

Construction Environmental Management Plan

Proposed 110kV Substation and Underground Grid Connection at Grangeford, Co. Carlow

**On behalf of
Prt Solar Limited**



Form ES - 04



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Proposed 110kV Substation and Underground Grid Connection,
Grangeford, Co. Carlow
Prt Solar Limited

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1 INTRODUCTION

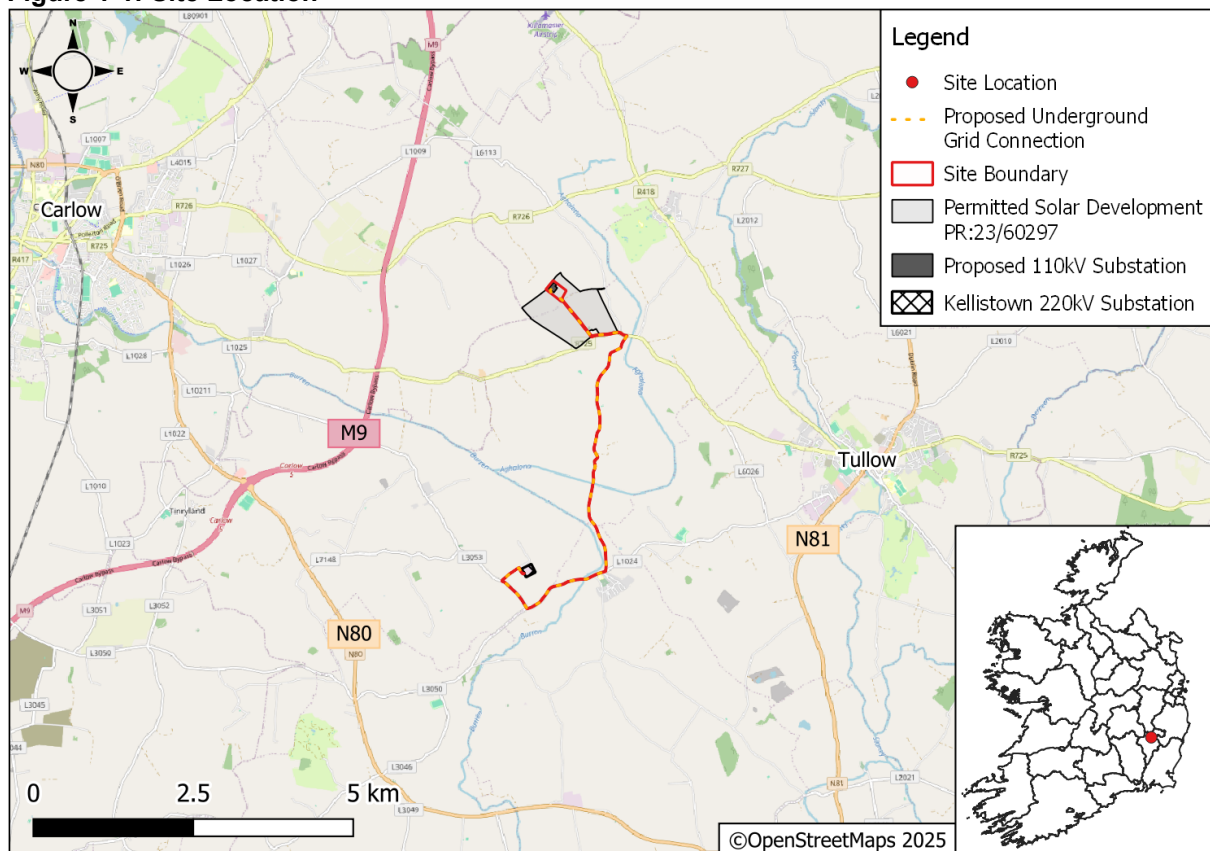
Malone O'Regan Environmental ('MOR Environmental') was commissioned by Prt Solar Ltd. ('the Applicant') to prepare a Preliminary Construction Environmental Management Plan ('pCEMP') in respect of the construction phase of a proposed 110kV substation ('henceforth referred to as the 110kV Substation') and associated 110kV underground cable ('henceforth referred to as the UGC') connecting the proposed to the existing ESB 220kV Kellistown Substation and all associated works ('henceforth referred to as the Proposed Development').

The proposed 110kV Substation will be located on a Site that is ca. 1.7 hectares ('ha') in size and located in the townlands of Grangeford Old and Friarstown, Co. Carlow (OS ITM Reference 076106 336077) as outlined in Figure 1-1 ('the Site').

The proposed 110kV UGC will be ca. 8km in length, primarily along public roads, and will traverse through the townlands of Friarstown, Grangeford Old, Grangeford, Moanalow, Glenoge, Rathnashannagh, Inchisland Or Moatalusha, Rathtoe, Kellistown East, Ballycurragh and Kellistown West.

The Proposed Development will form a major new strategic connection node to the national grid within County Carlow. The Proposed Development will transmit power from the permitted Grangeford Solar Farm (Planning Ref: 23/60297; which amended previous permission Reg. Ref: 21/23 and ABP-309987-21) (henceforth referred to as the 'Permitted Solar Development') via an UGC, which will connect into the existing ESB Kellistown 220kV substation located circa ('ca.') 3.4km (direct distance) southwest of the Permitted Solar Development.

Figure 1-1: Site Location



1.1 Background

The Proposed Development will be critical infrastructure that will be intrinsically linked to both permitted and planned renewable energy projects, comprising both solar and battery energy storage developments. Details of these projects are described below. These renewable energy projects will not be able to function as standalone developments as they will be reliant on connections to the Proposed Development in order to connect to the national grid.

It is anticipated that, subject to obtaining consent for the Proposed Development, the proposed 110kV substation will be developed in lieu of a previously permitted 38kV substation granted by Carlow County Council (Planning Ref: 2360297). The Proposed Development will connect the Permitted Solar Development to the national grid. It is envisioned that the Proposed Development will be constructed in conjunction with the Permitted Solar Development as part of one development (henceforth known as the 'Overall Development'). Please refer to Figure 1-2.

Carlow County Council Planning Reg: 21/23 (ABP Ref No. 309987-21) – Granted

10 Year permission for development consisting of the construction of a Solar PV development comprising photovoltaic panels laid out in arrays over a total development site area will be ca. 65.6 ha, the construction of a 38kV substation (ca 114.4m² x 4.75 tall) a transformer unit (ca. 18m² x 4m tall) and associated bund (ca. 55m²), along with ancillary development including; 24 no. Power Hubs (ca. 15.25m² x 2.4m) which incorporate an inverter and a transformer, 1 no. single storey communications building (11.1m² x 2.5m), 1 no. single storey client side sub-station building (15.25m² x 2.9m), 1 no. single storey equipment storage building (7.5m² x 2.7m), 10 no. CCTV cameras mounted on 4m high poles, perimeter security fencing, site access, site egress and all ancillary works.

A Notification to Refuse Permission was issued by Carlow County Council on the 23rd March 2021 due to a limitation on MW's outputs stipulated in their Development Plan at that time. A first party appeal was submitted to An Bord Pleanála on 17th May 2021. Planning was granted by An Bord Pleanála (ABP Ref: 309987-21) on the 26th October 2021.

This planning permission was superseded by Planning Ref: 23/60297 below.

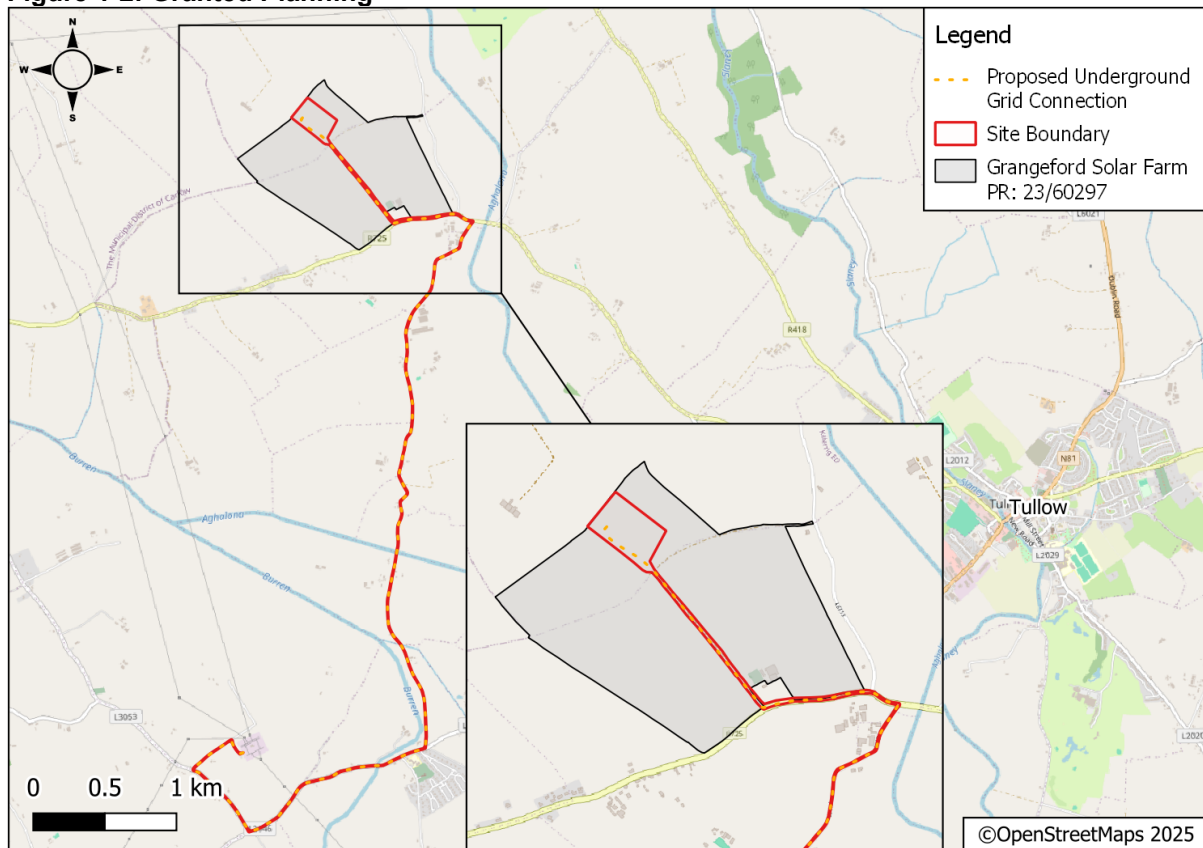
Carlow County Council Planning Reg: 23/60297– Granted

10-year permission. The development will consist of the construction of (i) a Solar PV development comprising photovoltaic panels laid out in arrays over a total development site area of ca. 91.2ha, (ii) the construction of a 38kV substation building ((6.1m (h) x 20.9 (l) and 7.3 (w)) and associated compound area, a transformer unit (ca. 6m x ca. 3.6m) and associated bund, (iii) 352 number Battery Energy Storage System units comprising 22 modules (ca. 21.9m x ca.5.2m) each with 16 number cabinet units within each module and (iv) all ancillary development including 15 number transformer integrated units (ca. 10.5m x ca.2.7m), 12 number inverter units (ca. 6.0m x ca.2.4m), 7 number CCTV cameras mounted on 4m high poles, a 3m high acoustic barrier, with berm and fencing, perimeter security fencing, site access, site egress and all ancillary works and services. The development will have a 40-year operational lifetime.

This planning permission superseded the previously permitted solar development (Planning Ref: 21/23; ABP Ref No. 309987-21). Carlow County Council granted the Permitted Solar Development on the 24th September 2024.

Figure 1-2 illustrates the Permitted Solar Development permission boundary and the Proposed Development boundary.

Figure 1-2: Granted Planning



1.2 Objectives of the pCEMP

The key objective of this pCEMP is to ensure that all potential Construction Phase environmental impacts will be addressed in accordance with current legislative requirements and best practice guidelines. It will assist in the control of environmental risks that may arise during construction to ensure that these works do not result in an environmental incident, environmental damage, or undue nuisance.

This document contains an assessment of the likely risks on-site, it outlines procedures for monitoring the effectiveness of the environmental protection measures and for the dissemination of information to all relevant personnel during the construction programme. In assessing the risks to the environment on and adjacent to the Site, full cognisance has been taken of:

- CIRIA C811 – Environmental Good Practice on Site (5th edition) [1];
- CIRIA C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [2];
- CIRIA C753 - The Sustainable urban Drainage Systems ('SuDS') manual [3];
- Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes [4];
- Guidance for the Treatment of Bats Prior to the Construction of National Road Schemes [5];
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads [6];

- Requirements for the Protection of Fisheries Habitat during Construction and Development” [7];
- BS 5228-1 + A1:2014: Code of Practice for noise and vibration control on construction and open sites- Part 1: Noise [8] and Part 2 Vibration [9]; and,
- Guidance for Invasive non-native species [10].

The objective of this pCEMP is:

- Provide a method of documenting compliance with the Environmental Commitments / Environmental Management Requirements / Best Practice Guidelines;
- Ensure compliance with current legislation;
- Effectively minimise any potential adverse environmental effects during construction, including how site-specific method statements will be developed to avoid, minimise, and mitigate construction effects on the environment; and,
- Communicate key environmental obligations that apply to all contractor organisations, their sub-contractors and employees while carrying out any form of construction activity.

This pCEMP will be used by the appointed contractor to prepare an updated and comprehensive CEMP prior to the commencement of any on-site works, it should be used as a working document. If required by the conditions of the grant of planning permission, the updated plan will be approved by the Planning Authority in advance of any works commencing on-site. The approved plan will be implemented for the duration of the construction works to protect the receiving environment from potential impacts arising during the construction works.

The Project Manager will be responsible for ensuring that this document reflects the status of the project. Any reviews of the document will be carried out in consultation with those affected by the changes. The adopted construction stage CEMP should be considered by the appointed contractor as a ‘living’ document, with reviews being undertaken at predetermined intervals and data added as appropriate. The measures identified in the CEMP should be:

- Viewed as mandatory and common practice on-site; and,
- Embedded within the construction company’s policies and site procedures, e.g., within an existing environmental management system framework.

2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

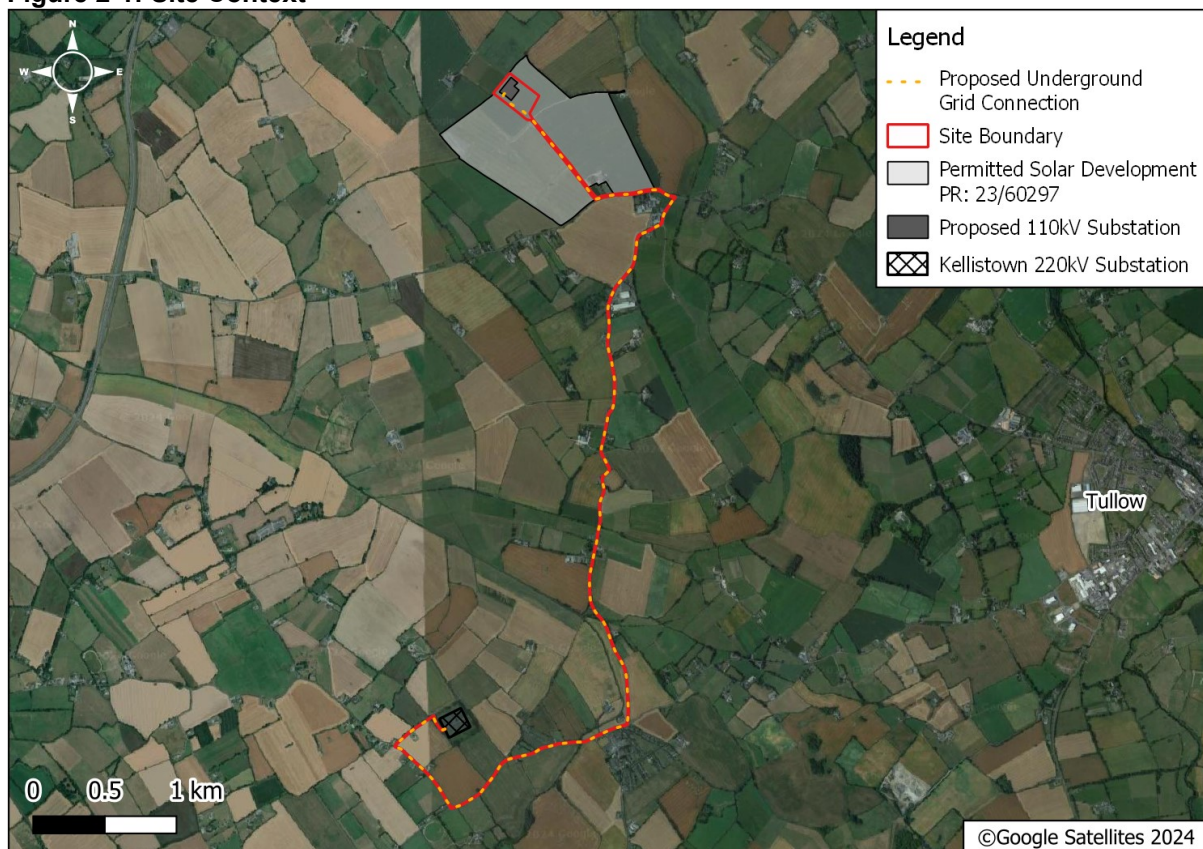
2.1 Site Description and Context

The Site is located within a predominately rural landscape within the townlands of Friarstown Grangeford Old, Grangeford, Moanalow, Glenoge, Rathnashannagh, Inchisland, Rathtoe, Ballycurragh, Kellistown West and Kellistown East, Co. Carlow. The Site is surrounded by agricultural grassland, with scattered residential properties and farmyards. The Killerig Golf Club is located ca. 1km northeast of the Site at the closest point. Refer to Figure 1-3.

The Site is 1.7ha in size, located in predominantly agricultural land, which at the time of writing this report is under arable crop with hedgerow / treeline forming the northern perimeter of the Site. The Site is accessed via the R725 and the L6113.

The proposed 110kV UGC will be situated along existing internal access tracks / agricultural land, with the majority located within existing public road infrastructure, both regional and local, before connecting to the existing ESB 220kV Kellistown Substation.

Figure 2-1: Site Context



2.2 Hydrological Features

2.2.1 Watercourses within the Vicinity of the Site

The Site is situated within the Barrow WFD Catchment [Catchment_ID: 14] and the Barrow_SC_090 subcatchment [Subcatchment_ID: 14_13] [11].

There are no open watercourses within the proposed 110kV substation site. However, as per EPA maps there are six hydrological features of note within close proximity to the Site and three watercourses will be crossed via the UGC route, as outlined below and illustrated in Figure 3-3 and Figure 3-4.

1. The Ardnehue River.

The Ardnehue River is located ca. 560m to the west / southwest of the Site at its closest point. This river flows in a south-westerly direction, draining into the Burren 14 River, ca. 3.2km downstream of the Site. The Burren 14 flows in a west / northwesterly direction, eventually discharging into the River Barrow, ca. 11.6km downstream of the Site. The River Barrow forms part of the River Barrow and River Nore SAC.

2. Grangeford Old Stream

According to the EPA maps, the Grangeford Old Stream is located ca. 230m southwest of the Site and joins the Ardnehue River (described above). However, this watercourse **was not identified** as part of the site inspection completed in May 2024.

The absence of this watercourse remains consistent with the findings of the previous site surveys completed in 2021 and 2023 as part of the previously permitted planning applications (21/23; ABP Ref No. 309987-21 and 23/60297). This portion of the Site is noted as being 'benefited land' that was drained as part of the Drainage District and has been infilled.

3. The Baunogenasraid Stream

The Baunogenasraid Stream runs parallel to the proposed UGC for ca. 200m and then flows in a southwesterly direction. The Baunogenasraid Stream discharges into the Burren River ca 2.8km downstream.

4. The Aghalona River

The Aghalona River will be crossed by the proposed UGC via Horizontal Directional Drilling ('HDD') under the existing bridge / culvert. This river flows in a southwesterly direction before discharging into the Burren River ca. 2.5km northwest of the Site.

5. The Roscat River

The Roscat River flows in a westerly direction and discharges into the Burren River ca.165m west of the proposed UGC route. This River will be crossed by the proposed UGC via HDD under the existing bridge along the road infrastructure.

6. The Burren 14 River ('Burren River')

The Burren River flows in a northwesterly direction and discharges into the River Barrow 11.6km downstream of the Site. The proposed UGC will cross the Burren River via HDD under the existing bridge. The River Barrow forms part of the River Barrow and River Nore SAC.

Water Quality Status and Risk

Under the Water Framework Directive ('WFD') 2000/60/EC, the Environmental Protection Agency ('EPA') classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [11]. According to the river waterbody WFD 2016-2021 [11], the water quality status and risk for the above-mentioned watercourses is as follows:

- The Ardnehue River has a '*moderate*' water quality status and is considered to be '*not at risk*';
- The Grangeford Old Stream has a '*good*' water quality status and is classified as '*not at risk*';
- The Baunogenasraid Stream has a '*good*' water quality status and is classified as '*not at risk*';
- The Aghalona River has a '*moderate*' water quality status and is classified as '*at risk*';
- The Roscat River is classified as '*moderate*' and '*under review*'; and,
- The Burren River has a '*moderate*' water quality status and is deemed '*not at risk*' along the section of river into which the Ardnehue and Aghalona rivers drain.

Approximately 3.5km downstream, the Burren River is considered to be ‘*at risk*’ of not achieving a ‘*high*’ water quality status even though its water quality remains ‘*moderate*’;

The location of the key surface water features in the vicinity of the Site are illustrated in Figure 2-2 and 2-3 below.

Figure 2-2: Watercourses in the vicinity of the Proposed Substation

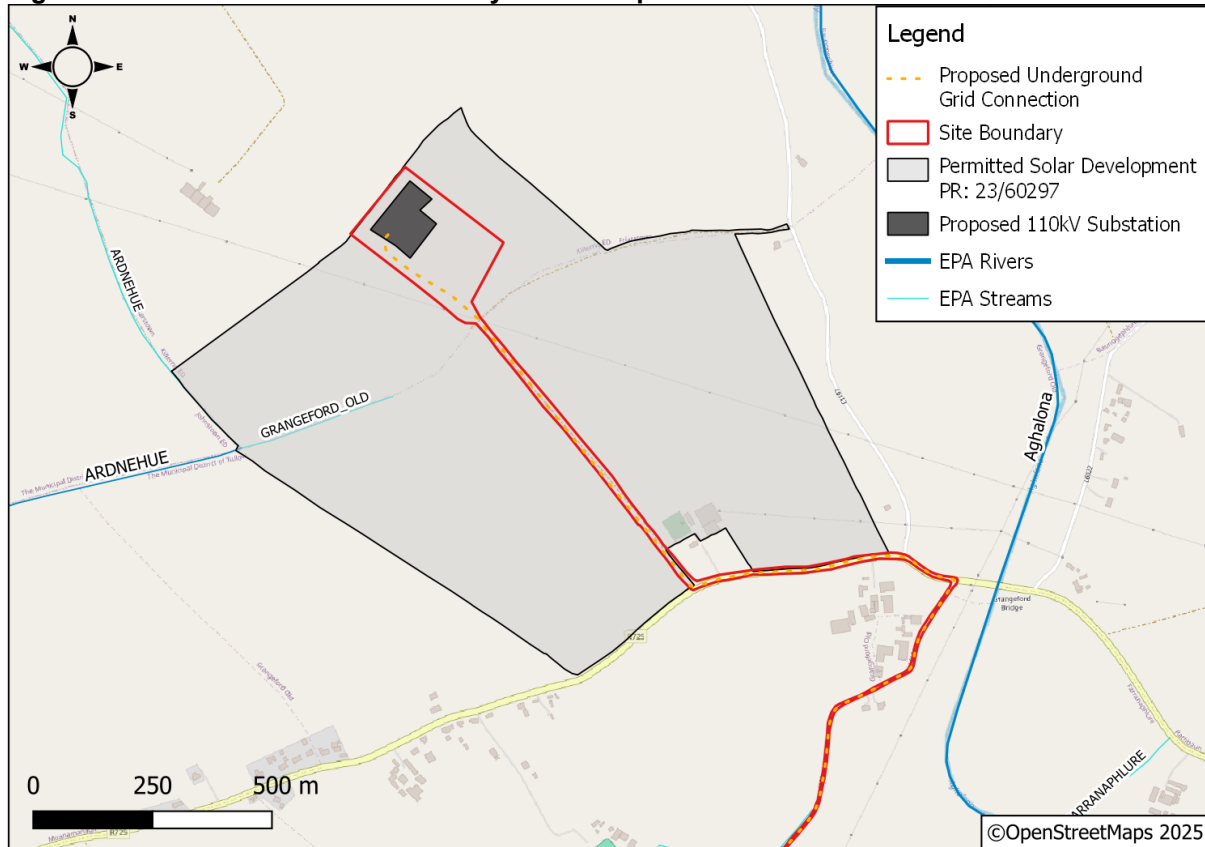


Figure 2-3: Watercourses in the vicinity to the Proposed Grid Connection



2.2.2 OPW Flood Maps

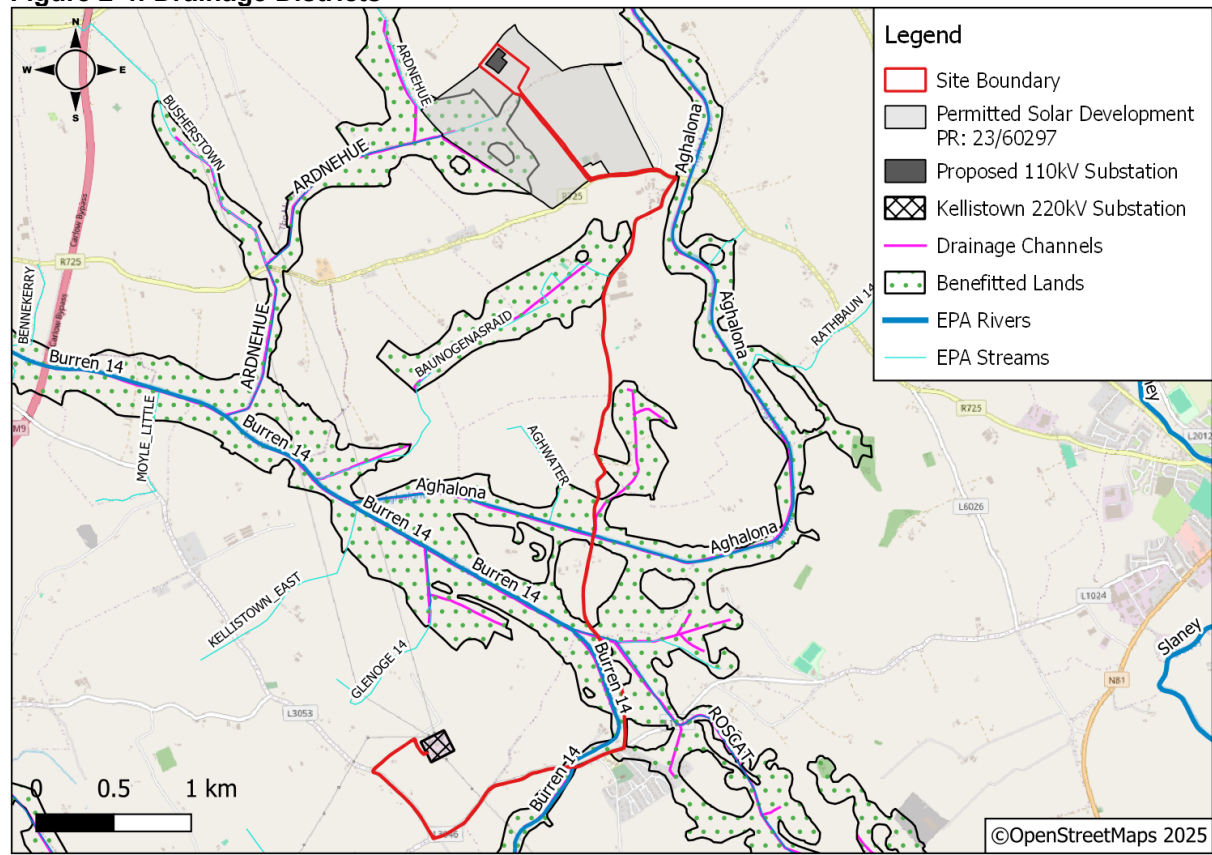
The Office of Public Works ('OPW') Flood Maps identifies Drainage Districts, Arterial Drainage Schemes and Benefitted Areas. Arterial Drainage Schemes were works that were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. The Benefitted land identifies land that was drained as part of the Drainage District with the aim to improve land for agriculture and to mitigate flooding.

The Site does not form part of the Benefitted Lands Scheme; see Figure 2-4. However, a section of land within the western portion of the Permitted Solar Development, directly adjacent to the Site Boundary, forms part of the Benefitted Lands Scheme. Additionally, a drainage ditch channel was also identified within the Permitted Solar Development under the Barrow Drainage District Scheme. The drainage ditch channel is located predominantly along the western perimeter of the Permitted Solar Development, ca. 100m at its closest point from the Proposed Development.

2.2.3 Drainage Ditch Network

A number of drainage ditches were noted within the vicinity of the Site, located adjacent to hedgerow / treelines along sections of the Permitted Solar Development perimeter. No drainage ditches were noted traversing the Site. The surveys undertaken at the Site in 2020, 2023 and 2024 confirmed that these ditches were not hydrologically connected to any EPA watercourse. See Figure 2-4. Such drainage regimes are typical features of agricultural lands as they facilitate drainage from the fields during periods of heavy rainfall to reduce flooding.

Figure 2-4: Drainage Districts



2.3 The Proposed Development

2.3.1 110kV Substation

The proposed 110kV electrical substation in Friarstown, on a site of ca.1.7ha will consist of:

- 1 no. electrical substation compound and access road, palisade fencing and gates, measuring 100.75m x 126.75m;
- 1 no. electrical substation / IPP control building measuring 10.74m x 20.15m and 6.920m in height;
- 1 no. Eirgrid switch room building measuring 18m x 25m and 8.55m in height;
- 6 no. lightning protection monopoles measuring up to 18m in height;
- Associated electrical apparatus, plant and equipment; overhead and underground electrical and communications cabling and ancillary works;
- Upgrading of existing access road;
- Temporary site construction compound; and
- All associated ancillary works above and below ground including landscaping.

The Substation is designed to the latest Eirgrid Standard, comprising a 110kV AIS 2 Bay Station extendable to 4 Bay and 8 Bay configuration. Eirgrid recommends this design as it facilitates future expansion and improving the overall availability of renewable energy on the grid. This design optimises resources in the initial substation development and reduces the downtime and impact on the grid over its lifecycle, thus facilitating future grid connections and improving the effectiveness of the substation. This substation design will improve the availability of customer renewable energy connections on the system and enhance the

integration of renewable sources, thus supporting the industry's collective goal of a sustainable energy future

This 110kV substation will be designed to connect the Permitted Development to the national grid. The substation will serve the permitted solar PV development and supersede the permitted 38kV substation.

As a 110kV substation, the proposed substation will be a "node" and become part of the transmission system and will be connected as a spur node to the existing ESB 220kV Kellistown Substation, located ca. 2km south, interconnected by the proposed underground 110kV cable.

CCTV

The on-site CCTV would be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the Site. The cameras will only be focused along the fence line and will not be focused on any residential properties.

Fencing

The switchyard will be enclosed in a palisade-type security fence. A perimeter fence which will be installed to provide security, restrict access, and be deer-proof.

Lighting

Emergency lighting will only occur as part of the Proposed Development.

2.3.2 110kV Grid Connection

The proposed 110kV UGC will be ca. 8km in length. The UGC will interconnect the Proposed 110kV substation to the existing 220kV ESB Kellistown substation.

The UGC will consist of:

- Three 160mm diameter HDPE power cable ducts;
- Two 125mm diameter HDPE communications duct; and,
- One 63mm diameter earth continuity duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep.

Variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. The power cable ducts will accommodate one power cables per duct. The communications duct will accommodate a fibre cable to allow communications between the Grangeford Solar Farm Substation and Kellistown 220kV substation. The inclusion one earth continuity conductor duct will also be required.

The 110kV UGC route will exit the proposed 110kV Substation and traverse in a southerly direction within the permitted development (PR 2360297) along existing internal access tracks and exit directly onto the R725. The UGC will then follow the R725 in an easterly direction for ca. 550m before turning onto the local road.

The UGC will continue in a southerly direction to the existing ESB 220kV Kellistown Substation. The cable will be installed in a cable trench as per industry standards, including ducting, fibre optic conductor, insulated earthing conductor where required and link boxes at some jointing locations. The ESB will ultimately be responsible for ensuring that the most appropriate connection option will be selected. This asset, together with the substation, will be owned and operated by the Independent Power Producer ('IPP').

Full details of the proposed cable route development are provided within the TLI Group Construction Methodology Report, which will be submitted in support of this application. This report outlines the summary of features along the UGC design route.

2.3.3 Drainage

Surface Water Drainage

A Sustainable urban Drainage System ('SuDS') approach is proposed for the surface water drainage. Rainfall runoff from the control building roof in the substation will be collected and piped to a rainwater harvesting tank for reuse in the onsite toilets. As water use for flushing toilets will be very low due to the infrequent use of the building, the majority of rainwater from the roof will drain into a proposed soak-away.

The Proposed Development access road shall be surfaced with a layer of permeable stone hardcore. This free-draining material will allow rainfall to permeate into the ground. A small proportion of the access roads on site will be surfaced in concrete. The surface water run-off from this area will drain freely into the surrounding free-draining areas, which will be constructed in hardcore stone. Rainfall in these areas will permeate through the stone into the ground as per the green field conditions.

Foul Water

There will be no foul drainage required. During the construction phase, portable toilets will be provided at the temporary Contractors' Compound for the duration of the construction phase only. All waste from the portable toilets will be removed and disposed of off-site by an approved contractor.

During the operational phase, the substation building will contain a sink and toilet. As the welfare facilities on-site will be infrequently used, it is proposed that foul water will be diverted into a below-ground holding tank. All wastes collected in this holding tank will be removed by a suitably licensed waste contractor as required.

No specific drainage infrastructure will be required for the Proposed Development.

2.3.4 Earthworks

Localised levelling works will be required for the development of the Site. The detailed design of the substation will determine the extent of the earthworks. However, the substation will comprise a concrete foundation for the transformers and electrical equipment, with the rest of the area filled with crushed rock.

It is estimated that the majority of the excavated materials will be reused within the Site for a berm creation that will extend from the Permitted Development to the perimeter of the proposed substation.

2.3.5 Water Supply

Water for onsite welfare facilities will be provided by a 1,500-litre rainwater harvesting tank which will be filled from roof runoff. Working with the projected usage of the sanitary facilities of 1,950 litres every 13 weeks, the rainwater storage tank will provide for up to 10 weeks without receiving any rainfall.

2.3.6 Site Access

Construction Phase

The Site is currently accessed via the existing commercial site entrance on the R725, which currently provides access for Nolan Farming, an ongoing farming business. This road runs west to east and is situated along the southern section of the Site. The existing entrance is wide and well-serviced and will be readily capable of taking all the vehicle movements during the construction phase of the 110kV substation.

It should also be noted that the existing commercial entrance on the R725 was successfully used while hosting the World Ploughing Contest in 2006, accommodating large numbers of farming equipment and spectator vehicles.

A temporary construction access via the L6113 was authorised as part of the permitted PV development (Ref No. 23/60297). For this Proposed Application, it is proposed that the L6113 will also serve as an alternative egress.

This existing access and egress were granted as part of the permitted development (PR:23/60297). It should also be noted that Transport Infrastructure Ireland ('TII') or the municipal district engineer had no objection to the permitted development.

Construction Phase Egress

It is proposed that the construction vehicles will follow the previously permitted one-way system to traverse the Proposed Development, thereby ensuring all Construction Phase egress will be via an existing site access point on the L6113 that also provides access to Nolan Farming. This is situated along the eastern section of the Site. This proposed one-way system will negate the need for construction traffic to exit the Proposed Development directly onto the R725, as previously requested by the Council.

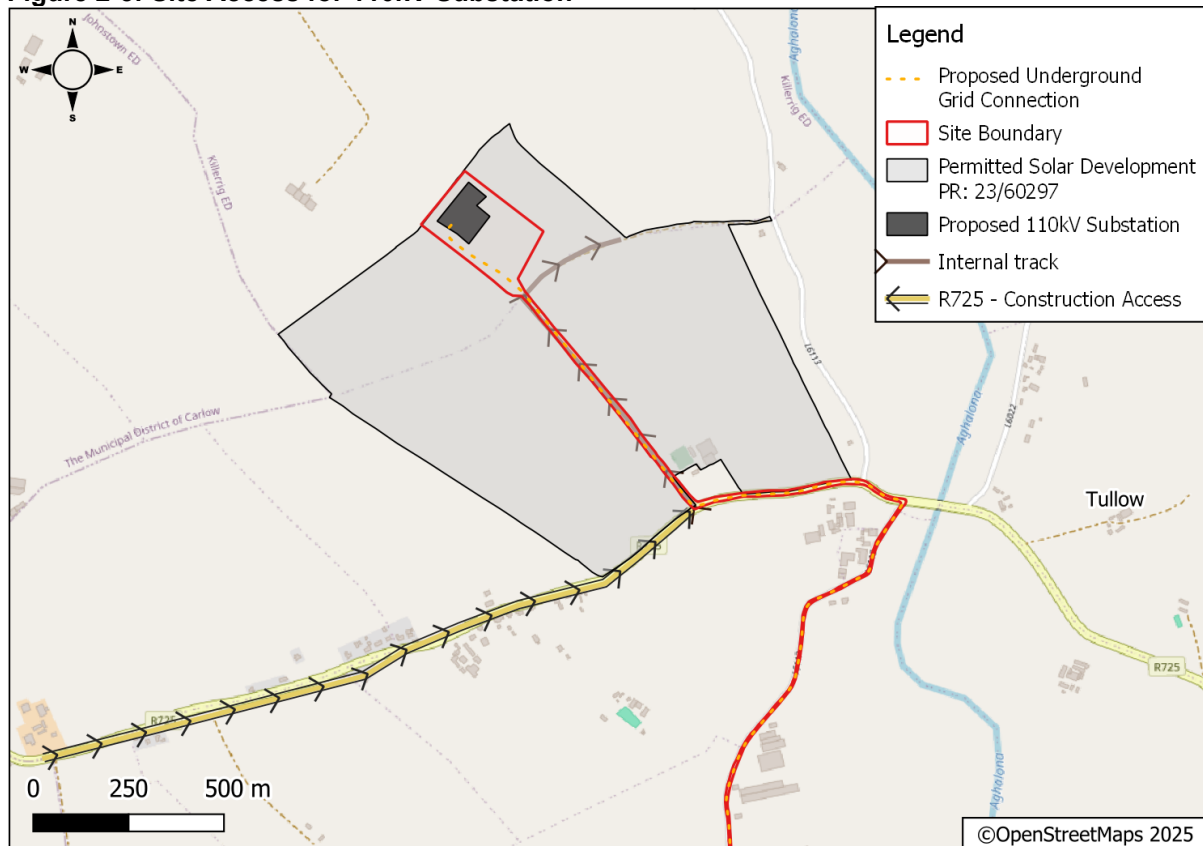
Internal Access

The Site will be accessed from the secure temporary compound in the Nolan farmyard via a network of pre-existing hardcore tracks extending to all areas of the Site and will be the principal means of all internal access. This was granted as part of the permitted PV development (PR 21/23; ABP Ref No. 309987-21).

Operational Phase Access and Egress

All Operational Phase access and egress will be via an existing commercial site entrance on the R725. This was granted as part of the permitted PV development (PR 21/23; ABP Ref No. 309987-21 and PR 23/60297).

Figure 2-5: Site Access for 110kV Substation



2.3.7 Sightlines

All site access and egress sightlines are in accordance with all sightline visibility requirements, as set out by the TII Design Manual for Roads and Bridges.

For vehicles entering the Site, the forward visibility in both directions is in excess of 150m, and for vehicles departing the Site, the forward visibility in both directions is in excess of 90m.

Both the R725 and L6113 provide adequate stopping Site distances and satisfy current standards; therefore, the Proposed Development will not contribute significantly to the risk to road users. TII or the municipal district engineer had no objection to these sightlines submitted as part of the permitted PV development (Ref No.23/60297).

2.3.8 Security Fencing/Hoarding Fencing

The Site will be secured by palisade fencing and gates. New double gates will be installed at the site entrance that will be kept locked and secured to prevent any unauthorised site access.

2.4 Specialist Ecological Input / Sensitive Design

Specialist ecological input was a key element of the design of the Proposed Development. This ensured that the design was extremely sensitive to valued ecological features that occur or may occur within the Site and the surrounding landscape. The key measures relevant for this Proposed Development are detailed below:

- The construction and maintenance of the Proposed Development will use the approved access as per Ref No.2360297 which utilises the existing farm access point. Options to access the Site have been carefully considered to ensure safe access to the Site;

- Buffers will be implemented and maintained throughout the lifecycle of the Proposed Development including:
 - A >100m buffer between all works and substation infrastructure and any designated European site;
 - A >500m buffer between all works and substation infrastructure and any EPA-designated watercourse;
 - A ca. 6m buffer between all works, substation infrastructure and existing hedgerows / treelines;
 - A ca. 5m setback from the perimeter fence and all infrastructure; and,
 - A minimum ca. 200m buffer between likely solar farm acoustic emission infrastructure and sensitive residential dwellings.

2.4.1 Archaeological Monitoring

Archaeological monitoring of top-soil stripping will be carried out during site development works. This approach will mitigate any potential risks to previously unknown archaeological features. The monitoring will also ensure that all archaeological mitigation measures are being implemented as outlined in the Archaeological Impact Assessment (AIA) which was completed as part of the Permitted Development.

2.5 Landscaping

A detailed Landscape Plan has been prepared as an integral part of the Permitted Development and will be implemented as part of the Proposed and Overall Development.

The landscape plan proposes to plant new native hedgerows and improve existing hedgerows on the Site. This new planting will help to screen, soften, and integrate the proposal into its environment and provide green connectivity to enhance ecological corridors in the local landscape. The species of trees and woody vegetation in the hedgerow have been chosen with consideration of those prevalent in the surrounding area and will include a wide variety of native species. The new planting will increase species diversity in the local landscape, improving the quality of canopy cover and resilience of the tree population to provide a significant improvement on the pre-development baseline.

2.5.1 Waste Management

- All excavated materials within the Site will be reused onsite, where possible. Excavated material from the grid route along the public road shall be employed to backfill the trench where appropriate and any surplus material will be transported off-site and disposed of at a fully authorised soil recovery site;
- Waste materials will be collected and stored in suitable receptacles before they are taken offsite;
- Waste materials will not be allowed to accumulate because of the fire / vermin risk; and,
- All wastes will be appropriately segregated with the objective of maximising the level of recycling.

To ensure the efficient management of the construction works, a Temporary Construction Compound will be set up for the duration of the construction works. Sewage will be chemically treated and removed off-site by a licensed contractor to a licensed disposal facility

2.5.2 Trenching Methodology

Trenches need to be excavated to install the uPVC power cable duct, communications cable duct and an earth continuity cable.

According to the TLI Group Outline Construction Methodology Report, the methodology for trenching will be as follows:

- *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 application and accompanying reports and as required by conditions where relevant.*
- *All existing underground services shall be identified on site 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 application and accompanying reports, the detailed Construction Environmental Management Plan (CEMP);*
- *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 ESB and Irish Water specifications.;*
- *Traffic management measures will be implemented in accordance with those included in the Traffic Management Report, and a detailed Traffic Management Plan;*
- *The excavated trench will be a minimum width of 325mm and approximately 1315mm deep both within the public road network and within private lands;*
- • *Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be located a minimum of 50m from surface water features. 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 off site and disposed at a fully authorised soil recovery site;*
- *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 metres will only be excavated once most reinstatement has been completed on the first;*
- *The excavation, installation and reinstatement process will take on average of 1 no. day to complete a 100m 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;*
- *Works will only be conducted in normal working hours of Monday to Friday 08:00 to 20:00 and Saturday 08:00 to 18:00, with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency; and,*
- *Following the installation of ducting, pulling the cable will take approximately 1 no. day between each joint bay, with the jointing of cables taking approximately 1 week per joint bay location.*

2.5.3 Stream Crossings – Horizontal Directional Drilling

The proposed cable route will require three Horizontal Directional Drilling ('HDD') crossings for Bridges 1,2,3. Where the cable route intersects with existing watercourses, a detailed construction method statement will be prepared by the Contractor before the commencement of construction and is to be approved by the relevant environmental agency.

No in-river works will be required during the construction of the Proposed Development. As part of the UGC, the Aghalona River, Roscat River and Burren River will be crossed by the Proposed Development. The crossing will be carried out using HDD. This method will drill beneath the watercourses and will avoid any disturbance to these streams. The methods used for the HDD will involve:

- *A works area of circa 40m² for the HDD entry side, and circa 20m² on the HDD exit side, will be required for the HDD equipment and vehicles. These areas will be fenced off during the HDD implementation;*
- *The drilling rig and fluid handling units will be located on the entry side and will be appropriately bunded using sandbags, which will contain any fluid spills and stormwater runoff;*
- *Entry and exit pits (approximately 2m (w) x 3m (L) x 1m deep) will be excavated using an excavator, and the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility;*
- *The HDD pilot bore will be undertaken using a wireline guidance system. Assembly will be set up by the drilling team and steering engineer;*
- *The pilot bore will be drilled to the pre-determined profile and alignment under the watercourse crossings;*
- *The steering engineer and drill team will monitor the drilling works to ensure that modelled stresses and pressures are not exceeded;*
- *The drilled cuttings will be flushed back by drilling fluid to the entry and exit pits and re-cycled for reuse;*
- *Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit side which will then be pulled back to the entry side as part of the pre-reaming / hole opening process to enlarge the hole to the correct size;*
- *When the pre-reaming / hole opening / hole cleaning has been completed, a reamer of a slightly smaller diameter than the final cut will be installed on the drill string to which the ducts will be attached for installation;*
- *The drilling fluid will be disposed of at a licensed facility;*
- *The ducts will be cleaned and proven and their installed location surveyed;*

- *The entry and exit pits will be reinstated to the specification of ESB Networks and any requirements of Carlow County Council; and,*
- *A joint bay / transition chamber / transition coupler will be installed on either side of the road following the horizontal directional drilling as per ESB requirements.*

2.5.4 Culvert Crossings

All crossings will be culverted, and it has been confirmed that there is sufficient cover within the local road to accommodate the UGC ducting. The installation will be at a minimum depth cover of 450mm to accommodate the cable ducts, as per the ESBN specifications. The ESB code of practice for crossing bridges will be followed during trenching and cabling works. Also, the permanent reinstatement of the road will be carried out to the specifications of the Local Authority.

2.5.5 Road Opening Licences

The proposed UGC will require a road opening licence under Section 254 of the Planning and Development Act 2000-2015 from Carlow County Council. A Traffic Management Plan ('TMP') will be agreed upon with Carlow County Council before the commencement of the development.

In the event that planning consent is granted for the Proposed Development, the TMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures, which are conditioned and will be submitted to the planning authority for written approval.

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 Carlow County Council in advance of the preparation of the TMP.

2.5.6 Hours of Work

Working hours will generally be restricted to between 08:00 until 20:00 hours Monday to Friday inclusive and between 08:00 and 18:00 hours on Saturdays. Construction work will not be permitted on Sundays, public holidays or at night-time except where safety concerns necessitate it or if agreed in advance with the Planning Authority.

2.5.7 Monitoring

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that they are completed in line with the measures detailed within this CEMP, along with the ER, TMP and NIS, and all wildlife legislation.

The ECoW will also either deliver or provide the resident engineer with sufficient environmental information to deliver a Site induction to all personnel working onsite

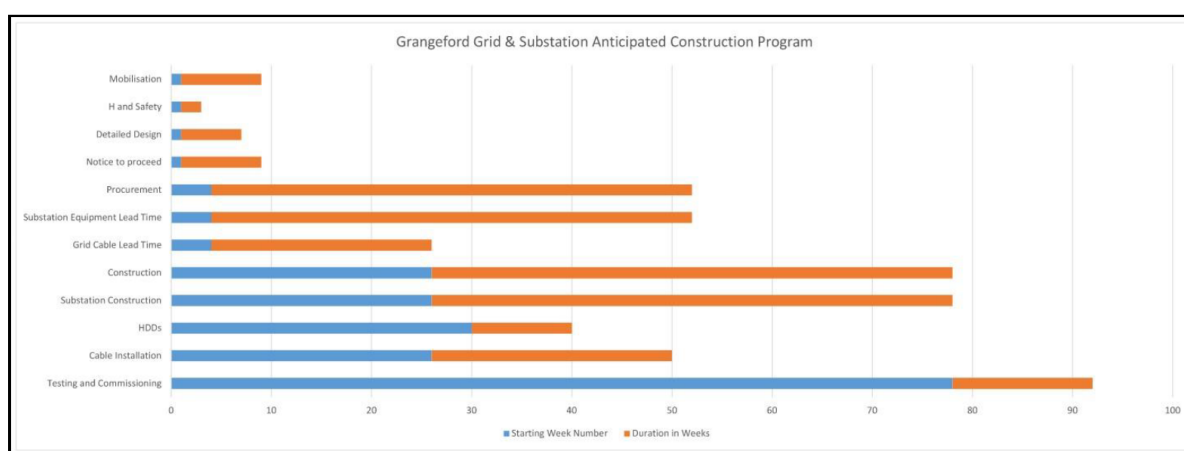
3 CONSTRUCTION SCHEDULE

3.1 Programme of Works

The construction programme, including indicative phasing and construction details have been prepared on the basis of one overall construction project comprised of the Proposed Development and the Permitted Development. It is anticipated to last for approximately 90 weeks.

It is envisaged that there will be one overall construction project comprised of the Proposed Development and the Permitted Development. This is an indicative Construction Programme with corresponding construction related traffic. The heavy construction traffic will be broadly spread evenly over the majority of the construction programme. Outside of this period, traffic will mostly be limited to light traffic from workers commuting to and from Site.

Figure 3-1: Indicative Construction Programme



Estimates for the duration of the UGC construction works are included in the table below. Please note that some of the elements are likely to happen concurrently, therefore the overall start-to-finish duration is estimated to be six months.

Table 3-1: Indicative Construction Phase – UGC Connection

Development Element	Estimated Construction Duration
Cable route (not including HDDs)	6 Months
HDD	2 Months

3.1.1 Construction Staff

During construction, taking into consideration the normal intensity of onsite activity and the duration of the programme, it is expected that the construction schedule is likely to require no more than 30 staff to be onsite at any one time. Staff are anticipated to arrive at the proposed site in the 30-minute period preceding the start of the operating day (i.e., 07:30 to 08:00hrs) and depart in the 30-minute period following the end of the operating day (i.e., 18:00 to 18:30hrs). Staff are likely to travel from different origins and hence distribute their impact across the roadway network.

It is expected that teams of specialist operatives will arrive together in shared transport and that other general operatives will arrive in single occupant cars. It is assumed that no operatives will arrive by walking, cycling or use of public transport.

All workers vehicles will park on the proposed site to avoid obstruction to the operation of the public roadway, and this will be strictly enforced. Temporary signage will be used to prohibit parking of staff vehicles on the local road. The signage will direct drivers to the staff parking area.

3.1.2 Construction Staff – Underground Cable Route

At the peak of construction, it is anticipated that there will be an approximate requirement for 6-10 construction workers actively engaged on the ducting, cable pulling and jointing works. The staff are forecast to arrive at site compounds and depart to site in crew-cab type vehicles to minimise traffic generation and parking requirements at structure locations.

3.1.3 Temporary Construction Compound

A secure construction compound will be set up in the existing farmyard at Grangeford, situated within the southern section of the Permitted Development. This compound will be utilised as part of the Overall Development. It is expected that the compound will contain the following:

- Temporary site facilities (Port-a-Cabin type) to be used for site office and welfare facilities, including welfare facilities with provision for sealed waste storage and removal;
- Container storage unit(s) for tools and equipment storage;
- Container storage unit(s) for components and materials;
- Refuelling compound for construction vehicles and machinery;
- Parking for staff, construction vehicles and machinery;
- Designated skips for construction waste; and,
- Wheel washing facility.

The Site Compound and Welfare area will be erected on existing hardstanding only and it will be located within the existing farmyard that is currently utilised for Nolan Farming. No earthworks or sub-surface disturbance will occur as part of these proposed facilities.

All materials for the construction of the Overall Development will be deployed and stored within the temporary construction compound located in the Nolan farmyard. Equipment and machinery will be stored in an existing lockable agricultural shed and bunded fuel stores will also be available.

The Nolan's Farming Tillage Business provides a concreted area with a wide sweep, and it will make an ideal delivery area where materials for the construction can be deployed and stored. All equipment and materials unloaded in the construction compound will be distributed throughout the site using smaller machines such as bobcats via a network of pre-existing hardcore tracks extending to all areas of the Site that will serve for providing internal access.

The construction compound area has been designed to allow for loading and unloading of all construction vehicles and will provide a turning area for vehicles to exit the Site. Adequate signage will be erected where required. The design of the compound will ensure no impacts will arise on the surrounding road network as a result of deliveries to the Proposed Development.

3.1.4 Working Hours

Construction work will generally be between 08:00hrs until 20:00hrs Monday to Friday, and between 08:00 and 18:00 on Saturdays, where required. No construction activities will take place on Sundays or Bank Holidays.

4 ENVIRONMENTAL MANAGEMENT FRAMEWORK

4.1 Environmental Policy

The project will be carried out in accordance with the policies / objectives listed below:

- Carlow County Council's Environmental Policy and Procedures; and,
- During construction works, management of the project will also need to comply with the appointed Contractor's Environmental Policy and procedures.

4.2 Objectives and Targets

Environmental objectives for the construction phase will be developed and should refer to legal compliance and environmental good practice, these may include:

- Zero pollution incidents;
- Minimise disruption to residents (and their complaints);
- Reduce / avoid impacts on biodiversity; and,
- Minimise waste sent to landfill.

Monitoring of the construction processes against the project's environmental objectives will be the responsibility of the Appointed Project Manager.

4.3 Structure and Responsibilities

A management structure that includes an organisational chart encompassing all staff responsible for environmental work will be included within the CEMP. This will set out the respective roles and responsibilities with regard to the environment and identify the nominated Construction Environmental Manager. Illustrative key roles and responsibilities are set out in Table 4-1 below.

Table 4-1: Roles and Responsibilities

Role	Responsibility
Project Manager (Appointed Contractor)	Responsible for management of the construction phase of the project. Has overall responsibility for the environmental performance of the project. Responsible for implementing the Site Waste Management Plan during the construction phase to ensure that waste is disposed of legally, economically, and safely. Ensure compliance with environmental legislation, consents, objectives, targets, and other environmental commitments, including those arising from the Environmental Report.
Site Staff (Assigned by Appointed Contractor)	To receive general environmental awareness training and undertake work in accordance with Method Statement Briefings and toolbox talks. Trained personnel to manage particular tasks such as refuelling plant and equipment, managing the stores, water quality monitoring and supervising the segregation and collection of waste.
Environmental Consultant (Assigned by Appointed Contractor)	To provide information relevant to construction that may assist the Contractor to manage environmental aspects of the scheme and to ensure that the Contractor complies with all the relevant legal requirements, commitments and targets agreed for the scheme.

4.4 Communication

The CEMP will be distributed to the project team, including sub-contractors, to ensure that the environmental requirements are communicated effectively. Key activities and environmentally sensitive operations will also be briefed to staff and Contractors. Project, client, and company environmental policies, where available, should be displayed on-site.

The Contractor will define procedures for internal and external communication. The client may require that any communication with external parties such as environmental regulators or the public will be undertaken through a nominated client representative.

During the construction phase, internal communication will include regular progress meetings, which should cover:

- Training undertaken;
- Progress reports;
- Inspections, audits, and non-conformance;
- Complaints received;
- Visits by external bodies and the outcome or feedback from such visits;
- Objective / target achievement, including reporting on environmental performance; and,
- External communication, including letter drops or meetings, and liaison with statutory authorities will be overseen by the Client Project Manager.

5 ENVIRONMENTAL RISK ASSESSMENT

5.1 Risk Classification

The classification of the environmental risks, arising from the construction phase will follow the definitions of significance as outlined by the Environmental Protection Agency ('EPA') for Environmental Impact Statements [13] as shown below in Table 5-1.

Table 5-1: Rating Magnitude of Impact

Magnitude of Impact	Importance / Sensitivity of Resource			
	High	Moderate	Low	Negligible
Large	Very Substantial	Substantial	Moderate	Slight
Medium	Substantial	Substantial	Moderate	Slight
Small	Moderate	Moderate	Slight	Slight
Negligible	Slight	Slight	Slight	Negligible

In addition to the assessment of risk arising from known sources, an assessment of risk for an unplanned event / incident on-site were also assessed. These were rated as per the EPA 'Guidance on assessing and costing environmental liabilities' [14]. The methodology for the rating of likelihood and consequence are shown in Tables 5-2 and Table 5-3.

Table 5-2: Rating of Likelihood of Risk Occurring

Rating	Likelihood	
	Category	Description
1	Trivial	Exceptionally low chance of hazard occurring
2	Low	Low chance of hazard occurring.
3	Medium	Medium chance of hazard occurring.
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring.

Table 5-3: Rating of Consequence of Risk Occurring

Rating	Consequence	
	Category	Description
1	Trivial	No impact or negligible change to the environment.
2	Minor	Minor impact/localised or nuisance.
3	Moderate	Moderate impact to environment.
4	Major	Severe impact to the environment
5	Massive	Massive impact to a large area, irreversible in medium term.

5.2 Risk Identification / Assessment

In developing this pCEMP, the following aspects were considered relevant to the construction phase:

- The location of the Site in the context of the surrounding area;
- The local road networks;
- Local residences and businesses;
- The location of the Site in the context of the on-site surface water and closest water bodies;
- An increase in air and noise emissions during the construction stage; and,
- The biodiversity value of the Site and its surrounding habitats.

The specific risks to the environment, methodologies to control these risks and pertinent site relevant factors to the construction area limiting these risks are outlined in Table 5-4. The likelihood of each of the risks occurring is related to the scope of the risk and the site-specific conditions.

Additionally, the following detailed Site-specific plans will be completed by the appointed Principal Contractor, adhered to, and incorporated into site works:

- Construction Stage Method Statement; and,
- Final Construction Environmental Management Plan ('CEMP').

Table 5-4: Site Specific Environmental Risk Assessment

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
1. Access and Egress from the construction site	a. Collision risk with other vehicles, / cyclists and pedestrians.	Moderate	Low	- Construction traffic will utilise a one-way system accessing the site via the existing commercial site entrance on the R725, that currently provides access for Nolan Farming Ltd, an on-going farming business. The construction vehicles will then follow the previously permitted one-way system to traverse the Proposed Development, before exiting the Site via an existing site access point on the L6113; and, - There will be sufficient space on the site to ensure no vehicles will need to park, even temporarily on the adjoining public roads. - The contractor will be required to ensure that all construction activities are undertaken in a manner that does not endanger pedestrians or cyclists at any time.
	b. Mud and dirt spilling onto the public road.	Slight	Low	- Existing hardcore access tracks will be utilised onsite that will be supplemented with additional hardcore areas that will allow all delivery vehicles sufficient space to turn within the site, to ensure that vehicles will be on hardcore at all times minimising the risk that they will encounter mud and debris; - The appointed contractor will develop mitigation measures within the CTMP to address noise, mud, and debris associated with construction vehicles which may include an on-site wheel washing facility, covering construction materials and waste to prevent spillage onto the local road network; and, - Appointed contractor will be responsible at all times to ensure that the public roadway is kept free of any dirt or debris.
2. Site Operations and Design	a. Potential nuisance towards public (out of hour's activities).	Slight	Low	Normal construction hours will be restricted to 08:00 to 20:00 Monday to Friday and 08:00 to 1800 on Saturdays.

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
	b. Traffic Incident on-site resulting in a fuel spill.	Moderate	Low	- Best practice measures and the Construction Traffic Management Plan will be implemented. Each vehicle will carry a Spill kit to be used in the unlikely event of a spill; and, - Adequate signage shall be provided on the public network identifying the Site, access, speed limits etc.
2. Water Quality – Suspended solids	a. Suspended sediment due to run-off from construction areas entering the drainage ditches causing potential detriment to water quality.	Moderate	Low	- Standard measures to control run-off will be incorporated to the Method Statements, to include Construction Industry Research and Information Association (CIRIA) 2001 C532 – Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors and CIRIA 2015 C741 Environmental Good Practice on Site (4th edition); - The working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance; - There will be no direct or indirect discharges into any nearby waterbodies during the construction phase; - Any stockpile of material will be covered during periods of prolonged or heavy rain and will be located away from ditches; and, - Where drainage ditches are crossed with underground cables, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and / or bunds. These will be put in place in advance of construction works and monitored on a regular basis;
2. Water Quality - Oil	a. Oil Spill to ground / surface water.	Moderate	Low	- All materials shall be stored at the main contractor compound and transported to the works zone immediately prior to construction; - Adequate spill kits, including absorbent booms and other absorbent material will be maintained on-site; - All contractor workers will be appropriately trained in the use of spill kits; - Fuels, lubricants, and hydraulic fluids for equipment used in the construction site will be carefully handled to avoid spillage, properly

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
				secured against unauthorised access or vandalism, and provided with spill containment according to current best practice; - Any sediments adversely effected by contamination will be excavated and stored in appropriate sealed containers for disposal offsite in accordance with all relevant waste management legislation; and, - Prior to any works commencing, all construction equipment will be checked to ensure that they are mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids, and grease.
	b. Oil spill during refuelling operations.	Moderate (low volume)	Low	- Adequate fuel storage facilities and re-fuelling protocols will be provided; - Fuelling and lubrication of equipment will be carried out offsite; - No vehicle or equipment maintenance work will take place within the construction site; and, - 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.
2. Water Quality - Cement	a. Cement and Concrete entering waters resulting in water pollution and contamination to the environment.	Low / Moderate	Low	- Concrete pours will be adequately planned and executed; - Any spillage of cementitious materials will be cleaned-up immediately; - Any pouring of concrete will only be carried out in dry weather; and, - Washout of concrete trucks will not be permitted on the Site.
3. Waste Management	a. Incorrect management of general Municipal Wastes / welfare facilities resulting in litter on-site and / or attraction of rodents	Slight	Medium	- Waste materials will be collected and stored in suitable receptacles before they are taken off site; - Waste materials will not be allowed to accumulate because of the fire/vermin risk; and, - The waste will be separated into recycling types and general waste in designated general waste and refuse and recycling stores.

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
	b. Welfare – Toilet waste.	Slight	Trivial	- Welfare facilities are available at the Construction Compound, it is proposed that these facilities will be used for the duration of the works; and, - There will be no foul effluent discharge arising from the initial site development works – portable toilet facilities will be used (emptied as required).
4. Nuisance – Dust / Dirt	a. Generation of dust / dirt causing loss of amenity at residential area or community areas.	Slight	Low	- The appointed contractor will ensure that the area around the Site including the public roadway is regularly and adequately swept to prevent any accumulation of dust and dirt; - Burning of materials onsite will not be permitted, in order to prevent smoke emissions; - A speed restriction will be enforced on-site by the appointed contractor to prevent materials becoming entrained in the air due to tyre wheels; and, - The contractor will use hoses to saturate all bulk materials with water, both during the process and whilst loading / unloading.
4. Nuisance - Noise	a. Generation of noise resulting in loss of amenity to the local area and cause disruption to the local species;	Slight	Medium	- While increased levels of background noise are unavoidable during any construction works, all construction activities will be confined within the Site Boundary; - Activities and deliveries to the Site to occur only during permitted hours; - All plant where possible shall be low noise rated; - Where necessary the use of enclosures and noise screens shall be used to control noise from plant; - Evaluation of construction methods to ensure the quietest option is utilised in proximity to an NSR; - Positioning of the Site Compound at distance from the closest NSR; - Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
				- All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues; - Working Method Statements will be developed for the Site Construction Personnel to ensure optimal working procedures are employed, thereby minimising time spent in proximity to NSRs; and, - A Site Representative will be appointed to receive and respond to noise complaints and enquiries during construction by local residents, the Local Authority, and any other regulatory body. Relevant details will be provided to the Local Authority prior to construction and will be made available to third parties, including local residences.
5. Green House Gases (GHG)	a. Carbon emission to the environment.	Slight	Medium	- All construction equipment will comply with Directive 88/77/EEC as amended by Directive 96/1/EC concerning measures to be taken against gaseous and particulate emissions from diesel engines; and, - Where site materials can be reused / recycled within the development, this will take precedence over the importation of materials.
6. Archaeological Heritage	a. Loss of national / local heritage	Slight	Low	- The development has been designed to avoid impact on all known archaeological monuments and features. - Any significant top soil stripping associated with the construction phase of the project will be subject to monitoring by an archaeologist in accordance with national guidelines (Dúchas 1999, and the recommendations of the National Monuments Section of Department of Culture, Heritage, and Gaeltacht) and such a requirement may form a condition of any grant of planning permission. - Particular caution is recommended in the vicinity of CW008-039 mound in the townland of Inchisland / Moatuluasa, CW013-007 moated site in the townland of Rathoe and CW013-03 barrow-mound barrow in Kellistown East and proposed UGC should be routed on the opposite side of the roadway from these monuments, if practical and feasible with respect to other variables.

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
	b. Visual Impact	Trivial	Trivial	- All works to be undertaken within the Proposed Site Compound and Welfare Area will be temporary only; and, - All Site compound facilities will be removed in full on completion of the construction phase. Therefore, issues of visual impact will not arise on Archaeological Heritage
	c. Physical Impact – Exclusion Zone	Low / Moderate	Low	- These fencing works will be undertaken as preparatory works in advance of any main construction works and remain in place for the duration of the works; - All security fencing to be erected within this area will solely comprise of a rubber base to ensure that no sub-surface works will be undertaken; - No machinery, storage of materials, or any other activity related to construction will be permitted within the defined zone; and, - All construction personnel will be notified of the restrictions pertaining to this area.

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
	d. Physical Impact –Non-intrusive construction method	Low / Moderate	Low	- The development has been designed to avoid impact on all known archaeological monuments and features. - This approach in favour of the '<i>preservation in situ</i>' is in accordance with the 'Framework and Principles for the Protection of Archaeological Heritage (DAGHI 1999) [15]; - Any significant top soil stripping associated with the construction phase of the project will be subject to monitoring by an archaeologist in accordance with national guidelines (Dúchas 1999, and the recommendations of the National Monuments Section of Department of Culture, Heritage, and Gaeltacht) and such a requirement may form a condition of any grant of planning permission. - No construction groundworks of any kind, including geotechnical investigation, temporary roads or compounds or subsurface cables, will be carried out within the zones with ballast PV panels as per the Permitted Development. These zones will be fenced off for the duration of the general construction and only entered by contractors assigned to the specifically agreed construction mitigation scheme; - The security fence to be erected will stand on rubber bases; - All cable connections and other necessary service conduits will be placed in above-ground housing.
	e. Archaeological Monitoring	N/A	N/A	Archaeological monitoring of significant top-soil stripping will be carried out during site development works.
7. Biodiversity Protection	a. Impacts on Badgers	Medium	Low	- In advance of works, all site personnel will receive a toolbox talk which will include reference to mitigation measures in relation to protected species, including badgers; - A pre-construction survey will be carried out to confirm absence of terrestrial mammals within or close to the works areas; - To prevent badgers (and other fauna) from accidentally falling into deep excavations and becoming trapped in trenches / excavations, all

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
				trenches / excavations will be covered or backfilled at the end of each working day; - Obvious mammal paths will be left clear of obstruction and gaps in fences will be sited accordingly to allow for the free movement of smaller mammals such as badgers and rabbits throughout the landscape; - Should construction works be required outside of daylight hours during the Site clearance works, the appointed project ECoW will be consulted as required; and, - If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.
	b. Impacts on Amphibians	Low	Low	Should amphibians be encountered during the construction works, a suitable qualified ecologist should be consulted for advice.
	c. Impacts on Bats	Low	Low	- The establishment of additional / supplementary hedgerow as a part of the works will provide additional foraging and commuting opportunities for species of bat that may occur within the area; and, - Artificial bat boxes will be erected within the retained trees of the proposed Site.

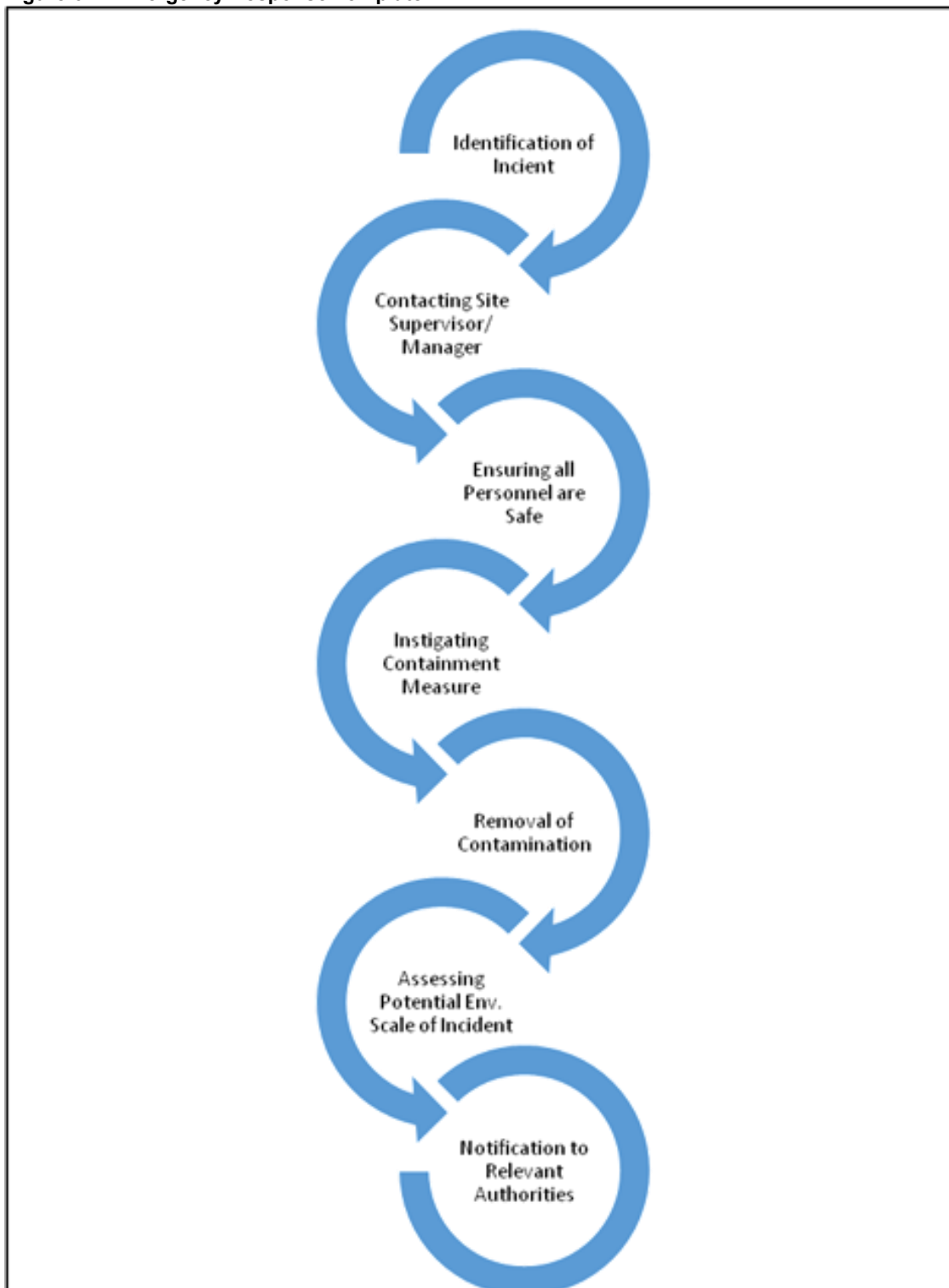
Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
	d. Impacts on Birds	Low	Low	- Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000; - In the event that any vegetation clearance works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS; - Should birds' nest within the active working area during the construction phase, works within the area will stop within the area and the project ECoW will be consulted; - As part of the landscaping works, additional hedge / treeline will be planted, which when they become established, will provide suitable foraging and nesting habitat for the bird species which are likely to be present at the Site; and, - A variety of bird nest boxes will be erected within the retained trees of the proposed Site.
	f. Impacts on Trees / Hedgerows	Slight	Low	- Trees and hedgerows close to construction areas will be fenced off to prevent accidental disturbance from construction vehicles; - Care will be required to prevent disturbance to root systems – a buffer zone of 6m of unexcavated ground will be maintained along the retained hedge and tree lines; - During any works close to the buffer zone, should the operatives encounter any root smaller than 35mm diameter they should be pruned carefully with an appropriate-cutting tool such as a saw or secateur and roots larger than this will require consultation with an arboriculture specialist; - No materials or equipment will be stored within the buffer zone; and, - In order for hedge protection measures to work effectively, all personnel associated with the operation of machinery must be familiar with the above principles for the protection of hedgerows / treelines.

Aspect of Construction	Potential Hazard	Magnitude	Likelihood	Risk Management Procedure
10. Invasive Species	a. Spread of Invasive Alien Species	Slight	Low	- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds; - Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed; - Any vehicles and machinery that are not clean will not be permitted entry to the Site; - All materials to be imported to the Site including additional planting will be sourced from a reputable supplier and records of all material and supplies will be maintained; - In advance of works, all Site personnel will receive a toolbox talk with regards to invasive species; and, - Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species.

6 EMERGENCY MANAGEMENT PLAN

Although the Site will be managed, there remains a minimal risk from the unexpected occurrences, such as accidental spillages on-site that may result in environmental pollution. Incidents on-site will follow a similar emergency response template. This template is outlined in the schematic presented in Figure 6-1.

Figure 6-1: Emergency Response Template



6.1 Incident Response

Where an environmental incident is identified then it will be reported to the on-duty Site Foreman and thereafter the Employer's Representative. Each incident will have the following information gathered and reported:

- Location of the incident;
- Time and date;
- Scale of the incident;
- Nature of the incident, including any specific environmental dangers;
- Remediation actions taken;
- Name of personnel noting the incident, and who they work for; and,
- Any other relevant details.

Works in the vicinity of the incident must be stopped until the incident is resolved and an all clear is issued by the Employer's Representative. All personnel in the immediate area of the release / spill shall be alerted to the circumstances and any dangers to them (Health and Safety) and to the environment.

The Employer's Representative will ensure, where required, that the incident details are communicated to the relevant regulatory authorities.

7 MONITORING AND IMPLEMENTATION OF THE CEMP

7.1 Complaints, Comments and Enquiries

Any complaint related to the Site will be dealt with by the Project Manager. The source of the complaint will be investigated immediately. If possible, the source of the complaint will be stopped, moved, or modified immediately. All complaints must be recorded including details of the complaint and any required corrective actions.

7.2 Site Visits and Evaluation of Compliance

A pre-construction Site walkover by a suitably qualified Ecologist will take place followed by additional Site visits as required. The aim of these visits will be to ensure compliance with procedures set out in the CEMP and environmental conditions established under planning.

This will be done by means of a Site inspection and the auditing of various aspects of the works including documentation. Checklists for compliance will be drawn up, corrective actions will be required for any non-compliances identified and follow-up surveys will be scheduled to ensure compliance.

All monitoring results and reports detailing the compliance or otherwise of the works will be maintained at the Site office. In the event of an incident, an incident report will be completed and that will document both the cause of the incident and the corrective action taken to address the incident. These incident forms will be available for inspection within the Site office.

7.3 Control of Records

Environmental records, including waste management records, will be maintained in accordance with the respective company procedure and legal requirements. The records are to be maintained, in either hard copy or electronic format as required by the individual procedure that the records relate to, in such a way that they are readily identifiable, retrievable, and protected against damage, deterioration or loss. The procedure that the records relate to also specifies the retention time for the records and who has the authority to dispose of them.

8 IMPLEMENTATION, REVIEW AND TRAINING

The Appointed Project Manager will be responsible for developing an updated Site-specific CEMP prior to commencement of Site works. The Site Manager will be responsible for ensuring compliance with the CEMP. Each sub-contractor will be responsible for appointing a point of contact for matters related to environmental protection.

Copies of the CEMP will be made available to all personnel on-site. All Site personnel and sub-contractors will be instructed about the objectives of the CEMP and informed of the responsibilities which fall upon them as a consequence of its provisions. All staff will be required to have the appropriate training and certification to undertake their specific roles.

All staff will receive environmental awareness training as part of their Site induction to ensure they are aware of their responsibilities under the CEMP. This will include:

- Site induction, including relevant environmental issues.
- Environmental posters and site notices.
- Method statement and risk assessment briefings.
- Toolbox talks, including instruction on incident response procedures; and,
- Key project-specific environmental issues briefings.

Furthermore, the provision of an Environmental Induction Sheet informing them of the specific measures which have been put in place and that must be adhered to.

The CEMP will be reviewed on an as needed basis if the scope of works changes significantly or if the need is identified following a site audit.

8.1 Training Awareness and Competence

Site personnel shall be trained appropriately to ensure they are competent to perform tasks that have the potential to cause a significant environmental impact as part of the Proposed Development. Competence is defined in terms of appropriate education, training, and experience.

All managers and supervisors will be briefed on the CEMP.

Method Statements will be prepared for specific activities prior to the works commencing and will include environmental management / best practice measures and emergency preparedness appropriate to the activity covered. The Construction Manager will review key Method Statements prior to their issue.

Method Statement briefings will be given before personnel carry out key activities for the first time.

9 CONCLUSIONS

This pCEMP document outlines the management procedures to enable the appointed Contractor to respond to potential environmental risks from construction activities on-site. This pCEMP should be considered a live document and as such once a contractor is appointed, the pCEMP will be updated and will be developed as the project progresses. The final CEMP will cover all aspects of the construction development.

In assessing risks on-site, full cognisance has been taken of best practice guidance as outlined in section 1.2.

The Appointed Contractor will be required to develop an updated CEMP prior to the commencement of any construction works. This updated CEMP will be submitted to Carlow County Council for approval.

The implementation of all the environmental management measures outlined in this pCEMP will ensure that the construction programme will be completed without significant adverse effects on the surrounding environment.

10 REFERENCES

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