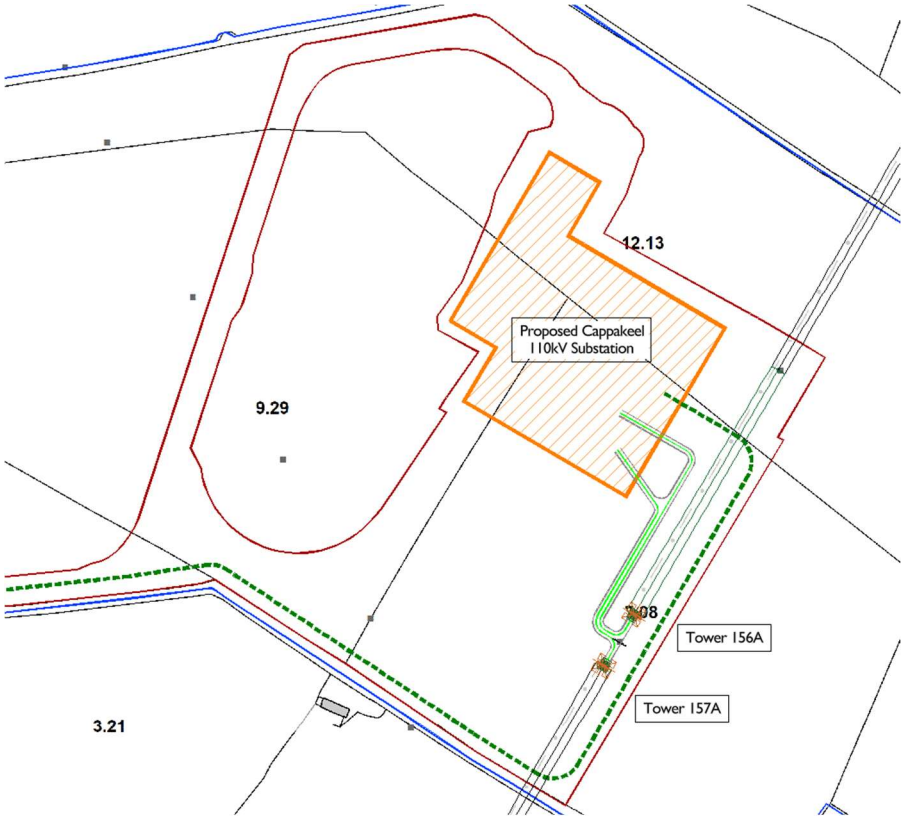


Figure 1: Loop-in Grid Connection Route

2.2 Overall UGC Grid Connection Route

The Grid connection route is approximately 13.7km in length and will travel in a southerly direction from the proposed Cappakeel Solar Farm 110 kV Substation to the Coolnabacky 110 kV Substation access road with most of the Grid connection route situated in the public road network.

The Grid connection route begins by exiting the Cappakeel Solar Farm 110 kV Substation, which is located in Morett, County Laois. The UGC exits through the western boundary of the Cappakeel Solar Farm, travelling northwest for a short distance of 1.2 km through private access track before reaching the L-7815 public road.

The Grid connection route turns south along the L-7815 for approximately 930 m before merging onto the L-3813 local road heading towards the Rock of Dunamase. The cable will traverse approximately 4.3 km onto L-3813 to reach at the at the T-junction with the local road L-7830. Along this section, the UGC route will cross one bridge, two culverts (C1 & C2), two cattle grids, and navigate narrow road sections while running parallel with Uisce Éireann assets. It should be noted that at this point of the route, the UGC passes through a proposed Natural Heritage Area (pNHA).

Continuing along the L-7830 local road for approximately 60 m, it diverts towards the access road located between the Rock of Dunamase and Trinity Holy Church to connect with the L-6831 local road. The UGC will continue along the L-6831 for approximately 1 km until it reaches the junction with the National Road N-80. Here the UGC route under crosses a medium-pressure gas pipeline and Uisce Éireann.

The UGC route then crosses the N-80 national road junction before merging onto the L-6772 then progresses southwest for approximately 2.59 km, until it joins the L-7832 local road and traverses southwest for 480m before joining the R-426 regional road traveling southeast. Along this section the UGC will run parallel with Uisce Éireann follows with narrow road widths, and sharp bends.

The route then continues onto the R-426 for an additional 3.1 km, traversing the R-427 regional road and Uisce Éireann at the junction until it reaches at the start of access road turning towards the Coolnabacky 110 kV substation.

The overall location of the grid connection route, the Cappakeel Solar Farm boundary and Coolnabacky 110 kV Substation location is shown in Figure 2 below.



Figure 2: Map Indicating overall location of Cappakeel Solar Farm and Grid Connection Route

2.3 Grid connection route summary

Table 2 below gives a summary of the grid connection routes location regarding public road network road types and private land ownership.

Description	Route Length
National Roads	0.06 km
Regional Roads	3.1 km
Local Primary Roads	4.3 km
Local Secondary Roads	5.1 km
Total Road Network	**12.56 km**
Private Lands[1] (Access Track)	1.2 km
Total Off Road Network	**1.2 km**
Total Route Length	**13.7 km**

Table 2: Grid Connection Route Summary

2.4 Section-by-section summary

As an aid to understanding, the grid connection route has been broken into four shorter sections as shown in Table 3 below. Each of these route sections is described in further detail in Sections 2.4.1-2.4.4 below. Across all sections of the UGC route, there is 20 no. of 110 kV joint bays required to accommodate the 13.7 km circuit.

Ref	Section Description	Route Length
Section 1	The T-junction of R-426 near Coolnabacky 110 kV Substation access road to the junction of R-426 merging to L-7832.	3.1 km
Section 2	The junction of R-426 with L-7832 to the junction of L-7830 with L-3813.	4.2 km
Section 3	The junction of L-7830 with L-3813 near Rock of Dunamase to the junction of L-3813 with L-7815	4.3 km
Section 4	The junction of L-3813 with L-7815 towards the proposed Cappakeel SF 110 kV Substation	2.1 km
Total		**13.7 km**

Table 3: Grid Connection Route Section Summary

2.4.1 Route Section 1 Summary (Approximate length 3.1 km)

The grid connection route begins following the regional road R-426 for approximately 3.1 km, crossing the R-427 regional road at the junction until it merges onto the L-7832 heading northeast. This section of the route is relatively flat with relatively slow long bends.

Features:

- Joint Bay 1 (JB-01) will be located approximately 25 m from the Coolnabacky 110 kV substation access road. It is proposed that this Joint Bay will be installed within the R-426 regional road.
- Joint Bay 2 (JB-02) will be located approximately 750 m from Joint Bay 1. It is proposed that this Joint Bay will be installed within the R-426 regional road.
- Joint Bay 3 (JB-03) will be located approximately 770 m from Joint Bay 2. It is proposed that this Joint Bay will be installed within the R-426 regional road.
- Joint Bay 4 (JB-04) will be located approximately 760 m from Joint Bay 3. It is proposed that this Joint Bay will be installed within the R-426 regional road.
- Joint Bay 5 (JB-05) will be located approximately 750 m from Joint Bay 4. It is proposed that this Joint Bay will be installed within the R-426 regional road.

[1] Access track within the Cappakeel Solar Farm boundary.

2.4.2 Route Section 2 Summary (Approximate length 4.2 km)

Section 2 for the grid connection route continues along the L-7832 local road and traverses northeast for 480m before joining L-6772 local road. Along this section the UGC will run parallel with Uisce Éireann follows with narrow road widths, and couple of sharp bends until it reaches at the junction with R-426 regional road.

The UGC route then progresses northwest for approximately 2.59 km, until the route crosses the N-80 national road joining the L-6831 local road. Here the UGC route under crosses a medium-pressure gas pipeline and Uisce Éireann services.

The UGC will continue along the L-6831 heading northeast for approximately 1 km until it reaches the Trinity Holy Church, it should be noted that this section of road is narrow. The route then continues north through an access road located between the Rock of Dunamase and Trinity Holy Church for approximately 115 m. The UGC then joins the L-7830 heading northeast for approximately 60m, where it merges onto the L-3813 local road.

Features:

There is 2 no. medium pressure GNI crossings and Uisce Éireann services crossings perpendicularly to the UGC at the N-80 National Road junction. These two-medium pressure GNI pipelines and Uisce Éireann services will be undercrossed within the N-80 National Road. The Uisce Éireann services running parallel for this whole section alongside the grid connection route and the grid route will also under cross Uisce Éireann services at multiple locations on this section. There is one LV UGC on this section of the grid connection route approximately 60 m southeast of the joint bay 6 which will be undercrossed. The grid connection route will cross under this cable as per EirGrid/ESB safety requirements.

- Joint Bay 6 (JB-06) will be located approximately 746 m from joint bay 5. It is proposed that this Joint Bay will be installed within the L-6772 local road.
- Joint Bay 7 (JB-07) will be located approximately 725 m from joint bay 6. It is proposed that this Joint Bay will be installed within the L-6772 local road.
- Joint Bay 8 (JB-08) will be located approximately 717 m from joint bay 7. It is proposed that this Joint Bay will be installed within the L-6772 local road.
- Joint Bay 9 (JB-09) will be located approximately 727 m from joint bay 8. It is proposed that this Joint Bay will be installed within the L-6772 local road.
- Joint Bay 10 (JB-10) will be located approximately 699 m from joint bay 9. It is proposed that this Joint Bay will be installed within the L-6831 local road.
- Joint Bay 11 (JB-11) will be located approximately 688 m from joint bay 10. It is proposed that this Joint Bay will be installed within the L-7830 local road.

2.4.3 Route Section 3 Summary (Approximate length 4.3 km)

This section of the grid connection route follows L-3813 local road. The grid route will be installed within the public road in parallel with other services in the road. The grid connection route will cross 2 Cattle Grids and 2 culverts, and 1 bridge continuing for approximately 4.3 km on the L-3813 until it reaches the T-junction merging onto the L-7815.

Features:

There are 2 culverts (C1, & C2) and 1 bridge encountered on this section of the grid connection route on the L-3813 local road. The crossing method for these culverts is proposed to be an undercrossing in flat formation, and the crossing method for the bridge is proposed to be an open trench. The grid connection route will under cross Uisce Éireann services at multiple locations on this section. The grid connection route will pass through the approximately 150 m stretch of pNHA.

- Joint Bay 12 (JB-12) will be located approximately 705 m from joint bay 11. It is proposed that this Joint Bay will be installed within the L-3813 local road.

- Joint Bay 13 (JB-13) will be located approximately 705 m from joint bay 12. It is proposed that this Joint Bay will be installed within the L-3813 local road.
- Joint Bay 14 (JB-14) will be located approximately 222 m from joint bay 13. It is proposed that this Joint Bay will be installed within the L-3813 local road.
- Joint Bay 15 (JB-15) will be located approximately 720 m from joint bay 14. It is proposed that this Joint Bay will be installed within the L-3813 local road.
- Joint Bay 16 (JB-16) will be located approximately 741 m from joint bay 15. It is proposed that this Joint Bay will be installed within the L-3813 local road.
- Joint Bay 17 (JB-17) will be located approximately 740 m from joint bay 16. It is proposed that this Joint Bay will be installed within the L-3813 local road.

2.4.4 Route Section 4 Summary (Approximate length 2.1 km)

The grid connection route continues along the L-7815 local road heading northeast for approximately 930m where the route will merge onto the access track within the proposed Cappakeel Solar Farm and travels for approximately 1.2 km where it will connect into the proposed Cappakeel 110 kV Substation.

Features:

- Joint Bay 18 (JB-18) will be located approximately 698 m from joint bay 17. It is proposed that this Joint Bay will be installed within the L-7815 local road.
- Joint Bay 19 (JB-19) will be located approximately 680 m from joint bay 18. It is proposed that this Joint Bay will be installed within the L-7815 local road.
- Joint Bay 20 (JB-20) will be located approximately 680 m south of joint bay 19. It is proposed that this Joint Bay will be installed within the Cappakeel 110 kV Substation access road.

3 Preliminary Site Investigation

A Site Investigation (SI) was carried out at the location of the proposed 110 kV substation and loop-in towers. The SI works consisted of trial pits and percolation testing. These investigations were undertaken to establish the ground and groundwater conditions to a depth of approximately 3.0 m BGL, assess the suitability of the site for the disposal of stormwater runoff via soakaways as part of the substation drainage strategy, and provide information for the design of the foundations for the loop-in towers.

A total of 13 No. trial pits and 4 No. percolation tests were completed within the footprint of the proposed substation. The intrusive SI works were conducted on 15 and 16 December 2025.

The Cappakeel Site Investigation Factual Report (300100925-CS-R-10-00) should be read in conjunction with this OCM to support a full understanding of the SI findings.

4 Access Routes to Work Area

Access tracks, combined towers laydown and crane hardstand area (80x30m), and combined pole laydown and crane hardstand area (28x20m) will be utilised for the structure installation and erection on the consented land (if required due to ground conditions and/or landowner requirements) will consist of crushed rock on a geotextile. Upon completion of the works, all access tracks will remain in place for future access to the substation and solar farm grounds. Access routes will be carefully selected to avoid any damage to land. Local consultation will be carried out with the relevant landowners to ensure that any potential disturbance will be minimised. Prior to the commencement of construction, the contractor will assess all access routes and determine specific requirements for each area. Any such requirements will be incorporated into the relevant method statement.



Figure 3: Crushed Rock Roadway build-up with Geotextile



Figure 4: Crane Pad and Laydown Areas

Most of the underground cable route will be installed within the public road network. Where the cable route is located on private lands, contractor(s) will be required to utilise the private access roads, where appropriate as agreed.

A Traffic Management Plan (TMP) will be prepared and agreed with the various stakeholders who have a wayleave agreement along the affected construction area, prior to the commencement of construction. Some work areas will require a road closure where it is not possible to safely implement a Stop/Go system. Where road closures are necessary, a suitable diversion will be implemented using appropriate signage, following consultation with Laois County Council.

Careful and considered local consultation will be carried out, to minimise the amount of disturbance caused during works. Prior to the commencement of construction, the contractor will assess all access routes and determine any

additional access requirements which will be incorporated as part of the method statement. All plant and equipment employed during the works (e.g., diggers, tracked machines, footwear etc.) will be inspected prior to arrival on site and on leaving site and cleaned where necessary to prevent the spread of invasive aquatic / riparian species.

5 Traffic Management

Traffic management and road signage will be in accordance with the Department of Transport: Traffic Signs Manual - Chapter 8: Temporary Traffic Measures and Signs for Road Works and in agreement with Laois County Council. All work on public roads will be subject to the approval of a road opening license application by Laois County Council. The contractor will prepare a detailed traffic management plan for inclusion as part of the road opening applications. Where road widths allow, the UGC installation works will allow for one side of the road to be open to traffic at all times by means of a 'Stop/Go' type traffic management system, where a minimum 2.5m roadway will be maintained at all times.

Where it is not possible to implement a 'Stop/Go' system a full road closure will be required. Temporary traffic signals will be implemented to allow road users safely pass through the works area by channelling them onto the open side of the road. Typically, the UGC will be installed in 150 metres sections, and no more than 100 metres will be excavated without most of the previous section being reinstated. Where the construction requires the crossing of a road, works on one carriageway will be completed before the second carriageway is opened, to maintain traffic flows.

All construction vehicles will be parked within the works area so as not to cause additional obstruction or inconvenience to road users or residents. Any traffic signals required will be in place prior to the works commencing and will remain in place until after the works are completed. The public road will be checked regularly and maintained free of mud and debris. Road sweeping will be carried out as appropriate to ensure construction traffic does not adversely affect the local road condition.

In the event of emergency, steel plates, which will be available on site, can be put in place across the excavation to allow traffic to flow on both sides of the road.

All traffic management measures will comply with those outlined within the accompanying planning and environmental report will be incorporated into a detailed Traffic Management Plan to be prepared, in consultation with Laois County Council prior to the commencement of UGC construction.

6 Road Opening Licence

The UG grid connection works will require a road opening licence under Section 254 of the Planning and Development Act 2000-15 from Laois County Council. A Traffic Management Plan (TMP) will be agreed with Laois County Council prior to the commencement of the development. The TMP will outline the location of traffic management signage, together with the location of any necessary road closures and the routing of appropriate diversions. Where diversions are required, these will be agreed with Laois County Council in advance of the preparation of the TMP.

7 Construction Hours

Standard working hours for construction will be 8:00 - 19:00 Monday to Friday, and 8:00 - 18:00 on Saturday (if required), with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency. If required, all local residents will be notified.

8 Loop-in Masts Construction Methodology

8.1 Existing 110 kV OHL

The proposed Cappakeel Solar Farm 110kV loop-in station will connect into the existing Cushaling – Port Laoise 110kV line. The 2 no. new end masts will be placed either side of existing pole set No.157. Pole set 157 is to be removed

after the installation of the 2 no. new cable interface masts (proposed masts No. 156A and 157A). Pole set No. 156 is to be replaced with larger poles. Presently pole set 156 consists of 2 no. 16m poles. These will need to be replaced with 2 no. 21m poles.

The proposed design for the 110kV Loop-In from the existing OHL will require two new 15m 1493ET mast structures, which will be constructed under the existing Cushaling – Port Laoise 110kV line. The existing OHL conductor will be terminated at these towers connecting to the substation via UGC.

The duration of works for the overhead line construction is expected to be approximately 12 weeks. Construction of foundations for masts circa. 7 days each with time allowing for curing of the concrete, erection of the masts circa 5 days each, weather dependant. Stringing of conductor will be a 2-week process and final connection to the existing grid will be carried out by ESBN and at that point in time commissioning of the substation can start.

8.2 Steel Mast Structures

The proposed mast structure locations have been selected based on ground surveys, ground profiles, sight lines and ruling span checks.

The proposed construction scope will require the relevant personnel, machinery and materials which is as follows:

Equipment	**Materials**
• 5 operatives • 4x4 vehicle • Winch • Tractor and trailer • Crane • Teleporter • Chains / small tools • Tracked Excavator • Tracked Dumper • Sheet Piling Rig	• 2 Cable Interface Masts • Insulators • Electrical connections • Concrete (foundation) • Aggregate

Table 4: Steel Mast Equipment and Materials

The following section outlines the methodology to be followed during construction works of the new mast structures.

1. Mast sites are scanned for underground services such as cables, water pipes etc. Consultation with the landowners will help to identify hazards and ensure there are no unidentified services in the area.
2. For each leg of the 2 No. masts (8 legs in total) a foundation circa. 4.3m x 4.3m x 3m deep is required. To allow for safe construction, the excavation will be stepped back which requires additional area to be excavated, or shutter piles used if ground material is not suitable for benching. The formation levels (depths) will be checked by the onsite engineer. The excavated material will be temporarily stored close to the excavation and excess material will be used as berms along the site access tracks.
3. To aid construction, a concrete pipe is placed into each excavation to allow operatives level the mast at the bottom of the excavation. The frame of the reinforcing bars will be prepared and strapped to a concrete pipe with spacers as required. The reinforcing bars will be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each mast will then be assembled next to the excavation.
4. Concrete trucks will pour concrete directly into each excavation in distinct stages.
5. A final pour for the mast is the encasing of the mast leg which will be finished 300mm over finished ground level. The leg of the mast is required to be shuttered with metal panels to form the required shape.

6. Once the concrete is set after five days the shuttering is removed and if used sheet piles removed.



Figure 5: Typical 110kV mast foundation excavation

7. The Mast foundations will be backfilled one leg at a time with the material already excavated at the location. The backfill will be placed and compacted in layers. All dimensions will be checked following the backfilling process. All surplus excavated material will be removed from the mast locations and stored in berms for reuse across the construction site.



Figure 6: Base of mast structure backfilled

8. Once the base is in place the line will be de-energised by ESB so the remainder of the tower cab be built during the approved outage.
9. An earth mat consisting of copper or aluminium wire will be laid circa 400mm below ground around the mast. This earth mat is a requirement for the electrical connection of the equipment on the mast structure.
10. Once the base section of each mast is completed and the concrete sufficiently cured, it is ready to receive the mast body.
11. A hardstand area for the crane will be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate.
12. A physical barrier (Heras Fence Site Boundary) will be put in place to restrict plant from coming too close to the OHL.
13. The mast will be constructed lying flat on the ground beside the recently installed mast base.
14. The conductor will be moved off centre using a stay wire and weights to anchor the stay wire to ground.
15. The mast section will be lifted into place using the crane and guide ropes.
16. The body sections will be bolted into position.
17. The conductor will be centred over the masts and held in place. Once the conductor is secured at both ends it is then cut and attached onto each mast. The section of conductor in between the two masts will be removed and utilised as connector wire for the new masts.
18. Down dropper conductors (for electrical connections, insulators, surge arrestors), shackles and all associated accessories required for transition from line to cable will be installed on the interface masts.
19. The circuit will be tested in both directions before the line is re-energised.



Figure 7: Cable End Mast

9 Proposed Substation Build Construction Methodology

The Cappakeel Solar Farm 110kV Substation will be constructed to loop-in the existing Cushaling – Port Laoise 110kV line. The substation will be made up of a control building, transformer compound, electrical equipment and a shunt filter. The control building works will consist of foundation works, block work, roofing, low voltage electrical fit out, cladding and building finishing works. The transformer, cable chair and structural steelwork will be installed in the transformer compound. Substation electrical equipment will be installed once the control building and compound is complete. Palisade fencing will be erected around the compound for security/protection and a concrete post and rail fence to mark the substation boundary.

9.1 110 kV Loop-in and Tail-Fed Substation

The proposed construction scope will require the relevant personnel, machinery and materials which is as follows:

Equipment	**Materials**
• Up to 10 Electrical/Civil Crews • Tracked Excavators • 360˚tracked excavators (13 ton normally, 22 ton for rock breaker) • Tracked dumpers / tractors and trailers • Crane • Hoist • Power Tools • Generator • Scaffolding	• Stone • Geotextile • Lighting • Paving. • Fencing • Steel Uprights • Concrete • Timber • Cladding • Doors

The following section outlines the methodology to be followed during construction works of the new 110 kV substation.

1. This new substation will consist of a costumer compound (IPP side) of circa 4,270m^2 and an EirGrid compound of circa 13,480 m^2 surrounded by a 2.6m high palisade fence.
2. A level compound area will be created using cut and fill methods.
3. The substation compound and drainage will be marked out by a qualified engineer.
4. A drainage system will be excavated and installed around the compound area.
5. Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material will be stored separately and temporarily on adjacent berms for later use during reinstatement works.
6. A layer of geotextile material will be laid over the footprint of the compound.
7. Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface.
8. Each layer will be compacted using a vibrating roller.
9. Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase.
10. The construction of a substation compound circa 17,750m², comprising of approx. 437.5m² single storey 110kV substation control building, a 403.5m² IPP building and associated outdoor electrical equipment, including 1 no. 110kV transformer, associated internal access track, 2.6m high station perimeter fencing and concrete post and rail property boundary fence will be built.

11. Adequate lighting will be installed around the compound on the lighting masts.
12. Lightning protection masts of approximate height 18m will be installed to protect the station from direct lightning strikes.
13. The electrical installation is expected to take 16 weeks and includes the following:
    - Delivery and installation of 33/110kV transformer. The deliveries will be managed in accordance with regulations governing the movement of large loads.
    - Delivery and installation of all other HV equipment.
    - Wiring and cabling of HV/LV equipment, protection, and control cabinets.
    - Commissioning of all newly installed equipment.



Figure 8: Typical 110kV Electrical Infrastructure



Figure 9: Typical 110kV Transformer Connection

10 UGC Construction Methodology

The UGC for the loop-in connection will consist of 2 No. trenches with a minimum of 2.3m separation distance between each circuit. Each circuit will consist of 3 no. 160 mm diameter HDPE power cable ducts, 2 no. 125 mm diameter HDPE communications duct and 1 no. 125 mm Earth Continuity Conductor duct to be installed in an excavated trench between the proposed solar farm substation and existing Cushaling – Port Laoise 110kV line.

The UGC grid to Coolnabacky 110 kV Substation will consist of 3 no. 160 mm diameter HDPE power cable ducts, 2 no. 125 mm diameter HDPE communications duct and a 125 mm Earth Continuity Conductor duct to be installed in

an excavated trench between the proposed solar farm substation and the Coolnabacky 110 kV Substation access road.

The standard trench is 825 mm wide, 1315 mm deep, with variations in this design to adapt to service crossings and watercourse crossings, etc., where applicable. The power cable ducts will accommodate one power cable per duct. The communications duct will accommodate a fibre cable to allow communications between the substations. The ducts will be installed, the trench reinstated in accordance with the private third-party landowners and Laois County Council specifications. Once all are satisfied, then the electrical cabling/fibre cable is pulled through the installed ducts in up to approximately 220 to 780 m sections. Construction method statements and templates will be implemented to ensure that the UGC is installed in accordance with the correct requirements, materials, and specifications of EirGrid.

10.1 Trenching Methodology

The following section outlines the methodology to be followed during trenching works:

- The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning and environmental report and as required by planning conditions where relevant.
- All existing underground services along the Grid connection route shall be confirmed prior to the commencement of construction works.
- At watercourse crossings, the contractor will be required to adhere to the environmental control measures outlined within the planning and environmental report, the detailed Construction Environmental Management Plan (CEMP) and best practice construction methodologies.
- Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with EirGrid and Uisce Éireann specifications.
- If culverts require removal for ducting installation, a suitable method of damming the water source and pumping the water around the work area will be set out in a method statement and agreed with the relevant stakeholders. Once the ducts are installed the culvert will be reinstated to match existing levels and dimensions. If works of this nature are required, the contractor will liaise with Inland Fisheries Ireland (IFI) in advance of works.
- Traffic management measures will be implemented in accordance with those included in the planning and environmental report, and a detailed Traffic Management Plan will be prepared and agreed with the local authority.
- Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2 m in height. Stockpiles will be located a minimum of 50 m from surface water features and all stockpiling locations will be subject to approval by the site manager and project Ecological Clerk of Works (ECoW).
- Excavated material shall be employed to backfill the trench where appropriate and any surplus material will be transported to the on-site borrow pit.
- Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement.
- The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.
- Where required, grass will be reinstated by either seeding or by replacing with grass turves.
- No more than a 100-metre section of trench will be opened at any one time. The second 100-metre section will only be excavated once most of the reinstatement has been completed on the first section.

- The excavation, installation and reinstatement process will take on average of two days to complete a 100-metre section.
- Where the cable is being installed in a roadway, temporary reinstatement may be provided to allow larger sections of road to be permanently reinstated together.
- Following the installation of ducting, pulling the cable will take approximately one day between each joint bay. The jointing of cables will take approximately 1 week per joint bay location.



Figure 10: Typical 110 kV Underground Duct Installation

10.2 Ducting Installation Methodology

For the trenching and ducting works the following step-by-step methodology will apply:

1. Grade, smooth and trim trench floor when the required 1315 mm depth and 825 mm width have been obtained.
2. Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.
3. Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers/templates as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.
4. Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.
5. Place cable protection strips on compacted CBGM B directly over the ducts.
6. Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.
7. Carefully surround and cover ducts with CBGM B material in accordance with the drawings and thoroughly compact without damaging ducts.
8. Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.
9. Place and thoroughly compact CBGM B material or Clause 804 backfill, or soil backfill as specified and place warning tape at the depth shown on the drawings.
10. For concrete and asphalt/bitmac road sections, carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with local authorities (Figure 11).

11. For unsurfaced/grass sections, backfill with suitable excavated material to ground level leaving at least 100 mm topsoil or match existing level at the top to allow for seeding or replace turves as per the specification of the local authority or landowner (Figure 12).
12. Clean and test the ducts in accordance with the specification by pulling through a brush and mandrel. Install 12 mm polypropylene draw rope in each duct and seal all ducts using robust duct end seals fitted with rope attachment eyes in preparation for cable installation later. All the works should be witnessed by ESBN Clerk of Works (CoW) as required.

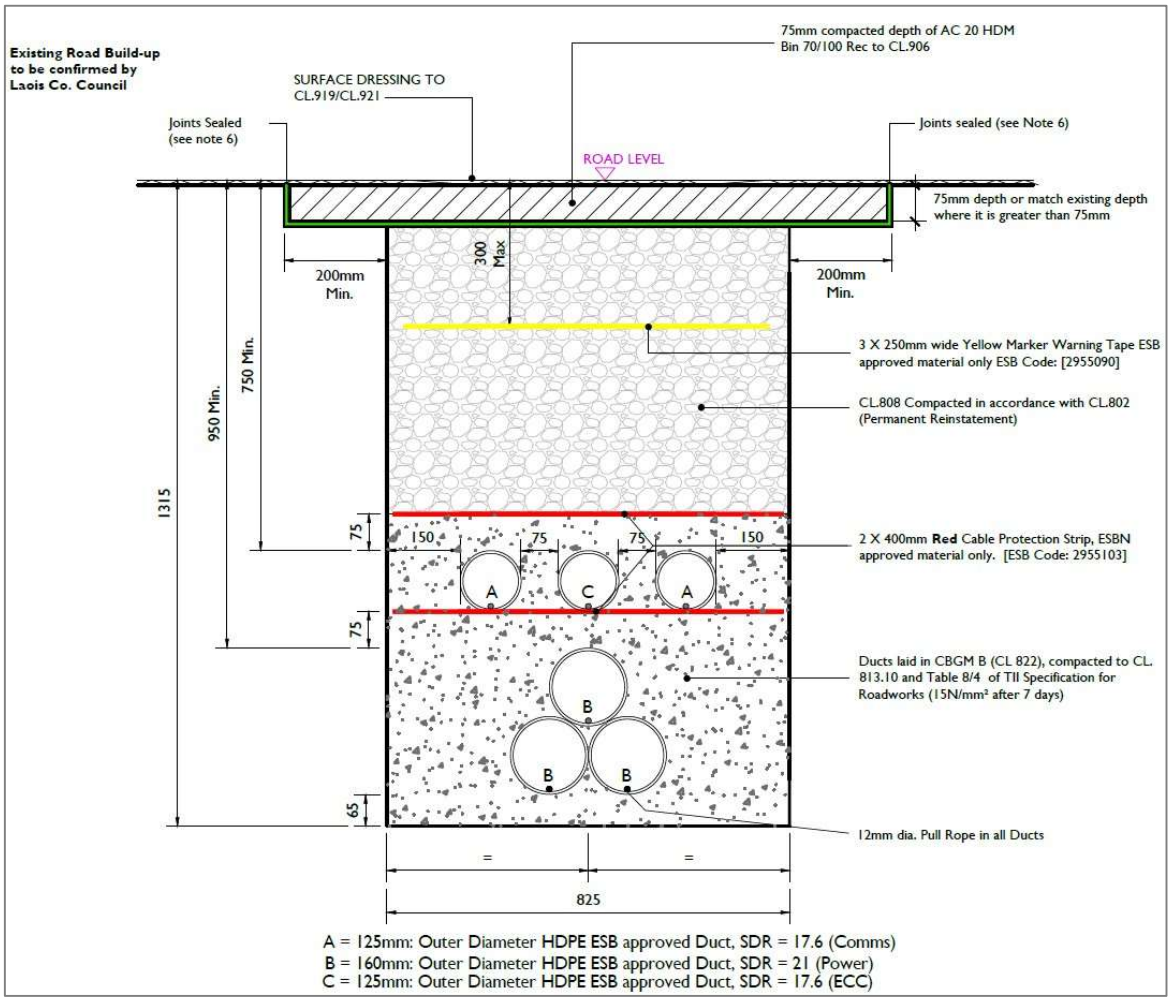


Figure 11: Typical Trench in Roadway

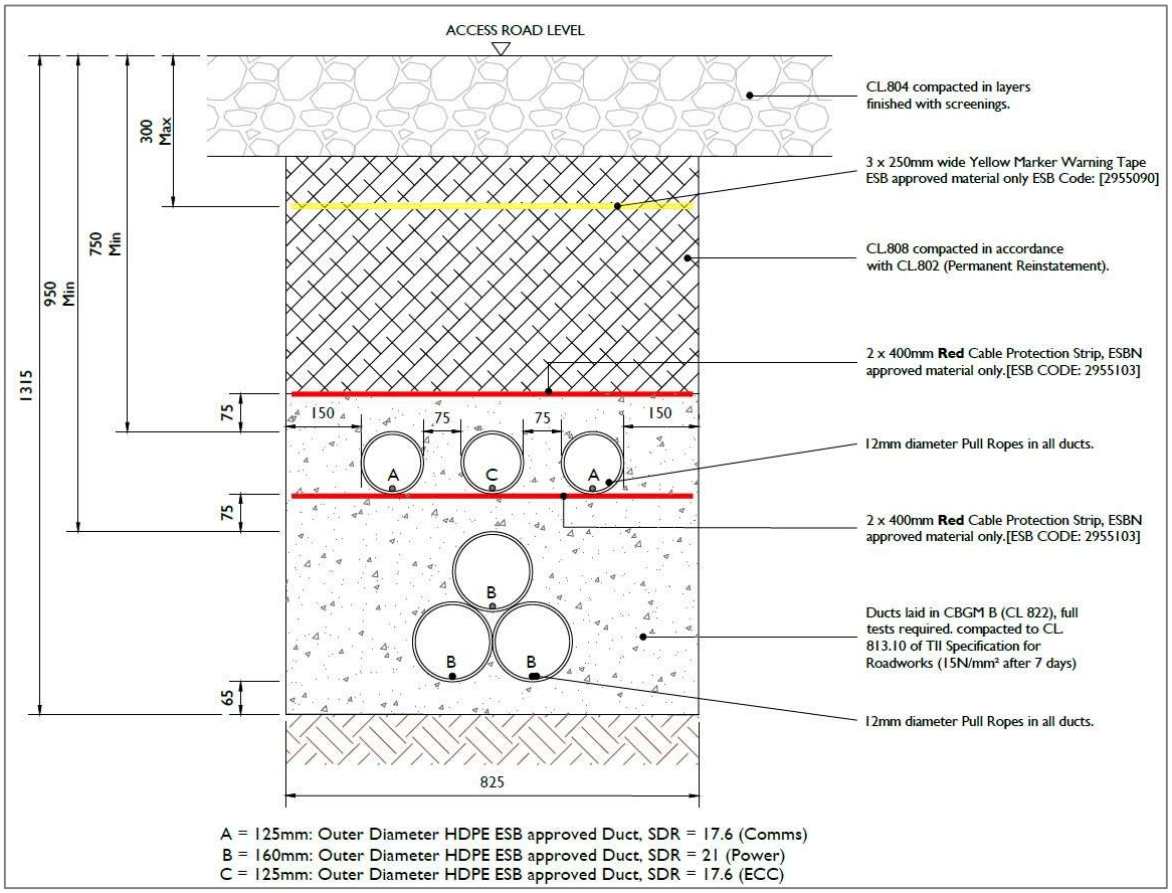


Figure 12: Typical Trench in Off -Road Section

10.3 UGC Installation on Private Land

Where the cable is to be laid in previously green-field areas, the exact location of the cable trench will depend on several factors such as width of track, bends along the track and crossings. Where the existing tracks need to be widened, stone will be brought in to build up the area to the same level of the existing track. The excess material from the track will be used elsewhere on reinstatement works or removed from site and disposed of at a licenced facility.

On existing private roads or access tracks, the cable trench will be installed in the non-trafficked strip between the wheel marks. The cable will be micro-sited based on the presence of exiting utilities and the nature of the road and the adjoining terrain.

10.4 Cable Pulling

Once the ducting is installed the electrical cables (situated on a drum) are pulled through the ducting by a specialised mechanical winch. The winch will also monitor the tension on the cables being pulled so as not to damage the cables. A guide rope is installed with the ducting to assist in the cable pulling process. The guide rope also is used for proving the ducts by attaching a mandrel, a sponge or brush, for cleaning the duct installed. Cable lubricant is applied to the outside of the cables being pulled through the duct. The lubricant assists in the pulling process by removing friction between the cable and the rollers. This not only speeds up the process but also prevents snagging and therefore damage to the cable.

10.5 Marker Posts

Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraints such as existing services, to indicate the precise location of the UGC. These markers will be metallic plates in accordance with ESBN and EirGrid standards.

Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions. Corrosion proof aluminium triangular danger sign, with 700 mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker post shall also be placed in the event that burial depth is not to standard. Siting of marker posts to be dictated by ESBN as part of the detailed design process (Figure 13).

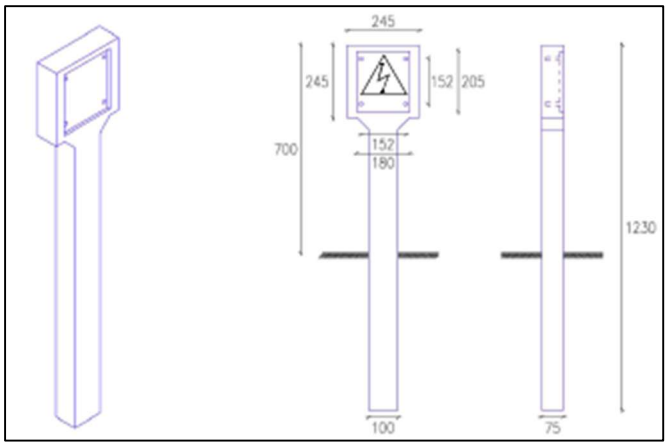


Figure 13: Typical ESB Marker Post Example

10.6 Managing Excess Material from Trench

All excavated material will be temporarily stored adjacent to the trench prior to re-use in the trench reinstatement (where applicable). Stockpiles will be restricted to less than 2 m in height. Where excess material exists, it may be used in the reinstatement of the borrow pit as part of the proposed 110 kV substation. Excavated tar from the public road network will be transported off site by an appropriately authorised waste collector and disposed of at an appropriately licenced waste facility.

10.7 Storage of Plant and Machinery

All plant, machinery and equipment will be stored on site within the UGC works area or within the temporary construction compound to be located nearby to the proposed Solar Farm substation. Oils and fuels will be stored in an appropriately bunded area within the temporary construction compounds.

Joints bays are to be installed with various separation distances approximately between every 220 m – 780 m along the grid connection route to facilitate the jointing of two lengths of underground cables. Joint bays are typically 2.6 m x 6 m x 1.75 m pre-cast concrete structures installed below finished ground level (Figure 14). Where possible joint bays will be in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this will not always be possible.

In association with joint bays, communication chambers are required at every joint bay location to facilitate communication links between the proposed 110 kV solar farm substation and the existing 110 kV node at Coolnabacky 110 kV Substation. Earth sheath link chambers are also required at every joint bay along the cable route. Earth sheath links are used for earthing and bonding cable sheaths of underground power cables, so that the circulating currents and induced voltages are eliminated or reduced. Earth sheath link chambers and communication chambers are located in proximity to joint bays. Earth sheath link chambers and communication chambers will typically be pre-cast concrete structures with an access cover at finished surface level.

The precise siting of all joint bays, earth sheath link chambers, and communication chambers is subject to approval by EirGrid. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions. The marker posts will consist of a corrosion-proof aluminium triangular danger sign, with a 750 mm base, and with a centred lightning symbol, on engineering grade fluorescent yellow background. They will be installed inadequately sized concrete foundations and will also be placed where the cable has not been buried to the standard depth, due to existing road conditions. Drawings of the joint bays and communication chambers are included within this planning package.

Equipment:

- 360° tracked excavator (wheeled excavator where required)
- 1 no. tracked dumper or tractor and trailer

Materials:

- Sand for pipe bedding
- Ready-mix Concrete where necessary (delivered to site)
- Trench backfilling material (excavated material and aggregates) to relevant specifications
- Precast Chamber Units / Construction materials for chambers
- Cable ducting

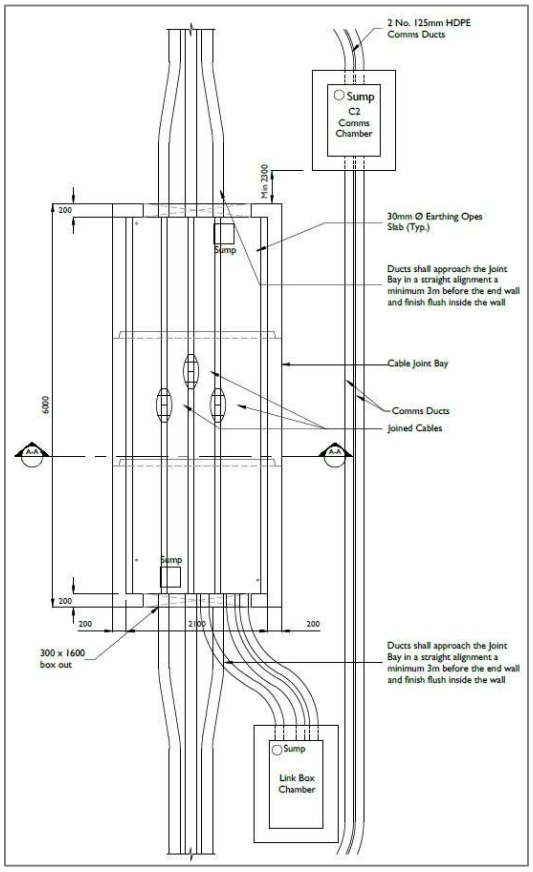


Figure 14: Typical Joint Bay and Link Box Plan Layout

10.9 Joint Bay Construction and Cable Installation

Before starting construction, the area around the edge of the joint bay which will be used by heavy vehicles will be surfaced with a geo-composite cover (Terram® or similar) if required and stone aggregate to minimise ground damage. Any roadside drains within the temporary works area will be culverted and check dams made from stone or geo-composite covered sandbags will be inserted upstream and downstream of these culverts to intercept any solids generated during the insertion or which wash out during the works. If the ground slopes from the working area toward a watercourse or if there is evidence of solids washing off the works area toward nearby watercourses or drains, a silt fence with straw bales, will be interposed between the works area and the watercourse.

All excavated material will be stored near the excavations and reused for reinstatement works. Any soil required for reinstatement that will be temporarily stockpiled on site will be placed at least 15 m back from the nearest watercourse on level ground and will be ringed at the base by silt fencing and be regularly monitored by a designated competent person for signs of solids escape. In which case an additional line of silt fencing with straw bales will be added in line with the relevant environmental control measures.

If the joint bay needs to be dewatered, this will be pumped to a percolation area if the soil is not saturated, otherwise a settlement tank will be used to remove any solids from the dewatering process to comply with the environmental control measures.

The risk of concrete reaching surface waters is considered very low given that all concrete will be poured into the pit excavated for the joint bay so that spills will be contained. The basic requirement therefore is that all pouring operations be constantly supervised to prevent accidental spillages occurring outside the pit.

Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g. using sandbags and geotextile sheeting or silt fencing to contain any solids in run-off.

The following steps outline the methodology for joint bay construction and reinstatement:

1. The contractor will excavate a pit for joint bay construction, including for a sump in one corner.
2. Grade and smooth floor; then lay a 75 mm depth of blinding concrete (for in situ construction) or 50 mm thick sand (for pre-cast concrete construction) on 200 mm thick Clause 804 granular material.
3. In situ construction. Construct 200 mm thick reinforced concrete floor slab with sump and starter bars placed for walls as detailed on the drawings.
4. In situ construction. Construct 200 mm thick reinforced concrete sidewalls as detailed on the drawings. (Figure 15)



Figure 15: Typical Joint Bay under Construction (In Situ)

5. In situ construction. Remove formwork and backfill with suitable backfill material in grassed areas or Clause 804 material once ducting has been placed in the bay. Backfill externally with granular material to local authority/Transport Infrastructure Ireland (TII) Specification for Roadworks. (Figure 16)



Figure 16: Completed Joint Bay prior to Cable Installation (In-Situ)

6. Pre-cast concrete construction. Place pre-cast concrete sections on sand bedding. (Figure 17)



Figure 17: Typical Joint Bay under Construction (Pre-Cast)

7. Where joint bays are located under the road surface the joint bay will be backfilled with compacted layers of Clause 804 and the road surface temporarily reinstated as specified by the local authority.
8. Precast concrete covers may be used as temporary reinstatement of joint bays at off road locations. These covers are placed over the constructed joint bay and are then removed at the cable installation stage of the project.
9. Later, to facilitate cable installation and jointing, reinstate traffic management signage, secure individual sites, re-excavate three consecutive joint bays and store excavated material for reuse.
10. The cable is supplied in pre-ordered lengths on large cable drums (Figure 18). Installing “one section” of cable normally involves pulling three individual conductors into three separate ducts. The cable pulling winch must be set at a predetermined cut off pulling tension as specified by the designer. The cable will be connected to the winch rope using approved suitably sized and rated cable pulling stocking and swivel or the pulling head fitted by the cable manufacturer. A sponge may also be secured to the winch rope to disperse lubricant through the duct. Lubrication is also applied to the cable in the joint bay before it enters the duct.



Figure 18: HV Cable Pulling Procedure (Typical Drum Setup)

11. Once the two sections of cable (total of 6 conductors) are pulled into the joint bay, a jointing container is positioned over the joint bay and the cable jointing procedure is carried out in this controlled environment. (Figure 19)



Figure 19: HV Cable Jointing Container

12. Following the completion of jointing and duct sealing works in the joint bay, place and thoroughly compact cement-bound sand in approximately 200 mm layers to the level of the cable joint base to provide vertical support. Install additional layers of cement-bound sand and compact each layer until the cement-bound sand is level with the top of the joint. Install an additional 100 mm cement-bound sand layer. Install cable protection strip. Backfill with cement-bound sand to a depth of 250 mm below surface and carry out permanent reinstatement including placement of warning tape at 400 mm depth below finished surface.

Equipment:

- 2-3 General Operatives
- 1 Excavator Operator
- 360° tracked excavator (13-ton normal operations, 22-ton for rock breaking applications)
- 1 no. tracked dumper or tractor and trailer

Materials:

- Sand for pipe bedding
- Blinding Concrete where necessary
- Clause 804 Material
- 160 mm diameter HDPE ducting
- 125 mm diameter HDPE ducting
- Precast Chamber Units / Relevant construction materials for chambers
- Earth Sheath Link Box

10.10 Major Watercourse Crossing

Where the cable route intersects with existing watercourses, a detailed construction method statement will be prepared by the contractor prior to the commencement of construction and is to be approved by the Local Authority and relevant environmental agencies. Crossing existing culverts will be implemented using either an undercrossing or an overcrossing, depending on the depth of the watercourse. The culvert crossing methods are detailed in Figure 20 and Figure 21 below.

Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled ‘Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites’, and these guidelines will be adhered to during the construction of the development.

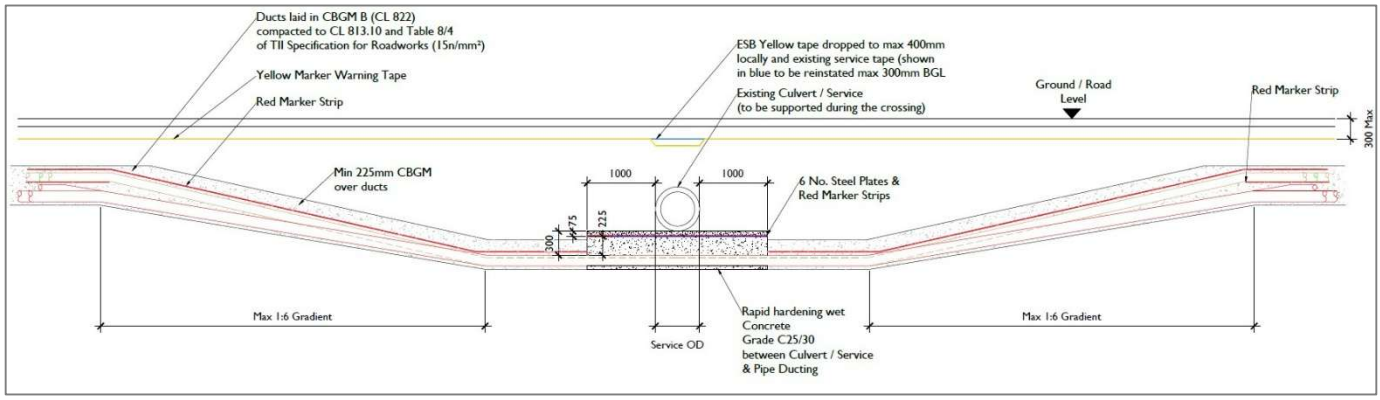


Figure 20: 110 kV UGC Culvert/Service Undercrossing

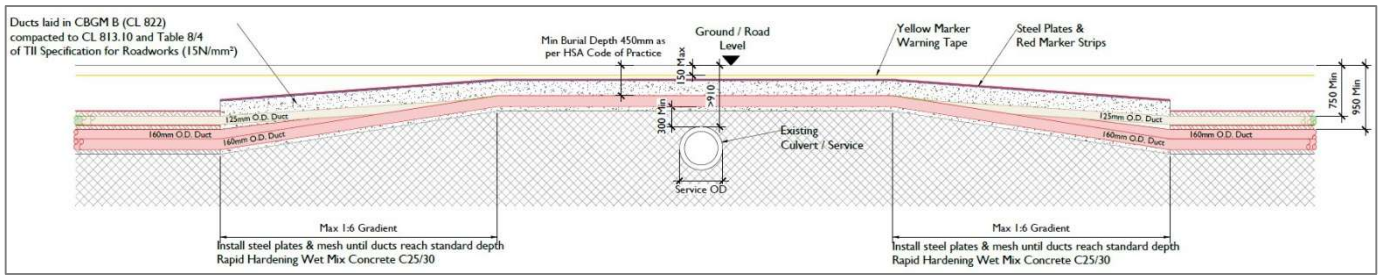


Figure 21: 110 kV UGC Culvert/Service Overcrossing

10.10.1 Bridge 1 Overcrossing – Open Trench Installation

ITM Coordinates: Eastings – 653458.0289, Northings – 701493.2993

This bridge is located between JB-16 & JB-17, along the L-3813 local road approx. 50m southeast of Cattle Grid 1.

In order to accommodate the installation of the UGC trench, the road will need to be raised by approx. 0.11m. It should be noted that due to the raised roadway in this section, the bridge walls will also need to be raised proportional to the road level through the installation of handrails. All works will need to comply with local county council & TII specifications.

In raising the road by approx. 0.11m, this will enable the ducting to be installed at a minimum of 0.45m below the road surface in line with EirGrid specification XDC-CBL-STND-H-006 Sheet 002 Rev 00. This raised road detail is indicatively shown in drawing 300100925-DR-515 which will needed to be viewed in conjunction with this OCM.



Figure 22: Bridge 1 - East Elevation View

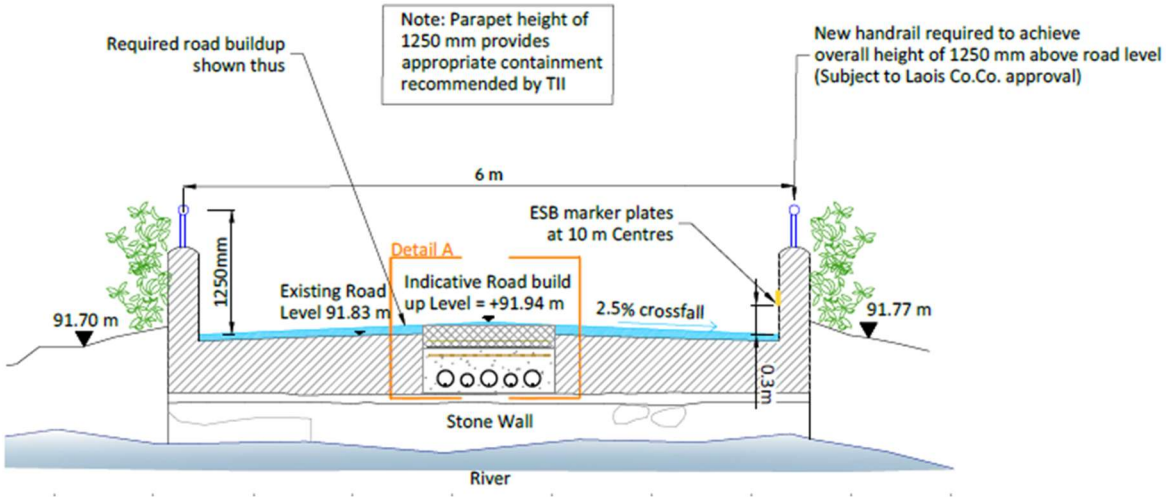


Figure 23: Bridge 1 – Indicative Raised Road Open Trenching detail

10.10.2 Culvert 1 Undercrossing – Open Trenching

ITM Coordinates: Eastings – 653505.7679, Northings – 701923.8520

The undercrossing of this concrete pipe is located between JB-17 & JB-18, along the L-3813 local road approx. 40m northeast of Cattle Grid 2. The culvert will remain in place (where possible) and the ducting will be installed below the culvert to provide minimum separation distances in accordance with EirGrid specifications as mentioned in section 10.1. Refer to Figure 20 for the required culvert undercrossing specification.



Figure 24: Culvert 1 - Concrete Pipe under the L-3813



Figure 25: Culvert 1 - Pipe running across the Road

10.10.3 Culvert 2 Undercrossing – Open Trenching

ITM Coordinates: Eastings – 653671.0769, Northings – 702079.9106

The undercrossing of this precast culvert is located between JB-17 & JB-18, along the L-3813 local road approx. 245m northeast of Culvert 2. The culvert will remain in place (where possible) and the ducting will be installed below the culvert to provide minimum separation distances in accordance with EirGrid specifications as mentioned in section 10.1. Refer to Figure 20 for the required culvert undercrossing specification.



Figure 26: Culvert 2 – Precast culvert under the L-3813



Figure 27: Culvert 2 – Overgrown under the road View

10.11 Watercourse Damming and Reinstatement Methodology

If sections of trenching and ducting would involve instream works at culvert crossing locations in order to install cabling. To facilitate the works, these watercourses will be dammed, and the water diverted over or around the works using either a flume pipe or a diversion channel. Following the completion of works at the watercourse, the dam will be removed, and the watercourse reinstated. These works would require pre-planning engagement with Inland Fisheries Ireland to agree environmental controls required.

Duration: 1-2 Days per location

Personnel, Machinery & Equipment:

- 2-3 operatives
- Wheeled dumper or track dumper (6 to 8 tons)
- 360° tracked excavator
- Materials:
- Pipe culvert
- Box culvert
- Cable ducting and trenching backfill
- Sandbags
- Water pump
- Geotextile membrane
- Straw bales

10.11.1 Standard Methods – Dam & Flume Work

1. The flume pipe(s) will be set out on the bed of the existing stream.
2. A dam will be constructed using sandbags and suitable clay material around the flume pipe(s) and across the stream so that all the flows are diverted through the pipe(s).
3. Silt traps, such as geotextile membrane, straw bales etc. will be placed downstream of the in-stream trenching location prior to construction, to minimise silt loss.
4. The ducting installation works will be carried out in the dry stream bed and under/around the flume pipe(s). If required, a temporary sump will be established and used to collect any additional water. This water will be removed by pumping to a percolation area if the soil is not saturated, otherwise a settlement tank will be used to remove any solids from the de-watering.

10.11.2 Standard Methods – Dam & Divert Work

1. A suitable channel for the stream will be excavated adjacent to the original channel. Bedding stone will be placed on the bed of the new channel.
2. A dam will be constructed using sandbags and suitable clay material across the stream so that the flow is diverted down the new channel.
3. Silt traps, such as geotextile membrane, straw bales etc. will be placed downstream of the in-river trenching location prior to construction, to minimise silt loss.
4. The trench will be excavated in the dry stream bed. If required, a temporary sump will be established and used to collect any additional water. This water will be removed by pumping to a percolation area if the soil is not saturated, otherwise a settlement tank will be used to remove any solids from the de-watering.

10.11.3 Standard Methods – Reinstatement of the Watercourse at Dam and Flume Locations

1. Following the completion of works, the stream bed will be reinstated with original or similar material and the spawning gravels replaced under the supervision of an aquatic ecologist.
2. Once the stream bed is appropriately re-instating the dam and the flume pipe(s) will be removed thus restoring the stream to its original condition.

10.11.4 Standard Methods – Reinstatement of the Watercourse at Dam and Divert Locations

1. Following the installation of the cable ducts, the stream bed will be reinstated with original or similar material and the spawning gravels replaced under the supervision of an aquatic ecologist.
2. Once the stream bed is appropriately reinstated, the dam will be removed thus restoring the stream to its original alignment.
3. The temporary channel will then be reinstated with the previously excavated material.

Given the length of both route options presented in this report, there is a high likelihood of encountering a significant number of culverts along the route. Of these culverts found during previous surveys, many appear to be either concrete pipe, HDPE twin wall pipe or stone construction, most of which are on the public road. Where there is insufficient cover over the culvert, it will be necessary to trench under the culvert. It should be again noted that the EirGrid preferred method of crossing third party services/culverts is undercrossing. For stone culverts there is a high probability that the culvert would collapse sending stream water into the trench. To avoid this occurring, stone culverts with insufficient cover will be identified and replaced prior to trenching works. The following approach will be taken:

1. Works will be supervised by the ECoW and / or the project aquatic ecologist who will liaise with IFI and National Parks and Wildlife Service (NPWS) prior to works commencing. The ECoW will also monitor surface water quality downstream of the works in accordance with the surface water monitoring programme and will have the authority to cease any works should the monitoring identify unacceptable water quality conditions.
2. Any works within watercourses that are subject to fish habitat (indicated in the planning and environmental report at least of “Medium” sensitivity), will be avoided between Oct 1st and April 30th as per IFI and Loughs Agency guidelines.
3. All plant and equipment will be serviced and cleaned before entry to site to limit risk of oil spillage and for biosecurity.
4. Where temporary fluming or flow diversion are in situ, in a watercourse frequented by salmon or trout, (at least medium sensitivity) all fish within the designated area will be subject to fish rescue and translocation downstream by a fisheries biologist. Fish rescue will be conducted under Section 14 authorisation (DCCAE/ IFI) or Section 69 authorisation (Loughs Agency) where appropriate.
5. Works will be carried out in dry weather with low flows in the streams with forecast for dry weather for the duration of the works – approximately 2 days.
6. Machinery used will stay on the public road; machinery will not be permitted to enter the stream channel.
7. The road edge adjacent to the watercourse will be lined with sandbags and silt fences (multiple fences recommended) as appropriate to prevent runoff from the trenching works reaching the stream. The design of these multiple features shall also allow for the safe removal of accumulated silt away from the channel, particularly through staged removal of the most contaminated upper fence before the lower ones, and the removal of the final fence only when it is clear of any silt.
8. Clean sandbags will be used to dam flows on the upstream side of the culvert. Sandbags will be placed by hand at a suitable location to take advantage of any natural pool but set back from the works to permit unhindered excavation of the existing culvert.
9. A second sandbag dam will be placed on the downstream side of the culvert to prevent backflow into the works and contain any groundwater seepage that is likely to be turbid.
10. Sandbagging requires careful attention to detail if it is to be effective. All bags must be laid neck uppermost and seams aligned. Bags must not be overfilled, or they will not tamp together or will burst with ease. Additional bags will be filled ready to raise freeboard of dams.
11. Flume placement for temporary flow diversion or permanent replacement of culverts will follow guidelines issued by IFI and CIRIA to ensure that fish passage is not impeded.
12. If topography permits, the water will be piped over the road by gravity flow, otherwise, it will be pumped. Discharge will be via break tank or similar approved storage onto a splash-plate or riprap (gabion basket) to dissipate energy and avoid scour or erosion of the stream bend or banks. The pump will be filled with a screen, so fish aren’t drawn into the pump intake.
13. The use of pump sumps will be considered within the dammed area. These will be lined to prevent scouring. The intention is to intercept clean groundwater ingress and pump it out rather than allowing it to get silted in the works area by segregating off areas.

14. Any spoil generated will be removed to designated safe area clear of the flood plain. Some of this spoil will be saturated and will require bunding and sheeting over.
15. If bank material needs to be removed, it will be stored separately and reinstated according.
16. The ducting will be advanced passed the culvert and the existing culvert will be excavated 'in the dry' and a new culvert, sized for a 100-year rainstorm event, will be installed with appropriate gradient, headworks, and outfall. A precast concrete culvert, concrete pipe or HPDE pipe will be used. Culverts will be embedded to at least 300mm below the existing stream bed to ensure backwatering. Culverts will avoid a significant change in gradient (i.e., >3%). After embedding, replacement culverts will be filled with clean washed gravels and cobbles to replace lost habitat and facilitate fish movement.
17. Dry stone headworks will be placed at the culvert intake and discharge and the stream bed adjacent to the works will be reinstated at the direction of the project aquatic ecologist.
18. The ECoW will determine the quality of any water trapped between the two dams – visual inspection and turbidity meter. If this water is clean, it will be left in situ. If it is not clean, it will be removed from the works area prior to removal of the dams. If required, dewatering of the works area prior to dam removal will be undertaken by pumping from the stream bed to either a) the cable trench for percolation or b) taken back to the wind farm site for treatment at an existing settlement pond or c) treatment using a mobile water treatment system such as Siltbuster® or similar. The most efficient method will depend on the volume of water present and the available percolation.
19. The upstream dam will then be removed to permit flow though the new culvert. This will be done in phases, so a large volume of water isn't released at once. The downstream dam will be removed in a similar manner.

11 Design and Construction & Environmental Management

Prior to commencement of construction works the contractor will draw up detailed Method Statements which will be informed by this Outline Construction Methodology, measures proposed within the CEMP, and the guidance documents and measures listed below. These method statement will be adhered to by the contractors and will be overseen by the Project Manager, Environmental Manager and ECoW where relevant.

The following documents will contribute to the preparation of the method statements in addition to those measures proposed below:

- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin,
- National Roads Authority (2008) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. National Roads Authority, Dublin;
- E. Murnane, A. Heap and A. Swain. (2006) Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA;
- E. Murnane et al., (2006) Control of water pollution from linear construction projects. Site guide (C649). CIRIA.
- Murphy, D. (2004) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin;
- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532);
- Enterprise Ireland (unknown). Best Practice Guide (BPGCS005) Oil storage guidelines;
- Law, C. and D'Aleo, S. (2016) Environmental good practice on site pocket book. (C762) 4th edition. CIRIA;
- CIRIA Environmental Good Practice on Site (fourth edition) (C741) 2015.
- The proposed works will be carried out by employing accepted good work practices during construction, and environmental management measures such as those discussed below. Please note that the following measures will be supplemented by further specific environmental protection measures that will be included in method statements prepared for specific tasks during the works and will form part of the detailed CEMP.
- All materials shall be stored at the temporary compound within the wind farm sites and transported to the works zone immediately prior to construction;
- Where drains and watercourses are crossed with underground cables, the release of sediment will be prevented through the implementation of best practice construction methodologies.
- Weather conditions will be considered when planning construction activities to minimise risk of run off from site;
- Provision of 50 m exclusion zones and barriers (silt fences) between any excavated material and any surface water features to prevent sediment washing into the receiving water environment;
- If dewatering is required as part of the proposed works e.g. in trenches for underground cabling or in wet areas, water must be treated prior to discharge;
- The contractor shall ensure that silt fences are regularly inspected and maintained during the construction phase;
- If very wet ground must be accessed during the construction process bog mats/aluminium panel tracks will be used to enable access to these areas by machinery. However, works will be scheduled to minimise access requirements during winter months;
- The contractor shall ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, and the Contractor is required to prepare a contingency plan for before and after such events;

- The contractor will carry out visual examinations of local watercourses from the proposed works during the construction phase to ensure that sediment is not above baseline conditions. In the unlikely event of water quality concerns, the Environmental Manager and ECoW will be consulted;
- Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows.
- Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures.
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off site. Adequate stocks of absorbent materials, such as sand or commercially available spill kits shall be available;
- Concrete or potential concrete contaminated water run-off will not be allowed to enter any watercourses. Any pouring of concrete (delivered to site ready mixed) will only be carried out in dry weather. Washout of concrete trucks shall be strictly confined to a designated and controlled wash-out area within the solar farm sites; remote from watercourses, drainage channels and other surface water features;
- Entry by plant equipment, machinery, vehicles and construction personnel into watercourses or wet drainage ditches shall not be permitted. All routes used for construction traffic shall be protected against migration of soil or wastewater into watercourses;
- Cabins, containers, workshops, plant, materials storage and storage tanks shall not be located near any surface water channels and will be located beyond the 50 m hydrological buffer at all times.

12 Relocation of Existing Services

In order to facilitate the installation of the proposed UGC, it may be necessary to relocate existing underground services such as water mains, telecoms or existing cables. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.

12.1 Underground Cables

If existing underground cables are found be present, a trench will be excavated, and new ducting and cabling will be installed along the new alignment and connected to the network on either end. The trench will be backfilled with suitable material to the required specification. Warning strip and marking tape will be laid at various depths over the cables as required. Marker posts and plates will be installed at surface level to identify the new alignment of the underground cable, with the underground cables will then be re-energised.

12.2 Gas Networks

Consultation with Gas Networks Ireland (GNI) must take place before starting works where gas pipes are present. Gas Networks Ireland will advise on the safety measures required and will arrange for the exact location of the gas pipe to be marked out on site. The works will be carried out in accordance with the safety working practices and utility standards to be outlined by GNI.

12.3 Water Mains

Uisce Eireann will need to be consulted and advised on details of the project and associated technical information with as much available information as possible. Early engagement between Uisce Eireann and the developer will be carried out on the project regarding any infrastructure which may be located near their assets with the intention of identifying as early as possible, to determine if bespoke design measures or diversions are necessary.

13 Reinstatement of Private Land

Once all construction works are complete, the work areas will be reinstated with excavated soil and either seeded out with native species, allowed to re-vegetate naturally or reinstated with excavated grass turves and will be restored to their original condition. This work will be carried out in consultation with the landowner and in line with any relevant measures outlined in the planning application, CEMP and planning conditions.

14 Emergency Response Plan

All site personnel will be inducted in the provisions of the Emergency Response Plan. The following outlines some of the information, on the types of emergencies, which must be communicated to site staff (list not exhaustive):

- Release of hazardous substance - Fuel or oil spill
- Concrete spill or release of concrete
- Flood event – extreme rainfall event
- Environmental buffers and exclusion zones breach
- Housekeeping of materials and waste storage areas breach
- Stop Works order due to environmental issue or concern

The Emergency Response Plan must be completed by the appointed contractor before the project begins.

15 Invasive Species Best Practice Measures

Invasive species can be introduced into a location by contaminated plant, machinery and equipment which were previously used in locations that contained invasive species. Good site organisation and hygiene management shall be maintained always on site, and best practice measures will be implemented, as follows:

- The contractor will prepare an Invasive Species Action Plan to be implemented during construction, and all personnel will be made aware of the requirements contained within;
    - Plant and machinery will be inspected upon arrival and departure from site and cleaned/washed as necessary to prevent the spread of invasive aquatic/ riparian species such as Japanese knotweed Fallopia japonica and Himalayan Balsam Impatiens glandulifera. A sign off sheet will be maintained by the contractor to confirm the implementation of measures:
- Site hygiene signage will be erected in relation to the management of non-native invasive material.

16 Waste Management

All waste products (general waste, plastic, timber, etc.) arising during the construction phase will be managed and disposed of in accordance with the provisions of the Waste Management Act 1996 and associated amendments and regulations, and a Waste Management Plan will be prepared by the contractor prior to the commencement of construction. All waste material will be disposed of at a fully licensed facility.

17 Archaeology

The following are the mitigation measures which will be carried out during construction where required:

- If required a project archaeologist will be appointed to oversee the project.
- Demarcation of protective buffer zones around cultural heritage sites where there is a potential for disturbance during the construction phase and inclusion of the same in site induction.

18 Programme

Estimates for the duration of the construction works are included in the table below. Please note that some of the elements are likely to happen concurrently.

Table 3: Estimated Construction Duration (Activities Run Concurrently)	
Development Element	**Estimated Construction Duration**
Construct 110kV Substation	14 months
Overhead Line Structures	3 months
Underground Cable	6 months
Cable Testing and Commissioning	6 weeks
Connection to Existing OHL and Commissioning	3 months
Total	18 Months

Table 5: Estimated Construction Duration

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