Appendix 5A

Construction Environmental Management Plan

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Proposed Derrygreenagh Power Project, Co. Offaly

Construction Environmental Management Plan

Bord na Móna Powergen Limited

Project number: 60699676

January 2024

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
Rev 0	Jan 24	Final	POC	Peter O'Connor	TD

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1. Introduction

1.1 Background

AECOM Ireland Limited (hereafter referred to as 'AECOM') has been appointed on behalf of Bord na Móna Powergen Limited (hereafter referred to as the 'Applicant') to prepare a Construction Environmental Management Plan (CEMP) in relation to a planning application to An Bord Pleanála (ABP) for a Combined Cycle Gas Turbine (CCGT) unit and an Open Cycle Gas Turbine (OCGT) unit (Power Plant Area), and Electricity Grid Connection including substations and associated buildings and infrastructure ('the Proposed Development') on land within a subset of the Derrygreenagh bog group in Co. Offaly (hereafter referred to as the 'Site').

The Proposed Development will also require a Gas Connection Corridor to facilitate the operation of the Power Plant Area. The underground gas connection is not being applied for in the planning application for the Proposed Development (as it will be applied for by Gas Networks Ireland (GNI) under separate consenting processes). The route of the Gas Connection Corridor is the preferred route, as indicated by GNI, at the time of writing but may be subject to change as part of the detailed design process to be carried out. As such, detailed design, construction methodologies and proposed mitigation for the construction, operation and decommissioning of the Gas Connection Corridor will be defined by GNI at a later date and included in a CEMP to accompany their future planning applications.

1.1.1 The Applicant

The Applicant, Bord na Móna Powergen Ltd., is a subsidiary of Bord na Móna PLC.

Bord na Móna PLC is a publicly owned company, originally established in 1946 to develop and manage some of Ireland's extensive peat resources on an industrial scale, in accordance with government policy at the time. Bord na Móna lands extend to approximately 80,000 hectares (ha) in total and are located mainly in the Irish midlands. Bord na Móna currently manages and operates a portfolio of thermal and renewable assets, namely Edenderry Power Plant a peat / biomass co-fired electricity generating unit, Cushaling peaking plant, Cloncreen Sliabh Bawn Bellacorick, Mountlucas, Bruckana and Oweninny wind farms, Derrinlough windfarm (under construction), Timahoe North solar farm (under construction) and the Drehid landfill gas facility.

The Applicant is primarily a climate solutions company and is developing renewable energy projects (wind, solar, biomass and biogas) across its landbank to make a significant contribution to Ireland's ambitious targets for net zero greenhouse gas emissions by 2050. Bord na Móna is seeking to contribute towards the target of increasing the proportion of renewable electricity to 80% by 2030, through accelerating the development of renewable energy by providing up to 2GW of renewable energy generating assets by 2030 in support of national climate and energy policy targets.

1.2 Overview of the CEMP

This CEMP has been prepared to outline the proposed management and administration of site activities during the construction phase of the Proposed Development, to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments of the construction phase, and the measures to ensure compliance with legislation and the requirements of statutory bodies, all as detailed in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) submitted with the planning application.

The CEMP contains an overview of the Proposed Development and existing site conditions. The CEMP also provides mitigation measures to be adhered to during the construction phase. However, these are not exhaustive and will be refined through additional consideration of local circumstances and conditions during preparation of the final CEMP.

This CEMP will be used by the appointed contractor ('Contractor') as the basis for the development of a Contractor's / final CEMP, which will be prepared prior to construction and will include any additional mitigation requirements as and when they arise. It will be the Contractor's responsibility to update this CEMP into a Contractor's CEMP with items such as an Environmental Method Statements and an Environmental Risk Assessment (ERA) for the proposed works.

This CEMP will be updated by the Contractor and will be signed off by Offaly County Council and Westmeath County Council prior to construction works commencing. The Contractor's CEMP will take account of this CEMP and any planning conditions upon grant of permission for the Proposed Development.

This CEMP will be a live document and will be reviewed and updated, as necessary. This CEMP should be read in conjunction with the EIAR, NIS, Planning Statement and Drawings produced for this planning application.

The following relevant guidance has been referenced in the preparation of this CEMP:

- British Standards Institution (BSI) (2014). *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.*
- Construction Industry Research and Information Association (CIRIA) (2023). *Environmental good practice on site guide (5th edition) (C811).*
- Construction Industry Research and Information Association (CIRIA) (2006). *Control of water pollution from linear construction projects. Site guide (C649)*.
- Environmental Protection Agency (EPA) (2021). *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects.*
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports.*
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*
- Institute of Air Quality Management (IAQM) (2014). *Guidance on the Assessment of Dust from Demolition and Construction.*
- National Roads Authority (NRA) (2007). *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan.*
- National Roads Authority (NRA) (2008). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.*

The Contractor will include a full list of all guidance and legislation relevant to the construction phase of the Proposed Development within the Contractors CEMP.

1.3 Aims and Objectives

The **aims** of this CEMP are:

- To ensure the project is undertaken in accordance with best practice guidance for the management of the environment during construction works.
- To ensure that mitigation measures to protect all aspects of the environment as set out in the EIAR and NIS are put in place.
- To ensure that construction activities are carried out in accordance with all planning conditions for the proposed development.
- To carry out the proposed works with minimal impact on the environment.

The objectives of this report are to ensure the above aims are achieved during the construction phase. The following will be implemented during the construction phase by the Contractor and will be set out as part of the Contractors objectives:

- Appointment and delegation of responsibility to an individual for monitoring environmental compliance and adherence to this CEMP.
- Updating the CEMP on a continuous basis in accordance with regular environmental auditing and site inspections.

- Providing adequate environmental training and awareness to all project personnel.
- Establishing documented schedules and records for monitoring and inspections.
- Establishing reporting procedures for any incidents on site with potential to impact on the environment.
- Providing opportunities for site staff, operatives and community feedback and submission of complaints.
- Adopting a sustainable and socially responsible approach to construction.

1.4 Revisions of the CEMP

This CEMP has been prepared at the planning stage of the Proposed Development, with the EIAR, NIS and planning drawings.

All the elements of this CEMP will be included in the Contractor's CEMP, which will be produced prior to construction by the Contractor. The CEMP will be updated prior to the commencement of the development, to include any additional mitigation measures, conditions and or alterations to the EIAR and application documents that may emerge during the course of the planning process. The final CEMP will be submitted to the Planning Authority for written approval in advance of commencement of any construction works on site. The CEMP will be subject to ongoing review throughout the construction phase of the Proposed Development, through regular environmental auditing and site inspections.

The Contractor is required to include further details and / or confirmation in the Contractor's CEMP which will include:

- Details of emergency plan including personnel and contact numbers.
- Details of fuel storage areas (including location and bunding).
- Site and traffic signage.
- Method statements.

The appointed Contractor shall also agree and implement monitoring measures to monitor the effectiveness of the CEMP.

2. Description of the Proposed Development

2.1 Introduction

The Proposed Development is located in the townlands of Knockdrin, Derrygreenagh, Derryarkin, Derryiron, Ballybeg, Coolcor, Barrysbrook, Clonin, Togher and Coole. The total area of the red line application boundary of the Proposed Development is c. 312 ha.

The Proposed Development comprises a Combined Cycle Gas Turbine (CCGT) unit and an Open Cycle Gas Turbine (OCGT) unit, gas Above Ground Installation (AGI), water abstraction and water treatment infrastructure, respective surface and process water discharge connection routes, and the Electricity Grid Connection, refer to **Section 2.2**.

The characteristics of the surroundings of the Proposed Development vary, but it is mostly low density agricultural and residential development with either scattered houses and farming buildings, or dwellings clustered along busier roads. The location of the Proposed Development and overall surrounding environs are illustrated below on **Figure 2.1**. Further details of the Proposed Development, including layout drawings, are provided in Chapter 5 (Proposed Development and Overall Project), Volume I of the EIAR, submitted with this application.

The following terms are used to describe the Proposed Development and its wider project context:

- **'Proposed Development'** – relates to the components for which planning permission is being sought (*i.e.,* the 'red line boundary') – this includes the Power Plant Area and Electricity Grid Connection as defined below.
- **'Power Plant Area'** – relates to the main thermal power plant area east of the R400 road, which includes Combined Cycle Gas Turbine (CCGT) and Open Cycle Gas Turbine (OCGT) plant; a gas Above Ground Installation (AGI) ('Derrygreenagh AGI'); water abstraction and water treatment infrastructure; respective surface and process water discharge connection routes; and a permanent peat and spoil deposition area for overburden material excavated from the Power Plant Area. The process water discharge pipe will extend west of the R400 road before ultimate discharge south into the Yellow River.
- **'Electricity Grid Connection'** - this is part of the Proposed Development and will consist of the 220 kV substation west of the R400 road, pylon towers, overhead lines, Line-cable Interface compound, underground cabling, associated cabling and a new loop-in 400kV substation and compound.
- **'Gas Connection Corridor'** - this is part of the Overall Project, as defined below, and will enable the Proposed Development to connect to the existing high pressure Gas Pipeline to the West (BGE/77), north of the Power Plant Area via an AGI at the tie-in location and an underground pipeline. The underground gas connection is not being applied for in the planning application for the Proposed Development (as it will be applied for by Gas Networks Ireland (GNI) under separate consenting processes).
- **'the Overall Project'** - relates to the Proposed Development (i.e. the components for which planning permission is being sought) and, includes the Gas Connection Corridor as described above.

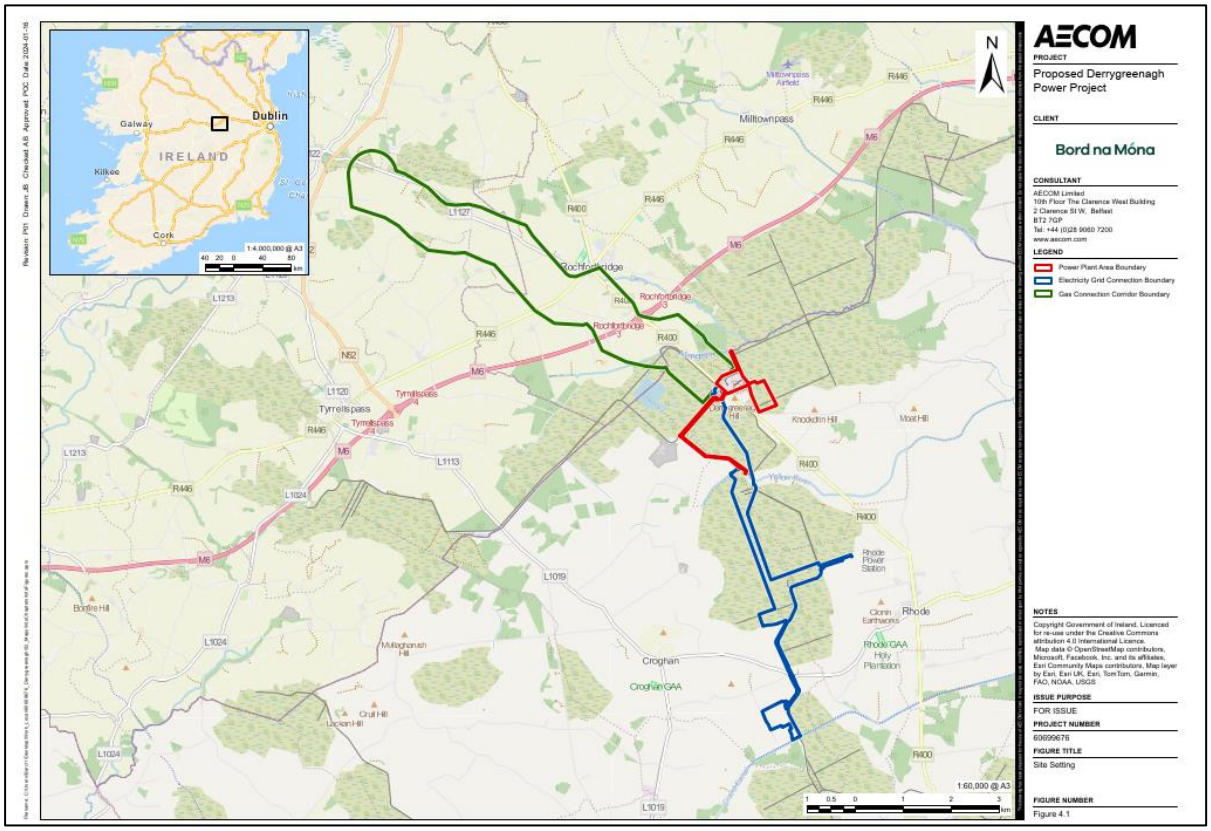

Figure 2-1. Location of the Proposed Development and Surrounding Environs

2.2 Existing Site

The majority of the Proposed Development is located within a subset of the Derrygreenagh bog group termed Bord na Móna Derrygreenagh Bog Group.

2.2.1 Power Plant Area

The Power Plant Area is located on a brownfield site known locally as Derrygreenagh Works. There are currently a number of buildings associated with Bord na Móna Derrygreenagh Works, such as workshops, stores, and offices; paved and concreted areas, outhouses, car-parking facilities, and machinery yards. The site also contains mature trees, hedges, and grassland; and a narrow railway, part of a network of railways connecting the site to the surrounding bog complex. The area was formerly used for servicing and repairing peat harvesting and transport equipment, it is currently servicing equipment required for post peat extraction activities required for site management and environmental monitoring. The existing operations at the Derrygreenagh Works site will be decommissioned and a number of buildings and structures will be demolished prior to the construction of the power plant. The proposals for discharge pipelines from the power plant are for the treated process water to discharge to the Yellow River to the southwest of the Power Plant Area, and clean surface water to discharge to the Mongagh River northeast of the Power Plant Area; both are to have respective routing along existing railway lines and machine pass corridors.

2.2.2 Electricity Grid Connection

The route of the proposed Electricity Grid Connection route starts to the west of the Power Plant Area, on the western side of the R400 road. The proposed overhead line and towers will traverse from the 220 kV Substation south for c. 5km over peat bogs within lands owned by the Applicant, crossing the Yellow River and a haul road associated with Kilmurray S&G, before being undergrounded at a compound c. 1km north of the L1010 Togher Road. An underground cable route will then continue south, beneath the L1010 Togher Road via existing railway underpass, following the route of the existing narrow railway which crosses Coolcor Stream, before connection to a proposed 400 kV Substation located on agricultural land in close proximity to the existing electricity 400 kV overhead route transmission network.

2.2.2.1 220kV Substation – Site Description

The site of the proposed 220 kV Substation is located west of the R400 road in close proximity to the Power Plant Area. The area is located on a brownfield site on the existing narrow gauge railway route on a mixture of made ground and bare peat on relatively flat ground c. 81mOD. There is an existing refuelling station to the northeast. The site of the proposed Contractor Compound will be located north of the proposed Substation site.

2.2.2.2 Overhead Electricity Grid Connection – Site Description

The overhead Electricity Grid Connection route will be located within Bord na Móna Derrygreenagh Bog Group on Derryarkin Bog and Ballybeg Bog. These bogs are served by installation of surface water drainage (incorporating a pump station east of Ballybeg Bog), silt ponds and drain channels as well as rail network (including rail lines, underpasses / bridges and ancillary infrastructure) and machine passes alongside. Drainage is by gravity flow, however in Ballybeg Bog, there is a pumped system used to drain the bog. The required pump station was located at low points in larger drains and are used to direct surface water to the outfall locations via silt ponds in accordance with the Licence Reg No. P0501-01 requirements.

The route of the 220 kV double circuit overhead line will extend from the 220 kV Substation across Derryarkin bog taking an angled route south into Ballybeg Bog, utilising as straight a line as possible before connecting in with the Line-Cable Interface Compound.

Derryarkin Bog has regenerated in recent years to form a scrub and immature woodland mosaic in between patches of bare peat. The lower end of Derryarkin bog contains land that can be prone to flooding. The top half of Ballybeg Bog is a patchwork of bare peat and areas that have begun to regenerate into bog woodland, scrub, immature woodland of mixture or broadleaf and conifer type; the lower end of Ballybeg Bog is bare peatland.

2.2.2.3 Underground Electricity Grid Connection – Site Description

The 220 kV overhead line will transition to a 220 kV underground cable via a double circuit Line-Cable Interface Compound. The cable compound location has been proposed in proximity to the existing railway line and machine pass access track and there is proximity to an existing tree line to the south reducing its visibility from surrounding dwellings.

The underground cable will be routed within an existing railway line and machine pass corridor on Bord na Móna lands for c. 2.8 km before routing through c. 550 m of third-party agricultural land before linking into the 400kV substation site area. There are a number of houses adjacent to the cable route where it dissects the L1010 road and in proximity at Taylors Cross in the townland of Togher.

2.2.2.4 400 kV Substation – Site Description

The site of the proposed 400 kV Substation is located on agricultural land to the west of the Ballybeg Remnant bog south of the L1010 road c. 450m north of the Grand Canal. The existing site is predominantly improved grassland, with perimeter mature trees and hedgerow.

Access to the 400 kV Substation site is currently via agricultural land units to the west however the proposed construction and operational access route will be from the historic railway line to the east. The site of the proposed Contractor Compound will be located north of the proposed 400 kV Substation site, immediately west of Bord na Móna lands. There are nine houses within 750m of the proposed Substation site. There is a permanent soil deposition area proposed to the north-west of the s-Substation and Contractor Compound for storage of excess soils from the substation site during the construction phase.

2.3 Power Plant Area

The Proposed Development will include the following components in relation to the Power Plant Area as per **Table 2.1**.

Table 2-1: Power Plant Area Components

Proposed Element	Component / Details
Combined Cycle Gas Turbine (CCGT) Plant	CCGT Turbine Hall and buildings
	Heat Recovery Steam Generator (HRSG) and associated cladding
	1 no. Emissions Stack (CCGT) 60m high and CEMS monitoring station and platforms
	Air Cooled Condensers (ACC)
	Air Intake (CCGT)
Open Cycle Gas Turbine (OCGT) Plant	OCGT Turbine Hall and Buildings
	Air Intake (OCGT)
	Emissions Stack (OCGT) 45m high
Secondary Fuel Storage and Unloading Facility	2 No. Fuel Storage Tanks and unloading area
	Fuel pumping and cleaning plant
	Fuel transfer system
Subsidiary items of plant/ equipment	Blowdown Tank
	Boiler Feed pumps
	Turbine blowdown tank
	Drains recovery tank
	Deaerator and feedwater storage tank
	Auxiliary Boiler
	Propane Ignition System
	Transformer Cooling Banks
	Emergency Diesel Generator
	Firefighting systems
	Fire Suppression Skid
	2 No. Ammonia storage tanks
	Raw/Fire Water Tank
	Process water treatment & pre-treatments infrastructure including water abstraction and discharge
	2 No. Demineralised water tanks
	Main and Auxiliary Transformers
	Silencers, vents and drains
	Underground / Overground Services (gas, sewage, process water, storm water drainage, water, secondary fuel, electrical services distribution etc.)
	Associated ancillary equipment
	Fuel Gas Performance Heater
Gas Connection Above Ground Infrastructure (AGI) Compound	Regulator building
	Boiler and instrumentation houses
	Gas analyser kiosk
	Pressure reduction system
	Security fencing and Boundary Treatment (gates)
	AGI Site Access - The AGI compound will be served by access point off the R400 road which also serves the power plant area.
	Gas compressor building

Proposed Element	Component / Details
Gas receiving facility	Fin fan coolers
	Pressure reducing station
Associated buildings and infrastructure	Administration Building
	Workshop
	Control Room
	Stores
	Car Parking
	Maintenance Compounds
	Abstraction wells
	Water Treatment Plant
	Process Wastewater Treatment Plant
	Foul Water Treatment System
	Surface water drainage attenuation
	Water Discharge Points
	Firewater Retention and Shutdown Facility
	Power Plant Area Site Access and Internal roads
	External lighting
	Security fencing and Boundary Treatment(gates)
	Utilities (pipes, cables, surface water drainage systems, oil- water separators, including channelling, culverting, crossings etc.)
	Landscape Mitigation
Demolition works	Demolition of a number of existing buildings and structures within the existing Derrygreenagh Works site is included in the Temporary Construction Phase Works. While the effects of the demolition will be permanent, the works activity will be temporary and related to site preparation.
Peat Deposition Area / Soil Deposition Area	Permanent storage of peat or soil from excavations as a result of the construction phase of the Power Plant Area. The peat and soil deposition area will not exceed 1m above ground level and will be suitably profiled to eliminate risk of movement or slippage of material.
Temporary Construction Phase Works	The Power Plant Area element of the Proposed Development will include the following Temporary Construction Phase Works: • Temporary Contractor compounds and welfare facilities • Temporary facilities and stores • Temporary vehicle parking facilities for construction phase • Temporary security fencing and gates • Temporary external lighting • Temporary Signage and Traffic Management

2.4 Electricity Grid Connection

The Proposed Development will include the following components in relation to the Electricity Grid Connection as per **Table 2.2**.

Table 2-2: Electricity Grid Connection Components

Proposed Element	Component / Details
220 kV Substation	Hybrid gas insulated switchgear (GIS) - air insulated switchgear (AIS) Substation design.
1 no. Telecommunication Mast for 220 kV Substation	36m telecommunication mast/steel lattice tower adjacent to 220 kV Substation
220 kV Overhead Line	Overhead line (OHL) facilitated by double circuit suspension pylon towers (13 No.) and strain pylon towers (6 No.).
220 kV Line-Cable Interface Compound	Interface compound to facilitate connection from overhead line to underground connection.
220 kV Underground Cable Connection	220 kV double circuit Underground Cable (UGC) Connection with paved and gated service road and associated 12 no. cable joint bays to facilitate construction and service of underground cables.
400 kV Substation	1 no. 400 kV GIS loop-in substation adjacent to the existing Oldstreet-Woodland 400 kV overhead line. Includes site access off L1010 road.
2 No. 400 kV Strain Towers	Strain towers to facilitate connection from the 400 kV Substation to the existing Oldstreet-Woodland 400 kV overhead line.
1 no. Telecommunication Mast for 400 kV Substation	36m telecommunication mast/steel lattice tower adjacent to 400kV400 kV Substation
Peat Deposition Area / Soil Deposition Area	Permanent storage of peat and soil from excavations arising during the construction phase of the Electricity Grid Connection. The peat and soil deposition area will not exceed 1m above ground level and will be suitably profiled to eliminate risk of movement or slippage of material.
Tree Replanting Area	Suitably sized areas totalling c. 17.5 Hectares for tree replanting have been identified, located in the vicinity of the 220kV line-cable interface compound and the 220 kV substation. These areas will compensate for all tree felling requirements associated with the Proposed Development.
Temporary Construction Phase Works	The Electricity Grid Connection will include the following Temporary Construction Phase Works: • Temporary Contractor compounds and welfare facilities • Temporary facilities and stores • Temporary construction staff vehicle parking facilities for the duration of the construction phase • Temporary security fencing and gates • Temporary External lighting • Temporary Signage and Traffic Management.

3. Overview of the Demolition and Construction Phase Works

3.1 Introduction

It is anticipated that the overall construction phase for the Proposed Development and Overall Project will be approximately 3 years, the final details of which will be determined by the Contractor and presented in the Contractor's CEMP, which will be agreed with Offaly County Council and Westmeath County Council prior to commencement of construction works.

The construction phase for the Power Plant will be approximately 3 years months and approximately 2.5 years for the Electricity Grid Connection. The construction of the Power Plant Area and Electricity Grid Connection will be managed by separate contractors.

Table 3.2 provides an overview of the construction programme for the Proposed Development.

3.2 General Construction Site Management

3.2.1 Roles and Responsibilities

The Contractor will employ a suitably experienced and qualified CEMP Coordinator (CEMPC) or Environmental Manager to undertake coordination and implementation of the Contractor's CEMP, in respect of all environmental requirements. The CEMPC / Environmental Manager will be present onsite whenever work is in progress.

The CEMPC / Environmental Manager will be the point of contact for dealing with environmental issues for the Local Authority, Contractor's employees, subcontractors, relevant regulatory authorities / environmental bodies, and members of the public. The CEMPC / Environmental Manager will also be responsible for controlling the construction impacts arising from the activities of the Contractor and their subcontractors in accordance with the CEMP.

The CEMPC / Environmental Manager will maintain a daily log, recording all environmental issues, events, and dealings with third parties.

The CEMPC / Environmental Manager will prepare, implement, manage, review, and revise the versions of the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts during construction.

In general, the duties of the CEMPC / Environmental Manager will include the following:

- Implementation of the CEMP procedures.
- Routine environmental monitoring, recording, and reporting.
- Maintaining and auditing the CEMP and documents that underpin it.
- Environmental training including daily Toolbox Talks to the construction staff and design staff.
- Any other activities that may be necessary in order to protect wildlife and the environment during the works.

Some of the indicative key contractor team roles and responsibilities are set out below in **Table 3.1**. Additional specialist input will be included as required (*i.e.,* archaeologist).

Table 3-1: Key contractor Team Roles and Responsibilities (Indicative)

Role	Responsibilities
Contractor's Project Director	• Assign specific environmental duties to competent member of the Contractor's team. • Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained. • Ensure that significant environmental aspects identified for the proposed development are managed. • Promote the continual improvement of environmental performance.
Contractor's Project Manager	• Ensure that the CEMP is produced, maintained, and implemented and distributed to all relevant parties. • Monitor the completion of corrective actions by the Site Manager and take action as required to expedite completion. • Ensure that all personnel for whom they are responsible are aware of the CEMP and implement the relevant requirements. • Evaluate the competence of all subcontractors and suppliers and ensure that they are made aware of and comply with the CEMP and associated procedures. • Establish a consultation and communication system with all relevant interested parties associated with the proposed development, including employees, partners, sub-contractors, designers and third parties, etc., where relevant.
CEMP Coordinator (CEMPC) / Environmental Manager	• Develop, maintain, and audit the CEMP (and supporting documents / plans) to ensure all aspects, impacts, statutory requirements, and EIAR and NIS commitments, etc., are reflected. • Develop and implement a programme of regular environmental inspections, monitoring, recording, and reporting, in accordance with procedures set out in the CEMP. • Ensure that the works are constructed in line with the CEMP. • Liaise with the Local Authority. • Attend regular construction meetings to ensure environmental issues are discussed and addressed by the Contractor's Team. • Comply with duties under relevant legislation and company procedures in relation to environmental incident investigation and reporting. • Provide support and training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints and methods of working. • Appoint environmental specialists as required. • Ensure identified environmental specialists are in attendance on-site as required by the CEMP. • Complete programme of regular environmental inspections, monitoring, recording, and reporting in accordance with the CEMP. • Provide direction on corrective action to be taken by the Site Manager in response to identified non-conformances. • Report all identified non-conformances separately to the Site Manager. • Ensure that corrective actions are completed fully by the Site Manager. • Maintain daily records of environmental issues, events, and consultations with third parties. • Ensure identified environmental specialists are in attendance on-site as required by the CEMP. • Maintain records of environmental awareness training / inductions delivered to site staff.
Site Manager	• Ensure that all personnel undergo suitable and sufficient environmental induction before starting work, and periodic refresher environmental awareness training throughout the construction phase. • Ensure staff attend the appropriate environmental courses that are organised by the CEMPC. • Ensure the CEMPC is maintaining records of training delivered to site staff. • Monitor the performance of personnel and activities under their control and ensure arrangements are in place so that all personnel can work in a manner which minimises risks to them and to the environment. • Undertake a programme of regular environmental inspections in liaison with the Environmental Manager.

Role	Responsibilities
	• Provide resources and support to complete corrective actions identified by the Environmental Manager. • Assist and support the CEMPC and statutory bodies in the investigation of any incidents. • Notify the Environmental Manager of all environmental issues or incidents arising over the course of operations.
Safety, Health, Environment and Quality (SHEQ) Officer	• A suitably qualified SHEQ Officer will be appointed by the contractor for the duration of the construction period. • The SHEQ will ensure compliance with all relevant Health and Safety regulations, environmental regulations, and quality control on-site during the construction stage. • The SHEQ will be on-site full time during the construction phase. • The SHEQ Officer, or other suitably qualified person, will fulfil the role of Project Supervisor Construction Stage (PSCS) in accordance with the requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended and will liaise with the Project Supervisor Design Process (PSDP) in the discharge of their duties under the Regulations.
Ecological Clerk of Works (ECoW)	• The Ecological Clerk of Works (ECoW) will hold a relevant degree in ecology and have appropriate relevant experience. • Provision of specialist input and supervision (licensed or otherwise), where necessary, of construction in relation to protected species including roosting bats. • Training of construction staff regarding measures to protect nesting birds and roosting bats. • Attend site as required to monitor the protection of asset in accordance with the requirements of relevant legislation, the construction contract and the CEMP. • Identify potential risks to wildlife and develop suitable control measures. • Provide status reports and updates to the Environmental Manager in the completion of their activities. • Liaison with the NPWS, Local Authority and other nature conservation agencies on ecological matters where required.

3.2.2 Safety and Security

All activities carried out by the Contractor on the Site will be in accordance with the requirements of the *Safety, Health and Welfare at Work Act 2005*, as amended, and Regulations made under this Act.

The scale and scope of the Proposed Development will require the appointment of a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) in accordance with the provisions of the *Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2103),* as amended. These persons will be appointed by Applicant and notified to the Health and Safety Authority (HSA) prior to commencement of detailed design works (in the case of the PSDP) and prior to commencement of construction (in the case of the PSCS).

The PSDP will prepare a Preliminary Health and Safety (H&S) Plan which will identify any particular risks, residual risks and particular sequences of work that are envisaged during the design of the works. Prior to construction works commencing, the Preliminary H&S Plan will be provided to the Contractor and the PSCS will further develop the document to prepare a construction phase H&S Plan. This H&S Plan will also provide relevant contact details and emergency response procedures for the Proposed Development. Mitigation and control measures will be implemented to minimise the identified risks.

Evidence of completion of construction safety training, typically in the form of a Safepass Card, will be required for all construction personnel prior to commencing onsite. A record of Safepass Cards and personnel approved for entrance to the Site will be completed as part of a site induction process. The Contractor's H&S Plan will detail the site induction and access requirements. Where relevant, equipment operators or specialist works will require personnel to hold a valid Construction Skills Certificate Scheme Card. All equipment and machinery used onsite will be appropriately certified for its intended purposes.

The perimeter of the construction compounds will be surrounded by palisade security fencing, c. 2m in height. There will be additional security fencing around specific areas of the Site, for added security and safety.

There will be temporary security cabins at access points onto the substation sites during the construction phase, with CCTV and gates with locks at access points on the transmission sites. The security cabins will be located close to the proposed temporary and permanent site entrances and at crossing points on local roads from one bog to another.

For Power Plant Area site security, there will be a single point of entry to the Site for all construction personnel. The Site entrance gates will be securely locked outside of construction hours to prevent unauthorised entry and will be monitored during construction hours to regulate access to the Site for authorised personnel. Public access to the Site during the construction phase will be prohibited.

The security cabins will be prefabricated structures and will serve as the check-in and check-out point for staff and visitors during the construction phase. The security cabins will be removed as part of the post-construction reinstatement works of the Proposed Development.

3.2.3 Environmental Training and Awareness

To ensure environmental awareness and compliance throughout the construction phase of the Proposed Development, this CEMP and its contents will be communicated to all site personnel, including management staff, operatives and subcontractors.

3.2.3.1 Site Induction

All personnel working on the Proposed Development (including all site personnel, management staff, operatives, contractors, subcontractors and visitors attending the Site) will attend a mandatory site induction before they commence work on site and, where appropriate, the Contractor(s) will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled. The key elements of this CEMP will form part of the Site induction. Personnel attending such an induction will complete a site induction record acknowledging attendance and confirming that they understand and agree to comply with the requirements of the Site. Copies of all certificates of competency, licences and other qualifications as deemed necessary by the Contractor will be copied and documented. The environmental induction will run concurrently with safety awareness training.

Key environmental considerations and objectives will be incorporated into this induction and a baseline level of environmental awareness will be established. The Site induction will include the following as a minimum:

- An introduction to the Environmental Manager.
- A description of the CEMP and consequences of non-compliance.
- An overview of the goals and objectives of the environmental policy and CEMP;
- Identification of environmental constraints.
- Information in relation to the environmental risk associated with the Proposed Development and methods of avoiding environmental risks as identified within the CEMP, the planning conditions, and any other relevant plans, documents, or reports;
- An overview of conditions of consents, permits and licences, including environmental control measures and commitments.
- Procedures associated with emergency and spill management, incident notification and reporting, including procedures for dealing with damage to the environment.
- Information of roles and individual responsibilities and environmental constraints to specific jobs;
- Location of any sensitive receptors on or adjacent to the Site;
- Location of habitats and species to be protected during construction, how activities may affect them and methods necessary to avoid impacts, controls to minimise noise and the importance of pollution

prevention measures to protect nearby watercourses and sensitive receptors including residential properties;

- Information on the environmental emergency response procedure to be followed onsite, should an environmental emergency occur, including contact details for key Site personnel to contact in an emergency; and
- Information on the storage locations of spill kits across site and on the correct use of spill kits.

3.2.3.2 Toolbox Talks

Environmental toolbox talks will be provided to all site personnel and sub-consultants on a regular basis. These will be targeted at particularly sensitive environmental issues such as:

- Protection of sensitive ecological habitats and key ecological receptors.
- Works close to waterbodies.
- Water pollution and silt control.
- Water pollution in relation to cement and concrete handling.
- Spill prevention and control.
- Dust management.
- Sensitive archaeological sites.
- Waste management.

In addition to the above, toolbox talks will be provided in advance of works which are considered to present an increased environmental risk. Toolbox talks will inform site personnel of any mitigation measures and working procedures which must be adopted specific to the works to be carried out.

3.2.4 Consents and Licences

All statutory consents and licences required to commence on-site construction activities will be obtained ahead of works commencing, allowing for the appropriate notice period. It will be the responsibility of the Contractor to ensure all consents and licences required are in place prior to the start of construction. These will include, but are not limited to:

- Site notices.
- Construction commencement notices.
- Licence to connect to existing utilities (including water) and mains sewers, where required.
- Abstraction and / or discharge licenses, where required (unless applied for separately under IE Licence to the EPA).
- Road opening / closure licences.

The CEMPC / Environmental Manager will oversee and advise the Contractor on compliance with additional requirements to the CEMP including licensing requirements, mitigation measures, and monitoring requirements specified in documents including, but not limited to, the following:

- Construction Traffic Management Plan (CTMP).
- Dust Management Plan (DMP).
- Invasive Species Management Plan (ISMP).
- Water Quality Management Plan.
- Emergency Response Plan.
- Resource and Waste Management Plan (RWMP).

3.2.5 Emergency Management

3.2.5.1 Emergency Response Plan

The Contractor will be responsible for developing a detailed Emergency Response Plan (ERP) for the proposed works, to cover health and safety emergencies as well as environmental emergencies, as part of the H&S Plan.

The ERP will be in accordance with legislative requirements including COMAH and IE Licence, which will include a fire strategy and appropriate training procedures.

Procedures will be in place for the ERP to clearly detail the responsibilities, actions and communication channels for staff and personnel on how to deal with emergencies should they occur. Staff will also receive the level of training required for their role and position. This will include dealing with events such as fires, explosions, spillages, flooding etc.

The ERP will be activated in the event of an emergency such as an accident, fire, spillage, collapse etc. and will provide details on who is required to be notified, first aid facilities and closest hospitals. The ERP will also include details of all personnel inducted and authorised to work on the Site as well as next of kin contact details and relevant medical information.

In the event of an emergency, the SHEQ Officer, CEMPC and Project Manager will be notified immediately and will determine the scale of the emergency and the requirement for the assistance of emergency services. Works will cease in the area of the incident and contact will be maintained with the emergency services to direct them to the scene of the incident as required. As part of the ERP, an evacuation drill will be carried out on a regular basis to make all personnel aware of the procedure to be followed in the event of an emergency where a full site evacuation is required.

Emergency point(s) will be identified at suitable locations in the construction compounds and the ERP will outline the persons responsible for checking names at the safety muster points. Records will be maintained of such drills.

The ERP must include contact names and telephone numbers for the relevant local authorities (all sections / departments) including ambulance, fire brigade, An Garda Siochána and the HSA. Reporting of environmental emergencies to the Local Authority will be required as well as other relevant stakeholders such as the NPWS, IFI or the EPA.

3.2.5.2 Spill Control and Response

Emergency spill kits with oil boom and absorbent materials will be kept on-site in the event of an accidental spill. Spill kits will be kept in the construction compounds. Spill kits and oil absorbent material will be carried by mobile plant and located at vulnerable locations (e.g., near oil filled equipment). Booms will be held on-site for works near waterbody/ drains. Spill kits will contain a breakable tie to show use and indicates whether it needs to be replenished. The Site Manager and Environmental Manager will be responsible for replenishing spill kits.

All construction personnel will be notified of where the spill kits are located as part of the site induction and will be trained on the site procedures for dealing with spills. In the event of a leak or a spill in the field, the spill kits will be used to contain and absorb the pollutant and prevent any further potential contamination. The absorbed pollutants and contaminated materials will be placed into leak proof containers and transferred to a suitable waste container for hazardous materials in the construction compounds. Where a leak has occurred from machinery, the equipment will not be permitted to be used further until the issue has been resolved.

The SHEQ Officer (or equivalent appointed person) will be notified of any spills on-site and will determine the requirement to notify the relevant authorities. Refer to **Section 5.7.1.3 and 5.7.1.5** for further mitigation on refuelling and spills.

3.2.5.3 Incidents

All safety or environmental incidents associated with the Proposed Development will be reported and investigated in line with the ERP. The following procedures will be followed in the event of an incident:

- Works will stop immediately where safe to do so.
- The SHEQ Officer, CEMPC and Project Manager and will be contacted.
- The size of the incident will be assessed and determined if it can be controlled by site staff or if emergency services are required to attend.
- The appropriate enforcing authority will be contacted.
- The SHEQ Officer will investigate after the incident.
- The findings will be sent to the appropriate authority.
- An action plan will be prepared to set out any modifications to working practices required to prevent a recurrence.
- All operatives and staff to be briefed on the updated working practices / procedures.

3.2.6 Complaints

A Complaints Register, detailing any and all complaints received from the general public in respect of the operation of the facility, will be maintained at the site. This register will also record complaints occurring from construction activity at the Site.

All complaints received regarding the construction works will be recorded and categorised (e.g., noise, property damage, traffic, dust etc.) within the Complaints Register.

When a complaint is received (telephone calls and letters of complaint etc.), the following information must be taken as a minimum:

- Name, address and contact details of the complainant (with the complainant's permission).
- Brief outline of the complaint.
- Date of complaint.
- Name of person receiving complaint details.

A mechanism for managing stakeholders' questions, concerns, and grievances from local residents and stakeholders' will be implemented, appropriate conflict resolution processes will be implemented to ensure any issues are heard by the developer. All complaints received from external sources and incidents must be reported to the CEMPC and the appropriate site personnel. Measures will include but will not be limited to:

- Complying with the requirements of the Data Protection Act, and other relevant legislation, the Contractor will record all Complaints, Comments and Queries (correspondence) received during construction. Stored data will be secured against theft, intrusion, or modification by malicious third parties in-line with current best practice.
- The Contractor will record any actions, including further correspondence, taken in respect of any Complaint, Comment or Query.
- The following timescales will apply in the Contractor's management of correspondence following submission:
  - within eight working hours from receiving the complaint, an acknowledgement will be sent to the correspondent; and
  - within 72 hours, the Contractor will issue a response to any correspondence detailing further actions to be undertaken.

- The Contractor will aim to have completed and implemented their actions within seven working days of receiving correspondence.
- The Contractor will have a means by which to explore the Complaints, Comments and Queries interface within the reception area of the site offices, to allow access to the records during normal working hours.

All complaints received by the Applicant will be communicated to the Contractor immediately so that the potential source(s) of the complaint can be stopped or shut down while the complaint is investigated. All complaints will be followed up and resolved in so far as is practicable. The complainant, Contractor and other stakeholders will be kept informed of the progress in resolving the complaint.

3.2.7 Monitoring and Inspections

Environmental focused monitoring and inspection activities will be carried out throughout the construction phase. The frequency of monitoring and inspection activities will be agreed in advance of construction with the Applicant and will be in line with planning conditions, the documentation and reports submitted with the planning application such as the EIAR, and any preconstruction surveys. Additional monitoring and inspection will take place outside of the agreed frequency where an incident occurs or where activities that can have a significant environmental impact are occurring.

Regular site inspections will be undertaken by the Contractor's CEMPC / Environmental Manager to monitor compliance with the CEMP and record inspection results. It is anticipated that a daily visual check and a detailed weekly check will be carried out and these records will be available to the Local Authorities upon request.

3.2.8 Community Consultation and Liaison

There shall be an ongoing commitment by the Project Team to maintain community consultation and liaison throughout the construction period for the Proposed Development. Signage will be provided at Site entrances which shall have a Project contact telephone number where the public will be able to leave messages in relation to the Proposed Development construction.

A liaison officer will be appointed to manage the calls / messages and any subsequent actions pertaining to these.

Details of community engagement and consultation to date is defined in EIAR Chapter 6: Consultation.

3.3 Demolition Works

Demolition of a large section of the existing Derrygreenagh Works is included in the Proposed Development in order to facilitate the construction of the Power Plant Area. While the effects of the demolition will be permanent, the demolition work activities themselves will be temporary and related to site preparation.

The following buildings and structures to be demolished on the Power Plant Area include:

- Site Offices
- Boiler House
- Workshop #1
- Workshop #2
- Water Tank
- Storage Unit.

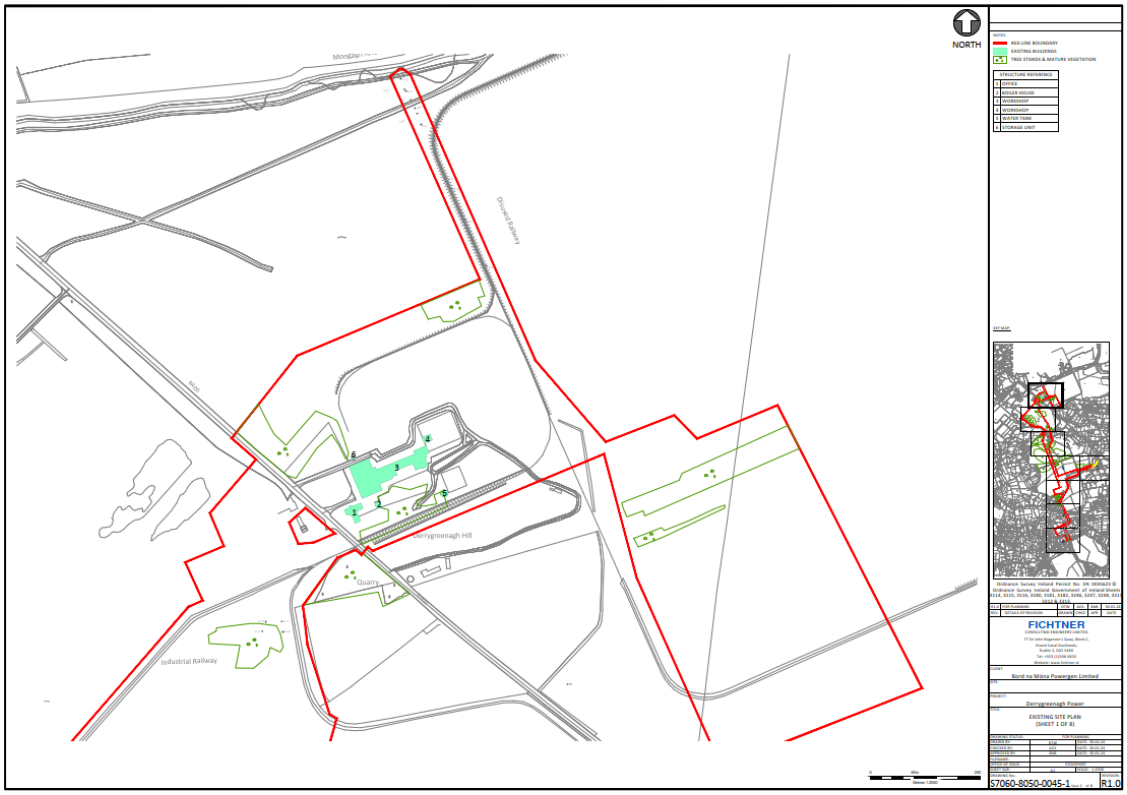

Figure 3-1. Location of the Structures to be Demolished.

Ahead of the dismantling and demolition works, certain activities and surveys / inspections will need to be undertaken to determine if there are any hazardous materials etc present. The reports from these surveys/inspections will be made available to the demolition contractors.

Asbestos will be progressively removed throughout the works in full compliance with current regulations. The removal of all hazardous materials is to be carried out prior to demolition work commencing and disposed of in line with the relevant legislation. The coating on the external sheeting is known to contain some asbestos bearing material.

The proposed demolition process will be undertaken in the following general stages:

- Removal of re-usable plant.
- Progressive stripping and disposal of asbestos (if present).
- Stripping out of internal equipment and fittings for scrap.
- Breaking up of the internal concrete floors.
- Demolition of external components and structures.

The demolition works will include a number of different methodologies and it is anticipated that a combination of the following demolition methods will be used:

- Manual removal of asbestos and asbestos containing materials (if / where required).
- Dismantling (reverse installation).
- High Reach Demolition Plant.
- Hot Works (cutting) to enable dismantling.
- Cranage.
- Vibration Pecker to break out concrete into smaller manageable sections.

- Manual gas / plasma cutting - cutting electrically conductive materials like mild steel, stainless steel, copper, aluminium.
- Hydraulic shears / crushers – used to demolish reinforced concrete and other materials.

Plant and equipment will be required and will include heavy duty earthmoving plant and excavating equipment. Vehicles and equipment will be securely stored within the Power Plant Area.

Refer to **Section 5.11.2** for details regarding the demolition waste management.

Table 3-2: Construction Phase Programme (Subject to planning permission timeline)

Activity	Year 1				Year 2				Year 3				Year 4			
	Q4 2024	Q1 2025	Q2 2025	Q3 2025	Q4 2025	Q1 2026	Q2 2026	Q3 2026	Q4 2026	Q1 2027	Q2 2027	Q3 2027	Q4 2025			
Power Plant Area																
Enabling works and mobilisation (inc. site clearance and demolition)	x	x														
Civil and Structural (Inc. ground works, piling and foundations)			x	x	x	x	x	x	x							
Erect steelwork and cladding				x	x	x	x	x	x							
Mechanical and electrical works					x	x	x	x	x	x	x	x				
Commissioning and testing								x	x	x	x	x	x			
Electricity Grid Connection																
Enabling works and site mobilisation	x	x	x													
Civil Works - Substation (220 kV + 400 kV) and interface compound	x	x	x													
Cabling and tower works									x	x	x					
Mechanical and electrical fitout			x	x	x	x	x									
Commissioning and testing								x	x	x	x					
Energisation											x					

Source: Fichtner Consulting Engineers Limited (2023)

3.4 Construction Phase for the Power Plant Area

3.4.1 Overview

The Applicant will appoint an Engineering Procurement Construction (EPC) Contractor for the construction of the Power Plant Area. The Contractor will appoint sub-contractors to undertake all the specific construction and civil works. The Applicant is committed to ensure a safe working environment for all employees and contractors.

Any vegetation clearance works required will commence outside the breeding bird season, which runs from the 1st of March to the 31st of August, to avoid any potentially significant effects on nesting birds. Construction may commence from September to March so that construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout that bird breeding season.

3.4.2 Construction Programme / Phasing

The construction phase for the Power Plant Area will be approximately 39 months, the final details of which will be determined by the EPC Contractor and presented in the Contractors CEMP. **Table 3.2** provides an overview of the construction programme for the Power Plant Area.

3.4.3 Construction Hours

Construction works will typically take place during the hours of 0700 hrs to 1900 hrs (Monday to Friday) and 0800 hrs to 1300 hrs (Saturday) with the exception of commissioning and specific engineering works (e.g., Non-destructive testing, internal erection concrete pours) which could take place outside these hours, as and when agreed with the planning authority.

Specific internal erection activities may be required to be carried out on a 24 hr 7 day per week basis, to ensure that optimal use is made of good weather period or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with the Local Authorities.

3.4.4 Construction Staff

Levels of employment will vary throughout the construction phase with peak levels of employment likely to be 400 staff average with a peak employment of approximately 750 staff.

Staff will comprise engineering, management, skilled and semi-skilled workers during the construction programme.

3.4.5 Temporary Construction Compounds

The temporary construction compound will be located on the west and north sides of the Power Plant Area. The construction compound will be used for the unloading and storage of construction materials, temporary site offices and welfare facilities, and will have availability for some construction staff vehicle parking. Refer to **Section 3.3.6** for further details on traffic management and parking.

The EPC contactor will carry out all works associated with preparing the areas for use and installing all required services. The arrangement of the contractor compounds will evolve over the duration of the project. Detailed requirements and designs will therefore be developed during the detailed design phase by the EPC contractor.

Wastewater from temporary construction phase welfare facilities will be directed to a sealed storage tank, with all wastewater tankered off site by an appropriately consented waste collector to a licensed disposal plant. The temporary wastewater storage tanks will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. All construction chemicals, oil and grease etc. will be stored in appropriate containers, cabinets and bunded areas.

Construction vehicles and equipment will be parked on hard standing and/or provided with drip trays as appropriate.

The compound will not be used for long-term storage of materials, and storage will be for the duration of the construction phase only. At the end of each shift, mobile plant will be returned to a secure overnight plant storage area within the construction compound where drip trays will be utilised under the various types of plant. Storage areas for flammable / toxic / corrosive materials will be located in a separate, locked, impermeable bunded and fenced off area. Material data sheets will be available for all these materials, as well as a copy of the relevant Risk Assessment for the task and control measures set therein, all subject to the Applicant's approval.

The contractor will be responsible for ensuring that all vehicles egressing the site have used the wheel wash facilities. A road sweeper will be available if any section of the surrounding public roads becomes soiled by vehicles associated with the Proposed Development.

Laydown requirements and construction phasing will be developed during the detailed design phase by the Contractor.

Construction security is the responsibility of the EPC Contractor. There will be security fencing around the construction compounds and specific areas of the site for access control, safety and security. Refer to **Section 3.2.2**, for further details on site security.

A construction phase temporary lighting scheme will be designed to provide safe working conditions in all areas of the Site during construction. The lighting scheme will aim to reduce light pollution and a visual impact on sensitive receptors and the local environment. The construction phase lighting scheme will be developed by the EPC contractor. The lighting system will comply with the guidance provided by HSG38 Lighting at Work, the Society of Light and Lighting guides and EN 12464-2.

The location of the construction compounds is shown on planning drawings submitted with the planning application**.**

3.4.5.1 Construction Facilities and Storage

The area to the immediate north and west of the Power Plant Area will be used for the unloading and storage of construction materials, temporary site offices and welfare facilities, and construction staff vehicle parking (refer to Planning Drawings). Some pre- fabrication of materials and components will also be undertaken in these areas. This area will have availability for approximately 100 No. cars and 36 No. minibuses, which will be adequate space for the peak staff construction vehicles, refer to **Section 3.3.6**.

Some pre-fabrication of materials and components will also be undertaken in this area. The temporary construction compound is currently underlain by made ground such that it provides a level surface that allows surface water and rainwater to percolate through it; no hazardous materials will be stored unbunded within this area.

3.4.6 Construction Materials

The construction of the Power Plant Area will require the relevant personnel, machinery and materials. **Table 3.3** outlines the equipment and materials.

Table 3-3: Power Plant Area – Estimated Construction Works

Equipment	Materials
• JCB Type excavators (20, 25, 35 ton) • 360˚ tracked excavators (13 ton normally, 22 tonne for rock breaker) • Tracked / wheeled dumpers / tractors and trailers • Compactors and rollers • Piling rigs • Telehandlers • Wheeled, tracked and fixed cranes • Hoists • Pumps • Power and hand tools • Generators	• Stone • Asphalt • Geotextile • Lighting fixtures and fittings • Paving • Fencing • Steelworks • Concrete • Timber • Cladding • Doors • Piping inc. fixtures and fittings

Equipment	Materials
• Cutting and welding equipment • Scaffolding	• Cabling inc. fixtures and fittings • Switchgear • Instrumentation and control systems

3.4.7 Construction Traffic and Site Access

It is expected that the extent of HGV (Heavy Goods Vehicle) movements will vary at different stages of the construction works in response to the activities taking place at any given time.

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 Offaly and Westmeath County Councils. All work on public roads will be subject to the approval of a road opening license application. The Contractor will prepare detailed Construction Traffic Management Plans (CTMP) for inclusion as part of the road opening licence applications.

All traffic management measures will comply with those outlined in the CTMP, which was submitted as part of the planning application for the Proposed Development. The CTMP submitted as part of the application for the Proposed Development will be finalised in consultation with Offaly and Westmeath County Councils, before construction commences.

The peak HGV movements during the construction of the Power Plant Area are associated with cut and fill movements. HGV trips associated with cut and fill material are expected to arrive between December 2024 – May 2025.

It is proposed that abnormal loads will be delivered to site via the M4/M6 motorway, exiting at Junction 3 before traveling south on the R400 road and onto the site. These abnormal loads are expected to arrive between Months 19 and 24. An Abnormal Loads report has also been (completed as part of the EIAR) to identify mitigation measures required for movement of abnormal loads. This is provided in Appendix 14B, Volume II of the EIAR. Access to the Site will be east off the R400 road via an existing access site which will be developed for use in the construction phase.

Based on the location of proposed development at Derrygreenagh, the proposed route for the delivery of any abnormal loads is to be via Dublin Port.

In relation to HGV trip distribution all deliveries to the Site will be directed to approach the site along the R400 road from the direction of the junction with the M6. Therefore, HGV trips are expected to approach the site from the direction of the M6 motorway. This may include HGV traffic from the nearby sand and gravel quarries to the north of the Site, though materials may be sought from quarries south of the Power Plant Area within the sphere of the Proposed Development.

The CTMP will be agreed with the Local Authorities and An Garda Síochána prior to construction works commencing onsite.

Refer to **Section 5.9** for details on the construction traffic mitigation measures and the CTMP in **Appendix 1A**.

3.4.7.1 Parking

Parking will be available onsite to allow all construction staff vehicles to park at once. Therefore, no extraneous parking is to be expected.

The Contractor will organise minibuses to and from site to a number of locations and will encourage all construction staff to travel to site by minibus to limit the number of vehicles entering the site.

As noted in **Section 3.3.4**, levels of employment will vary throughout the construction phase. Based on a 1.5 car occupancy, it is expected that there will be 100 No. staff cars (LGVs: light good vehicles) arriving to the Site each day during the peak months (200 LGV two-way trips), during peak employment.

3.4.8 Construction Waste Management

Refer to **Section 5.11** for the full demolition and construction waste mitigation measures.

Waste will be generated during all stages of construction. 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, as amended, and associated amendments and regulations.

A Construction & Demolition Resource and Waste Management Plan (RWMP) (to be incorporated into the Contractor's CEMP) will be prepared and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will take place offsite at appropriately licensed facilities where noise and dust are more easily managed and less likely to impact on surrounding properties.

During the civil construction works, the Site boundary will be clearly marked with high visibility tape and the Contractor will not be permitted to use any areas outside the identified Site boundary for any activity relating to construction.

The construction compounds will be provided with drainage systems designed in accordance with EN 12056 and provided with silt traps and, if required, hydrocarbon interceptors. The surface water will infiltrate into the ground and/or be discharged into the local area drainage system. A detailed drainage plan for the construction phase will be developed during the detailed design phase by the EPC contractor. Additional information is provided in **Section 5.7.1.2**.

3.4.8.1 Peat and Soil Waste Management

The approximate quantity of peat and non-peat material (soil) requiring management on the Site of the Power Plant Area has been calculated, as presented in **Table 3.3**. These quantities were calculated as part of the Peat and Soil Management Plan, refer to **Appendix 2A**.

Table 3-4: Power Plant Area - Peat / Soil Excavation (for onsite Deposition Areas)

Development Element	Average Peat / Soil Depth	Peat / Soil Volume (m^3) Excavated	Peat / Soil Volume (m^3) Factored For Bulking (20%)
Power Plant Area (Main)	1.0	119,700	144,000
Power Plant Area (AGI)	0.0	0.0	0.0
Power Plant Area – Discharge Routes	1.0	8,000	9,600

Source: Appendix 2A: Peat and Soil Management Plan

Note, a factor of 20% (bulking factor of 15% and contingency factor of 5%) has been applied and is included to the excavated peat and soil volumes above to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the site.

The following recommendations / best practice guidelines for the placement of peat and non-peat soil alongside the proposed infrastructure elements will be considered and taken into account during construction.

- Any surplus excavated material (peat and non-peat) will be reused, either in profiling/landscaping or constructing berms as close to the excavation areas as possible. Peat present in the north and east of the Power Plant Area is largely drained peat covered in a layer of fill material.
- The placement of excavated peat and soil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and soil within the placement areas may require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.
- The most environmentally sensitive and stable way of handling and moving of peat is its placement across the site and at locations as close as possible to the excavation areas. A peat deposition area

and soil deposition area has been included to facilitate the construction phase of the Power Plant Area site.

- All placed soil will be allowed to revegetate naturally from the extensive seed source of the plants that have already colonised in the area. Alternatively, if significant areas of bare soil are still evident after a three-year period and possibly in addition, seeding of the placed soil could be carried out which would aid in stabilising the placed soil in the long term.

3.5 Construction Phase for the Electricity Grid Connection

3.5.1 Overview

The Applicant will appoint an EPC Contractor for the works on the Electricity Grid Connection.

The Contractor will appoint subcontractors to undertake all the specific construction and civil works. The Applicant is committed to ensure a safe working environment for all employees and contractors.

Any vegetation clearance works required will commence outside the breeding bird season, which runs from the 1st of March to the 31st of August, to avoid any potentially significant effects on nesting birds. Construction may commence from September to February so that construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout that bird breeding season.

3.5.2 Construction Programme / Phasing

The construction phase for the Electricity Grid Connection will be approximately 2.5 years the final details of which will be determined by the EPC Contractor and presented in the Contractor's CEMP.

The final connection to the 400 kV line would take place during the appropriate period to avoid disruption to the electricity network in consultation with transmission service operators (TSO).

Estimates for the duration of the construction works are presented in **Table 3.2**.

3.5.3 Construction Hours

Refer to **Section 3.4.3** for the construction hours for the Proposed Development.

3.5.4 Construction Staff

Levels of employment will vary throughout the construction phase. Peak staffing for the 220kV station is due to be during March 2025 – August 2026 when 40 staff are on site. Peak staffing for the 400kV power station is during March 2025 – November 2026 when 40 staff are on site each day. Peak staffing for the grid route construction is during March 2026 – May 2027 when 40 staff are on site. There will be a peak of 120 staff numbers in construction across the Electricity Grid Connection

Staff will comprise engineering, management, skilled and semi-skilled workers during the 33-month construction programme.

3.5.5 Temporary Construction Compounds

During the construction of the Electricity Grid Connection substations (the 220 kV and 400 kV substations), there will be two temporary construction compounds - north of the 220 kV substation and north of the 400 kV substations. In addition, there will be two satellite temporary compounds along the overhead line (OHL) transmission route. The temporary construction compounds will include temporary site offices, parking, stores, and laydown areas.

Welfare facilities during the construction phase will be located within the construction compound. The wastewater will be directed to a sealed storage tank and will be tankered offsite by an appropriately consented waste collector, to a WWTP. The temporary wastewater storage tanks will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying.

The contractor will be responsible for ensuring that all vehicles egressing the site have used the wheel wash facilities. A road sweeper will be available if any section of the surrounding public roads becomes soiled by vehicles associated with the Proposed Development.

Laydown requirements and construction phasing will be developed during the detailed design phase by the Contractor.

The perimeter of the compound will be surrounded by palisade security fencing, refer to **Section 3.6.2**, for further details on site security.

The construction phase lighting scheme will be developed by the EPC contractor and designed to provide safe working conditions for the development whilst reducing light pollution and the visual impact on sensitive receptors and the local environment. The lighting system will comply with the guidance provided by HSG38 Lighting at Work, the Society of Light and Lighting guides and EN 12464-2. Upon completion of the Electricity Grid Connection, the construction compounds will be decommissioned by covering with landscape fill and topsoil or peat.

The location of the construction compounds is shown within planning drawings submitted with the planning application.

3.5.5.1 Construction Facilities and Storage

During the construction phase Electricity Grid Connection, there will be two construction compounds: north of the 220 kV substation and north of the 400 kV substation respectively. In addition, there will be 2 No. satellite temporary construction compounds along the OHL transmission route.

These areas will include temporary site offices, parking, stores, and laydown areas.

3.5.6 Construction Materials

The proposed construction scope of the Electricity Grid Connection will require the relevant personnel, machinery and materials which is as follows for the substation sites.

Table 3-5: Electricity Grid Connection – Substations Estimated Construction Works

Equipment	Materials
• Approximately 10 No. Electrical / Civil Crews • Wheeled and Tracked Excavators • 360˚ tracked excavators (13 ton normally, 22 tonne for rock breaker) • Tracked dumpers / tractors and trailers • Cranes • Hoists • Generators • Scaffolding • Pumps • Power and Hand Tools • Cutting and Welding Equipment • Piling Rigs	• Stone • Asphalt • Geotextile • Lighting fixtures and fittings • Paving • Fencing • Steelworks • Concrete • Timber • Cladding • Doors • Piping inc. fixtures and fittings • Cabling inc fixtures and fittings • Switchgear • Instrumentation and control systems

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

Table 3-6: Electricity Grid Connection – OHL Estimated Construction Works

Equipment	Materials
• 5 No. operatives • 4x4 vehicle • Winch • Tractor and trailer • Crane • Teleporter	• Lattice steel mast • Insulators • Electrical connections • Concrete (foundation) • Aggregate • Geotextile

Equipment	Materials
• Chains / small tools • Tracked Excavator • Tracked Dumper • Sheet Piling Rig	

The proposed construction scope will require the relevant personnel, machinery and materials which is as follows for the underground cable.

Table 3-7: Electricity Grid Connection – Underground Cable Estimated Construction Works

Equipment	Materials
• 5 No. operatives • 4x4 vehicle • Tractor and trailer • Teleporter • Chains / small tools • Tracked Excavator • Tracked Dumper	• Insulators • Steel guy ropes • Connection clamps • Electrical connections • Crushed rock and timber (foundation) • Crushed rock and concrete (alternative foundation) • Geotextile

3.5.7 Construction Traffic and Site Access

It is expected that the extent of HGV (Heavy Goods Vehicle) movements will vary at different stages of the construction works in response to the activities taking place at any given time.

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 Offaly and Westmeath County Councils. All work on public roads will be subject to the approval of a road opening license application. The Contractor will prepare detailed Construction Traffic Management Plans (CTMP) for inclusion as part of the road opening licence applications.

All traffic management measures will comply with those outlined in the accompanying CTMP, refer to **Appendix 1A** of the CEMP. The CTMP submitted as part of this application but will be finalised in consultation with Offaly and Westmeath County Councils, before construction commences.

For the 220 kV Substation, peak HGV movements are expected during March 2025 – May 2025 with 61 No. HGV arrivals daily. For the 400 kV Substation, peak HGV movements are expected during September 2024 – February 2025 with 44 No. HGV arrivals daily.

It is proposed that the large substation components will be delivered to the Site via the M6 motorway, exiting at Junction 3 onto the R400 road and onto the Site, c. 2.2km to the south.

The Site entrance for the 220 kV substation site is off the R400 road. The Site entrance to the 400 kV substation site will be through existing site access south from the L1010 Togher Road across Bord na Móna lands and then west into the substation site. These existing entrances will be developed to facilitate the construction phase of the Electricity Grid Connection.

Refer to **Section 3.6.2** for details on site safety and security.

In addition to the above, the Electricity Grid Connection an entrance via an existing haul route west off the R400 road to the intersection between Derryarkin Bog and Ballybeg Bog, and another entrance north from the L1010 road (opposite the entrance to the 400 kV substation site) onto Ballybeg Bog; will be utilised in both instances to facilitate the delivery of construction materials and construction staff.

To provide internal access to the Site a number of internal access floating roads will need to be constructed to connect the OHL to the existing network of internal roads. These internal roads will be required at the north (access via 220 kV entrance west of R400 road) and south of the OHL in Derryarkin

(access via existing haul route), north of Ballybeg (access via existing haul route) and south on Ballybeg (access north from L1010 road). There will be a requirement to upgrade existing internal roads (machine passes) for development of floating road access to the OHL satellite compounds.

All HGVs will be required to travel to the site via the M6, exiting at Junction 3 onto R400 Regional road. The proposed route for the delivery of any abnormal loads is to be via Dublin Port.

It is proposed that all abnormal loads will travel to the site via the M4/M6 and exit via Junction 3 before travelling south on R400 Regional Road. The deliveries will travel to a number of different access points as follows:

- 220kV access – located on R400. All vehicles will turn right into this access.
- 400kV access – located south off L1010 Togher Road. Travel to this access will require turning right at the Coolcor roundabout towards Rhode village. A right turn will then be taken at the Rhode crossroads onto L1010 Togher Road. A further left turn will then be taken on to an unnamed road.
- Grid Connection access – travel to this access point will follow a similar path to the 400kV access, except a right turn will be made off L1010 Togher Road rather than a left turn.

The CTMP will be agreed with the Local Authority and An Garda Síochána prior to construction works commencing onsite.

Refer to **Section 5.9** for details on the construction traffic mitigation measures and the CTMP, refer to **Appendix 1A**.

3.5.7.1 Parking

Parking will be available onsite to allow all construction staff vehicles to park at once.. Therefore, no extraneous parking is to be expected.

The Contractor will organise minibuses to and from site to a number of locations and will encourage all construction staff to travel to site by minibus to limit the number of vehicles entering the site. As noted in **Section 3.4.4**, levels of employment will vary throughout the construction phase. Based on a 1.5 car occupancy, it is expected that there will be 27 No. staff cars (LGVs) arriving to the Site during the construction of the 220 kV Substation, each day during the peak months.

As noted in **Section 3.4.4**, levels of employment will vary throughout the construction phase. Based on a 1.5 car occupancy, it is expected that there will be 27 No. staff cars (LGVs) arriving to the Site during the construction of the 400 kV Substation, each day during the peak months.

3.5.8 Construction Waste Management

Refer to **Section 5.11** for the construction waste mitigation measures.

A RWMP (to be incorporated into the Contractor's CEMP) will be prepared and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will take place offsite at appropriately licensed facilities where noise and dust are more easily managed and less likely to impact on surrounding properties.

3.5.8.1 Peat and Soil Waste Management

The approximate quantity of peat and non-peat material (soil) requiring management on the Site of the Electricity Grid Connection has been calculated, as presented in **Table 3.7**. These quantities were calculated as part of the *Peat and Soil Management Plan*, refer to **Appendix 2A**.

Table 3-8: Electricity Grid Connection – Peat / Soil Excavation (for onsite Deposition Areas)

Development Element	Average Peat / Soil Depth	Peat / Soil Volume (m^3) Excavated	Peat / Soil Volume (m^3) Factored For Bulking (20%)
Electricity Grid Connection - 220kV Substation	1.6	33,458	40,150
Electricity Grid Connection - Towers	3.5	5,954	7,144
Electricity Grid Connection - Line-cable Interface Compound	1.6	1,914	2,297
Electricity Grid Connection – Underground Cable Route	1.5	3,600	4,320
Electricity Grid Connection - 400kV Substation	0.5	21,484	25,780

Source: Appendix 2A: Peat and Soil Management Plan

Note, a factor of 20% (bulking factor of 15% and contingency factor of 5%) has been applied and is included to the excavated peat and soil volumes above to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the site.

The Site which is generally flat consists predominantly of bare, locally re-vegetated cutaway peat and shallow peat with an established drainage network. The site has been harvested by Bord na Móna using mechanical harvesting equipment. Bord na Móna has experience managing peat in similar terrain, both during peat production operations and during renewable energy construction projects. These projects have demonstrated safe and effective methods for peat management and storage. The proposed methodology is outlined in the Peat and Soil Management Plan (**Appendix 2A**). General recommendations for good construction practice as outlined within the Peat and Soil Management Plan are summarised below.

The following recommendations / best practice guidelines for the placement of peat and non-peat spoil alongside the proposed infrastructure elements will be considered and taken into account during construction.

- All excavated peat will be reused where possible for reinstatement or by being placed/spread alongside the proposed infrastructure elements on-site.
- The peat and soil placed adjacent to the proposed infrastructure elements will be restricted to a maximum height of 1m over a 10m wide corridor on both sides of the proposed infrastructure elements. It should be noted that the designer will define / confirm the maximum restricted height for the placed peat and soil within the indicated parameters.
- The placement of excavated peat and soil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and soil within the placement areas may require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.
- Where a peat stability analysis following the confirmatory ground investigation reveals areas with an unacceptable risk of peat instability, then no material shall be placed on to the peat surface.
- The most environmentally sensitive and stable way of handling and moving of peat is its placement across the site and at locations as close as possible to the excavation areas. A peat deposition area and soil deposition area has been included to facilitate the construction phase of the 220 kV and 400 kV sites. Side casting methods of deposition will be used for excavations on the transmission route.
- The surface of the placed peat and soil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the peat and soil should be carried out as placement of peat and soil within the placement area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed peat and soil.

- Finished / shaped side slopes in the placed peat and soil shall be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat and soil are encountered then slacker slopes will be required.
- The acrotelm shall be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat within the placement areas.
- All placed soil will be allowed to revegetate naturally from the extensive seed source of the plants that have already colonised in the area. Alternatively, if significant areas of bare soil are still evident after a three-year period and possibly in addition, seeding of the placed soil could be carried out which would aid in stabilising the placed soil in the long-term.
- Movement monitoring instrumentation may be required adjacent to the access road where peat has been placed. The locations where monitoring is required will be identified by the designer on site if required.
- An interceptor drain will be installed upslope of the designated soil placement areas to divert any surface water away from these areas. This will help ensure stability of the placed soil and reduce the likelihood of debris run-off.
- All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.

3.6 Peat Deposition Areas

3.6.1 Power Plant Area

A permanent Peat Deposition Area (PDA) is provided in the vicinity the Power Plant Area to store excess overburden material which cannot be used in localised landscaping or backfill. Excavated peat and soil arising from the formation of the foundations will be placed in a designed and dedicated deposition area in close proximity on land to the east of the Power Plant Area (refer to Planning Drawings).

It is estimated that approximately 153,000m^3 of excess peat and soil will be required to be stored within the permanent PDA.

Peat will be deposited to a maximum height of 1m above ground level across a 225,000m² area. Once excavations are completed and following the commissioning of the project, the PDA will be allowed to naturally revegetate.

3.6.2 Electricity Grid Connection

A permanent PDA is provided in the vicinity of the 220kV Substation to store excess overburden material which cannot be used in localised landscaping or backfill. Excavated peat and soil arising from the formation of the substation foundation will be placed in a designed and dedicated deposition area in close proximity on land to the north of the 220 kV Substation.

It is estimated that approximately 48,000m^3 of excess peat and soil will be required to be stored within the permanent PDA.

Peat will be deposited to a maximum height of 1m above ground level across an area of approximately 50,200 m². Once excavations are completed and following the commissioning of the project, the PDA will be allowed to naturally revegetate.

4. Construction Methodology

4.1 Introduction

Prior to commencement of construction works, the Contractor will draw up detailed Method Statements which will be informed by this Outline Construction Methodology, environmental protection measures included within the planning application, measures proposed within the CEMP, and the guidance documents and best practice measures listed below.

This 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:

- CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland (updated 2022).*
- Construction Industry Research and Information Association (CIRIA) (2006). *Control of water pollution from linear construction projects. Technical guidance (C648D).*
- Construction Industry Research and Information Association (CIRIA) (2006). *Control of water pollution from linear construction projects. Site guide (C649).*
- Construction Industry Research and Information Association (CIRIA) (2001). *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).*
- Construction Industry Research and Information Association (CIRIA) (2023). *Environmental good practice on site guide (5th edition) (C811).*
- Construction Industry Research and Information Association (CIRIA) (2016). Environmental good practice on site pocketbook (4th edition) (C762).
- EirGrid (2012). *Ecology Guidelines for Electricity Transmission Projects, A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Project.*
- Enterprise Ireland (unknown). *Best Practice Guide (BPGCS005) Oil storage guidelines.*
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.*
- Murphy, D. (2004). *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board (ERFB).*
- National Roads Authority (NRA) (2008). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.*
- National Roads Authority (NRA) (2019). *Guidelines for assessment of Ecological Impacts of National Road Schemes.*
- Scottish Natural Heritage (2016). *Guidance – Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds.*
- Smith *et al.*, (2011). *Best Practice Guidance for Habitat Survey and Mapping.*

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 Contractor's CEMP that will be provided prior to construction. This Construction Methodology's measures listed below are non-exhaustive and should be read in

conjunction with the EIAR and all its mitigation measures as well as the NIS and all other reports that accompany the planning application.

- All materials will be stored at the construction compound and transported to the works zone immediately prior to construction. Refer to **Sections 3.3.5** and **3.4.5**.
- Weather conditions will be taken into consideration when planning construction activities to minimise risk of runoff from the Site.
- Provision of 50m 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 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. Refer to **Section 3.2.5**. 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 regular visual examinations of local watercourses that may be impacted by 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. Refer to **Section 3.2.5**.
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed off site, refer to **Section 3.2.5.3**. 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 not be permitted on site. Refer to **Section 5.7.1.4**.
- 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 50m hydrological buffer at all times.

4.2 Construction Methodology for the Power Plant Area

For the Power Plant site, the construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy, equipment delivery schedules and site constraints.

The general construction methodology and sequencing is anticipated to be as follows.

- The EPC contractor will prepare and level the Power Plant site, followed by piling and excavation for main foundations, e.g., stack, HRSG, turbine hall etc. The lighter buildings may be piled or have raft foundations.
- Underground services such as drainage and earthing will be installed, and the foundations constructed.

- Once the foundations are complete erection of equipment (HRSG, ACC, Storage tanks, OCGT modules etc) and building structures (Turbine Hall, water treatment plant, administration building etc) will commence.
- Once the building structure is in place the EPC contractor will commence the erection of the plant within them. In some cases, e.g., the CCGT gas and steam turbines and generator, the erection may take place before the structure is complete for constructability reasons.
- As plant and systems are completed, they will be commissioned until the whole plant is commissioned.
- Temporary construction works will generally be removed and remediated and landscaping of the Power Plant Area completed in line with the agreed landscaping plan.
- Once commissioning is complete the plant will undergo testing before handover from the EPC contractor to Bord na Móna Powergen Limited.

4.2.1 Volumes of Material for Construction of Power Plant Area

The volumes of granular fill (sand and stone) required for the construction of the Power Plant Area, outlined in **Table 4.1**, have been calculated based on the Power Plant Area element footprints, the anticipated excavation levels to suitable formation or suitable subgrade, and the proposed final levels for the infrastructure components. Construction grade granular fill and higher quality, final surfacing fill (including sand) will both be required for the construction of the Proposed Development.

Granular fill volumes have been estimated using the following methodology:

- The peat beneath the Power Plant Area site, all proposed hardstanding areas including temporary construction compounds will be excavated and replaced with construction grade granular fill up to the existing ground level.
- The hardstanding areas and roads will be constructed to the 100-year flood level. Roads will generally comprise approximately 650mm of granular fill and approximately 150mm of final surfacing layer (or capping). Geotextiles separators will be placed on the subgrade and geogrids will be installed within the road build-up.
- The peat and unsuitable soil excavated beneath the Power Plant Area footprint will be replaced with select granular fill. The final 250mm shall comprise capping material.

Table 4-1: Power Plant Area - Volume of Granular Fill Required

Development Component	Stone Fill Required Volume (m^3)
Power Plant Area - Main	162,300
Power Plant Area - AGI	22,000
Power Plant Area - Discharge Routes	8,000

4.3 Construction Methodology for the Electricity Grid Connection

4.3.1 220 kV & 400 kV Substations

For the 220 and 400 kV Substations the construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy, equipment delivery schedules and site constraints.

The general construction methodology and sequencing is anticipated to be as follows.

- The EPC contractor will prepare and level the substation sites, followed by piling and excavation for main foundations.
- Underground services such as drainage and earthing will be installed, and the foundations constructed.

- Once the foundations are complete erection of equipment (Air Insulated Switchgear, Communications towers etc) and the building structures will commence.
- Once the building structure is in place the EPC contractor will commence the erection of the plant within them.
- As equipment and systems are completed, they will be commissioned until each substation is commissioned.
- Once commissioning is complete the substation will undergo testing.
- Temporary construction works will generally be removed and remediated and landscaping of the substation areas completed in line with the agreed landscaping plan. On completion of testing of the Electricity Grid Connection the substation is handed over from the EPC contractor to Bord na Móna Powergen Limited.

4.3.1.1 400 kV Substation

The 400 kV substation will be constructed to Loop-In the existing Oldstreet - Woodland overhead line and the proposed 220 kV GIS-AIS substation will be constructed to terminate the 220 kV OHL and connect to the gas-fired power plant. The respective substations will be made up of a control building, transformer compound and busbar compound. 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. The busbar compound structural steelwork will be erected, and gantries installed. 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.

The 400 kV GIS compound is to be constructed with a compound level of 78.45m and a finished floor level of 78.60mm.

The 400 kV substation construction scope will include:

- The 400 kV substation will be in a compound with a secured high palisade fence.
- The 400 kV 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 temporarily stored in adjacent berms for later use during reinstatement works.
- A layer of geotextile 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 the substation compound comprising of 2 No. GIS buildings, 2 No. 400 kV Gantries and associated outdoor electrical equipment, including 2 No. 400 / 220 kV transformers along with all associated internal access tracks, 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 will be installed on the top of buildings to protect the station from direct lightning strikes.

- 2 No. 400 kV gantries and associated line equipment will be required to connect the 400kV overhead lines into the substation. The support structures will be located outdoors. The electrical installation is expected to take 20 weeks and includes the following:
  - Delivery and installation of 400 / 220 kV transformers. These are unusually large and the deliveries will be managed in accordance with regulations governing the movement of large (abnormal) 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.

4.3.1.2 220 kV GIS - AIS Substation

The 220 kV GIS – AIS compound is to be constructed with a compound level of 82.5m with a finished floor level of 82.65m. This is greater than 1m above local road heights.

The 220 kV GIS - AIS substation construction scope will include:

- The 220 kV GIS - AIS substation will be in a compound with secured high palisade fence.
- 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 temporarily stored in adjacent berms for later use during reinstatement works.
- A layer of geotextile 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 the substation compound comprising of 1 No. GIS building, 2 No. 220 kV Gantries and associated outdoor electrical equipment, along with all associated internal access tracks, 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 will be installed on the roof of buildings to protect the station from direct lightning strikes.
- 2 No. 220 kV gantries and associated line equipment will be required to connect the 220 kV overhead lines into the substation. The support structures will be located outdoors. The electrical installation is expected to take 20 weeks and includes the following:
  - Delivery and installation of all HV electrical equipment.
  - Wiring and cabling of HV equipment, protection and control cabinets.
  - Commissioning of all newly installed equipment.

There will be a requirement for 19 No. of double circuit 220 kV pylon towers (13 No. suspension pylons and 6 No. strain pylons) along a route corridor of c. 5km through Derryarkin Bog and Ballybeg Bog. There is also a requirement for 2 No. 400 kV strain towers.

The proposed pylon structure locations have been selected based on ground surveys, ground profiles, allowable angles, and ruling span checks. For the OHL route there will be 2 tower types required. Type 223 Strain Tower and Type 222 Suspension Tower.

4.3.2 220 kV Overhead Line

For the 220 kV Overhead Line the construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy, equipment delivery schedules and site constraints.

The general construction methodology and sequencing is anticipated to be as follows.

- The removal of vegetation (hedges and trees), topsoil stripping and storage, pre-construction drainage measures and construction of temporary roads etc.
- The EPC contractor will prepare and level each tower site followed by excavation for the tower foundations.
- An earth mat will be installed, and the foundations constructed.
- Construction of the transmission tower bases and erection of the transmission tower steelwork. The base and body sections etc of each tower will be assembled next to their respective foundations. The towers sections are lifted into place and joined together.
- Installation of the insulators and stringing of the conductors and earth wire.
- Temporary construction works will be removed and reinstatement works will be carried out.

On completion of testing of the Electricity Grid Connection the overhead line is handed over from the EPC contractor to Bord na Móna Powergen Limited.

4.3.3 400 kV Overhead Line Loop-In

The construction methodology of the new 400 kV towers for the loop in from the existing Oldstreet - Woodland 400 kV line will be the same as for the 220 kV towers. There will be additional safety precautions in place reflecting working in the vicinity of a live line and to mitigate any potential risk to the operational line during construction works.

Disconnection of existing conductors and connection of the new towers to the existing grid will be carried out by ESBN and at that point in time live commissioning and testing of the Electricity Grid Connection can start.

4.3.4 220 kV Underground Connection

For the 220 kV underground connections the construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy, equipment delivery schedules and site constraints.

The ducts for the cables of the underground connections will primarily be installed using an open cut trenching technique.

The general construction methodology and sequencing is anticipated to be as follows.

- The removal of vegetation (hedges and trees), topsoil stripping and storage, pre-construction drainage measures and construction of temporary roads etc.
- The EPC contractor will prepare and level the line-cable interface compound and joint bays areas followed by excavation and construction of the compound foundations and the joint bays.
- The equipment and structures of the line-cable interface compound are installed.
- Excavation of the cable trenches, installation of the duct bedding and ducts, backfilling and reinstatement will generally take place in short sections. The short sections minimise the amount of ground disturbed at any one time and minimises the potential for drainage runoff to pick up silt or

suspended solids. There may be more than one work front for this activity depending on schedule requirements.

- Once the trenching works is complete between joint bays cable installation can take place.
- Cables are supplied on large drums. Each drum contains a single length of cable. The length of the cable is equal to the distance between a pair of joint bays plus an installation and jointing margin.
- A drum is placed adjacent to a joint bay and the cable pulled from the drum though a duct to the receiving joint bay by a draw cable attached to a winch. The operation is repeated until all cables are installed in their ducts between the joint bays. Cable pulling then proceeds to what was the receiving joint bay and the cables are pulled from there to the next joint bays on the route until the cables are installed over the complete route.
- The cable sections between the joint bays will be tested and the six cable ends in each joint bay joined together by a specialist machine and the joints tested. Once testing is complete the covers of the joint bays will be installed.
- At the line-cable interface compound and the 400 kV Substation the cables will be terminated onto the interfacing equipment cable sealing ends and tested.
- The permanent access road will then be completed, temporary construction works will removed and reinstatement works will be carried out.

On completion of testing of the Electricity Grid Connection the overhead line is handed over from the EPC contractor to Bord na Móna Powergen Limited.

4.3.5 Pylon Towers

Mast or pylon sites are scanned for underground services such as cables, water pipes etc. Consultation with the landowners (as required) will help to identify hazards and ensure there are no unidentified services in the area.

For each leg of the 21 No. masts (84 legs in total) a foundation c. 4.5m x 4.5m x 3.5m deep is required. To allow for safe construction where ground conditions are good the excavation will be stepped back which requires additional area to be excavated. In the cut away bog where conditions are poor sheet piles will be used. 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 roads.

To aid construction, a concrete pipe is placed into each excavation to allow operatives level the pylon 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.

In areas of poor ground and high-water table it may be necessary to use sheet piles supported by hydraulic frame(s) to prevent collapse of the sides and also to prevent the excavation becoming too large. In this case the requirement for a concrete pipe (which is normally used in tower foundations) is removed. During any dewatering activities a standard water filtration system will be utilised to control the amount of sediment in surface water runoff.

A setting template is used to set and hold the tower stubs in position while the concrete is being poured and cured. Any water in the excavation is pumped out prior to any concrete being poured into the foundation.

Concrete trucks will pour concrete directly into each excavation in distinct stages.

A final pour for the pylon is the encasing of the mast leg which will be finished 300mm over finished ground level. The leg of the pylon is required to be shuttered with metal panels to form the required shape.

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

The pylon 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.

An earth mat consisting of copper wire will be laid c. 600mm below ground around the mast. The earth mat is a requirement for the electrical connection of the equipment on the mast structure. The exact details of the earth mat will be completed at detailed design stage.

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 (fence boundary) will be put in place to restrict plant from coming too close to the OHL. The pylon will be constructed lying flat on the ground beside the recently installed pylon base. The pylon section will be lifted into place using the crane and guide ropes. The body sections will be bolted into position.

Stringing of the shield wire and phase conductors will use tension stringing methods. A pulling rope will be run out between structures using a quad bike or drone and the rope lifted into position in running blocks on each tower. Tension stringing machines and conductor drums will be set up at tension masts and the pulling rope used to haul the conductors through. The conductor is then made off at the angle / tension masts and connected into the suspension insulators ready for ESB to commission.

4.3.6 Underground Cables

Underground cables (UGC) will be constructed in accordance with EirGrid policy CDS-GFS-00-001-R1 underground cable functional specification.

The 220 kV double circuit underground cable route ranges from approximately 2.4 km - 3.3km long and runs predominantly in Bord Na Móna lands. The proposed UGC will consist of a 2 No. trenches each containing 3 No. 200mm diameter HDPE power cable ducts, 2 No. 125mm diameter HDPE communications duct and 1 No. 63mm diameter Earth Continuity Conductor (ECC) duct to be installed in an excavated trench, typically 825mm wide by 1425mm deep, with variations on this design to adapt to service crossings and watercourse crossings, etc. The power cable ducts will accommodate 3 No. power cables.

The communications duct will accommodate a fibre cable to allow communications between the 400 kV substation site and the 220 kV substation. The ducts will be installed, the trench reinstated in accordance with appropriate specification, and then the electrical cabling / fibre cable is pulled through the installed ducts in approximately 550-750m sections. Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements and specifications of EirGrid and ESB.

Consultation has been made with Irish Water, Gas Networks Ireland and Offaly County Council Roads Engineer to notify them of the Proposed Development and any specific requirements considered in detailed design.

The conductors in underground HV cables must be heavily insulated to avoid a short circuit between the conductor and the ground around the cable. The proposed underground cable for 220 kV comprises cross linked polyethylene (XLPE) insulated electrical conductors, typically surrounded by HDPE (High Density Polyethylene) with diameter of approximately 110mm. Three separate cables are required for each circuit. Installation of the underground cable requires burial in a trench of approximately 1.1m width, at a depth of approximately 1m. Cables are installed directly into the ground in an excavated trench. The cable is installed in ducts, in a flat formation, surrounded by approximately 300mm of cement bound material. The trench is be backfilled and reinstated, as appropriate.

The underground cable will follow existing railway track and machine pass routes within the bog area. The cable route will avoid changes of line and direction as much as possible and any changes in direction will not exceed a radius greater than the minimum installation radius per manufacturer instructions.

Transmission cable routes comprise sections of cable that are connected using a cable joint. Cable joints are installed in joint bays which are typically concrete structures buried underground, occurring generally every 550m - 750m along an alignment, and ranging in size up to 8m long, 2.5m wide and 1.75m deep.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between substations.

- 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 close 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 ESBN. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions.

Before starting to construct, the area around the edge of the proposed joint bay which will be used by heavy vehicles will be surfaced with a terram cover 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 sandbags covered with terram 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 15m 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 ECM.

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 ECM.

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 sand-bags 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:

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

- 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 County Council / TII Specification for Roadworks.
- 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.
- 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.
- At a later date 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.
- The cable is supplied in pre-ordered lengths on large cable drums.
- 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.
- 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.
- Following the completion of jointing and duct sealing works in the joint bay, place, and thoroughly compact cement-bound sand in approximately 200mm 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 100mm cement-bound sand layer. Install cable protection strip. Backfill with cement-bound sand to a depth of 250mm below surface and carry out permanent reinstatement including placement of warning tape at 400mm depth below finished surface.

The cables are pulled through the ducts in sections of around 500m which is the approximate length of cable that can be shipped on a standard size cable drum. The sections of cable would be jointed at specially selected joint bay positions, which would also be backfilled and reinstated after jointing to complete the installation. Approximately 30-50m per day of underground cable can be installed requiring no more than 50m of the road / track to be open at any one time. A joint bay, which is larger in size than the standard trench required to be installed, would be at approximately 500m intervals.

The cable route will transect Coolcor stream watercourse. The watercourse has already been traversed by the existing machine pass and railway line. In this case where the cable is being trenched along an existing crossing, there is adequate overburden in the deck of the bridge at the point of crossing to continue the cable over the bridge without any need for off-road or in-stream works.

Cable trenches are typically constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences. This operation normally occurs over a period of 2-4 hours. To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed / smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Development, used for landscaping and reinstatements on other areas elsewhere on site.

Durable robust route markers shall be provided at agreed positions (line of sight, at bends location and property boundaries) along the route (Route Markers to have height 1700mm, width 92mm, weight 3.5kg).

4.3.7 Volumes of Material for Construction of Electricity Grid Connection

The volumes of granular fill (sand and stone) required for the construction of the Electricity Grid Connection, outlined in **Table 4.2**, have been estimated based on the Electricity Grid Connection element footprints, the anticipated excavation levels to suitable formation or suitable subgrade, and the proposed final levels for the infrastructure components. Construction grade granular fill and higher quality, final surfacing fill (including sand) will both be required for the construction of the Proposed Development.

Granular fill volumes have been estimated using the following methodology:

- The peat and/or unsuitable soil beneath the substations, Line Interface compound and all associated hardstanding areas, including temporary construction compounds, will be excavated and replaced with construction grade granular fill up to the existing ground level.
- The main 220kV and 400kV substations will be accessed directly off existing roads during construction and will not require roadways crossing soft ground, however access to the Line Interface Compound may require a short section of floating road due to the presence of peat along the access route from the existing Bord na Mona service track to the south).
- The substation and interface compounds and associated hardstanding areas will be constructed to the 100-year flood level and greater than 1m above local road heights. Roadways will generally comprise approximately 650mm of granular fill and approximately 150mm of final surfacing layer (or capping). Geotextiles separators will be placed on the subgrade and geogrids will be installed within the road build-up.
- The peat and unsuitable soil excavated beneath the substation and interface compounds footprints will be replaced with select granular fill of Clause 804 material in accordance with Eirgrid requirements. The final 250mm shall comprise capping material of site-won 6F2 material.
- The internal site underground cable trenches will be approximately 1200mm in depth. The cable trench will be backfilled up to approximately 600mm with sand, within which the ducting will be placed. Suitable materials from the excavations of the trenches will be reinstated to form the final layer of the trench.

Table 4-2: Electricity Grid Connection - Volume of Granular Fill Required

Development Component	Granular Fill Required Volume (m^3)
220 kV Substation	33,458
OHL, Line Cable Interface Compound	3,654
Underground Cable Route	3,600
OHL tower foundations	33,306
400 kV Substation	43,928

4.3.8 Construction Access Tracks

Temporary access tracks (required due to ground conditions and / or landowner requirements) will consist of timber or aluminium bog mats or crushed rock on a geotextile fabric to spread the weight of machinery over a greater area to prevent damage to the ground. If necessary, a low ground pressure excavator may also be utilised to spread weight across a wider area thereby reducing the pressure exerted on the ground. No invasive works will be undertaken when placing the matting.

Upon completion of the works, all mats will be removed immediately. 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 the requirement for bog mats. Any such requirements will be incorporated into the relevant method statement.

Once all construction works are complete, the work areas will be reinstated with excavated soil and either seeded out with native species, allowed to vegetate naturally or reinstated with excavated grass turves and will be restored to their original condition.

Transitions between the Site floating tracks and excavated tracks (or other forms of track not subject to long term settlement) will be gentle (e.g., 1:10 basal transition slope) in order to minimise likelihood of track failure at the boundary between construction types.

The internal road construction preliminary design has taken into account the following key factors as outlined in the Peat and Soil Management Plan, refer to **Appendix 2A**.

- Buildability considerations.
- Serviceability requirements for construction and wind turbine delivery and maintenance vehicles.
- Minimise excavation arisings.
- Requirement to minimise disruption to peat hydrology.

Whilst the above key factors are used to determine the track design, the actual construction technique employed for a particular length of track will be determined on the prevailing ground conditions encountered along that length of track.

The general construction methodology for upgrading of existing section of excavated roads or tracks is summarised below:

- The edge of the existing tracks will be cut back by 1m and a Combigrid™ (a geocomposite stabilisation and reinforcement geogrid product) placed over the proposed area to be widened. The cutting back of the existing track allows an anchorage of the Combigrid under the existing track.
- Granular fill will be placed in layers to match the depth of stone on the existing track and in accordance with the contractor's specification. A geogrid will be applied at this level across the existing and widened road area.
- The surface of the existing/widened access track will be overlain with up to a 300mm of selected granular fill.
- A layer of geogrid/geotextile may be required at the surface of the existing access road and in the widened section of road, where excessive rutting is anticipated (to be confirmed by contractor and onsite engineer).
- Where excavations in peat are required, side slopes shall be not greater than 1 (v): 2 or 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.
- The finished road width will be approximately 5m.
- If required, interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.

A final capping layer shall be placed over the existing access track, as per design requirements, to provide a suitable road profile and will be graded to accommodate construction traffic and HGV movements.

The construction techniques proposed to be used for the tracks across the Site are shown in the Peat and Soil Management Plan, refer to **Appendix 2A**.

4.4 Invasive Species

Refer to **Section 5.4.5** of this CEMP, the NIS submitted with the planning application and the Invasive Species Action Plan (to be prepared by the Contractor).

4.5 Surface Water Runoff and Drainage Management

The routes of any natural drainage features will not be altered as part of the Proposed Development.

4.5.1 Power Plant Area

Temporary stilling / settlement ponds will be used to attenuate runoff from works areas *(i.e.*, hardstand areas, construction compounds, and the substations) of the Site during the construction phase. The purpose of the temporary stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity.

General surface water management measures are detailed within the CEMP and summarised below:

- The existing surface water management system, such as drains, settlement ponds, outfalls and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any Power Plant Area works commencing on the Site.
- Additional new drainage installations will be installed in early stages of construction, alongside the remaining existing drainage facilities, which can be used to treat runoff for silt and hydrocarbons early on in the programme. Daily weather forecasting will also be used to inform the works schedule, ensuring excavation works do not coincide with high intensity or extreme rainfall events.
- The proposed surface water management system, including existing and proposed infrastructure, will be inspected and confirmed to be of sufficient capacity to treat any additional water generated by the Power Plant Area, including runoff from dust suppression, prior to discharge.
- Washout from power cleaning of drainage lines, oil interceptors or any other pipework which may contain pollutants will be collected and treated. No contaminated washout will be allowed enter any water body or be discharged to ground.
- There will be regular monitoring and prompt maintenance of the overall surface water management system throughout the Power Plant Area. This will ensure that the drainage system continues to function as designed.
- There will be no direct discharge to any water body at any time during the construction phases. All surface water run-off within the Site will be directed to this drainage system.

The final drainage design prepared for the Power Plant Area prior to commencement of construction will have to provide for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously. Appropriate response to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site. In the event that works are giving rise to siltation of watercourses, works will stop in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works. Regular inspections of installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system where it is not intended.

All environmental protection measures contained within this CEMP, will be incorporated into the detailed Contractor's CEMP and construction method statements prior to the commencement of development and will be implemented in full during the construction phase.

The Project Manager and Site Manager will be responsible for the implementation of measures following consultation with the Environmental Manager and ECoW where necessary.

4.5.2 Electricity Grid Connection

The Electricity Grid Connection and associated new roadways are designed to avoid interference with natural watercourses, using existing roads wherever possible. There will not be any direct discharges to any natural watercourses in the construction of the Electricity Grid Connection, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Electricity Grid Connection.

The surface of the cutover bog is drained by a network of parallel field drains that are typically spaced every 15 - 20m. The field drains are approximately 0.5 - 1.5m deep and in most areas, they intercept the mineral subsoil underlying the peat. These field drains mostly feed into larger main drains which drain the bogs towards the outfall locations. There are a number of shorter cross drains (sometimes piped below ground in lower lying areas) which intersect the small field drains. There are various outfalls on the bog boundaries. Surface water draining from the site is routed via settlement ponds (in accordance with the IPC licence requirements) prior to discharge into off-site drainage channels, streams and rivers.

Runoff control and drainage management are key elements in terms of mitigation measures to reduce potential effects on downstream surface waterbodies. Drainage management with the proposed site will be risk based, and will employ various methods, building on the existing drainage systems within the proposed site. The main tenet of the proposed drainage plan is ensuring to 'keep clean water clean' by avoiding unnecessary or significant disturbance to existing drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas through the construction of interceptor drains. Where possible (depending on orientation), existing field drains can be used as interceptors drains. Otherwise, new interceptor drains will be excavated, and they will outfall to field drains downstream of the works areas.

A second method involves collecting construction area runoff and routing that water through new proposed temporary settlement ponds (or stilling ponds) prior to controlled release into the existing field drain network. There will be no discharges to the existing field drains without prior treatment from construction areas.

A collector drain may be used during construction phase, or over the edge (OTE) drainage to allow runoff from access tracks to flow into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, and it is only proposed in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations. Silt traps and check dams will be installed in field drains downstream of OTE drainage areas, and these will provide attenuation and treatment of dirty water.

During the construction phase, all runoff from works areas *(i.e.*, dirty water) will be attenuated and treated prior to being released within the proposed site. All drainage outfall from the proposed site is routed through existing settlement ponds that remain in-situ from the previous site use.

A preliminary drainage design for the Electricity Grid Connection, incorporating all principles and measures outlined below, has been prepared, and is included in **Drawing Ref. S7060-8050-0044.**

Interceptor drains will convey clean runoff water around works areas to the existing downstream drainage system (field drains and main drains). Where required, interceptor drains will be installed in advance of any construction works commencing. This will ensure that clean water is kept clear by diverting surface water flow around excavations, construction areas and temporary storage areas. Where possible (depending on orientation), existing field drains can be used as interceptors drains. The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. On completion of the construction phase works, it is envisaged that the majority of the interceptor drains will be removed, with the exception being where original field drains were used. At that stage (*i.e.,* after the construction phase is complete), there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, hardstands, will have been built up with large grade hardcore, which even when compacted in place, will retain sufficient void space to allow water to infiltrate the subsurface of these constructed areas. Roadways or other installed site infrastructure will not intercept ground-conveyed surface water runoff to any significant extent that would result in scouring

or over-topping or spill over. Where the drains are to be removed, they will be backfilled with the material from the diversion dike.

Collector drains will be used to intercept and collect runoff from construction areas (from hardstand areas, construction compounds, and the substation). During the construction phase temporary settlement ponds will be used to attenuate and treat runoff from the construction areas (hardstand areas, construction compounds, and the substation) and treated water will then discharge into existing field drains and main drains. Temporary settlement ponds will be removed at the end of the construction phase, and runoff will discharge into existing field drains and main drains.

A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect and carry any sediment-laden runoff to a sediment-trapping facility and stabilised outlet. Swales are proven to be most effective when a dike is installed on the downhill side. They are similar in design to interceptor drains and collector drains described above.

Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. Check dams may also be installed in some of the existing field drains on the proposed site, downstream of where drainage swales connect in. The proposed check dams will be made up of straw bales or stone, or a combination of both depending on the size of the drainage swale it is being installed in. Where straw bales are to be used, they will be secured to the bottom of the drainage swale with stakes. Clean 4 to 6-inch stone will be built up on either side and over the straw bale to a maximum height of 600 mm over the bottom of the interceptor drain. In smaller channels, a stone check dam will be installed and pressed down into place in the bottom of the drainage swale with the bucket of an excavator. The check dams will be installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam is at the same level as the top elevation of the next down-gradient check dam in the drain. The centre of the check dam will be approximately 150 mm lower than the edges to allow excess water to overtop the dam in flood conditions rather than cause upstream flooding or scouring around the dams. Check dams will not be used in any natural watercourses, only artificial drainage channels (field drains) and interceptor/collector drains. The check dams will be left in place at the end of the construction phase to limit erosive linear flow in the drainage swales during extreme rainfall events. Check dams are designed to reduce velocity and control erosion and are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams will be removed. For this reason, check dams will be inspected and maintained regularly to insure adequate performance during construction. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.

Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the site. Dewatering silt bags are also used where water is pumped temporarily from excavations (e.g., pylon bases). Water is pumped into the silt bags, and then arising discharge is filtered through the silt bag fabric and flows into local collector drains. Dewatering silt bags can also be used as an additional filtration measure downgradient of stilling ponds, wherever it is deemed appropriate, throughout the site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of peaty silt into any field drain / main drain. The dewatering silt bag that will be used will be approximately 3m in width by 4.5m in length and will be capable of trapping approximately four tonnes of silt. The dewatering silt bag, when full, will be removed from site by a waste contractor with the necessary waste collection permit / license, who will then transport the silt bag to an appropriate, fully licensed waste facility.

Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream. Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document *'Control of Water Pollution from Linear Construction Projects'* (No. C648D, 2006) and '*Control of Water Pollution from Linear Construction Projects – Site guide'* (No. C649, 2006) published by CIRIA. Silt fence material will comprise Terrastop™ Premium material, and silt fences will be installed as per the manufacturer's guidelines. Silt fences will be inspected on a regular basis to ensure that they are operating effectively.

Silt traps will be installed in field drains downstream of drainage outfalls from works areas. The purpose of the silt traps is to capture silt by means of slowing water flow within the field drains. The existing field drains have a low gradient already, and with the installation of local silt traps drainage water from the wind farm works will be filtered and treated on its onward journey towards the existing settlement ponds. The peat ditch silt traps will be constructed using stacked timber logs, or marine plywood. These can also be covered in geotextile to enhance filtration. The majority of peat ditch silt traps will be left in-situ following the construction phase.

Temporary stilling / settlement ponds will be used to attenuate runoff from works areas (i.e., hardstand areas, construction compounds, and the substations) of the site during the construction phase. The purpose of the temporary stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is discharged to field drains / main drain within the proposed site. Stilling ponds will be located towards the end of collector drains, close to where the treated water will be discharged to field drains/main drains.

During the construction phase, a water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond if it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows. Temporary stilling ponds (at main works areas) will be removed at the end of the construction phase. They will not be needed beyond that point, as there is an existing drainage system, and boundary settlement ponds already located within each bog.

All materials and equipment necessary to implement the drainage measures detailed above, will be brought on-site in phases as they are required during the construction phase. A sufficient number of straw bales, clean drainage stone, terram, stakes, etc. will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures detailed in the above will be installed prior to, or at the same time as the works they are intended to drain. The works programme for the groundworks part of the construction phase of the project will take account of weather forecasts and predicted rainfall. Large excavations, large movements of overburden or large- scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate to the amount of rainfall forecast.

The final drainage design prepared for the Electricity Grid Connection prior to commencement of construction will have to provide for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously. Appropriate response to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site. In the event that works are giving rise to siltation of watercourses, works will stop in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works. Regular inspections of installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system where it is not intended.

Check dams will be inspected and maintained weekly during the construction phase of the project to insure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam. Any excess sediment build-up behind check dams will be removed. Drainage swales (interceptor and collector drains) will also be inspected for evidence of erosion along the length of the swale. If evidence of erosion is detected, additional check dams will be installed to limit the velocity of flow in the channel. Peat ditch silt traps will be inspected and maintained monthly during the construction phase ensure adequate performance. Any excess sediment build-up behind silt traps will be removed. A water level indicator such as a staff gauge or level marker will be installed in each temporary stilling ponds with marks to identify when sediment is at 50% of the ponds capacity. Sediment will be cleaned out of the stilling pond when it exceeds 50% of pond capacity. Stilling ponds will be inspected weekly during the construction phase of the project and following rainfall events.

Inlet and outlets will be checked for sediment accumulation and impediments to flow. Any excess sediment build-up behind inlets and outlets will be removed.

5. Environmental Management

5.1 Introduction

This section of the CEMP outlines the environmental procedures that have been identified to ensure appropriate environmental management of specific aspects of the proposed works.

These environmental procedures have been prepared in accordance with the design and mitigation measures set out in the EIAR and the NIS, submitted with the planning application for the Proposed Development. The requirements outlined within the following sections are a summary of key implementation constraints, site specific obligations and best practice requirements with which the Contractor shall comply. The construction methodology for the Proposed Development is set out in Section 4 of this CEMP.

Construction of the Proposed Development will be carried out in line with best practice guidance in all areas of potential environmental impact and these specific guidance documents are identified within the following sections. Across the full project duration, the Contractor will utilise the general guidelines set out in the CIRIA *C811 Environmental Good Practice on Site Guide (5th Edition)*.

Following grant of planning for the Proposed Development, the appointed Contractor will further develop this CEMP into the Contractor's CEMP which will incorporate any additional measures identified during the planning assessment process, specified in planning conditions and associated post-planning statutory body consultation for the management of the environment during the construction works. Any mitigation and/or monitoring measures identified during preconstruction surveys and reports will also be incorporated into the Contractor's CEMP.

The Contractor's CEMP will include an updated and refined construction phase programme of works and will set out specific timings and requirements for surveys and monitoring prior to and throughout the construction works.

The Contractor's CEMP will be a dynamic document and will be continuously reviewed and updated throughout the construction works to ensure it takes account of all environmental auditing and site inspections.

5.2 Air Quality

5.2.1 General Mitigation Measures

The Contractor will have due regard to the relevant guidance and those outlined within the EIAR relevant to construction phase:

- Greater London Authority (GLA) (2014). *Control of Dust and Emissions during Construction and Demolition.*
- Institute of Air Quality Management (IAQM) (2023). *Guidance on the assessment of dust from demolition and construction. Version 2.1.*
- National Roads Authority (NRA)[1] (2011). *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes.*

5.2.2 Power Plant Area

During the construction phase, **dust** or **air** pollutants generated from the Power Plant Area will typically arise from:

- Wind generated dust from stockpiles, exposed unconsolidated soils and roads.
- Movement of construction vehicles.
- Transportation of construction materials to and within the Site.

[1] now TII

- Excavation and crushing of rock.
- Piling operations.
- Excavation, movement and placement of soil stockpiles.

An assessment of the potential effects of construction **traffic** movements associated with the Power Plant Area is presented in Chapter 7 (Air Quality) and Chapter 14 (Traffic) of the EIAR, Vol. I.

In order to minimise emission of pollutants from plant and equipment, the following measures will be implemented during the construction phase:

- Regular maintenance of plant and equipment will be carried out to ensure that the equipment is operated efficiently and generating minimal air emissions.
- Minimising vehicle and plant idling as far as is practical (*i.e.*, when not in use).
- Locating static plant in a central area of the Site away from sensitive boundaries or receptors.

The greatest potential impact on air quality during the construction phase will be from dust emissions associated with the construction works, refer to **Section 5.2.2.1**. The proactive control of fugitive dust, rather than an inefficient attempt to control dust once released will ensure the prevention of significant emissions.

5.2.2.1 Dust Suppression

In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression. Water bowser movements will be monitored to limit increased runoff.

Emissions of dust and particulates from the construction phase of the Power Plant Area will, however, be controlled in accordance with standard good working practices regularly employed in the construction industry on sites of this type.

Based on the assessment of the area of sensitivity to dust impacts and the likely risk of impacts arising from each of the key construction activities (demolition, earthworks, construction and trackout of material onto roads), appropriate standard mitigation measures to be implemented during construction (good site techniques drawn from the 'low risk' site schedule in IAQM guidance) that have been identified are:

- Storage of sand and aggregates in bunded areas and storage of cement powder and fine materials in silos.
- Use of water suppression and regular cleaning, as necessary, to minimise mud on roads.
- Covering of vehicles leaving the construction site that are carrying construction waste materials (note: the transfer of any excavated material offsite will be minimised).
- Employment of a wheel wash system at exits from the Site during the construction phase.
- Minimising storage duration of spoil during construction as far as is practical.
- Prohibiting open fires on Site.

A Dust Management Plan (DMP) has been prepared which sets out the measures that will be implemented by the Contractor to minimise and control dust emissions, set out in **Section 5.2.2.1.1**.

This DMP will be updated by the Contractor in the Contractor's CEMP to account for any additional measures identified in Planning Conditions.

5.2.2.1.1 Dust Management Plan

The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction.

The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within 200m of the construction area.

It is noted that the during the construction phase of the Power Plant Area there will be no human health, amenity or ecological receptors within 250m of the Power Plant Area site or the access point.

During the construction phase of the Electricity Grid Connection, all Ramsar sites, SPAs, SACs and NHAs are further than 50m from the construction works. There are a small number of human receptors within 500m of the site.

In order to ensure mitigation of the effects of dust nuisance, a series of measures will be implemented. Site access roads will be regularly cleaned and maintained as appropriate; dry sweeping of large areas shall be avoided. Hard surface access roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced access roads shall be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and / or windy conditions. Vehicles using site access tracks shall have their speeds restricted where there is a potential for dust generation.

Vehicles delivering material with dust potential to an off-site location shall always be enclosed or covered with tarpaulin to restrict the escape of dust.

Vehicles exiting the Site, prior to the local road crossing point, will make use of a wheel wash facility prior to entering onto public roads to ensure mud and other wastes are not tracked onto public roads. Public roads outside the Site will be regularly inspected for cleanliness daily and cleaned using a street sweeper, as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions. On-site haul routes shall be inspected for integrity and necessary repairs to the surface instigated as soon as reasonably practicable.

Table 5.1 outlines the embedded construction phase mitigation measures as outlined in the Appendix 7A, Air Quality Impact Assessment, Vol. II of the EIAR, submitted with the planning application.

This DMP will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust using best practices and procedures.

Table 5-1: Embedded Construction Phase Mitigation Measures

Phase	Mitigation Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences onsite. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager / engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), approved by the Local Authorities. The level of detail will depend on the risk, and will include as a minimum the highly recommended measures in this CEMP and the EIAR submitted with the planning application. The desirable measures will be included as appropriate for the site.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.

Phase	Mitigation Measure
	Record any exceptional incidents that cause dust and / or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.
Monitoring	Undertake daily on-site and off-site visual inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences onsite or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers if required around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence any stockpiles to prevent wind whipping.
Operating vehicle / machinery and sustainable travel	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Ensure all vehicles switch off engines when stationary - no idling vehicles
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Phase	Mitigation Measure
	Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Measures specific to earthwork	Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
	Only remove the cover in small areas during work and not all at once.
Measures specific to construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Waste Management	Avoid bonfires and burning of waste materials.
Measures specific to track-out	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site logbook.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system.
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.

Also see Section 5.9 for additional mitigation measures associated with dust management during the construction phase.

5.2.3 Electricity Grid Connection

The same air and dust mitigation measures will be in place during construction of the Electricity Grid Connection to minimise the potential for adverse impacts from dust, air pollutants or traffic to environment and sensitive receptors.

5.3 Cultural Heritage

5.3.1 Power Plant Area

The following mitigation measures are for the construction phase of the Power Plant Area.

- Should planning permission be obtained for the Proposed Development, the Applicant will appoint a suitably qualified archaeologist as the Project Archaeologist to oversee the construction phase activities. Archaeological testing will be carried out at the pre-construction phase in areas identified in the construction impacts (refer to Chapter 8 of the EIAR (section 8.5)), where the Proposed Development has the potential to impact upon archaeological remains.

- This testing will take the form of mechanically excavated test trenches. These will be excavated under the constant supervision of a suitably qualified and licensed archaeological contractor who will be appointed to carry out the archaeological fieldwork. Relevant licenses will be acquired from the Department for Housing, Local Government and Heritage (DHLGH) / NMS and the National Museum of Ireland (NMI) for all archaeological works. These will be carried out in accordance with an Overarching Method Statement for Archaeological Works prepared by the Project Archaeologist and agreed with the NMS. It is anticipated that all archaeological works will be completed prior to the commencement of construction activities.

- The programme of pre-development archaeological testing will consist of the mechanical excavation of test trenches down to sterile glacial tills and bedrock, by means of a smooth toothless bucket. These will be undertaken at specified locations within the Proposed Development. The Project Archaeologist will undertake full-time monitoring of the excavation of the test trenches and where appropriate, carry out archaeological investigation.

- Should archaeological material / features be encountered during the archaeological testing, the use of machinery shall cease and further archaeological investigation (by hand) shall be carried out to determine the nature and extent of the archaeological remains. Archaeological deposits shall not be removed as part of the assessment process.

- The testing will be undertaken in advance of construction to allow adequate time to evaluate, record and, where necessary, mitigate any archaeological features that may be revealed. In the event that any archaeological features are uncovered during construction, the Project Archaeologist and the National Monuments Service will be consulted to determine the appropriate mitigation measures. These may include preservation in situ, preservation by record through systematic archaeological excavation, and / or archaeological monitoring of specific construction activities during the construction phase.

- Archaeological issues will be resolved where possible, at the pre-construction phase of the development, although areas within peat bog may require evaluation during the construction phase with groundworks carried out under archaeological supervision. If unexpected archaeological remains or artefacts are discovered during construction work, work in that area will cease and the area will be protected. An unexpected finds procedure will be included in the Overarching Method Statement for Archaeological Works. The Project Archaeologist and NMS will be notified, and the unexpected finds procedure will be implemented.

5.3.2 Electricity Grid Connection

The following mitigation measures are for the construction phase of the Electricity Grid Connection.

- If after planning is consented and the project proceeds, the Applicant will appoint a suitably qualified archaeologist as the Project Archaeologist. Archaeological testing will be carried out at the pre-construction phase in areas, identified in the construction impacts section of Chapter 8, section 8.5 of the EIAR submitted with the planning application, where the Proposed Development has the potential to impact upon archaeological remains. These include the substation areas, construction compounds, hardstandings, pylon bases, underground cable and new access tracks Figure 8.5 of the Vol. II of the EIAR.

- This testing will take the form of mechanically excavated test trenches. This will be undertaken under the constant supervision of a suitably qualified and licensed archaeological contractor who will be appointed to carry out the archaeological fieldwork. Relevant licenses will be acquired from the Department for Housing, Local Government and Heritage (DHLGH) / National Monument Services (NMS) and the National Museum of Ireland (NMI) for all archaeological works. These will be carried out in accordance with an Overarching Method Statement for Archaeological Works prepared by the Project Archaeologist and agreed with the NMS. It is anticipated that all archaeological works will be completed pre-construction.

- The programme of pre-development archaeological testing will consist of the mechanical excavation of test trenches down to sterile glacial tills and bedrock, by means of a smooth toothless bucket. These will be undertaken at specified locations within the Proposed Development. The Project Archaeologist will undertake full-time monitoring of the excavation of the test trenches and, where appropriate, carry out archaeological investigation.

- Should archaeological material / features be encountered during the archaeological testing, the use of machinery shall cease and further archaeological investigation (by hand) shall be carried out to determine the nature and extent of the archaeological remains. Archaeological deposits shall not be removed as part of the assessment process.

- The testing will be undertaken in advance of construction to allow adequate time to evaluate, record and where necessary mitigate any archaeological features that may be revealed. In the event that any archaeological features are uncovered during construction, the Project Archaeologist and the NMS will be consulted to determine the appropriate mitigation measures. These may include preservation in situ, preservation by record through systematic archaeological excavation, and / or archaeological monitoring of specific construction activities during the construction phase.

- Archaeological issues will be resolved where possible at the pre-construction stage of the development, although the elements of the scheme associated with the overhead powerline and the underground cable trench, within peat bog, may require evaluation during the construction phase with groundworks carried out under archaeological supervision. If unexpected archaeological remains or artefacts are discovered during construction work, work in that area will cease and the area will be protected. An unexpected finds procedure will be included in the Overarching Method Statement for Archaeological Works. The Project Archaeologist and NMS will be notified, and the unexpected finds procedure will be implemented.

5.4 Biodiversity

Key themes underpinning the mitigation measures are:

- Pre-construction surveys for protected species, where required/necessary, to determine if any breeding or resting sites have become established in the period between baseline survey and construction works commencing will be carried out, and for the presence of any non-native invasive species. Any surveys which require licensing (e.g. inspection of bat roosts) will be supported by a specific mitigation plan. All pre-construction surveys will be completed immediately prior to vegetation clearance (i.e. weeks/days leading up to clearance to ensure recency/robustness of information).

- Safeguarding of retained habitats.

- Safeguarding of protected or notable species known or likely to occur within the Proposed Development Site.
- Commission/appointment of an appropriately experienced ecologist to undertake an Ecological Clerk of Works (ECoW) role, which will be to oversee and advise both contractors and site operators during times of major works within particularly sensitive ecological windows (e.g., breeding bird season) during both the construction phase, and as part of monitoring during the operational phases.
- Approach to the Identification of Ecological Constraints.

5.4.1 Environmental / Ecological Clerk of Works (EcoW)

The following general measures will be taken to minimise potential effects on the local and regional biodiversity during construction:

- Prior to commencement of construction, a suitably experienced ECoW, will be appointed by the Contractor.
- The ECoW shall be appointed sufficiently in advance of the Proposed Development to arrange for any mitigation requirements to be incorporated into the Contractor's site-specific Method Statements and programme as well as overseeing the implementation of the CEMP.
- The ECoW will ensure compliance during the construction phase with all mitigation measures and planning conditions related to ecology and with wildlife law.
- The ECoW will be engaged and consulted on a regular basis by the Environmental Manager.

5.4.2 General Mitigation Measures

The Proposed Development must consider and engage the following mitigation hierarchy where there is potential for impacts on relevant ecological receptors.

1. Avoidance: seek options that avoid harm to ecological features (e.g., locating to an alternative site).
2. Mitigation: negative effects will be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed (e.g., through a condition or planning obligation).
3. Compensation: where there are significant residual negative ecological effects despite the mitigation proposed, these will be offset by appropriate compensatory measures e.g., by providing suitable habitats elsewhere on the client-owned parts of the wider site.
4. Enhancement: seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation, or compensation.

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. The rationale for the proposed mitigation and/ or compensation will be provided as part of the Contractors CEMP and method statements, including sufficient detail to show that these measures are feasible and how they would be implemented.

The appointed contractor will protect the Site, the works, and the general environment including the watercourses and waterbodies, against pollution and sedimentation during the construction phase of the Proposed Development. The Contractor will comply with all relevant legislation in relation to the control of hazardous substances and pollutants during the works.

The appointed contractor will, at all times, work within and comply with all relevant environmental regulations and pollution prevention guidelines. The use of oils, chemicals and other potential pollutants onsite requires significant care and attention. All construction works will be carried out by employing accepted good work practices during construction, and environmental management measures such as the following will be implemented:

- All materials will be stored at the construction compound and transported to the works zone immediately prior to construction.

- Weather conditions will be taken into consideration when planning construction activities to minimise risk of runoff from the Site.
- Provision of 50m 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 e.g., in wet areas, water will 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 / aluminum panel tracks will be used to enable access to these areas by machinery. However, works will be scheduled to minimize 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 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 onsite. 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 offsite. 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 not be permitted onsite.
- 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 50m hydrological buffer at all times.
- All oils, fuels, lubricants, or other chemicals will be stored in appropriate bunded containers in suitable storage areas, with spill kits provided at the storage location and relevant places across the Proposed Development. There will be no storage of any oils, fuels, lubricants or other chemicals within 30m of watercourses.
- Controls and contingency measures to manage run-off from construction areas and fine sediment will be implemented;
- All refuelling and servicing of vehicles and plant will be carried out in designated bunded areas with impermeable bases, which will be situated at least 30m from watercourses.
- The use of concrete will only occur outside the set-back zone of 30m from watercourses and will be carefully controlled to avoid the release of dust and contaminated run-off. No on-site batching should occur. Washout from concrete chutes will be only carried out in designated impermeable areas.
- Temporary storage of excavated materials will be located at least 30m from watercourses.
- Soil exposure during the construction works will be minimized and exposed soil will be reinstated as rapidly as possible.

- The Contractor will be required to implement appropriate communications including reporting of environmental practice on-site, Toolbox Talks, daily briefings, an environmental noticeboard (with ecological information, spill/emergency response and refuelling area / procedure) and signage (including ecological exclusion areas).
- All site personnel involved in the construction of the Proposed Development will be made aware of the ecological features present and the mitigation measures and working procedures which must be adopted. This will be achieved as part of the site induction process through the delivery of a Toolbox Talk with particular focus on high-risk works (e.g. soil excavations and safe materials storage). In addition, briefings will be provided to all site personnel in advance of those works which are considered to present an increased risk of impacting upon ecological features.
- The Contractor's CEMP will include a Pollution Prevention Plan (PPP) (or similar document) which will set out procedures and diagrams for:
  - Identification if a water quality incident has occurred and any remedial actions to be undertaken.
  - Dewatering of excavations to designated treatment area / sustainable drainage system (SuDS) treatment area.
  - Temporary soil storage.
  - Fuel storage / refuelling.
  - Concrete wash-out area.
  - Preventing existing drainage features becoming pathways for construction run-off.
  - Reducing soil exposure and reinstating as rapidly as possible.
  - Temporary construction mitigation measures / SuDS such as ditches with check dams, clean water ditches, settlement ponds, silt fencing and straw bales.
  - Contingency measures.
- The Contractor will not be permitted to use materials that could lead to run-off containing heavy metals, sulphides, acids and must use aggregates free of excessive fines clays.
- Lighting, where necessary, will be kept to essential locations only (particularly near waterbodies), with the position and direction of lighting designed to minimise intrusion and disturbance to waterbodies. Using full cut-off lanterns would minimise light spillage through directional lighting (directing the cone of light downward) and not allowing light across the horizontal plane. Furthermore, all lighting will have the minimum brightness and power rating to perform the required function.
- Excavations near riverbanks will either be covered or fenced off at the end of each working day, or include a means of escape for trapped animals (e.g., mammal ramps or ladders).
- Root protection zones will be established around retained trees, in accordance with the relevant guidance. These will be clearly demarcated, and no machinery will enter these areas, nor will any material be stored within them.
- Any seeding of grass along verges should include native local flowering species that provide food for pollinators, such as plants that produce pollen and nectar throughout the year.
- Pre-works check for invasive species will be conducted by a suitably experienced ecologist / ECoW. Also see Section 5.4.5 of this CEMP
- Standard measures for protected species and wildlife in general will be implemented, including:
  - Sightings of protected or notable species within the Site or immediate surroundings will be recorded. If any evidence or sightings of protected or notable species occur within 30m of works, then works in that area will stop immediately and advice will be sought from the ECoW.

- Any excavations will be left with a method of escape for any animal that may enter overnight and will be checked at the start of each working day to ensure no animals are trapped within them.
- Wherever possible, tree felling and vegetation removal works which will directly impact upon areas of vegetation which could be used by nesting birds will be undertaken outside the breeding season (taken to be March to August, inclusive). Where this cannot be achieved, a pre-works check for active nests will be conducted by a suitably experienced ornithologist. Each new construction/felling area will be checked not more than 72 hours prior to commencement of works as nests can be quickly established. Where any active nests are identified, suitable exclusion zone(s) will be established and maintained until the ornithologist determines that the breeding attempt(s) have concluded.
- Any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped.

5.4.3 Power Plant Area – Detailed Mitigation

5.4.3.1 Sites with Statutory Designations (European and National Sites)

Watercourses, ditches surrounding the Power Plant Area are hydrologically connected to the River Boyne and River Blackwater SAC and SPA. Measures for pollution prevention and safeguarding of local watercourses detailed within **Section 5.4.2, Section 5.4.5 and Section 5.7** and will ensure safeguarding of watercourses and waterbodies from impacts of pollution and sedimentation.

5.4.3.2 Habitats

Habitat Replacement, Compensation, and Enhancement

Within the Power Plant Area, there will be unavoidable loss of habitats to facilitate the Proposed Development, including losses to amenity grassland, dry meadows and grassy verges, scrub and immature woodland, and bog woodland.

Habitat loss will be kept to a minimum where possible, by only removing habitat required to facilitate the construction footprint, including working, storage areas and laydown areas etc. Where habitats are disturbed, removed, or damaged for temporary construction compounds and within the Peat Deposition Area, these will be reinstated naturally through succession and left unmanaged following construction.

Landscape mitigation is proposed for the Power Plant Area. Full details are presented in the Landscape Mitigation Strategy (Volume I, Chapter 10 Landscape and Visual, Volume II Appendix 10B of the EIAR submitted with the planning application, also see Volume I chapter 09 Biodiversity).

An area of approximately 17.5 ha will be planted with trees, over five areas. The largest within an area of bare cutover bog to the west of the line-cable interface compound within Ballybeg Bog, and two areas of vegetated cutover bog to the east of the 220kV overhead line, and then in two strips along the boundary with the old railway track through Derryarkin (See Volume II Appendix 9K of the EIAR). This is to replace for the loss of trees, in particular bog woodland, as a result of the construction of the Proposed Development, including the Power Plant Area and Electricity Grid Connection. Replanting will aim to create an area of bog woodland, dominated by downy birch, but include to a lesser extent include holly, rowan, Scots pine, oaks Quercus spp. and willows, which aligns with the Ballybeg Cutaway Bog Decommissioning and Rehabilitation Plan and Derryarkin Cutaway Bog Decommissioning and Rehabilitation Plan (see Volume II Appendix 9J of the EIAR). Full details are presented in the Habitat Management Plan (see Volume II Appendix 9K of the EIAR).

Habitats – Pollution and Water Quality

Watercourses, ditches, and waterbodies are present within and surrounding the Power Plant area. Measures to safeguard watercourses and waterbodies from impacts of pollution have been included within this CEMP in **Section 5.7** and will be implemented within the Contractor's CEMP for the Power Plant Area.

5.4.3.3 Fauna

5.4.3.3.1 Bats

Eight bat roosts of four different bat species (soprano pipistrelle, common pipistrelle, Natterer's bat and brown long-eared bat), were confirmed within six buildings and one structure within or directly south of the Power Plant Area. Roosts present within B4, B4a, B5 and S1 will require derogation licences prior to exclusion of bats from these roosts to proceed with demolition works required.

All works to demolish buildings with known bat roosts must be carried out under the supervision of a suitably experienced and licensed ecologist or the project ECoW.

The loss of these bat roosts will be compensated with the provision of alternative roosting sites. To mitigate for the loss of these known bat roosts, Building B2 (which will be retained) located approximately 85m to the south of the Power Plant Area and outside the Proposed Development boundary, will be further enhanced. This building is already known to contain a maternity colony of Natterer's bats, but through the safeguarding of this structure and provision of suitable enhancement measures as presented below, it is envisaged that this structure can support additional roosting bat populations.

Various bespoke artificial bat roosts will be included within and on the exterior of this building to provide roosting opportunities for both soprano and common pipistrelle, as well as for brown long-eared bats.

In addition, it is also proposed to erect ten artificial bat roost boxes, to be mounted on poles across the wider Site (e.g five Sku pole mounted roost maternity double bat box or similar), either within the Site or within Bord na Móna's ownership/control in appropriate locations to compensate for the loss of the roosts (see Volume I, Figure 9.10, of the EIAR). The provision of bat boxes across the Site will also provide additional roosting opportunities throughout the wider site.

These must be erected prior to commencement of construction and therefore the demolition of existing roost sites in the Power Plant Area.

Buildings B1 and B3 are considered to be used as either night roosts or feeding perches, in particular by brown long-eared bats. These are located outside of the Proposed Development boundary and will be retained.

Bats are particularly sensitive to lighting, and whilst B1, B2 and B3 are outside the Proposed Development footprint, the following mitigation (following BCT/ILP: GN08/2023) regarding lighting must be adhered to in relation to these retained roosts and the surrounding habitat on this southern boundary with the Proposed Development during the construction:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level) along this southern boundary of the Proposed Development, with light reaching these buildings not greater than 1 lux to avoid roost disturbance; similarly using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity.
- Directional lighting, facing and located away from these roosts and surrounding vegetation along this southern boundary is proposed.
- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security.

5.4.3.3.2 Badger

As badgers are mobile species which are active within the vicinity of the Proposed Development, it is possible that badger may establish new setts prior to construction. Therefore, pre-construction badger surveys will be carried out within the ZoI of the Proposed Development no sooner than one month prior to works commencing, to determine if any setts have become newly established since baseline surveys. The ECoW will provide advice in the event that additional setts are identified, including potential requirements under licence on a temporary or permanent basis.

If piling is required within 150m of BA01 or BA02, south of the Proposed Development, then these setts will require temporary closure, until works are complete. Otherwise, these setts will be retained.

The use of artificial lighting during construction has likelihood to deter badger from retained habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to badger setts.

To alleviate a range of general likely significant effects to badger during the construction phase of the Proposed Development, the following mitigation will be adhered to:

- A Badger Management Plan will be devised and implemented by the appointed contractor (with input from the ECoW). The Badger Management Plan will include the mitigation presented within this Section and Volume I Chapter 09: Biodiversity of the EIAR. This Plan will ensure all sett locations, immediately prior to the commencement of the construction phase are known to the relevant personnel (with congnisance to the preferred confidentiality) and drawings of sett locations and protection zones will be prepared.
- All works will be largely restricted to daylight hours ((07:00 – 19:00), where working schedules permit, to reduce as far as possible disturbance to badger.
- The use of artificial lighting during the construction period will be limited and lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise intrusion and disturbance to semi-natural habitats and their conservation value. Use of full cut-off lanterns are proposed to minimise light spillage onto adjacent areas. All lighting will have the minimum brightness and power rating to perform the required function.
- Drainage and attenuation ducts will restrict badger entry, and any excavation/trench which is liable to entrap wildlife will be covered, fenced off at the end of the day or have a means of escape for any animal which may fall in (e.g., mammal ladder or ramps).
- Water sources which may be used by badger will be safeguarded by the pollution prevent measures outlined throughout this CEMP.

5.4.3.3.3 Otter

Construction phase impacts to otter associated with the Proposed Development comprise pollution of watercourses and waterbodies, disturbance and displacement caused by increased human presence, noise, artificial lighting, and vibrations; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. Construction safeguards in respect of badger will also alleviate risk of mortality or injury to otter, should they be present within the Site during the construction.

No additional or specific mitigation for otter is required.

5.4.3.3.4 Other Protected Mammals

Mitigation during the construction phase for safeguarding badger (**Section 5.4.3.3.2**) is also relevant to pine marten, Irish hare, stoat, and red squirrel and will safeguard these species from negative impacts during the construction phase should they be present. No specific mitigation is proposed for red squirrel or pine marten, as the habitats to be impacted within the Proposed Development are not considered suitable to support dreys or dens.

Potential impacts to hedgehog and stoat will be mitigated by avoidance. Prior to construction works commencing that have the potential to disturb these species (*i.e.*, within woodland and scrub), the footprint of the works area will be subject to a robust walkover by the ECoW to ensure that there are no hedgehogs or stoats are present and at risk from machinery.

Hedgehogs hibernate over winter typically under log piles or tree roots, or within dense vegetation and scrub. Should construction works be undertaken during winter months, such vegetation or potential hibernacula at risk of disturbance or removal will be inspected by the ECoW for the presence of hibernating hedgehog prior to any removal.

5.4.3.3.5 Marsh Fritillary

Habitats within the Site are suitable for marsh fritillary, although no larval webs were identified in this area. Removal of this habitat will only take place following checks for larvae of marsh fritillary between August and September when larval webs on devil's-bit scabious are conspicuous and before larvae begin to hibernate.

Should marsh fritillary larval webs be recorded within the Power Plant Area, these will be translocated if avoidance is not feasible during construction. This will be advised and carried out by the ECoW, and a licence will be required. The method will normally include the following provisions:

- The proposed donor and recipient areas will be surveyed by a suitably experienced ecologist / ECoW to identify suitable areas with devil's-bit scabious and habitat structure.
- The ECoW will monitor the translocation operations and deliver toolbox talks to relevant site personnel.
- Translocation will take place in autumn or winter (October-December), when plants are dormant and outside of the bird breeding season. It is best to avoid such work when soil conditions are very wet, to avoid damage and disruption to the habitat.
- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.
- A specialist machine operator will be appointed for the translocation operations (removal, translocation, and placement of turves), who will be suitably experienced with the required machinery and equipment.
- The recipient area (the area where the translocated turves are to be re-established) should be similar to the donor site in terms of soil conditions and hydrology. The recipient area will be prepared before the turves are removed from the donor site, so that the turves can be translocated and put in place as quickly as possible, minimise drying out or other disruption.
- A flat-bottomed digger bucket will be used for removal of the turves from the donor site. The turves should be 20-25cm in thickness, and as large in area as can be accommodated by the digger bucket. Turves will be neatly and vertically cut along their edges as much as possible, to ensure turves are as large as possible with clean edges for best reinstatement.
- Operations will be planned so that turves are moved from the donor area to the recipient area in a single movement, so that temporary storage is not needed.
- Translocated turves will be placed in the prepared recipient area at the same depth as they were previously situated, so that their upper surface is flush with the surrounding ground surface.
- A monitoring plan will be put in place to assess the degree of success of the translocation.
- Any areas of marsh fritillary habitat lost will be replaced, ideally within the Site boundary.

5.4.3.3.6 Amphibians

Mitigation for smooth newt and common frog will focus on safeguarding their breeding habitat from damage and / or disturbance, avoiding impacts to breeding smooth newt and common frog, and minimising disturbance impacts to terrestrial smooth newt and common frog during construction.

Robust mitigation is required to protect smooth newt and common frogs from impacts arising from construction works on Site. The ponds to be retained supporting smooth newt populations, and potentially common frog populations must remain intact and untouched by potential pollution. This will require a full suite of pollution prevention measures during the construction phase, including silt fencing around the ponds to prevent sediment runoff, and a buffer of at least 10m between the pond and construction works and refuelling of machinery and plant.

Pond 3 will be removed to facilitate the construction of the Power Plant Area. To reduce the risk of injury or mortality of amphibians during the construction phase, it will be necessary to ensure that individuals are absent from the construction footprint of the Power Plant Area and retained within a safe 'refuge area' prior to construction commencing. This will be achieved using capture and exclusion methods. Standard techniques for these methods are described for great crested newt in the Great Crested Newt Mitigation Guidelines (English Nature, 2001) and Great Crested Newts: Survey and Mitigation for Development Project (Natural England, 2015). Published literature on smooth newt mitigation is not currently available.

The precise method by which the capture and exclusion will be achieved will be detailed in a Species Protection Plan which will be required as part of the licensing process with NPWS. The method will normally include the following provisions:

- The recipient pond(s) will be surveyed by a suitably experienced ecologist / ECoW during the breeding season (March to June inclusive) to determine suitability and presence of resident breeding newts or frogs.
- Amphibian fencing will be installed around the recipient waterbodies within a 'refuge area' in late January/early February prior to the translocation exercise commencing (weather dependent, it is best to avoid such works when soil conditions are very wet, to avoid damage and disruption to the habitat). The refuge area will encompass areas of habitat required by smooth newts at all times of year, including waterbodies for breeding and terrestrial areas.
- Prior to installation of amphibian fencing, and where necessary, vegetation will be removed from along a 1m corridor following the route of the amphibian fence. This will be done mechanically (e.g. strimming or clearance of scrub) and following checks for presence by the ECoW.
- The amphibian fencing will be designed to ensure that amphibians can remain in the refuge area and that they can continue to move between terrestrial and aquatic habitats. It will however serve to prevent amphibians from re-entering the construction areas of the Power Plant Area.
- If present, amphibians will be translocated (through netting and torching) from Pond 3 to the recipient pond(s) within the refuge area. Translocation will take place during the amphibian breeding season (March to June inclusive). Operations will be planned so that newts and/or frogs are moved from the donor pond to the recipient pond in a single movement. Following translocation, the pond to be removed will be lost drained carefully, ensuring no amphibians remain in the pond.
- On completion of construction works, the amphibian fencing will be removed, and amphibians will be free to move around.
- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.

Removal of the grassland and scrub on Site within 200m of ponds may potentially injure or kill hibernating smooth newts and common frogs and therefore should only be removed following checks of these habitats for presence by the ECoW. These areas will be cleared in stages – firstly by cutting back vegetation to around 5-10cm to facilitate easier and more effective searches for these species, and following searches this vegetation can be removed entirely.

Peat storage areas will be checked by the ECoW for the presence of smooth newt and common frog before any deposition commences.

5.4.3.3.7 Breeding Birds

Any removal of vegetation will be restricted to the non-breeding season (i.e., carried out from September to February inclusive), unless carried out under the supervision of a suitably experienced ecologist / ECoW who must survey the vegetation for breeding birds immediately prior to removal. For the avoidance of doubt, it should be noted that birds may nest in grass and low scrub, in addition to trees. Birds can also nest in buildings, which must be checked for nests if the buildings are to be demolished in the breeding season. If nests are found, work must stop immediately until birds fledge and cease to return to the nest and the ECoW will advise the contractor of any exclusion zones around potential or confirmed nests.

The loss of vegetation may displace breeding birds, and this loss of habitat may require them to move to the wider area where there is ample foraging and nesting habitat. Likewise, the loss of some buildings on site will remove nesting opportunities on site. Although new buildings will be constructed, it is possible they will be maintained to a higher standard reducing the opportunities for breeding birds. Therefore, nest cups suitable for house martin and swallow must be provided on new buildings in similar locations to existing nests These must be installed under the direction a suitably experience ecologist / ECoW. . Sufficient nest boxes suitable for those species breeding in the natural habitats to be removed on Site must also be provided.

5.4.3.3.8 Wintering Birds and Other Protected and Notable Species

No other specific mitigation in addition to that already outlined within this CEMP, the NIS and Volume I Chapter 9 Biodiversity of the EIAR submitted with the planning application is proposed or recommended.

5.4.3.4 Aquatic Ecology

Mitigation for fish and other aquatic species will focus on the protection given to the water environment as outlined throughout the CEMP.

Careful design and management of site drainage based on the principal of Sustainable Urban Drainage Systems (SUDS) during construction will mitigate the risk of polluted surface run-off to watercourses.

Any in-stream river work will be avoided during the main salmonid spawning season and egg incubation phases (October-April inclusive).

All construction and operation lighting will be directed away from watercourses to prevent light spill.

5.4.4 Electricity Grid Connection

5.4.4.1 Sites with Statutory Designations (European and National Sites)

Watercourses, ditches surrounding the Electricity Grid Connection are hydrologically connected to the River Boyne and River Blackwater SAC and SPA.

The use of oils, chemicals, sediment and other potential pollutants on-site requires significant care and attention. The Contractor will comply with all relevant legislation, guidance, and mitigation measures in relation to the control of hazardous substances and pollutants during the works, ensuring safe handling and storage of potential contaminants to prevent accidental release to the surface water and groundwater environments and all standard guidance will be followed, as outlined in the CEMP. Measures for pollution prevention and safeguarding of local watercourses detailed within Section 5.4.2, Section 5.4.5 and Section 5.7 and will ensure safeguarding of watercourses and waterbodies from impacts of pollution and sedimentation.

5.4.4.2 Habitats

Habitat Replacement, Compensation, and Enhancement

Within the lands associated with the Electricity Grid Connection, there will be unavoidable loss of habitats to facilitate the Proposed Development, including losses to cutover bog (both bare peat and partly vegetated), mixed woodland, bog woodland and scrub.

Habitat loss will be kept to a minimum where possible, by only removing habitat required to facilitate the construction footprint, including working, storage areas and laydown areas etc. Where habitats are disturbed, removed, or damaged for working and laydown areas, these will be reinstated naturally through succession if left unmanaged following construction.

Landscape mitigation is proposed around both the 220 kV and 440 kV substation compounds. For the 220 kV substation compound a mix of deciduous tree will be planted to the east along the R400 to screen the lower parts of the development from the road and enhance visual aesthetics. A grassland mix will be planted on areas that are currently hard standing. Around the 440 kV substation compound a band of deciduous trees will be planted along the southern and eastern side of the compound to provide screening for views north of the Grand Canal. A grassland mix will be planted along the eastern entrance, as well as the northern, western and southern boundary of the substation compound. Full details are presented in the Landscape Mitigation Strategy (Volume I, Chapter 10 Landscape and Visual, Volume II Appendix 10B of the EIAR submitted with the planning application, also see Volume I chapter 09 Biodiversity).

An area of approximately 17.5 ha will be planted with trees, over five areas. Further information is provided in Section 5.4.3.2 of this CEMP, and in Volume II Appendix 9J and 9K of the EIAR.

Habitats – Pollution and Water Quality

Watercourses, ditches, and waterbodies are present within and in the area surrounding lands associated with the Electricity Grid Connection. Measures for pollution prevention and safeguarding watercourses and waterbodies from impacts of pollution have been included throughout this CEMP and within **Section 5.7** and will be implemented within the Contractor's CEMP for the Electricity Grid Connection. The use of SuDs during construction will mitigate the risk of surface run-off to watercourses.

Similarly, raised bog adjacent the southern section of the Electricity Grid Connection will be protected from runoff through measures outlined in this CEMP.

5.4.4.3 Fauna

5.4.4.3.1 Bats

Construction works in the vicinity of building B6 immediately adjacent to the Electricity Grid Connection, and construction work adjacent to the treelines and hedgerows in the south of the Electricity Grid Connection have potential to disturb and displace roosting and foraging/commuting bats.

Works must be restricted to the daylight hours (07:00 – 19:00), and lighting used during construction will not illuminate any natural habitats used by roosting, foraging or commuting bats.

Bats are particularly sensitive to lighting, and whilst B6 is outside the Proposed Development footprint, the following mitigation regarding lighting (following BCT/ILP: GN08/2023) must be adhered to in relation to this retained roost and the surrounding habitat during the construction:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level), with light reaching these buildings not greater than 1 lux to avoid roost disturbance; similarly using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity.
- Directional lighting, facing and located away from this roost and surrounding vegetation.

5.4.4.3.2 Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security. Badger

Subsidiary sett BA03 will require permanent closure for works to proceed. Outlier sett BA04 is within the 50m distance stated by the NRA guidance within which no works should take place during the breeding season (December to June). If works are required within the breeding season, this sett should be temporarily closed, but the sett can remain open if works are to take place in the non-breeding season as the sett is more than 30m away from the works. If there is piling within 150m of outlier sett BA02, this sett will require temporary closure. Sett closure will require a licence and be overseen by a suitably qualified ecologist / ECoW.

As badgers are a mobile species which are active within the vicinity of lands associated with the Electricity Grid Connection, it is possible that badger may establish new setts prior to construction. Therefore, preconstruction badger surveys must be carried out within the ZoI of the Electricity Grid Connection no sooner than one month of the works commencing, to determine if any setts have become newly established since baseline surveys. The ECoW will provide advice in the event that additional setts are identified, including potential requirements under licence on a temporary or permanent basis.

The use of artificial lighting during construction has likelihood to deter badger from retained setts and habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to any retained badger setts.

To alleviate a range of general likely significant effects to badger during the construction phase of the Electricity Grid Connection, the following mitigation will be adhered to:

- A Badger Management Plan will be devised and implemented by the appointed contractor with input from the ECoW to include the mitigation presented within this Section. This Plan will ensure all sett locations are known to the relevant personnel (with cognisance to the preferred confidentiality) prior to construction and drawings of sett locations and protection zones will be prepared.
- All works will be largely restricted to daylight hours (07:00 – 19:00), where working schedules permit, to reduce as far as possible disturbance as possible to badger.

- The use of artificial lighting during the construction period will be limited and lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise intrusion and disturbance to semi-natural habitats and their conservation value. Use of full cut-off lanterns are proposed to minimise light spillage onto adjacent areas. all lighting will have the minimum brightness and power rating to perform the required function.

- Drainage and attenuation ducts will restrict badger entry, and any excavation / trench which is liable to entrap wildlife will be covered, fenced off at the end of the day or have a means of escape for any animal which may fall in (*e.g.*, mammal ladder or ramps).

- Water sources which may be used by badger will be safeguarded by the pollution prevention measures outlined in this CEMP (pollution guidance will be adhered to).

5.4.4.3.3 Otter

Construction phase impacts to otter associated with the Electricity Grid Connection comprise pollution of watercourses and waterbodies, disturbance and displacement caused by increased human presence, noise, artificial lighting, and vibrations; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. The implementation of the measures outlined within this CEMP will ensure these habitats are safeguarded from pollution. Construction safeguards outlined in Section 5.4.3.3.2 and Section 5.4.4.3.2 in respect of badger will also apply to otter, should they be present within the site during the construction.

5.4.4.3.4 Other Protected Mammals

Mitigation during the construction phase for safeguarding badger is also relevant to pine marten, Irish hare, stoat, and red squirrel and will safeguard these species from negative impacts during the construction phase should they be present. No specific mitigation is proposed for red squirrel or pine marten, as the habitats to be impacted within the Electricity Grid Connection are not considered suitable to support dreys or dens.

Potential impacts to hedgehog and stoat will be mitigated by avoidance. Prior to construction works commencing that have the potential to disturb these species (i.e., within woodland and scrub), the footprint of the works area will be subject to a robust walkover by the ECoW to ensure that there are no hedgehogs or stoats are present and at risk from machinery.

Hedgehog hibernate overwinter typically under log piles or tree roots, or within dense vegetation and scrub. Should construction works be undertaken during winter months, such vegetation or potential hibernacula at risk of disturbance or removal will be inspected by the ECoW for the presence of hibernating hedgehog prior to any removal.

5.4.4.3.5 Marsh Fritillary

Habitats within the lands associated with the Electricity Grid Connection are suitable for marsh fritillary, with larval webs identified in this area. Removal of this habitat must only be completed following checks for larvae of marsh fritillary between August and September when larval webs on devil's-bit scabious are conspicuous and before larvae begin to hibernate. Should larval webs be found in areas of grassland to be removed, these areas must remain intact to provide future breeding habitat for this declining species.

Where marsh fritillary habitat within the lands associated with the Electricity Grid Connection are to be impacted, these will be translocated if it is not feasible to avoid these during construction. The methodology will normally include the following provisions:

- The proposed donor and recipient areas will be surveyed by a suitably experienced ecologist / ECoW to identify suitable areas with devil's-bit scabious and habitat structure.

- The ECoW will monitor the translocation operations and deliver toolbox talks to relevant site personnel.

- Translocation will take place in autumn or winter (October – December), when plants are dormant and outside of the bird breeding season. It is best to avoid such work when soil conditions are very wet, to avoid damage and disruption to the habitat.

- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil.
- A specialist machine operator will be appointed for the translocation operations (removal, translocation and placement of turves), who will be suitably experienced with the required machinery and equipment.
- The recipient area (the area where the translocated turves are to be re-established) should be similar to the donor site in terms of soil conditions and hydrology. The recipient area will be prepared before the turves are removed from the donor site, so that the turves can be translocated and put in place as quickly as possible, in order to minimise drying out or other disruption.
- A flat-bottomed digger bucket will be used for removal of the turves from the donor site. The turves should be 20-25cm in thickness, and as large in area as can be accommodated by the digger bucket. Turves will be neatly and vertically cut along their edges as much as possible, to ensure turves are as large as possible with clean edges for best reinstatement.
- Operations will be planned so that turves are moved from the donor area to the recipient area in a single movement, so that temporary storage is not needed.
- Translocated turves will be placed in the prepared recipient area at the same depth as they were previously situated, so that their upper surface is flush with the surrounding ground surface.
- A monitoring plan will be put in place to assess the degree of success of the translocation.
- Any areas of marsh fritillary habitat lost will be replaced, ideally within the Site boundary.

5.4.4.3.6 Amphibians

Mitigation for smooth newt and common frog will focus on safeguarding their breeding habitat from damage and / or disturbance, avoiding impacts to breeding smooth newt and common frog, minimising disturbance impacts to terrestrial smooth newt and common frog during construction, and creating amphibian friendly habitats for the operational stage.

Pond 1, which was confirmed to support sooth newt, is located within the 220kV substation compound and at the southern boundary of the proposed substation infrastructure of the Electricity Grid Connection. In addition, further suitable terrestrial and aquatic habitat is present within the Electricity Grid Connection. Robust mitigation is therefore required to protect smooth newt and common frogs from impacts arising from construction works.

To ensure terrestrial and aquatic amphibian habitats are protected, a full suite of pollution prevention measures as outlined in this CEMP will be adhered to.

A capture and exclusion exercise will be carried out, whereby amphibians within Pond 1 will be translocated to a safe ‘refuge’ area prior to construction commencing. To reduce the risk of injury or mortality of amphibians during the construction phase, it will be necessary to ensure that individuals are absent from the construction footprint of the Electricity Grid Connection and retained within a safe ‘refuge area’ prior to construction commencing. This will be achieved using capture and exclusion methods. Standard techniques for these methods are described for great crested newt in the Great Crested Newt Mitigation Guidelines (English Nature, 2001) and Great Crested Newts: Survey and Mitigation for Development Project (Natural England, 2015). Published literature on smooth newt mitigation is not currently available.

The precise method by which the capture and exclusion will be achieved will be detailed in a Species Protection Plan which will be required as part of the licensing process with NPWS. The method will normally include the provisions previously outlined in Section 5.4.3.3.6.

Removal of the grassland and scrub may potentially injure or kill terrestrial smooth newts and common frogs and therefore should only be removed following checks of these habitats for presence by the ECoW. These areas will be cleared in stages – firstly by cutting back vegetation to around 5-10cm to facilitate easier and more effective searches for these species, and following searches this vegetation can be removed entirely.

Peat Deposition Areas will be checked by the ECoW for the presence of smooth newt and common frog before any deposition commences.

Robust mitigation is required to protect smooth newt and common frogs from impacts arising from construction works on Site. Any ponds potentially supporting smooth newt populations, and potentially common frog populations must remain intact and untouched by potential pollution. This will require a full suite of pollution prevention measures during the construction phase, including silt fencing around the ponds to prevent sediment runoff, and a buffer of at least 10m between the pond and construction works and refuelling of machinery and plant.

5.4.4.3.7 Breeding Birds

Any removal of vegetation will be restricted to the non-breeding season (i.e., carried out from September to February inclusive), unless carried out under the supervision of a suitably experienced ecologist / ECoW who must survey the vegetation for breeding birds immediately prior to removal. For the avoidance of doubt, it should be noted that birds may nest in grass and low scrub, in addition to trees. Birds can also nest in buildings, which must be checked for nests if the buildings are to be demolished in the breeding season. If nests are found, work must stop immediately until birds fledge and cease to return to the nest and the ECoW will advise the contractor of any exclusion zones around potential or confirmed nests.

5.4.4.3.8 Wintering birds and Other Protected and Notable Species

No other specific mitigation in addition to that already outlined within this CEMP, the NIS and Volume I Chapter 9 Biodiversity of the EIAR submitted with the planning application is proposed or recommended.

5.4.4.4 Aquatic Ecology

Mitigation for fish and other aquatic species will focus on the protection given to the water environment as outlined within this CEMP during the construction phase. Use of SuDs during construction will mitigate the risk of surface run-off to watercourses.

Any in-stream river work will be avoided during the main salmonid spawning season and egg incubation phases (October – April inclusive).

All construction lighting will be directed away from watercourses to prevent light spillage.

5.4.5 Invasive Species

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.
- 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.

5.5 Landscape and Visual

5.5.1 Power Plant Area

Proposed landscape mitigation measures are detailed in the Landscape Strategy Report included in Volume II, Appendix 10B of the EIAR submitted with the planning application. A synopsis is provided below:

The Power Plant is located east along the R400 with a low-lying landscape as a backdrop. The proposed landscape mitigation and enhancement measures involve the introduction of the following specific elements:

- Mix of Deciduous Trees: Positioned to the west of the site, these clusters aim to screen the lower parts of the development and the area around the site entrance. Their placement is intended to enhance visual aesthetics and promote integration with the natural environment.
- Woodland Mix and Grass Mix: To the south of the site, a combination of woodland mix and grass mix will be introduced. This aims to facilitate better integration with the existing scrubland adjacent to the site, extending beyond the site boundary, and to enhance the screening of the lower section of the PPA over time when the woodland mix matures.
- Retention of existing vegetation: Clusters of existing semi-mature and mature vegetation in the northern section of the existing site entrance east of the R400 shall be retained and protected during construction.

Landscape mitigation in areas to the north and east of the PPA and within the redline boundary will not be suitable for replanting due to the location of the contractors compounds.

Habitat Replacement Areas

There will be unavoidable loss of habitats within the Power Plant Area to facilitate the construction phase, including losses to amenity grassland, dry meadows and grassy verges, scrub and immature woodland, and bog woodland. Habitat loss will be kept to a minimum where possible, by only removing habitat required to facilitate the construction footprint, including working, storage areas and laydown areas etc. Where habitats are disturbed, removed, or damaged for temporary construction compounds, these will be reinstated naturally through succession and left unmanaged following construction.

An area of approximately 8 hectares will be planted with trees, located to the west of the line-cable interface compound within Ballybeg Bog. This is to replace the loss of trees, in particular bog woodland, as a result of the construction of the Proposed Development, including the Power Plant Area and Electricity Grid Connection. Refer to Volume II, Appendix 10B (Landscape Mitigation Strategy) of the EIAR submitted with the planning application for the location and extent of the replanting lands to compensate for tree felling requirement as well as Chapter 8 (Biodiversity) and its associated appendices of the EIAR submitted with the planning application.

Replanting will aim to create an area of bog woodland, dominated by downy birch, but include to a lesser extent Holly, Rowan, Scots pine, Oaks and Willows, which aligns with the Ballybeg Cutaway Bog Decommissioning and Rehabilitation Plan (see Volume II, Appendix 9J of the EIAR submitted with the planning application). Full details are presented in the Habitat Management Plan (refer to Volume II, Appendix 9K of the EIAR submitted with the planning application).

5.5.2 Electricity Grid Connection

220 kV Substation

Proposed landscape mitigation measures are detailed in the Landscape Strategy Report included in Volume II, Appendix 10B of the EIAR submitted with the planning application. A synopsis is provided below:

The Electricity Grid Connection is located west of the R400 with a low-lying landscape as a backdrop. The proposed landscape mitigation and enhancement measures involve the introduction of the following specific elements:

- Mix of Deciduous Trees: Positioned to the east along the R400, additional clusters of deciduous trees will aim to screen the lower parts of the development from the road and the area around the site entrance. Their placement is intended to enhance visual aesthetics and promote integration with the natural environment.
- Grass Mix: Areas to the north and east of the substation compound shall be planted with a grass mix. This aims to increase the biodiversity in this area which his currently mostly hardstanding. Considering the required underground services and overground lattice structures, the establishment of a woodland mix will not be feasible in the vicinity of the substation.
- Retention of existing vegetation: Existing regenerating bog vegetation west of the proposed substation compound shall be retained and protected during construction works.

400 kV Substation

Proposed landscape mitigation measures are detailed in the Landscape Strategy Report included in Volume II, Appendix 10B of the EIAR submitted with the planning application. A synopsis is provided below:

The Electricity Grid Connection is located north of the Grand Canal and south of the L1010 Togher. The site is adjacent to agricultural fields to the west, south and north. Areas of regenerating bog are located to the east. The proposed landscape mitigation and enhancement measures involve the introduction of the following specific elements:

- Woodland Mix: A band of trees is to be planted along the southern and eastern side of the substation compound and separated by a band of grassland from the compound fence. This is to provide screening of the lower section of the substation building and to pick up the pattern of bands of trees along field boundaries. Additional screen planting in form of bands of trees will be provided along the western and southern redline boundary in order to enhance screening in views north from the Grand Canal.
- Grass Mix: A band of grassland will be created along the eastern (entrance area), northern, western and southern boundary of the substation compound. Other areas associated with former access tracks and agricultural fields located within the southern tip of the redline boundary are to become grassland.
- Retention of existing vegetation: Existing bands of trees along field boundaries north of the substation compound as well as a wide strip south of the substation compound is to be retained.

Overhead Transmission Line and underground cable

Proposed landscape mitigation measures are detailed in the Landscape Strategy Report included in Volume II, Appendix 10B of the EIAR submitted with the planning application.

<u>Location of Proposed OHL and UGC</u>

- Avoidance of locating the Proposed OHL where there was a specific conflict with a view or amenity;
- Restricting the siting of structures close to a road unless it could be screened by an adjoining hedgerow or hedgerow trees. Towers to be set back well from the edges of local roads, where practical, especially where there was a lack of hedgerows.
- Avoidance of running the Proposed OHL close and parallel to a road;
- Place UGC within existing road / access track corridors where possible;
- Avoidance of placing overhead transmission line structures on axial views, or where there was a change in direction of a road;
- Taking advantage of existing tall hedgerows, bands of trees, or stands of trees that enclosed fields within the study area - using them either as a background or to screen the overhead transmission line;
- Minimise construction impact on adjoining vegetation;

- Avoidance of placing the overhead transmission line structures on rising ground where they will break the skyline, where possible;
- Alignment of the Proposed OHL as straight as possible in order to minimise the requirement for angle towers;
- Micro-siting of proposed towers/pole-sets in order to avoid mature trees;
- Where possible, location of tower structures near or on field boundaries in order to retain the visual appearance of existing field pattern; and
- Avoidance of traversing relevant roads in a perpendicular manner.

Vegetation

- Retention of existing mature tree planting where possible;
- Minimising removal or pruning of hedgerows and trees/woodland areas; and
- Minimising the removal of roadside vegetation where the Proposed OHL crosses.

Lattice Tower locations

Careful analysis has been undertaken for all tower positions in areas where towers are likely to give rise to significant visual effects. These locations will be reviewed at construction stage to ensure optimum micro-siting is achieved with regard to visual effects.

5.6 Noise and Vibration

5.6.1 General Mitigation Measures

The Contractor will be required to have regard to the following and those outlined within the EIAR relevant to construction phase noise and vibration:

- British Standards Institution (BSI) (2014). *Code of practice for noise and vibration control on construction and open sites* BS 5228:2009+A1:2014.
- Environmental Protection Agency (EPA) (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.
- National Roads Authority (NRA) (2004). *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*.
- Health and Safety Authority (HSA) (2007). *Guide to the Safety, Health and Welfare at Work (General Application) Regulations 2007: Chapter 1 of Part 5: Control of Noise at Work.*
- UK Highways Agency (UKHA) (2020). *Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2*.

An assessment of construction phase noise emissions has been carried out in Volume I, Chapter 11 of the EIAR, and outlines the predicted noise levels from construction activities at the closest noise sensitive locations (sensitive receptors).

The Environmental Manager will supervise the works to ensure compliance with the noise and vibration limits set out in the Standards document referred above and those references within the EIAR.

The Contractor will address noise and vibration, through measures such as the following where appropriate:

- A site representative and designated noise liaison responsible for matters relating to noise and vibration will be appointed prior to construction on site.
- Prior to particularly noisy construction activity, e.g., excavation close to a property, the Site contact will inform the nearest noise sensitive locations of the time and expected duration of the works.

- Any complaints will be logged, investigated, and followed up in a prompt fashion and, where required, measures taken to ameliorate the source of the noise complaint. The Contractor will develop a complaints and corrective action procedure to be adhered to throughout the construction phase. This will outline timeframes within which complaints should be logged, investigated and complaints resolved, taking into account the timeframes outlined in section 3.2.6 of this CEMP.
- The site representative and designated noise liaison will also liaise with environmental advisors, relevant authorities / environmental bodies, and the local community as required with respect to noise and vibration impacts during the construction phase.
- Good community relations shall be established and maintained throughout the construction process. This shall include informing residents on progress and ensuring measures are put in place to minimise noise and vibration impacts.
- The Contractor will highlight through Method Statements and / or risk assessment specific activities that will create significant noise and vibration levels. Contractors will demonstrate how they will mitigate / manage these emissions. The Contractor will implement mitigation measures where noise sources are located near sensitive receptors and where required onsite. Where significant noise or vibration levels are expected, this will be communicated with any affected parties.
- The Contractor shall select construction plant with low inherent potential for generation of noise and / or vibration.
- The hours of working will be planned, and account will be taken of the effects of vibration upon persons in areas surrounding Site operations and upon persons working on site, taking into account the nature of land use in the areas concerned, the duration of work, and the likely consequence of any lengthening of work periods.
- Where reasonably practicable, low vibration working methods will be employed. Consideration should be given to use of the most suitable plant, reasonable hours of working for operations which might give rise to perceptible vibrations, and economy and speed of operations.
- Measures shall be put in place to ensure that employees know that minimisation of noise will be important at the Site.
- Any machinery which is in intermittent use shall be shut down in intervening periods of non-use or where this is impracticable, it shall be throttled back to a minimum.
- All plant and vehicles shall be maintained in good mechanical order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable.

5.6.2 Power Plant Area

To ensure noise and vibration levels are kept to a minimum and to reduce the risk of cumulative impacts, it is recommended that measures including the following are adopted during the construction phase:

- Standard construction working hours will be adhered to, *i.e.,* 0700 hours - 1900 hours weekdays and 0800 hours - 1300 hours Saturdays, with no working on Sundays or Bank Holidays (including site deliveries) unless agreed with the local planning authority. Any activities that are required to be undertaken outside of standard construction hours our will be discussed with the relevant authorities in advance.
- Selection of quiet and low vibration equipment and methodologies in accordance with the principles of ‘best practicable means’.
- Fixed and semi-fixed ancillary plant such as generators, compressors and pumps will be located away from receptor locations wherever possible.
- The appointed Contractor for the construction phase will be provided with electrical power which minimises the requirement for diesel generators at the Site.
- Diesel generators, if and when required, will be enclosed in sound proofed containers to minimise the potential for noise impacts.

- All plant used on site will be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- All noise generating construction plant will be shut down when not in use.
- The loading and unloading of materials will take place away from residential properties, ideally in locations which are acoustically screened from nearby NSRs.
- Materials shall be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant shall be kept to a minimum.
- Modern plant shall be selected which complies with the latest European Commission noise emission requirements. Electrical plant items (as opposed to diesel powered plant items) shall be used wherever practicable. All major compressors shall be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Site operations and vehicle routes will be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography.
- No employees, subcontractors and persons employed on the site will cause unnecessary noise from their activities, e.g., excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site shall include information on minimising noise and reminding them to be considerate of the nearby residents.
- As far as practicable, noisier activities shall be planned to take place during periods of the day which are generally considered to be less noise-sensitive or when existing ambient noise levels are higher to help mask the construction noise, i.e., not particularly early or late in the day.

5.6.3 Electricity Grid Connection

To ensure noise and vibration levels are kept to a minimum and to reduce the risk of cumulative impacts, it is recommended that mitigation measures outlined in Sections 5.6.1, 5.6.2 and 5.6.4 as well as those listed throughout this CEMP are implemented during the construction phase of the Electricity Grid Connection.

5.6.4 Noise and Vibration Limits

The Contractor will be responsible for compliance with these prescribed noise and vibration levels, which will be agreed between the Contractor and the Local Authorities during the post-planning stage, prior to any works commencing on Site. This shall apply to all works carried out by the Contractor and any sub-contractors under their control. Any deviation from the threshold noise levels agreed with the Local Authority will only be allowed in exceptional circumstances and when prior written approval has been received from the Local Authority. The requirement whether or not to undertake noise and vibration monitoring will be agreed with the Local Authority.

Transport Infrastructure Ireland (TII) is the only government body in Ireland to publish construction noise limits, which are presented in the document ‘Guidelines for the Treatment of Noise and Vibration in National Road Schemes’ (NRA 2004) (NRA Guidelines). It is acknowledged that the limits presented relate to construction works for road schemes, however it is considered reasonable and pragmatic to assume that noise sensitive receptors (NSR) are likely to be equally sensitive to construction noise from other project types, like the Proposed Development. Construction noise and vibration limits set out by the NRA Guidance (2004) are set out in **Table 5.2**. Criteria given in both the NRA Guidelines and BS 5228-1 will be considered during the construction phase.

Table 5-2: Maximum Permissible Noise Levels at the Facade of Dwellings During Construction

Day & Time	Noise Levels dB(A)	
	$L_{Aeq\ 1\ hour}$	$L_{AMax,slow}$ dB
Monday to Friday 07:00 to 19:00	70	80
Monday to Friday 19:00 to 22:00	60[2]	65[2]
Saturday 08:00 to 16:30	65	75
Sundays and Bank Holidays 08:00 to 16:30	60[2]	65[2]

5.7 Water Management

5.7.1 Power Plant Area

To minimise the potential for adverse impacts to groundwater, surface water quality and geomorphology during construction, the following is an outline of the general mitigation measures that will be in place. Water quality monitoring of surface water courses will be undertaken pre and during-construction. Also see Section 5.8 for additional mitigation measures.

5.7.1.1 Surface Water Management

During the construction phase of the Proposed Development surface water quality measures will be installed and maintained in accordance with the following guidance:

- Construction Industry Research and Information Association (CIRIA) (2001). *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).*
- Construction Industry Research and Information Association (CIRIA) (2006). C*ontrol of water pollution from linear construction projects. Technical guidance (C648D).*
- Construction Industry Research and Information Association (CIRIA) (2023). *Environmental good practice on site guide (5th edition) (C811).*
- Eastern Regional Fisheries Board (ERFB) (2004). *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.*
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on the Protection Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.*
- Inland Fisheries Ireland (IFI) (2016). *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.*
- Institute of Geologists of Ireland (IGI) (2013). *Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements.*
- National Roads Authority (NRA) (2008). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.*
- National Roads Authority (NRA) (2009). *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.*
- Transport Infrastructure Ireland (TII) (2015). *Road Drainage and the Water Environment (DN-DNG-03065).*

General surface water management and good practice are detailed below:

- All construction works will be confined to within the Proposed Development site boundary. No works will be undertaken outside of this area.

[2] Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority.

- The existing surface water management system, such as drains, settlement ponds, outfalls and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any Power Plant Area works commencing on the Site.
- Additional new drainage installations will be installed in early stages of construction, alongside the remaining existing drainage facilities, which can be used to treat runoff for silt and hydrocarbons early on in the programme. Daily weather forecasting will also be used to inform the works schedule, ensuring excavation works do not coincide with high intensity or extreme rainfall event
- The proposed surface water management system, including existing and proposed infrastructure, will be inspected and confirmed to be of sufficient capacity to treat any additional water generated by the Power Plant Area, including runoff from dust suppression, prior to discharge.
- Washout from power cleaning of drainage lines, oil interceptors or any other pipework which may contain pollutants will be collected and treated. No contaminated washout will be allowed enter any water body or be discharged to ground.
- There will be regular monitoring and prompt maintenance of the overall surface water management system throughout the Power Plant Area. This will ensure that the drainage system continues to function as designed.
- There will be no direct discharge to any water body at any time during the construction phases. All surface water run-off within the Site will be directed to this drainage system.

5.7.1.2 Sedimentation of Surface Waters

The proposed works will be carried out by employing accepted good work practices during construction, and environmental management measures such as those outlined below:

- All materials will be stored within temporary compounds, refer to the temporary construction compound details (see Section 3.4.5 and Section 3.5.5 of this CEMP, also see the EIAR submitted with the planning application), and transported to the works zone immediately prior to construction.
- Weather conditions will be taken into consideration when planning construction activities to minimise risk of run off from site.
- Provision of 50m exclusion zones and barriers (silt fences) between any excavated material and any surface water features to prevent sediment washing into the receiving water environment.
- The contractor shall ensure that silt fences are regularly inspected and maintained during the construction phase.
- Any silt fencing will be erected as per the manufacturer’s guidelines, under the ECoW supervision and will be maintained until all ground disturbance has ceased and vegetation re-established. Once installed the contractor shall ensure that silt fences are regularly inspected and maintained during the construction phase, inspections will occur more frequently during heavy rainfall events. The ECoW will also supervise the removal of the silt fences following the completion of the works.
- 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 regular visual examinations of local watercourses that may be impacted by 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 throughout Site 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. Any used spill kit materials will be disposed of using a licenced hazardous waste contractor in accordance with relevant legalisation.
- 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 50m hydrological buffer at all times.
- Unnecessary clearing and grading will be avoided.
- Clearing of adjacent drainage channels will be minimised.
- Silt control measures will be installed along the perimeter of the excavation areas adjacent to drainage channels and at locations along the proposed discharge pipeline routes, where there is a potential impact on drains or the Yellow River (process water discharge) and Castlejordan River (surface water discharge).
- Construction activities phased to minimise soil exposure, with large areas of grading avoided to minimise erosion potential.
- Soils are to be stabilised as soon as is practicable.
- To prevent chemical pollution, all liquid fuels and chemicals will be stored in suitable containers within bunds in designated areas away from the main construction site activities. The designated areas will be located an appropriate distance away from drainage channels and onsite boreholes.
- On-site refuelling is to be carried out in designated bunded areas only.
- Spill kits are to be maintained near working areas. All spills / leaks are to be cleaned up immediately. The Contractor will prepare and implement an emergency response plan. The plan will detail the measures to be undertaken should pollution be identified, and will be detailed within the Contractors CEMP.
- Equipment will be regularly maintained, and leaks repaired as soon as is practicable. If the equipment cannot be repaired, it will be removed from the site. Accidental spillages will be contained and cleaned up immediately.
- Contained chemical portaloo toilets will be used on site during the construction phase. All sewage will be removed from the site to an authorised treatment plant.
- Construction of the discharge pipe placement will be carried out in accordance with the Inland Fisheries Ireland *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (2016*). The guidelines will also be consulted regarding discharge pipes (process water and surface water) placement to avoid disruption to the river during the most sensitive stages of salmonid or lamprey development.
- If dewatering is required as part of the proposed works e.g. in wet areas, water will be pumped from excavations via settlement tanks or collection basins where any solids can settle out before discharging to drains or watercourses. The settled solids will be removed from the tank/basin as required and disposed offsite by licensed hauliers. Suitable best practice de-watering methods will be used.
- Run-off from spoil heaps will be prevented from entering watercourses by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.

- Silt traps will be placed at any crossing points to avoid siltation of drainage channels and, if the need arises, silt fences will be used during the course of works in order to reduce the potential for pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase.

- Surface water run-off from working areas will not be allowed to discharge directly to local watercourses.

5.7.1.3 Fuel, Refuelling and Chemical Handling

- Fuel and chemical handling will be carried out by employing accepted good work practices during construction, and environmental management measures such as those discussed below: Oils and lubricants will be required to be stored at least 50m away of a watercourse where practical and stored in vessels designed to hold 110% of the capacity of the largest tank / container within the bunded area. All plant and equipment shall be checked for leaks of fuel and lubricants before being allowed onto the Site. The Contractor will allow for regular checks and maintenance as required.

- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities will be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials should be disposed of via a hazardous waste contractor.

- Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the Site, a suitably sized spill pallet will be used for containing any spillages during transit.

- All equipment and machinery will be checked for leaks and other potential sources of contaminants before arriving on-site and on a daily basis. Any equipment or machinery likely to introduce contaminants will not be brought on-site or will be removed from the Site immediately if any leak is discovered. Spill kits will be available to machine operators, and they will be trained in their use. Any used spill kit materials will be disposed of via a hazardous waste contractor.

- The storage of hazardous substances will be necessary during construction and a number of considerations will need to be made to reduce the potential for pollution from these sources. Fuel will be required to be stored at least 50m from a water body and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.

- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) will be held on-site in order to facilitate response to accidental spills.

- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of all construction vehicles. All machine operators and site staff will be fully trained in the use of this equipment.

- Spill kits and oil absorbent material will also be located at vulnerable locations (e.g., near oil filled equipment). Booms will be held on-site for works near waterbody / drains. Spill kits will contain a breakable tie to show use and indicates whether it needs to be replenished. The Site Manager and Environmental Manager will be responsible for replenishing spill kits.

- A limited amount of fuel will have to be stored on site in bunded areas. On-site refuelling of machinery will be carried out at dedicated refuelling locations using a mobile double skinned fuel bowser or fuel truck, away from watercourses and surface water drains. The fuel bowser will be parked on a level area in the construction compound when not in use. Only designated trained and competent operatives will be authorised to refuel plant.

- Mobile measures such as drip trays, spill kits and fuel absorbent mats will be available and will be used when required during all refuelling operations.

- All machinery will be regularly maintained and checked for leaks and services will only be undertaken within the construction compound or offsite.

5.7.1.4 Control of Concrete and Lime (Including Concrete Deliveries and Pours)

Concrete will be used to construct the Proposed Development and will therefore need to be managed to reduce the potential for pollution. The control of concrete and lime will be carried out by employing accepted good work practices during construction, and environmental management measures such as those discussed below.

Ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. Before leaving site, washing of the delivery truck chute will be minimised and restricted to designated wash out areas only. No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the Site within 20m of an existing surface water drainage point. Washing of the concrete lorry's chute will only be allowed to take place in designated areas with an impervious surface or offsite at a licensed facility. Concrete truck bodies will not be washed out on the Site, concrete trucks will be washed out fully at their off-site batching plant, where facilities are already in place.

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane.

The areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site and transported to an appropriately authorised facility. Any solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste.

The risks of pollution arising from concrete deliveries will be further reduced by the following:

- Site roads will be constructed to the required standard to allow transport of materials to the Site, concrete delivery trucks will be able to access all areas where the concrete will be needed. No concrete will be transported around the Site in open trailers or dumpers to avoid spillage while in transport.
- The arrangements for concrete deliveries to the site will be agreed with suppliers before work starts, agreeing routes, prohibiting on-site washout and to agree emergency procedures.
- Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the site.
- Contractor will be required to manage and mitigate concrete works ensuring that no concrete is laid during wet weather if achievable, so to reduce the risk of concrete being washed off the site and into the surface water drains or water bodies.
- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.
- Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete.
- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets.
- Ensuring that covers are available, and used, when necessary, for freshly placed concrete to avoid the surface washing away in heavy rain.
- Surplus concrete after completion of a pour will be taken off-site and disposed of at an appropriately authorised / licenced facility.

- Concrete mixing will be undertaken in designated impermeable areas, at least 10 m away from a water body or surface water drain to reduce the risk of runoff entering a water body, or the sub-surface, or groundwater environment.

5.7.1.5 Accidental Spillage, Flooding or Other Emergencies

Accidental spillages, flooding, or other emergencies will be avoided by employing accepted good work practices during construction, and environmental management measures such as those discussed below:

- Leaking or empty oil drums will be removed from site immediately and disposed of via an appropriately licensed waste disposal contractor.
- Spill kits and oil absorbent material will be carried by mobile plant and all machine operators and site staff will be fully trained in the use of this equipment.
- Spill kits and oil absorbent material will also be located at vulnerable locations (e.g., near oil filled equipment). Booms will be held on-site for works near waterbody / drains. Spill kits will contain a breakable tie to show use and indicates whether it needs to be replenished. The Site Manager and Environmental Manager will be responsible for replenishing spill kits.
- An Emergency Response Plan (ERP) including a spill clean-up plan will be prepared by the Contractor and included in the CEMP and construction workers trained to respond to spillages.
- A copy of the ERP will be kept in the Site Emergency Information File (along with other safety emergency preparedness plans) together with the results of any test of the plan.
- Oil interceptors will be required for refuelling areas; runoff from washing areas that contains detergents which may prevent oil interceptors from working correctly will be prevented from entering oil separators by providing separate designated areas for washing and refuelling.
- Discharge with oils and chemicals from vehicle washing areas will be considered as trade effluent and therefore will be disposed off-site.
- The installation of protective bunds along all waterbody boundaries and drains during construction will filter contaminants and prevent adverse runoff.
- Any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use.
- Any site welfare facilities will be appropriately managed, and all foul waste disposed of by a licenced contractor to a suitably permitted facility.
- During the construction phase, the Contractor will monitor weather forecasts on a monthly, weekly, and daily basis, and plan works accordingly. The Contractor will describe in the Emergency Response Plan the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.

5.7.2 Electricity Grid Connection

The same general mitigation measures that will be in place during construction of the Electricity Grid Connection as that of the construction of the Power Plant Area to minimise the potential for adverse impacts to groundwater, surface water quality and geomorphology, and off-site receptors and construction workers, will be in place during the construction phase of the Electricity Grid Connection.

5.8 Soils and Geology

Also see Section 5.7 for additional mitigation measures.

5.8.1 Power Plant Area

- To minimise the potential for adverse impacts to soil structure and quality during construction, the following general mitigation measures will be in place: Soil material will be stored temporarily within the Site in managed stockpiles that will not be allowed to dry out, to avoid generation of wind-blown dust.

- Any stockpiled material will be managed in accordance with best practise guidelines (such as *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (defra 2009)). When required, pre-earthwork drainage will be put in place to avoid sediment being washed off-site as outlined in **Sections 4.5** and **5.7.**

- The Contractor will be required to prepare a final Construction Traffic Management Plan (CTMP) to minimise site traffic and, if relevant, damage to soil structure from smearing and compaction. Refer to **Appendix 1A.**

To minimise the potential for adverse impacts to soil chemistry and to water quality during construction, the following is an outline of the general mitigation measures that will be in place (also see Section 5.7).

- The Contractor will be required to include measures in the Contractor's CEMP for minimising erosion by reducing disturbance and stabilising exposed materials. The CEMP will also consider control measures to minimise the release of mobilised sediment such as stockpile profiling, silt dams on water courses and silt fences. The Contractor's CEMP will also include methods of handling and storing chemicals and fuels, followed by an Emergency Response Plan (ERP) to be implemented in the event of a spill or leak.

- Water quality monitoring of surface water courses will be undertaken pre and during-construction, details of which will be included in the contractors CEMP. This will be based on a combination of visual observations, in situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.

- The Contractor will be required to ensure the safe storage of any hazardous materials or chemicals required onsite. Storage areas for flammable/ toxic/ corrosive materials will be located in a separate, locked, impermeable bunded and fenced off area. Material data sheets will be available for all these materials and the COSHH (Control of Substances Hazardous to Health) assessments kept within the relevant Risk Assessment for the task, all subject to the Applicant's approval. Storage will not be within 50m of a watercourse and designated storage areas will be bunded to 110% of storage capacity to contain the effects of any spills. These areas will be cleared and re-instated following completion of the Site.

- A RWMP will be prepared and incorporated into the Contractor's CEMP, and all relevant Contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will primarily take place off-site where noise and dust are more easily managed and less likely to impact on surrounding properties. Refer to **Section 5.11** of this CEMP for waste management mitigation measures.

- Should significant contamination occur as a result of construction stage activities, Offaly County Council and the EPA will be notified, and appropriate corrective actions will be agreed and undertaken.

- If water is encountered during below ground construction, suitable best practice de-watering methods will be used. Depth to water in all site investigation trial pits and boreholes undertaken at the Power Plant Area site in mid-2023 was greater than 4.0m below ground, other than at TP205 where groundwater ingress was associated with a peat layer, therefore significant groundwater dewatering is not anticipated but, if required, will be undertaken as outlined in Section 5.7.

- Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered) in compliance with the CEMP. Examples of these measures are as follows:

- The Contractor will ensure that any significant contamination not identified during previous site investigations is recorded and dealt with in line with the EPA's "*Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites*".
- Should ground with significant levels of unknown contamination be encountered during construction, working methods and procedures for handling and disposal of material will be employed to minimise risk in line with the EPA's "*Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites*". If required, the material will be disposed of at a suitably licensed waste facility.
- 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing where contamination is encountered.
- Personal Protective Equipment (PPE) will be worn by ground workers and other staff (see below for more detail on PPE).
- Those potentially at risk will be made aware of potential site hazards via site safety induction procedures.
- No excavated material will be exported off site without a Soil Waste Classification assessment to determine the correct disposal route compliant with waste regulations.

To minimise the potential for adverse impacts to off-site receptors and construction workers, the following is an outline of the general mitigation measures that will be in place.

- The Contractor has a duty under the Safety, Health and Welfare at Work Act 2005 and the Control of Substances Hazardous to Health (COSHH) Regulations 2002 to protect their employees against hazardous substances encountered at work.
- To that end and in accordance with CIRIA guidance R132 *A guide for safe working on* contaminated *sites* (1996), the Contractor will be required to undertake a COSHH assessment before any work is carried out at the Site which is likely to expose staff to substances hazardous to health.
- No hazardous substances were identified during the site investigation; however, it would be best practice for the Contractor to ensure that all employees (construction workers) are issued with PPE appropriate to the hazards identified. PPE could consist of hazard-specific gloves, eye protection and respiratory protective equipment (RPE).
- The Contractor will implement measures to minimise the amount of dust produced during the construction phase, including the preparation of a Dust Management Plan (DMP) and refer to **Section 5.2.2.1** of this CEMP. There will be a Duty of Care on the Contractor to ensure that dust-raising activities are located away, and upwind where possible, from sensitive receptors, the duration be kept to a minimum when in proximity to a receptor, and the spread of dust be controlled by judicious use of water, the most effective and efficient way being in the form of a fine spray.
- Comprehensive site investigations have been undertaken and the existing ground conditions are therefore understood and have informed the siting and layout of the Proposed Development.
- The Proposed Development will be constructed in accordance with current engineering standards, including site investigation and understanding of ground conditions to inform construction works and design. No excavated material will be exported off site.

5.8.2 Electricity Grid Connection

The same general mitigation measures that will be in place in the CEMP during construction of the Power Plant Area to minimise the potential for adverse impacts to soil structure and quality, soil chemistry and to water quality, and off-site receptors and construction workers, will be in place during the construction phase of the Electricity Grid Connection.

5.8.2.1 Excavation of Borrow Pits, Processing of Materials and Reinstatement

No borrow pit locations are envisaged to be required for the Proposed Development and aggregates for temporary and permanent works will be source from local aggregate providers.

5.8.2.2 Construction of Access Routes

Access routes will be carefully selected to avoid damage to land. Local consultation will be carried out with the relevant landowners to ensure that any potential disturbance will be minimised. The routes will be constructed as floating roads only. Founded roads are excavated down to and constructed up from a competent geological stratum, whereas floated roads are built directly on top of the peat and soft soils.

Prior to the commencement of construction, the contractor will assess all access routes and determine the requirement for bog mats. Any such requirements will be incorporated into the relevant method statement.

Temporary access tracks on the consented land (only if required due to ground conditions and/or landowner requirements) will consist of timber or aluminium bog mats (on peatland) or crushed rock on a geotextile (on mineral soils) to spread the weight of machinery over a greater area to prevent damage to the ground.

If necessary, low ground pressure machinery may also be utilised to spread the vehicle's weight across a wider area thereby reducing the pressure exerted on the ground.

No invasive works, such as removal of peat or topsoil, will be undertaken when placing the matting.

Upon completion of the works, all mats will be removed immediately.

Access routes for construction traffic 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 the requirement for bog mats. Any such requirements will be incorporated into the relevant method statement.

5.8.2.3 Management of Excavated Materials

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 contractors CEMP that will be provided prior to construction.

- All materials shall be stored either at the construction compound, refer to **Section 3.4.5**, or within the substation sites and transported to the works zone immediately prior to construction.
- Weather conditions will be taken into consideration when planning construction activities to minimise risk of run off from site.
- Provision of 50m 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 wet areas, water will 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 not be permitted on site.
- 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 or areas of standing water or fenland.
- Cabins, containers, workshops, plant, materials storage and storage tanks shall not be located near any surface water channels and will be located beyond the 50m hydrological buffer at all times.

5.8.2.4 Excavation for Tower Foundations

- To allow for safe construction, where ground conditions are good, the excavation will be stepped back, which requires additional area to be excavated.
- In the cut away bog, where ground conditions are likely be poor, sheet piles will be used to support the mast foundation excavations.
- The excavated material will be temporarily stored close to the excavation and excess material will be used as berms along the site access roads.
- Concrete trucks will pour concrete directly into each excavation in distinct stages and the mast footings will be finished 300mm above the finished ground level.
- All surplus excavated material will be removed from the mast locations and stored in berms for reuse across the construction site.
- No soil removal to form the hardstand crane pads is envisaged. The aggregate and geogrid will be removed once the mast is in place.

5.8.2.5 Hardstanding, Substations and Line-Cable Interface Compound Foundations

At the Substation and Line-Cable Interface Compound sites, a drainage system will be excavated and installed around the compound area. Topsoil and subsoil will be removed from the footprint of the compound and will be temporarily stored in adjacent berms for later use during reinstatement works.

A layer of geotextile material will be laid over the footprint of the compound and an aggregate base layer of Clause 804 material will be laid, followed by a 6F2 capping layer which will provide the finished surface. Both layers will be compacted using a vibrating roller.

5.8.2.6 Cable Route

Prior to excavations for installation of Joints Bays, Communication Chambers and Earth Sheath Link chambers, the area around the chamber to be used by heavy vehicles will be surfaced with a geotextile cover 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 sandbags covered with terram 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 be reused for reinstatement works. Any soil required for reinstatement that will be temporarily stockpiled on site will be placed at least 15m 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 ECM.

If a joint bay needs to be dewatered, the abstracted water 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 water abstracted for the dewatering process to comply with the ECM.

The risk of concrete reaching surface waters is considered very low given that all concrete will be pre-mixed offsite and will be poured into the pit excavated for the joint bay so that any spills will be contained. The basic requirement therefore is that all pouring operations be constantly supervised to prevent accidental spillages occurring outside the chamber 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 sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off.

5.9 Traffic Management

5.9.1 General Traffic Mitigation Measures

General traffic mitigation measures are applicable to both the Power Plant Area and the Electricity Grid Connection. The Contractor will adhere to the relevant guidance, including the following:

- Department of Transport (2019). *Traffic Management Guidelines.*
- Department of Transport (2019). *Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Sign Roadworks.*
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*
- Transport Infrastructure Ireland (TII) (2014). *Traffic* and *Transport Assessment Guidelines*
- Transport Infrastructure Ireland (TII) (2016). *Unit 16.1 (Expansion Factors for Short Period Traffic Counts) of the Project Appraisal Guidelines.*
- Transport Infrastructure Ireland (TII) (2019). *TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections.*

The Contractor shall establish the control measures necessary to manage all traffic activities and risks associated with construction works effectively and efficiently. It will be the Contractor's responsibility to enact these measures in advance of any works and monitor them on a regular basis to ensure that they are being adhered to and targets are being met. Every effort shall be made to ensure that the safety of the local road users is maintained. The Contractor will implement and adhere to any planning conditions upon grant of permission for the Proposed Development.

In terms of general traffic management measures, typical controls will include barriers defining footways and safety zones to prevent construction vehicles encroaching on pedestrian areas, segregated pedestrian routes (where appropriate), temporary warning signs erected to highlight particular hazards, and include Site accesses and temporary traffic management measures.

The CTMP will be updated by the contractor prior to the commencement of work on site and will be finalised in consultation with Offaly County Council and Westmeath County Council.

No works shall commence until such time that the full CTMP has been approved by Offaly County Council and Westmeath County Council.

The Contractor will be required to accommodate and make provision for access and egress to local residential premises, paying particular attention to the provision of pedestrian/disabled/cyclist safe access and egress for the entire duration of the construction phase. The contractor will identify alternative routes for pedestrians and vehicles in the event that public roads or right of ways are closed during works, though this is not expected to be required. The CTMP will also include measures to limit the amount of queuing required by construction vehicles outside the site boundaries.

All licensing and administration matters should be directed through the Roads Department in Offaly County Council and Westmeath County Council. Construction debris, particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will be fully addressed in the contractors full CTMP.

Site Management

The site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the project on the surrounding air quality. The following measures will be implemented to ensure impacts are minimised:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;
- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional;
- Monitoring and control of demolition/construction traffic during construction works; and
- The use of prefabricated elements to minimise on site fabrication and assembly thereby reducing the numbers of site operatives required.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedures will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposition Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of VDI standard 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m2/day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

Dust Control Measures

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The timing of construction activities including stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities will be

reviewed, and procedures implemented to rectify the problem. Specific dust control measures to be employed are presented below.

Also see Section 5.2 for additional dust control mitigation measures.

Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80%.

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the site construction boundaries;
- Bowsers will be available during periods of dry weather throughout the construction period. Research has shown that the effect of surface watering is to reduce dust emissions by 50%. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

Excavation

Excavation works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust; and
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

Also see Section 5.8 for additional mitigation measures.

Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust;
- Should short-term stockpiles be required these will be located at least 50 m away from any watercourse. Slopes of these stockpiles will be made stable and regularly checked by the contractor or appointed staff member. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.

Also see Section 5.8 for additional mitigation measures.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;

- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- Road sweepers will be employed to clean the site access route as required.

Traffic Management Measures

Proposed traffic management measures to be adopted into the Contractor's detailed CTMP are listed below. Please note that this is not an exhaustive list, and it will be updated by the appointed contractor:

- Clear signage of any temporary diversions to existing motorised and non-motorised routes (e.g., pedestrians and cyclists).
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons.
- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations. For example, warnings advise other road users of times of slow-moving vehicles during abnormal load deliveries.
- Consideration will be given to reduce the volume of construction traffic accessing the site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys.
- Temporary signage designating permissible HGV routes
- Road closures and restrictions should be planned in agreement with the appropriate stakeholders.
- Plan deliveries to the Site. Material deliveries and collections from site will be planned, scheduled and staggered to avoid unnecessary build-up of demolition/construction works related traffic. Haulage routes, delivery timings, and access arrangements will continuously be reviewed throughout the construction phase of the Proposed Development to ensure smooth operation.
- Outline measures to limit the amount of queuing required by construction vehicles outside the Site boundaries.
- HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day to avoid pressure on the morning and evening peak hour periods
- Ensure that the roads and footways in the vicinity of the construction site are kept clear of debris, soil, spoil removal, dirty water, and other materials.
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access, and movement of construction vehicles will be restricted to these designated routes.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example, the use of dust covers on trucks carrying dust producing material.
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site.
- Parking of site vehicles will be managed and will not be permitted on public road. Refer to **Sections 3.4.7.1** for details on the parking arrangements.
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public roads leading away from the construction works.
- On site wheel-washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site and to remove any potential debris on the local roads.

- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation. Refer to **Section 5.7**.
- All scheduled maintenance carried out off-site will not be carried out on the public highway.
- Using Garda escorts for abnormal loads where required.

5.9.2 Power Plant Area

The R400 road, east of the M6 Motorway forms part of the haulage route for HGVs travelling to and from the Site. As this is a regional road, it is built to allow for HGV travel, however, not in large volumes.

A CTMP has been submitted as part of the planning application, refer to **Appendix 1A**, but will be finalised in consultation with Offaly and Westmeath County Councils, before construction commences.

The CTMP will ensure work activities in, near, or having impact upon the public highway, are undertaken safely and with minimal impact on traffic movement and existing infrastructure throughout the works programme. The CTMP covers the following points:

- Identify haulage routes.
- Set out preferred routes for travel to and from the site for staff.
- Identify designated parking locations.
- Set out start and finish times to ensure traffic restriction outside of core hours.
- Set out the provision of additional measures such as wheel wash facilities (if required).
- Provision of construction signage and convex mirrors at the site entrance / junctions (subject to agreement with the local authority through the CEMP). This will increase driver awareness at the junction during the temporary construction period (39 months).
- An Abnormal Loads report has also been completed to identify mitigation measures required for movement of abnormal loads. This is provided in Volume II, Appendix 14B of the EIAR submitted with the planning application.

5.9.3 Electricity Grid Connection

The information set out in Section 5.9.2 Power Plant Area is also applicable to the Electricity Grid Connection.

5.10 Material Assets

5.10.1 General Mitigation Measures

The Contractor will adhere to the relevant guidance, including the following:

- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Institute of Environmental Management and Assessment (IEMA) (2020). *IEMA Guide to Materials and Waste in Environmental Impact Assessmen*t.

5.10.2 Power Plant Area

Material Assets - Land Use and Utilities

Demolition and construction phase mitigation measures include avoidance, reduction, and remedy measures to reduce or eliminate any significant adverse impacts identified.

As good practice, an up-to-date utilities plan will be produced and submitted to the local authority prior to construction showing all utilities present on the existing Power Plant Area Site before construction begins.

The following mitigation measures will be implemented in order to reduce the likelihood of any impacts on utilities.

- As with any excavations there is a potential to disrupt local underground services. A confirmatory survey of all existing services will be carried out prior to construction and identify the precise locations of any services. The developer will liaise with the service provider where such services are identified. These will be mapped and communicated to all contractors working on the Power Plant Area.
- All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers / authorities (i.e., ESB, GNI, Eir, Virgin Media and any others of relevance). These works will be carried out in a manner that is safe, and which avoids or minimises interruptions of service which might affect local residents and businesses and adjacent development.
- Works during the construction phase, including service diversions and realignment will be carried out in accordance with relevant guidance documents, including GNI's publication 'Safety advice for working in the vicinity of natural gas pipelines'; the ESB's 'Code of Practice for Avoiding Danger from Overhead Electricity Lines', and the Health and Safety Authorities (HSA) 'Code of Practice for Avoiding Danger from Underground Services'.
- All new infrastructure will be installed in accordance with the applicable standards, guidelines and codes of practice.
- The timing of local domestic connections will be addressed between the developer / Contractor and the local community at the detailed design stage.

Wastewater Services (Foul, Process and Surface Water)

Foul water during the construction phase will be collected and periodically removed from the Site by road tanker to a licensed water treatment plant.

All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers / authorities (i.e., Irish Water). These works will be carried out in a manner that is safe, and which avoids or minimises interruptions of service which might affect local residents and businesses, and adjacent development.

The construction phase surface water mitigation measures are presented in **Section 5.7**.

5.10.3 Electricity Grid Connection

The general mitigation measures for the Electricity Grid Connection are the same as those described for the Power Plant Area.

Wastewater Services (Foul, Process and Surface Water)

The final drainage design prepared for the Electricity Grid Connection prior to commencement of construction will have to provide for reactive management of drainage measures.

5.11 Waste Management

5.11.1 General Mitigation Measures

The Contractor will adhere to the relevant guidance, including but not limited to the following:

- Construction Industry Research and Information Association (CIRIA) (1997). *Waste minimisation in construction - site guide (SP133).*
- Construction Industry Research and Information Association (CIRIA) (1999). *Waste minimisation and recycling in construction - technical review.*
- Department of the Environment, Climate and Communications (DECC) (2020). *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025.*
- Eastern-Midlands Region (EMR) (2015). *Eastern-Midlands Region Waste Management Plan 2015-2021.*
- Enterprise Ireland (unknown). *Best Practice Guide (BPGCS005) Oil storage guidelines.*
- Environmental Protection Agency (EPA) (2019). *Guidance on Soil and Stone By-products (in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011).*
- Environmental Protection Agency (EPA) (2020). *(Draft) By-product - Guidance Note* (in the context of Article 27 of the European Communities (Waste Directive)).
- Environmental Protection Agency (EPA) (2021). *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects.*
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.*
- Environmental Protection Agency (EPA) (2022). *Hazardous Waste Statistics for Ireland.*
- Environmental Protection Agency (EPA) (2022). *National Waste Statistics Summary Report for 2020*.
- Government of Ireland (GOI) (2020). *Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025.*
- Institute of Environmental Management and Assessment (IEMA) (2020). *IEMA Guide to Materials and Waste in Environmental Impact Assessment*.

Given the nature of the Proposed Development and the volume of wastes that will be generated, wastes will be classified, segregated, stockpiled, recycled and disposed of from the Site to appropriately licensed receiving facilities. All waste generated from the proposed development will be managed in accordance with the provisions of the Waste Management Act 1996 as amended and associated Regulations.

Having regard to the provisions of *"A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020–2025",* and the *"Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Waste Projects"*, a RWMP will be prepared by the Contractor prior to work commencing to help manage site waste more effectively, reducing potential harm to the environment and human health, refer to **Section 5.11.5**.

Typical waste streams (including material-related streams such as metals, paper and cardboard, plastics, wood, rubber, textiles, bio-waste and product-related streams such as packaging, electronic waste, batteries, accumulators and construction waste) will be managed, collected, segregated and stored in separate areas at the construction compounds and removed off site by a licensed waste management contractor at regular intervals for the duration of the construction works. Skips and bins of appropriate sizes will be stored in construction compounds and used to maximise source segregation of waste materials. This will include food and packaging waste from welfare facilities. Appropriate control of food waste in the compound will minimise the potential for pests and rodents to visit the area.

Any contaminated materials used for spills and equipment maintenance works will be separately stored in a suitable container for collection by an authorised hazardous waste contractor.

The Contractor will encourage all of the construction teams to minimise waste generation and to maximise the segregation of waste at source. Material wastage will be avoided by delivering only the required quantities of material to site and utilising off-site manufacturing of steel reinforcement cages and concrete materials as much as possible. The Contractor will establish 'just-in-time' deliveries to avoid excess material storage at the site which can lead to waste generation. Delivery drivers will be encouraged to remove any excess packaging from materials delivered to site and remove unused timber pallets where possible.

The SHEQ Officer, or other appropriate person, will be appointed as the Waste Manager for the duration of the project in accordance with the general guidance set out in the EPA 2021 Guidelines - *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Waste Projects.*

During construction, the practicalities of waste prevention, salvaging re-useable materials, and the need to synchronise the recycling of waste materials through the timing of their use in the new construction works will be emphasised by the Waste Manager.

The Waste Manager will be responsible for auditing waste handling and storage throughout the project and for advising construction personnel on best practices.

All waste collections and records of waste movement off-site will be collated by the Waste Manager and retained in the site office.

5.11.2 Demolition Waste Management

The demolition of existing buildings and the removal of all other structures will be necessary. The demolition within the construction phase will include the removal of the existing Derrygreenagh Works within the Power Plant Area which consists of offices, workshops and associated buildings, as well as the removal of all other structures deemed necessary. The buildings and structures to be demolished are presented on the drawings submitted with the planning application.

The single storey office building is a load bearing masonry structure with a concrete tiled roof, and the demolition process will follow that of a domestic house. Plant and machinery will breakdown the roof and walls and waste materials will be removed offsite to a waste facility. Following this, the concrete foundations will be dug up, cut out and disposed of accordingly. However, depending on the depth, some buried foundations may need to remain. Any excavations will be backfilled with imported gravel and the site will be levelled.

The workshops and boiler house are cladded steel frame structures. There is the potential for asbestos cladding in some areas of the workshop. The total potential asbestos cladding to be removed is c. 2,400m^2. This will be removed first by a competent asbestos contractor, and the remaining cladding will be removed and disposed of accordingly. The steel frames will be dismantled and recycled, and the foundations will be dug out and removed. Any excavations will be backfilled with imported gravel and the site will be levelled.

The estimated demolition waste is presented in **Table 5.3**.

Table 5-3: Estimated Demolition Waste

Waste Type	Low Code	Estimated Quantities
Strip Concrete	17 01 01	375 m^3
Floor slab concrete	17 01 01	1,650 m^3
Masonry	17 03 02	800 m^3
Asbestos containing cladding	17 06 01	2,400 m^2
Cladding area	17 06 04	6,475 m^2

There will be concrete material generated from the demolition of structures onsite, and consideration at design stage has been given to recovering, crushing and reusing this concrete material as inert backfill in a number of underground voids.

If any of the material is to be reused on-site as a product (and not as a waste), this will be done in accordance with the relevant regulatory approval as required.

It is anticipated that a large proportion of the materials resulting from the demolition will be recycled and a record will be kept demonstrating that the maximum level of recycling and reuse has been achieved. Plant and equipment that can be used elsewhere on other Bord na Móna sites will be transferred to the appropriate sites.

The precise composition and volume of this waste is dependent on several factors and will be further informed by the contractor, based on their experience of similar demolition works. It is assumed that all demolition waste will require off-site management.

In addition, site clearance will be required including soil, vegetation and hardstanding. Where possible, uncontaminated material will be reused on-site and if deemed unsuitable for reuse on-site, an outlet for offsite reuse will be sought.

Excavation earthwork impacts will relate to removal of made ground and peat, including any superficial peats. Infill earthwork will mainly relate to the import and compaction of acceptable fill material to achieve the required engineering design and grades.

Where possible excavated materials will be reused on-site. If the material is considered unsuitable for reuse on-site an outlet for offsite reuse will be sought. If reuse is not possible the material will be removed to an authorised facility by authorised waste contractors for composting or disposal as appropriate.

A permanent PDA will be designed and constructed provided on cut-over peatland to the north-east of the Power Plant Area to store excess peat and overburden soil material which cannot be used in localised landscaping or as backfill. It is estimated that excess peat and soil from across the entire Proposed Development will be required to be stored within the permanent PDA (See Section 3.6 of this CEMP).

Peat will be deposited to a maximum height of 1m above ground level across an area of a cut-over peatland. Once excavations are completed and following the commissioning of the project, the PDA will be allowed to naturally revegetate (See Section 3.6 of this CEMP).

The footprint of the proposed facility will require clearing and levelling after the initial works. There is a difference in level of approximately 8m across the Site. The topsoil layer, including any superficial peats, will be cleared across the Site. Where possible this material will be reused on-site. If the material is considered unsuitable for reuse on-site an outlet for offsite reuse will be sought. If reuse is not possible the material will be removed to a licensed facility by licensed waste contractors for composting or disposal as appropriate.

Bulk soil, subsoils or other material will be stored in designated areas only. Only uncontaminated material will be used on-site for the purpose of fill and site levelling. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste.

All demolition activities will be carried out in accordance with the waste hierarchy and the circular economy. Materials and waste produced during decommissioning and demolition will be stored in segregated areas within the Power Plant Area to maximise reuse and recycling. All materials that cannot be reused or recycled will be removed from the site and transferred to suitably permitted waste recovery / disposal facilities.

Segregation of waste will be carried on-site to maximise the potential for waste recycling and minimise any potential for impacts on waste services. A licensed waste collector will be used to remove any waste that does occur on-site to a licenced / permitted wate facility.

The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing and recording waste arising on site. Opportunities for on-site and offsite reuse, recycling and recovery of excavated material

and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works.

5.11.3 Power Plant Area

Waste will be generated during all stages of the construction works. **Table 5.4** summarises the types of waste materials that will be used and the waste that is likely to arise during the construction phase of the Power Plant Area.

Table 5-4: Estimated Types of Material Use and Waste Arising from the Construction of the Power Plant Area

Activity	Material Use	Waste Arising
Construction	Main construction materials including: • Aggregates (including well graded materials, granular fill, backfill, pipe bedding and drainage media). • Asphalt and bituminous materials. • In-situ cast concrete. • Steel reinforcing bar (for reinforced concrete). • Precast concrete products (components, kerbs, drainage pipes, chambers and channels). • Lighting • Stone • Paving • Fencing	• Excess, offcuts and broken / damaged construction materials. • Packaging from materials delivered to site. • Construction worker wastes from offices and rest areas / canteens. • Waste oils from construction plant.

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction phase workers *e.g.* organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

The precise quantity, composition, and management route of construction waste is dependent on several factors and will be further informed by the contractor, based on their experience of similar developments. It is assumed that all construction waste will require off-site management.

Hazardous waste arisings are expected to comprise small quantities of oils, chemicals and similar materials typically used as part of construction activities. Procedures for the storage and management of these wastes will be set out in the Contractor's RWMP. Copies of all Waste records and Hazardous Waste Transfer Forms for wastes removed from site will be retained by the contractor for the timeframe required under legislation.

Ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching.

Concrete pours will be required for the construction of the facility. A concrete chute wash-out facility will be provided onsite and will be clearly signposted, self-contained, and leak-proof. Where the facility is required to be emptied, the contaminated waters will be taken off-site for treatment and disposal at a suitably licenced facility.

All waste removal from Site will be undertaken by fully licensed waste carriers and taken to licensed waste facilities.

5.11.4 Electricity Grid Connection

Waste will be generated during all stages of the construction works. Table 5.5 summarises the types of waste materials that will be used and the waste that is likely to arise during the construction phase of the Electricity Grid Connection.

Table 5-5: Estimated Types of Material Use and Waste Arising from the Construction of the Electricity Grid Connection

Activity	Material Use	Waste Arising
Construction	Main construction materials including: • Stone • Asphalt • Geotextile • Lighting fixtures and fittings • Paving. • Fencing. • Steelwork • Concrete • Timber • Cladding • Doors • Piping inc. fixtures and fittings • Cabling inc. fixtures and fittings • Switchgear • Instrumentation and control system	• Excess, offcuts and broken / damaged construction materials. • Packaging from materials delivered to site. • Construction worker wastes from rest areas. • Waste oils from construction plant. • Surplus excavated materials. • Surplus topsoil and subsoil. • Unsuitable and made ground and excavated materials, including peat and unsuitable soil excavated beneath the Power Plant Area. • Vegetation from site clearance.

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction phase workers, *e.g.,* organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

The precise quantity, composition, and management route of construction waste is dependent on several factors and will be further informed by the contractor, based on their experience of similar developments. It is assumed that all construction waste will require off-site management.

Hazardous waste arisings are expected to comprise small quantities of oils, chemicals and similar materials typically used as part of construction activities. Procedures for the storage and management of these wastes will be set out in the contractor's RWMP. Copies of all Waste records and Hazardous Waste Transfer Forms for wastes removed from site will be retained by the contractor for the required timeframe under legislation.

The waste management facilities to be utilised during demolition and construction are not yet known and suitability will be determined by the Contractor.

5.11.5 Resource Waste Management Plan (RWMP)

A Resource and Waste Management Plan (RWMP) (to be incorporated into the Contractor's CEMP) will be prepared and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will take place offsite at appropriately licensed facilities where noise and dust are more easily managed and less likely to impact on surrounding properties.

The Contractor / Waste Manager will be required to identify measures for the avoidance and reduction of waste materials during the construction works in accordance with the waste hierarchy. Segregated

waste skips will be provided in the construction compound to enforce source segregation. Skips will be maintained in good condition, labelled as to the type of waste to be placed in each and the area around skips will be kept clean. Smaller wheelie bins will be provided for storage of waste from the welfare facilities.

The Contractor's RWMP will set out measures relating to waste management that will be implemented during construction of the Power Plant Area and will include design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:

- Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse.
- Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material.
- Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated.
- Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.

The RWMP will set out measures relating to waste management that would be implemented during construction of the Proposed Development. The Contractor will be required to develop the detailed RWMP in accordance with the EPA 2021 Guidelines - *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Waste Projects* and DECC 2021 Plan - *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025.*

The Waste Manager will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing and recording waste arising on site.

Opportunities for on-site and offsite reuse, recycling and recovery of excavated material and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works.

5.12 Climate

A number of mitigation measures have been considered in the design of the Proposed Development which mitigate the effects of its GHG emissions and climate change risks.

With regards to climate change risks, mitigation measures refer to measures which reduce the impact of climate change risks on the Proposed Development.

With regards to greenhouse gas (GHG) emissions, mitigation measures refer to measures to reduce the amount of GHG emissions associated with the Proposed Development.

5.12.1 Power Plant Area

5.12.1.1 Climate Change Risk Assessment

The following climate change risk mitigation measures are embedded in the design of the Power Plant Area and are applicable for mitigating climate change risks during the construction phase.

- Flood protection designed to withstand 1:1000-year flood.
- For periods of drought, site water abstraction is capable of exceeding the daily site water requirement.
- Infrastructure is to be maintained and monitored for degradation due to extreme temperatures.
- Emergency procedures are to be implemented against extreme weather events.

5.12.1.2 Greenhouse Gas Assessment

The following GHG mitigation measures are embedded in the design of the Power Plant Area and are applicable to the construction phase:

- Implement policies to source materials locally where possible.
- Use of secondary aggregates and lower carbon materials.
- Implement a green procurement policy that considers life cycle analysis of materials.

5.12.2 Electricity Grid Connection

5.12.2.1 Climate Change Risk Assessment

The following climate change risk mitigation measures are embedded in the design of the Electricity Grid Connection and are applicable for mitigating climate change risks during the construction phase.

- Flood protection designed to withstand 1:1000-year flood.
- Infrastructure is to be maintained and monitored for degradation due to extreme temperatures.
- Emergency procedures are to be implemented against extreme weather events.

5.12.2.2 Greenhouse Gas Assessment

The following GHG mitigation measures are embedded in the design of the Electricity Grid Connection and are applicable to the construction phase:

- Implement policies to source materials locally where possible.
- Use of secondary aggregates and lower carbon materials.
- Implement a green procurement policy that considers life cycle analysis of materials.

Appendices

Appendix 1A Construction Traffic Management Plan (CTMP)

Proposed Derrygreenagh Power Project

Construction Traffic Management Plan (CTMP)

Bord na Mona

January 2024

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
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1. Introduction

1.1 Background

AECOM have been commissioned by Bord Na Móna, to provide a Construction Traffic Management Plan (CTMP) to accompany the proposals for their development at Derrygreenagh Power Station, Co. Offaly ('the Site').

This document is a live working document and will therefore be updated with more detail by the contractor once appointed. Reference will therefore be made throughout to a 'full construction traffic management plan', this refers to the CTMP once the contractor has provided input.

1.2 Site Location

The site on which the Proposed Development will be located is in the townlands of Derrygreenagh, Derryarkin, Derryiron, Ballybeg, Barrysbrook, Togher and Coole. The Power Plant Area (PPA) site (with the exception of the process & surface water discharge pipelines) will be predominantly located on the site of existing Derrygreenagh Works east of the R400 road. The location of the existing Bord Na Mona facility is shown in Figure 1. The proposed site boundary is shown in **Appendix A.**

Figure 1 - Site Location

The Proposed Development and Overall Project will consist of three elements:

- Power Plant Area;
- Electric Grid Connection; and
- Gas Corridor Connection.

The Gas Connection Corridor, which runs from the Dublin-Galway high pressure gas network (BGE/77) to the Power Plant Area, is not included as part of this planning application but is integral to the Overall Project and so is considered throughout the EIAR in so far as reasonably practicable. The Gas Connection Corridor may be subject to change during the detailed design and consenting process to be carried out by Gas Networks Ireland (GNI). The location of site entrances and transport routes for the construction phase of the Gas Connection Corridor cannot be established until the design has been further progressed by GNI.

This CTMP is therefore, by necessity, associated only with the Proposed Development i.e., the Power Plant Area and Electric Grid Connection. It is envisaged that a separate CTMP for the Gas Connection Corridor will be developed and submitted as part of the future consenting process by GNI. Any future CTMP for the Gas Connection Corridor will also consider the Proposed Development (i.e., Power Plant Area and Electricity Grid Connection).

2. Proposed Development Overview

The Proposed Development includes a Power Plant Area which comprises a Combined Cycle Gas Turbine (CCGT) unit and an Open Cycle Gas Turbine (OCGT) unit, and an Electricity Grid Connection which includes 220kv and 400kV substations and associated buildings, grid connection cabling in the form of overhead lines and underground cabling and all associated infrastructure. The Proposed Development is located in County Offaly, predominantly on Bord na Móna land within the Derrygreenagh bog group.

The Proposed Development will support Bord Na Mona's portfolio of renewable energy and associated intermittent renewable generation but will also support the security of supply for the National Grid network by allowing for replacement of older conventional power systems with lower carbon gas-fired technology. The Proposed Development will also have the capability to operate off renewable gas blends as supply chains for hydrogen and biogas develop in accordance with the Hydrogen Strategy for Ireland and subject to future fuel mixes which will be provided by GNI through a high-pressure gas pipeline.

3. Outline Construction Traffic Management Plan

3.1 General

This CTMP deals directly with the impacts of construction of the Proposed Development. This document is considered to be a live working document and will therefore be appropriately updated by the contractor once appointed. Reference to the 'final' CTMP relates to any changes or revisions which may be made to this live document once the contractor has provided more detailed input.

The purpose of this CTMP is to outline measures to manage the expected construction traffic activity during the construction period.

3.2 Construction Programme and Phasing

The preliminary works are scheduled to commence in Q3 2024. The construction process for the entirety of the Proposed Development is expected to take 39 months.

The contractor will be required to update this document if any programme changes are made.

3.3 Construction Route

All HGVs will be required to travel to the site via the M6, exiting at Junction 3 onto R400 Regional road.

Any potential future deviations from this route will be agreed in advance between the contractor and the Local County Councils prior to the commencement of the construction phase.

The M6 and R400 in relation to the site are shown in Figure 1.

3.4 Parking

Parking areas are available for construction staff at the Power Plant Area, 220kV and 400kV sites. These parking areas are shown in **Appendix A.**

3.5 Mitigation Measures

This CTMP will be updated by the contractor prior to the commencement of work on site and will be finalised in consultation with Offaly County Council (OCC) and Westmeath County Council (WCC).

No works shall commence until such time that the full CTMP has been approved by OCC and WCC. Details of anticipated vehicle volumes are noted within this report, however final confirmation on movements and trip distribution will be set out in the final CTMP.

The Contractor will be required to accommodate and make provision for access and egress to local residential premises, paying particular attention to the provision of pedestrian/disabled/cyclist safe access and egress for the entire duration of the construction phase. The contractor will identify alternative routes for pedestrians and vehicles in the event that public roads or right of ways are closed during works, though this is not expected to be required. The CTMP will also include measures to limit the amount of queuing required by construction vehicles outside the site boundaries.

All licensing and administration matters should be directed through the Roads Department in OCC and WCC.

Construction debris, particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will be fully addressed in the contractors full CTMP.

3.5.1 Site Management

The site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the project on the surrounding air quality. The following measures will be implemented to ensure impacts are minimised:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;
- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional;
- Monitoring and control of demolition/construction traffic during construction works; and
- The use of prefabricated elements to minimise on site fabrication and assembly thereby reducing the numbers of site operatives required.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedures will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposition Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of VDI standard 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

3.5.2 Dust Control Measures

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The timing of construction activities including stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed, and procedures implemented to rectify the problem. Specific dust control measures to be employed are presented below.

3.5.3 Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80%.

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the site construction boundaries;
- Bowsers will be available during periods of dry weather throughout the construction period. Research has shown that the effect of surface watering is to reduce dust emissions by 50%. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and

- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

3.5.4 Excavation

Excavation works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust; and
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

3.5.5 Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust;
- Should short-term stockpiles be required these will be located at least 50 m away from any watercourse. Slopes of these stockpiles will be made stable and regularly checked by the contractor or appointed staff member. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.

3.5.6 Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- Road sweepers will be employed to clean the site access route as required.

3.6 Hours of Operation

Working hours, will be in line with Council requirements and/or planning conditions and are to be agreed in advance with WCC and OFF**.** The hours are expected to be as follows, subject to approval:

- 07:00 hours to 19:00 hours Monday to Friday;
- 08:00 hours to 13:00 hours Saturday.

There may be circumstances when construction activities may need to be completed outside of these hours, and these activities and times will be discussed and agreed in advance with appropriate stakeholders on a case by case basis.

During the commissioning of the development at the onset of the Operational Phase, commissioning activities will be required outside of normal working hours and may result in 24 hour operation during the latter stages of commissioning.

3.7 Traffic Management Measures

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and it will be updated by the appointed contractor:

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations. For example, warnings advise other road users of times of slow-moving vehicles during abnormal load deliveries;
- Consideration will be given to reduce the volume of construction traffic accessing the site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys.
- Temporary signage designating permissible HGV routes;
- Material deliveries and collections from site will be planned, scheduled and staggered to avoid unnecessary build-up of demolition/construction works related traffic;
- HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day to avoid pressure on the morning and evening peak hour periods;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Parking of site vehicles will be managed and will not be permitted on the public road, unless proposed within a designated area that is subject to traffic management measures and agreed with OCC and WCC;
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works;
- On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public highway;
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons; and
- Using Garda escorts for abnormal loads where required.

The mitigation measures will therefore ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the proposed works. Furthermore, it is in the interests of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

3.8 Staff Travel

During the site construction, the staff will be required to adhere to staff travel to work restrictions.

These restrictions are as follows:

- All PPA construction staff will be encouraged to travel to the site in minibuses to limit the number of vehicles entering the site. These minibuses will be organised by the contractor and will pick up staff at a range of different locations where parking is available. Pick up locations will be confirmed once the contractor staff are confirmed.
- For those PPA construction staff travelling to site in private vehicles the contractor will promote and organise a car sharing scheme.
- Staff working on the EGC sites will be permitted to drive to work, however, will also be encouraged to car share to limit vehicle arrivals. Once appointed, the contractor will identify staff living within close proximity to each other to organise car sharing groups.

3.9 Predicted Construction Traffic

The anticipated level of construction phase HGV traffic has been based on an assumed and preliminary outline construction methodology. The construction HGV traffic will be scheduled around the construction sequencing and avoid or minimise deliveries during the morning and afternoon traffic peaks.

Appendix 14B sets out the daily total trips expected each month during construction.

The maximum/peak combined construction traffic volumes are expected to occur between December 2025 and February 2026 when there are expected to be 828 two-way trips generated (412 of which are HGVs). However, the peak HGV traffic generation is expected between March 2025 and May 2025 when there are 454 two-way HGVs trips generated.

3.10 Abnormal Loads

During the construction of the Power Plant Area there are expected to be abnormal load deliveries for the following components:

- CCGT Gas Turbines Circa 350 tonnes;
- CCGT Generator 400 tonnes;
- CCGT Steam turbine modules;
- OCGT modules;
- OCGT and CCGT Generator Transformers; and
- HRSG modules.

During the Construction of the Electric Grid Connection there are expected to be abnormal load deliveries for the following components:

- 2 no. Transformers.

Abnormal load assessments have been completed on the local road network to identify where vehicle movements will require alternations to the road network, such removal of street furniture/ signage. The route assessed covers travel from the M6 to as far as the 400kV access i.e., from the M6, along R400, and through Rhode then along L1010 to the 400kV access. The contractor will undertake a detailed assessment of the full route once appointed.

WCC, OCC, TII, MMARC and An Garda Síochána will need to be informed of and approve any abnormal load movement before they take place as these may require road closures or other temporary measures.

Appendix A – Red Line Boundary

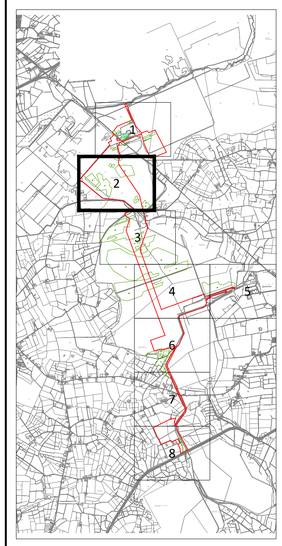
NORTH

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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PROJECT: Derrygreenagh Power

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REVISION: R1.0

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Metres 1:2500

NORTH

0 80m 200

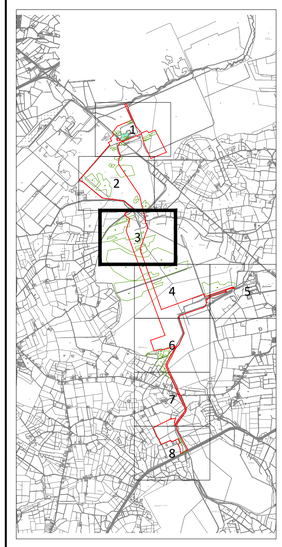
Metres 1:2500

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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TITLE: EXISTING SITE PLAN (SHEET 3 OF 8)

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REVISION: R1.0

NORTH

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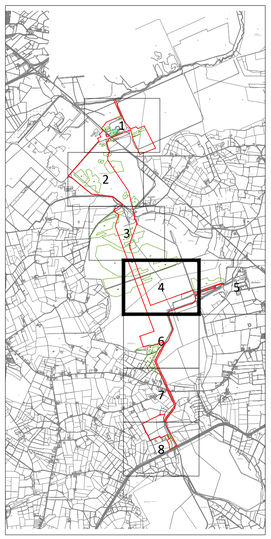
Metres 1:2500

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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NORTH

Monastery
(Site of)

R400

An Cluainín
Clonin

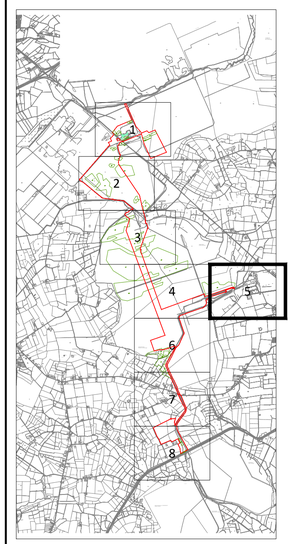
0 80m 200
Metres 1:2500

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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(SHEET 5 OF 8)

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NORTH

BARRYSBROOK
Sruthán an Bharraigh

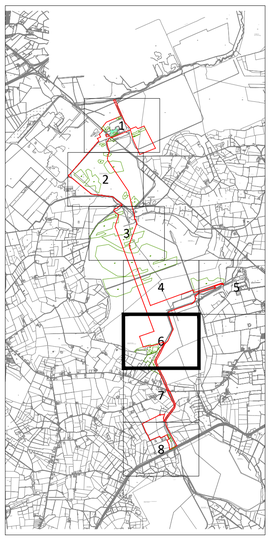
Killaragh

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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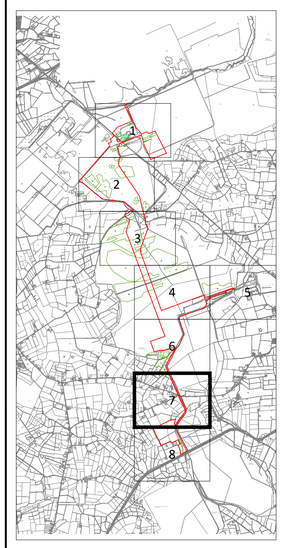
NORTH

NOTES:

RED LINE BOUNDARY

TREE STANDS & MATURE VEGETATION

KEY MAP:



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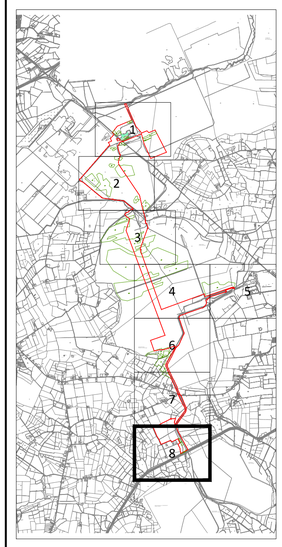
NOTES:

- RED LINE BOUNDARY
- TREE STANDS & MATURE VEGETATION

KEY MAP:



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Appendix 2A Peat and Soil Management Plan (PSMP)

Proposed Proposed Derrygreenagh Power Project, Co. Offaly

Peat & Spoil Management Plan

Bord na Móna Powergen Limited

Project number: 60699676

January 2024

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Grisel Calcagno Graduate Environmental Consultant	POC	POC	POC

Revision History

Revision	Revision date	Details	Authorized	Name	Position
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Table of Contents

Figures

Tables

1. Introduction

1.1 Background

AECOM Ireland Limited (hereafter referred to as 'AECOM') has been appointed on behalf of Bord na Móna Powergen Limited (hereafter referred to as the 'Applicant') to prepare a Peat & Soil Management Plan (PSMP) in relation to a planning application to An Bord Pleanála (ABP), for a Combined Cycle Gas Turbine (CCGT) unit and an Open Cycle Gas Turbine (OCGT) unit, and electricity grid connections including substations and associated buildings and infrastructure ('the Proposed Development') on land within the Derrygreenagh bog group in Counties Offaly, Westmeath and Meath (hereafter referred to as the 'Site'). Derrygreenagh bog group consists of the lands of Derryhinch Bog, Drumman Bog, Derryarkin Bog and Ballybeg Bog which have been designated for development of energy generation projects. These lands are termed as Bord na Móna Energy Park (c. 3,000 hectares (ha)) for communication purposes.

The Scottish Government published the guidance document *'Guidance on Developments on Peatland – Site Surveys'* in 2014, where peat is defined as:

> *"Peat is defined as the partially decomposed remains of plants and soil organisms which have accumulated at the surface of the soil profile. Peat accumulates where the rate of input of organic material from the surface exceeds the rate of decomposition and 'turn-over' of this new material. A peat layer does not include a mineral fraction (hence being differentiated from topsoil).*
>
> *Peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres in thickness."*

Peat instability in this report is defined as a mass movement of a body of peat that would have a significant adverse impact on the surrounding environment. Peat instability excludes localised movement of peat that would occur below a floating access road, creep movement or localised erosion type events.

1.2 Objective

The role of the PSMP is to demonstrate that the management of peat excavated during construction phase of the Proposed Development has been considered and will be treated appropriately. Adherence to the PSMP should also reasonably minimise the potential for all such peat movements. The PSMP outlines the overall design approach that has been applied to the Proposed Development to minimise peatland disruption and aims to ensure that all opportunities to minimise peat disturbance and extraction during construction will be taken. The PSMP identifies appropriate and industry-proven methods for the reuse of excess peat without significant environmental or health and safety implications, to restore the effects of construction activities and reduce the release of carbon and minimise risk in terms of human health.

This PSMP also includes general recommendations for good construction practice which will be implemented during the construction phase of the Proposed Development and a contingency plan should peat instability/failure occur at the Site. The PSMP acts as a live document arising from information presented during the consenting process, planning conditions, and the content of which will be updated as work is carried out on-site via a full Contractor's PSMP, to be prepared prior to commencement of construction.

1.3 Guidance

The legislation and guidance regarding the management of peat includes:

- Department of Housing, Local Government and Heritage (2023), *'National Peatlands Strategy Mid-Term Review and Implementation Plan'*;
- EPA (2011), *'BOGLAND: Sustainable Management of Peatlands in Ireland'*;

- Scottish Environment Protection Agency (SEPA) (2010), '*Regulatory Position Statement – Developments on Peat*';
- SEPA (2017), *'Developments on Peat and Off-Site Uses of Waste Peat'*;
- Scottish Government (2014), *'Guidance on Developments on Peatland – Site Surveys'*;
- Scottish Natural Heritage (2011), *'Floating Roads on Peat'*; and
- Scottish Renewables and SEPA (2014), *'Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste'*.

Many of the publications listed above have been developed by the Scottish Government. The Scottish documents are considered to be best practice in Ireland and are therefore appropriate for use within this PSMP.

SEPA has provided a hierarchy of management approaches in which the effectiveness of the approach to peat management is optimised at development sites as summarised below (SEPA, 2010 & 2014):

1. Prevention: avoiding generating excess peat during construction (e.g., by avoiding peat areas or by using construction methods that do not require excavation, such as floating tracks);
2. Reuse: re-use peat produced on-site in habitat restoration of hardstanding or landscaping;
3. Recycling/recovery/treatment: modify peat produced on-site for use as fuel, or as a compost/soil conditioner, or dewater peat to improve its mechanical properties in support of reuse; and
4. Storage: temporarily store peat on-site (for example, during short periods in the construction phase) and then reuse.

This SPMP has been prepared in accordance with the principles set out by the aforementioned Scottish Renewables and SEPA (2014) Guidance document for Stage 1 and proposes that prevention and reuse are the most appropriate means of managing peat excavated during construction at this Site. This report details the methodologies required to assess all potential surplus materials and presents the expected volume of excavated materials and required reuse volumes for reinstatement and restoration purposes.

2. Peat Description

Organic material less than 0.5m depth is not defined as peat. This is in accordance with guidance from:

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland states that '*Peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres in thickness*'; and
- The James Hutton Institute define shallow peat as having '*a prescribed depth of organic matter of 50 – 100 cm*[1]'

Also, The Forestry Commission use 45 cm as the critical depth for peat to occur ('*Understanding the greenhouse gas (GHG) implications of forestry on peat soils in Scotland*', 2010[2]);

- Peat can therefore be classified as organic material over 0.5m in depth.

Peat can be separated into three main layers: acrotelm (the upper living layer), catotelm (the middle to lower layer) and occasionally amorphous (lower layer) peat:

- Acrotelm peat is the living layer of the peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is found within the top layer of peat (often less than 0.5m) depending on the degree of decomposition and fibrous nature of the peat (H1 to H6 on the von post classification scale). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled >1m.
- Catotelm peat is the dead layer of peat found deeper than acrotelm peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the von post classification scale) and strength. Water flow in the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

The best management option to minimise potential surplus peat is to prevent its production. Therefore, the design of the project has aimed to minimise peat excavation where possible.

In relation to the SEPA guidance, the following has been applied to the design and construction of the proposed project:

1. Floating tracks are proposed along temporary construction access tracks to tower locations with suitable gradients.
2. Reuse of excavated material is proposed for landscaping and restoration of excavations such as at tower sites, along the underground cable route and at the power plant and substations.
3. Off-site recycling/recovery of excavated materials is not appropriate or required on this site; and
4. Temporary storage and reuse of excavated peat is proposed (to the east of the power plant area).

[1] https://www.hutton.ac.uk/learning/exploringscotland/soils/organicsoils
[2] https://www.forestresearch.gov.uk/publications/understanding-the-greenhouse-gas-ghg-implications-of-forestry-on-peat-soils-in-scotland/

3. Proposed Development Description

3.1 Components of the Proposed Development

The Proposed Development is situated in Derrygreenagh and adjacent townlands (Derryarkin, Derryiron, Ballybeg, Barrysbrook, Togher and Coole), Co. Offaly, Ireland (Irish Grid Reference N49525 38259). The components of the Proposed Development include the Thermal Power Plant, gas above ground installation (AGI), water abstraction and water treatment infrastructure, respective surface and process water discharge connection routes, and the Electricity Grid Connection. The latter will consist of a 220kV substation, pylon towers, overhead lines, undergrounding compound, underground cabling, associated cabling and connections to a new loop-in 400-220kV (herein '400kV substation site') substation site and compound. The location of the Proposed Development and overall surrounding environs are illustrated below in Figure 3-1.

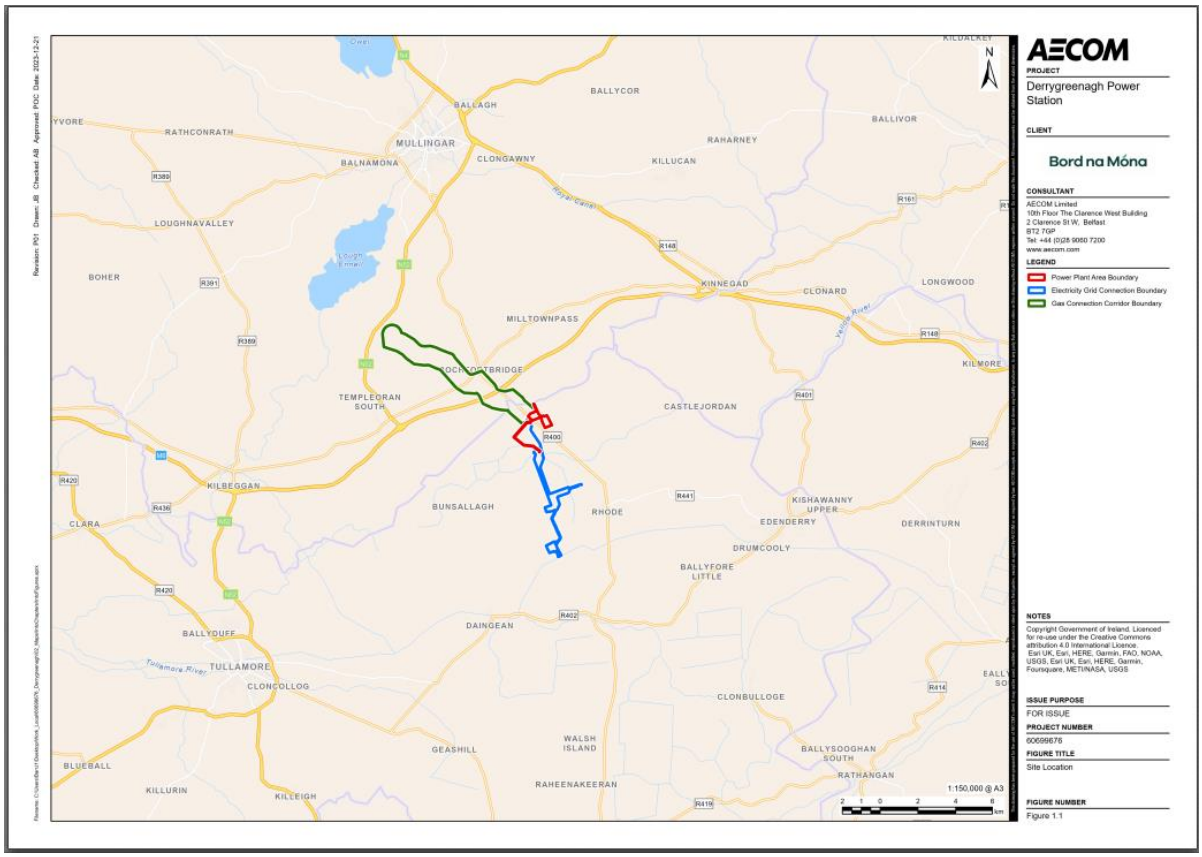

Figure 3-1. Proposed Development Location and Surrounding Environs

Temporary works to facilitate construction of the Proposed Development will include contractor compound for AGI, upgrade to public roads, upgrade to machine passes, peat deposition areas, pipe dumps, floating access tracks, bog mats and tower hard stands. Respective areas within and adjacent to the Site will be used for the contractor's compound, material storage and laydown, parking, and office areas during the construction phase.

For a detailed description of the components of the Proposed Development, refer to Chapter 5: Proposed Development of the EIAR prepared for this application.

3.2 Site Description

The Power Plant Area containing CCGT and OCGT units and supporting is located within Drumman bog on the existing Derrygreenagh Works site east of the R400 road. There are currently a number of buildings associated with Bord na Móna Derrygreenagh Works, such as workshops, stores, and offices; paved and concreted areas, outhouses, car-parking facilities, and machinery yards. The site also contains mature trees, hedges, and grassland; and a narrow railway, part of a network of railways connecting the site to the surrounding bog complex. The area was formerly used for servicing and

repairing peat harvesting and transport equipment, it is currently servicing equipment required for site management and environmental monitoring of post-peat extraction activities.

The existing operations at the Derrygreenagh Works site will be decommissioned prior to the construction of the power plant. The proposals for discharge pipelines from the power plant are for the treated process water to discharge to the Yellow River to the southwest of the Power Plant Area, and clean surface water to discharge to the Mongagh River northeast of the Power Plant Area; both are to have respective pipeline routing along existing railway lines and machine pass corridors.

The proposed Electricity Grid Connection 220kV substation is located west of the R400 road within a brownfield site in the wider Derryarkin bog complex with limited mature trees and grassland, and cutover bogs with varying degrees of vegetation, with the narrow railway crossing from west to east into the Power Plant Area via underpass below the R400 road. It is proposed that 220kV overhead lines from the 220kV substation will run for approximately 5 km via a series of double circuit pylon tower sets with three conductors hanging either side, through bogs associated with historic peatland harvesting in the area, crossing the haul road leading into Kilmurray S&G (active quarry) and the Yellow River (between Derryarkin Bog and Ballybeg Bog). The route design of the proposed overhead lines is angled at the passage from Derryarkin Bog to Ballybeg Bog, so as to comply with EirGrid's policy on wind turbine clearance to overhead lines in respect of consented wind turbine locations under development. The overhead lines traverse through Ballybeg Bog before linking into a proposed underground cabling connection at the south end of Ballybeg Bog. The underground connection follows the route of an existing peat railway for approximately 2.6 km south, including a crossing of Coolcor stream, crossing the L1010 Togher road via an existing underpass, until it links into the 400kV substation on agricultural land adjacent to the west side of the Bord na Móna Energy Park lands and south of the L1010 road.

4. Peat Conditions

4.1 Peat Conditions on Site

The site was assessed for peat vegetation in desktop review of maps and plans, previous SI data, site walkovers by ecologists and hydrologists in 2023; and in intrusive site investigation in 2023 which included:

- Drilling and trial pit excavation, including coring to bedrock, at the locations of the 18 proposed overhead powerline towers along the largely peatland northern section of the Electricity Grid Connection route,
- Trial pits along the along the southern underground section of the Electricity Grid Connection route
- Drilling and trial pitting at the 2x substations, the interface compound and power plant which are located on non-peatland areas.

The total area within the planning boundary of the Proposed Development is c. 312 hectares.

The Power Plant area is at an elevation between 82 and 87 metres OD (Ordnance Datum Malin Head) with the proposed 220kV Substation Site to the west of the R400 roadway at between 79 and 84 metres OD. The Electricity Grid Connection route ranges in altitude between just over 74 and 81 mOD, with the southern 400kV substation at an elevation of 81mOD.

The Power Plant site and Substation is an island of mineral soils surrounded by peatlands, whereas the Electricity Grid Connection route is characterised by drained cutover peatland with few areas of standing water.

The land cover for the Electricity Grid Connection route comprises of highly degraded, cutover peatland with some intact peat in the surrounding area. The majority of the natural vegetation has been removed resulting in extensive areas of bare peat. Harvesting is likely to have been halted very recently in some areas and recolonization by native species is taking place. This results in a mosaic of habitats representing various stages in ecological succession, including bare peat, scrub, immature woodland, and bog woodland. The climax habitat type along the Electricity Grid Connection route will likely be bog woodland (see Chapter 09 Biodiversity).

The peat is generally <1.0m thick, with the majority of the central portion of the Electricity Grid Connection route (between trial pits TPT 04 and TPT 15) reporting logged peat thicknesses of less than 0.5m, and therefore not strictly classified as ‘peat’, according to the guidance cited in Section 2 of this report. Thicker peat is logged at the northern and southern ends of the Electricity Grid Connection route (logged as over 2.0m thick in BHT 01, BHT 02, BHT 17, TPT 01, TPT 02, and TPT 17 which may represent areas of unharvested peat close to the edges of Derrygreenagh and Ballybeg Bogs.

The peat layer overlies silt-, sand- or gravel-dominated subsoils.

4.2 Data Collection Methodology

To obtain a detailed understanding of the spatial and depth distribution of peat and its properties, a series of tasks have been completed which include:

- Habitat mapping detailed within the Chapter 6 - Biodiversity.
- Drilling and trial pit excavation (see Appendix 15A) as follows:
  - At the power plant site,
  - At the 220kV and 400kV substations
  - At overhead cable pylon locations (x18),
  - Along the underground cable route and
  - At the proposed peat stockpile area;

- Measurement and description of peat layers.
- Collection of peat samples for laboratory analysis, including moisture content;
- Development of a peat depth map to indicate the maximum depth of peat at all investigated points across the proposed Electricity Grid Connection route development;
- Calculation of the maximum potential peat volumes that will be removed due to excavation for infrastructure based on the depth penetration probing results; and,
- Examination of areas where peat is re-used to allow calculation volumes.

A comparison of the peat depth with the site infrastructure footprint. These data indicate that peat (>0.5m depth) is present across <50% of the Electricity Grid Connection route.

Peat Characteristics

The peat encountered was generally less than 0.5m thick along the overhead section of the Electricity Grid Connection route but was up to 2.6m thick at the northern and southern ends of the overhead route (trial pits TPT 01, TPT 02, TPT 03, TPT 05, TPT 17, TPT18). The peats encountered along the Electricity Grid Connection overhead route were generally described as pseudo-fibrous brown/black peat and rootlets were commonly identifiable, up to 20mm thick in TPT07. The decomposition state of the peats along the overhead route was generally assessed as H4 to H6 on the Von Post scale.

The site investigations at the Interface Compound (trial pit TP CC 01) and along the proposed underground route, which follows an existing peatland access track way (trial pits TP C 01 to TP C 09), encountered peat up to 4+ m thick and largely assigned a grade of H4 to H6. In places, this peat was overlain by made ground up to 0.9 m thick associated with the existing access track.

At the Power Plant site, peat soils between 2.45 to 4.50m thick was reported along the northern and eastern edges of the proposed development (at trial pits TP201 to TP203 and at TP205 and at Boreholes BH102, BH104, BH109, BH116, BH117, BH118) and the composition was variable, with both highly decomposed amorphous peat (H8/H9) and lighter fibrous peat (H2/H3) containing tree stumps reported.

Across the central and southern portions of the Power Plant are (trial pits TP204 and TP206A to TP212) peat was only reported as a buried layer beneath existing Made Ground at TP204 (1.1 m thick, H2) and TP206A (0.35m thick, H6) in the north west of the proposed Power Plant area.

Elsewhere across the Power plant area, in the east of the 220kV Substation site (trial pits TP213 to TP215) and at the former waste disposal area, outside the southern boundary of the proposed Development (trial pits TP206 to TP220) no peat was encountered, consistent with the description of the Derrygreenagh Works being on an island of mineral soils within the surrounding peat land.

No clear basal layer of amorphous peat (H9/H10) was observed was observed in any trial pit. Tree roots were frequently encountered on the site at the peat-subsoil boundary. The peat characterisation studies concluded that the site comprises drained cut-over peatland across much of the route.

These values have been used in calculations of volumes of peat across the site where the peat contour map indicates that peat is present (e.g., >0.5m proven depth).

Habitat Conditions

Habitat mapping was undertaken by Project Ecologists and is detailed within Chapter 9 Biodiversity of the EIAR. Full details of the habitat survey carried out by Woodrow APEM are presented and discussed in Appendix 9B.

The majority of the Power Plant and 220kV substation areas are occupied by artificial surfaces (BL3), cutover peat (PB4a and PB4b) habitat, dry meadows and grassy verges (GS2), amenity grassland (GA2) and bog woodland (WN7).

The overhead Electricity Grid Connection route to the south crosses cut-over peatland with significant areas of re-vegetating peatland mapped as Scrub and Immature Woodland Mosaic (W) to the north of the Yellow River, and with areas of Bog Woodland (WN7), Scrub (WS1 Immature Woodland (WS2),

Mixed Broadleaf/Conifer Woodland (WD2) and Cutaway Bog (partly vegetated, PB4b) to the south of the Yellow River.

The underground cable route is bordered to the west by a mix of Improved Grassland (GA1), Hedgerow (WL1) and Buildings and Artificial Surfaces (BL3) and on the east by Improved Grassland (GA1), Cutaway Bog (mainly bare peat, PB4a) and an area of degraded Raised Bog (PB1 (7120) – a priority Annex 1 habitat)

The majority of peatland systems recorded in the Power Plant Area are highly degraded, where the natural vegetation has been removed resulting in extensive areas of bare peat. Harvesting is likely to have been halted very recently in some areas and recolonization by native species is taking place. This results in a mosaic of habitats representing various stages in ecological succession, including bare peat, scrub, immature woodland, and bog woodland. The climax habitat type here will likely be bog woodland.

The peat depth is but is deep (>80cm) in places, so the peat resource has not been exhausted. In places the peat surface is loose and milled, while in others it is more compact and drier. For the purposes of habitat mapping, a distinction was made between areas of cutover bog which are still mainly bare peat (PB4a) and cutover areas which are at least partly colonised by vegetation (PB4b).

4.3 Site Conditions

Chapter 13: Soils & Geology carried out an assessment of current Site conditions which has informed this PSMP. The PSMP should be read in conjunction with the EIAR as the information presented herein refers only to findings relevant to this report.

Establishment of the baseline environment involved reference to existing data sources, consultation with statutory bodies and other organisations, and fieldwork surveys. The following sources of information were reviewed:

- Geohive website for historical Ordnance Survey of Ireland (OSI) maps of 1:2,500 scale and 1:10,560 scale (1837 to 1913) and aerial photographs (1995, 2000, 2005, 2013 and 2018);
- Geological Survey Ireland (GSI) website for Public Viewer Geoheritage, Geotechnical, Geochemistry, Geohazards, Natural Resources (Minerals/Aggregates) and Groundwater mapping;
- EPA website for groundwater, industrial licencing and land use information;
- Environmental Sensitivity Mapping (ESM) website for soil and water data;
- Previous site investigation reports (Glover 2008, Bord na Mona 2009, Anua 2013);
- Local authority web portals;
- Previous environmental impact statements for the site (Mott McDonald 2008 EIAR and interpretive reports); and
- Information was also obtained from a geo-environmental site walkover undertaken by AECOM on 22 March 2022 and from ground investigation undertaken by IDL at the site during the period 13th April 2023 to 31st July 2023, comprising trial pits, cone penetrometer boreholes, cable percussion boreholes, rotary boreholes, well installations, geophysical surveys and infiltration tests.

The purpose of the ground investigations was to supplement previous site investigation findings at the power station site and obtain an overview of the ground and groundwater conditions present at the Power Plant Site and along the Electricity Grid Connection, including the presence or otherwise of soil and groundwater contamination.

5. Peat and Spoil Management Plan

5.1 Construction Activities Covered by the PSMP

The overall layout of the proposed project is shown in Figure 1-1 of the EIAR. This figure shows the proposed locations of the wind turbines and associated hardstanding areas, substation, meteorological mast, temporary construction compounds, peat deposition areas, borrow pits, internal access roads and the main site entrance.

The following activities will generate peat and spoil or are considered to have potential for possible peat stability problems during the construction phase of the Proposed Development:

- Excavation in peat for:
  - Power Plant Foundations;
  - Hardstanding foundations;
  - Interface Compound foundations;
  - Surface and process water discharge connection routes;
  - Construction compounds;
  - Underground cables;
  - Overhead powerlines foundations;
  - Peat Deposition Area(s)
  - All other infrastructure foundations;
- Construction of new temporary floating access tracks over peat;
- Upgrade of existing access tracks (excavate and replace tracks); and

5.2 Proposed Measures

In relation to the SEPA Guidance documents published in 2010 and 2014, the following has been applied to the design and construction of the Proposed Development:

- Floating tracks are proposed along access tracks with suitable gradients;
- Reuse of material is proposed for landscaping and restoration of borrow pits;
- Recycling/recovery is not appropriate on this Site; and
- Temporary storage and reuse are proposed (outside of borrow pits).

This methodology includes procedures that are to be included in the construction phase to minimise peat excavations. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations.

The Principal Contractor (hereafter referred to as the ‘Contractor’) will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage, and reinstatement of peat will be outlined in this Method Statement. The Contractor will consider potential impacts on downstream receptors and the potential for instability issues with the excavated material.

Some of the requirements to be contained within this are outlined below. The majority of the Site comprises drained cut-over peatland and mineral soils. No founded roads are proposed for access to construction sites on peatland, such as the overhead cable pylon foundations and the Interface Compound, and only temporary floating roadways will be used, except in areas with shallow peat and highly trafficked areas (e.g., site entrances and access roads in and out of borrow pits). Works will be scheduled to minimise access requirements to areas of soft/wet ground during winter months.

Classification of excavated materials will depend on their identified reuse in reinstatement works. At this Site, it is anticipated that the material to be excavated will comprise peat, made ground (at Derrygreenagh Works) and mineral subsoils of variable composition.

A total of 5-7km of temporary access tracks for the overhead route are proposed at the Site, with the existing 2.4km of Bord na Mona track alongside which the underground cable route runs being upgraded to a 4m wide paved and gated service road.

Ground investigation in the form of trial pitting has been carried out at the power plant area, at the substations and along the entire Electricity Grid Connection Route consisting of trial pits and/or boreholes at suitable locations to inform the depth of excavation and upfill required.

Volume calculations provide an approximate estimation of fill required for all of the hardstanding foundations. It is calculated that 245,764m^3 of peat and spoil material will be generated as part of the Power plant and Electricity Grid Connection elements of the Proposed Development (as tabulated below). This material will be reused on-site or deposited at a thickness of up to 1m in the Peat Deposition Area or Soil Deposition Area.

Table 1: Power Plant Area - Peat/Soil Excavation (for onsite Deposition Areas)

DEVELOPMENT COMPONENT	AVERAGE PEAT/SPOIL DEPTH (m)	PEAT/SPOIL VOLUME (m^3) EXCAVATED	PEAT/SPOIL VOLUME (m3) FACTORED FOR BULKING (20%)
Power Plant Area - Main	2.0	132,000	158,400
Power Plant Area - AGI	1.0	39,354	47,225
Power Plant Area – Discharge Routes	1.0	8,000	9,600

Table 2: Electricity Grid Connection - Peat/Soil Excavation (for onsite Deposition Areas)

DEVELOPMENT COMPONENT	AVERAGE PEAT/SPOIL DEPTH (m)	PEAT/SPOIL VOLUME EXCAVATED (m^3)	PEAT/SPOIL VOLUME FACTORED FOR BULKING (m^3) (20%)
Electricity Grid Connection -220kV Substation	1.6	33,458	40,150
Electricity Grid Connection -Towers	3.5	5,954	7,144
Electricity Grid Connection - Line-cable Interface Compound	1.6	1,914	2,297
Electricity Grid Connection – Underground Cable Route	1.5	3,600	4,320
Electricity Grid Connection - 400kV Substation	0.5	21,484	25,780
Totals		**66,410**	**77,691**

Peat management of the above construction activities are covered individually in this report.

5.2.1 Excavation in Peat for Power Plant Foundations?

The volumes of granular fill (sand and stone) required for the construction of the Power Plant Area are based on the Power Plant Area element footprints, the anticipated excavation levels to suitable formation or suitable subgrade, and the proposed final levels for the infrastructure components. Construction grade granular fill and higher quality, final surfacing fill (including sand) will both be required for the construction of the Proposed Development.

Granular fill volumes have been estimated using the following methodology:

- The peat beneath the Power Plant Area site and all associated proposed hardstanding areas, including temporary construction compounds, will be excavated and replaced with construction grade granular fill up to the existing ground level.
- The hardstanding areas and roads will be constructed to the 100-year flood level. Roads will generally comprise approximately 650mm of granular fill and approximately 150mm of final surfacing layer (or capping). Geotextiles separators will be placed on the subgrade and geogrids will be installed within the road build-up.
- The peat and unsuitable soil excavated beneath the Power Plant Area footprint will be replaced with select granular fill. The final 250mm shall comprise capping material.

Table 3: Power Plant Area - Volume of Granular Fill Required

DEVELOPMENT COMPONENT	STONE FILL REQUIRED VOLUME (m^3)
Power Plant Area - Main	132,000
Power Plant Area - AGI	39,354
Power Plant Area - Discharge Routes	8,000

Temporary stilling ponds/settlement ponds will be used to attenuate runoff from works areas (i.e., hardstand areas, construction compounds, and the substations) of the site during the construction phase. The purpose of the temporary stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity.

Constructed Peat Deposition Areas (PDAs) are required in the vicinity the Power Plant Area. Excavated Peat arising from the formation of the foundations will be placed in designed and dedicated deposition areas in close proximity on cut-over peat land to the east of the Power Plant Area (see Figure xxx). Peat will be deposited to a maximum depth of 1m across these areas. Once excavations at the Power Plant site are completed and following the commissioning of the project, the PDAs will be allowed to naturally re-vegetate.

5.2.2 Excavation in Peat for Substation Foundation

The peat and/or unsuitable soil beneath the substations, Line Interface compound and all associated hardstanding areas, including temporary construction compounds, will be excavated and replaced with construction grade granular fill up to the existing ground level.

The main 220kV and 400kV substations will be accessed directly off existing roads during construction and will not require roadways crossing soft ground, however access to the Line Interface Compound may require a short section of floating road due to the presence of peat along the access route from the existing Bord na Mona service track to the south).

The substation and interface compounds and associated hardstanding areas will be constructed to the 100-year flood level and greater than 1m above local road heights. Roadways will generally comprise approximately 650mm of granular fill and approximately 150mm of final surfacing layer (or capping). Geotextiles separators will be placed on the subgrade and geogrids will be installed within the road build-up.

The peat and unsuitable soil excavated beneath the substation and interface compounds footprints will be replaced with select granular fill of Clause 804 material in accordance with Eirgrid requirements. The final 250mm shall comprise capping material of site-won 6F2 material.

The internal site underground cable trenches will be approximately 1200mm in depth. The cable trench will be backfilled up to approximately 600mm with sand, within which the ducting will be placed. Suitable materials from the excavations of the trenches will be reinstated to form the final layer of the trench.

Table 4: Electricity Grid Connection – Substations - Volume of Granular Fill Required

DEVELOPMENT COMPONENT	STONE FILL REQUIRED VOLUME (m^3)
Electricity Grid Connection - 220kV Substation	33,458
Electricity Grid Connection - Line Cable Interface Compound	3,654
Electricity Grid Connection - 400kV Substation	43,928

All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Electricity Grid Connection.

Temporary stilling ponds/settlement ponds will be used to attenuate runoff from works areas (i.e., hardstand areas, construction compounds, and the substations) of the site during the construction phase. The purpose of the temporary stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity.

Once all construction works are complete, the work areas will be finished with a 6F2 capping layer, which will provide the finished surface within the compound fence line.

A constructed soil deposition area is required in the vicinity of and to the west of the 400kV substation site. Excavated soil arising from the formation of the substation foundations will be placed in designed and dedicated deposition areas in close proximity. Soil will be deposited to a depth of up to 1m across these areas. Once construction works are completed and following the commissioning of the project, the soil deposition area will be allowed to naturally revegetate.

5.2.3 Excavation in Peat for Surface and Process Water Discharge Connection Routes

The planned process wastewater discharge pipe is to extend west of the R400 road and discharge to the Yellow River at approximately 3km southwest of the Power Plant Area (Easting 649758, Northing 736426) (Chapter 12).

Surface water run-off will be discharged northward to the Mongagh River in accordance with Sustainable Urban Drainage System (SUDs) guidance. The planned rain/surface water discharge, consisting of stormwater runoff from hardstanding areas within the power plant site, is be treated in an on-site stormwater system, incorporating oil interceptors, to enable the legislative limits to be achieved, prior to controlled discharge to the Mongagh River at approximately 700m north of the Power Plant Area (Easting 649504 Northing 738976) (Chapter 12). Surface water will be conveyed directly to the discharge point on the Mongagh River via a pipeline following a former bog railway line across cutover peatland, to eliminate the possibility of sediment entrainment.

Foul water will be treated in a proprietary secondary treatment system on the site and discharged via pipeline to the Yellow River (Chapter 12 Water of the EIAR Volume I) .

5.2.4 Excavation in Peat for Construction Compounds

For the Electricity Grid Connection substations (both the 220kV and the 400kV substations) the construction and laydown area will be 2 No. temporary construction compounds - north of the 220kV substation and north of the 400kV substations. In addition, there will be 2 No. satellite compounds along the OHL transmission route.

At the commencement of the relevant construction phase, a construction compound will be constructed to provide temporary office space, parking, stores, welfare facilities, concrete wash out areas, hardstand laydown areas for storing materials and hazardous materials, which are within the red-line boundary but outside the existing substation fence line. The hardstanding areas shall be constructed to the 100-year flood level average heights of 0.5m above existing ground level and greater than 1m above local road heights.

Volume calculations in the descriptions of the Power Plant and Substations excavations include an estimation of fill required for the temporary compound areas. It is likely that the fill material volume to surface the temporary construction compounds will be sourced on site and/or imported from locally approved quarries.

The construction of the substation foundation will require removal of peat and soil to a competent founding layer and upfilling with concrete or structural fill to the required finished floor level. Ground investigations at the substation location have been undertaken and have been used to inform the depth of excavation and upfill required. Peat/peaty soil is present on the northern and eastern sides of the Power Plant area at the proposed locations of Construction compounds. Peat is between 2.8 and 4.5m thick beneath the proposed northern construction compound and 0.3 to 2.6 m thick beneath the eastern proposed construction compound. TP 214 is the only site investigation location in the proposed construction compound to the north of the proposed 220kV substation and west of the Power Plant Area and reported a peat thickness of 1.0m.

During construction, peat will be excavated to the substrate to make room for concrete foundations, and for a small working area surrounding the foundation footprint. Once excavated, peat will be reused to batter the edges of platforms grading the bases into the local topography.

5.2.5 Excavation in Peat for Underground Cables

It is EirGrid policy that for environmental and engineering reasons the routing of underground cables through peatland shall be avoided if at all possible.

To a large extent, underground cable routes will utilise existing railway line and machine pass infrastructure and was chosen with cognisance of nearest sensitive receptors and crossing utilities. It is proposed to excavate the trenches for the underground cable at a uniform level in peat or overburden material. The trenches will typically be 1.2m wide and 1.2m deep. These existing access tracks will be upgraded to form 5m wide paved roads to permit heavy vehicle access to the cable joint chambers on the underground cable route and to the interface compound.

This methodology includes procedures that are to be included during the construction phase to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations.

With respect to placement of arisings from excavation, the guidelines below are to be followed.

- All excavations within peat are to be adequately supported or peat slopes are to be battered to a safe slope inclination typically of 1 (v): 2 or 3 (h). This slope inclination will be reviewed during construction, as appropriate;
- Where areas of weaker peat are encountered then slacker slopes will be required;
- Excavations shall always be kept reasonably free from water; and
- Backfill requirements for the cable trench will be decided as part of the detailed design/construction.

All cable laying works will be carried out as per ESBN requirements, but it is assumed that initially the Contractor will excavate cable trenches and then lay high density polyethylene (HDPE) ducting in the trench in a surround of CBM (cement bound material). A rope will be inserted into the ducts to facilitate cable-pulling later. The as-constructed detail of the cable duct locations will be carefully recorded. Cable marker strips will be placed 75mm above the ducts with two communication ducts also laid.

An additional layer of cable marker strips will be laid above the communication ducts and the trench backfilled. Back-filling and reinstatement in public roads will be to a specification to be agreed with the road authority.

Table 5: Electricity Grid Connection – Underground Cable Route - Volume of Granular Fill Required

DEVELOPMENT COMPONENT	STONE FILL REQUIRED VOLUME (m^3)
Electricity Grid Connection - Underground Cable Route	3,600

A similar construction methodology will apply for cable trenches laid within the Site access tracks. In this case the cable-ducts will generally be laid after the track has been constructed and will be within the Site access tracks. The trenches within these locations will generally be backfilled using the excavated material.

5.2.6 Excavation in Peat for Overhead Powerlines Foundations

Temporary access tracks (required due to ground conditions and/or landowner requirements) to the pylon locations will consist of timber or aluminium bog mats or crushed rock on a geotextile fabric along the 5km overhead cable route to spread the weight of machinery over a greater area to prevent damage to the ground. If necessary, a low ground pressure excavator may also be utilised to spread weight across a wider area thereby reducing the pressure exerted on the ground.

To provide internal access to the Electricity Grid Connection overhead powerline route to facilitate the delivery of construction materials and construction staff, a number of short, internal floating access roads will also need to be constructed to connect the OHL route to the existing network of internal and local roads. These internal access roads will be required at:

- the north end of the OHL at Derrygreenagh Hill (access via 220kV entrance west of R400 road)
- south end of the OHL in Derryarkin (access via an existing Bord na Mona haul route)
- at the north of Ballybeg (access via existing Bord na Mona haul route) and
- south on Ballybeg (access north from the L1010 road).

There will be a requirement to upgrade existing internal access roads (machine passes) for development of floating road access to the OHL satellite compounds.

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 the requirement for bog mats. Any such requirements will be incorporated into the relevant method statement.

For each leg of the 21 No. masts (84 legs in total) a foundation circa. 4.5m x 4.5m x 3.5m deep is required. To allow for safe construction where ground conditions are good, the excavation will be stepped back, which requires additional area to be excavated. In the cut away bog where conditions are poor (i.e., poor ground and/or high water table) it may be necessary to use sheet piles supported by hydraulic frame(s) to prevent collapse of the sides and also to prevent the excavation becoming too large.

The excavated material will be temporarily stored close to the excavation and excess peat or soil material will be used as berms along the site access roads.

To aid construction, a concrete pipe is placed into each excavation to allow operatives level the pylon at the bottom of the excavation. If sheet piles are used, the requirement for a concrete pipe (which is normally used in tower foundations) is removed.

A setting template is used to set and hold the pylon stubs in position while the foundation concrete is being poured direct from a concrete tuck and cured. Any water in the foundation excavation is pumped out prior to any concrete being poured. During such dewatering activities for pylon leg foundations, a standard water filtration system will be utilised to control the amount of sediment in surface water runoff.

Once the concrete has set the excavated area around the pylon foundations will be backfilled one leg at a time with the material previously excavated at the location. This backfill will be placed and

compacted in layers, with an earth mat, consisting of copper wire, laid circa 600mm below ground around the mast.

Table 6: Electricity Grid Connection – Overhead Powerlines Foundations - Volume of Granular Fill Required

DEVELOPMENT COMPONENT	STONE FILL REQUIRED VOLUME (m^3)
Electricity Grid Connection - OHL tower foundations	5,954

All surplus excavated material will be removed from the mast locations and stored in berms for reuse across the construction site.

Construction of the mast body will require a hardstand area for the crane will be created at each pylon location by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate. The base and body section of each pylon will be constructed lying flat on the ground beside the recently installed pylon base. The pylon section will be lifted into place using the crane and guide ropes. The body sections will be bolted into position.

Upon completion of the works, all hardstand areas and roadway mats will be removed.

All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Electricity Grid Connection.

Temporary stilling ponds/settlement ponds will be used to attenuate runoff from works areas (i.e., hardstand areas, construction compounds, and at the substations) of the site during the construction phase. The purpose of the temporary stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity.

Once all construction works are complete, the work areas will be reinstated with excavated peat or soil as appropriate and either seeded out with native species, allowed to vegetate naturally or reinstated with excavated grass turves and will be restored to their original condition.

5.2.7 Excavation in Peat for Borrow Pits

It not proposed to open borrow pits for the construction of the Proposed Development.

5.2.8 Construction of Temporary Floating Access Tracks Over Peat

Access tracks will be needed to accommodate the construction works and provide access to 18 Overhead cable pylons and the Interface Compound during the Construction Phase of the Proposed Development. Approximately 10km of temporary access tracks are to be constructed which will provide access to necessary locations along the Electricity Grid Connection route.

The access tracks in peatland areas will be constructed as floating roads only, built directly on top of the peat and soft soils, except in arras of very thin peat or at heavily trafficked area such as entrances/junctions.

Ground investigation, in the form of trial pitting and borehole drilling, has been carried out along the proposed access Electricity Grid Connection route to inform the depth of peat present. No peat material is proposed to be excavated to construct roadways.

5.2.8.1 Track Construction Types

To provide access within the Site and to connect pylons, substations and associated infrastructure, new tracks will need to be constructed or existing tracks upgraded. The identification of the access track layout is an iterative procedure. Where practical, tracks on-site will be constructed on mineral soil or along the route of existing Bord na Mona tracks/railways, there are some locations where construction on peat will be required.

The track construction preliminary design has considered the following key factors:

- Requirement to minimise disruption to peat hydrology;
- Minimise excavation arisings;
- Serviceability requirements for construction, delivery, and maintenance vehicles; and
- Buildability considerations.

Whilst the above key factors are used to determine the track design the actual construction technique employed for a particular length of track will be determined on the prevailing ground conditions encountered along that length of track.

The majority of Electricity Grid Connection and discharge pipeline construction will utilise a temporary access track networks for access and egress, and this access will be constructed in advance of other ground works in a sequential manner.

It is intended that the access tracks will be constructed using will consist of either timber or aluminium bog mats or crushed rock on a geotextile fabric Site-won material as subbase and unbound crushed aggregates and incorporate drainage to maintain the performance of the pavement during wet weather. No invasive works will be undertaken when placing the matting. The access tracks shall be constructed to average heights of 0.5m above existing ground level.

Ground investigations in the form of trial pitting has been carried out along the proposed Electricity Grid Connection route to inform upfill required for the access tracks. The discharge pipeline routes largely follow existing constructed Bord na Mona tracks or railway lines.

Table 7: General Construction of Access Tracks

Construction Method	Typical Site Conditions		
	Description	Typical Peat Depth	Typical Slope Inclination
Construction of new excavated tracks in peat	Flat slopes with relatively shallow peat	Typically, less than 0.5m, locally up to 1m	Less than 3 degrees
Construction of new floating tracks over peat	Flat slopes with relatively deeper peat	>1m	Less than 3 degrees

It should be noted that Table 7 summarises the general track construction techniques only. Prior to the construction of any access tracks, on-site a detailed design will be carried out.

5.2.8.2 Excavated Track Construction Methodology

Given the flat topography and relatively shallow peat on-site, temporary floated access tracks are deemed an appropriate construction technique for the majority of the Electricity Grid Connection and excavated tracks are not proposed to be used, except in localised areas with shallow peat and highly trafficked areas (e.g., site entrances and junctions).

For any excavated track sections required, the following methodology will be used:

- Interceptor drains will be installed upslope of the access track alignment to divert any surface water away from the construction area;
- Excavation of tracks shall be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat (as agreed with the site designer);
- Track construction, where required, will be carried out in sections of approximately 50m lengths or shorter; i.e., no more than 50m of access track will be excavated without re-placement with stone fill unless otherwise agreed with the resident engineer on-site;
- All excavated peat shall be placed/spread alongside the excavations or placed in the PDA;

- Side slopes in peat shall be not greater than 1 (v): 2 or 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses;
- The surface of the finished excavated access track will be finished above current ground level;
- A layer of geogrid/geotextile may be required at the surface of the competent stratum (to be confirmed by the designer);
- At transitions between floating and excavated tracks a length of track of about 10m shall have all peat excavated and replaced with suitable fill. The surface of this fill shall be graded so that the track surface transitions smoothly from floating to excavated track;
- If slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e., greater than 1.5m) and where it is proposed to construct the access track perpendicular to the slope contours, it is best practice to start construction at the bottom of the slope and work towards the top, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability. It should be noted that slopes greater than 5 degrees are not envisaged along the Electricity Grid Connection route access tracks; and
- A final surface layer shall be placed over the excavated track, as per design requirements, to provide a track profile and graded to accommodate construction and delivery traffic.

Access tracks require careful monitoring to ensure that there is no significant standing water forming, which would lead to potholes in the surface. If areas of track are causing concern, repairs will be carried out in favourable, preferably dry, conditions, to ensure that there is no saturation of the surface of the track.

5.2.8.3 Construction of new Floating Tracks over Peat

Floating roads are built directly on top of the peat and soft soils. As peat of variable thickness is present along the majority of the Overhead Line section of the Electricity Grid Connection route and only construction stage vehicular access is envisaged, temporary floating roads will be used on peatland areas, other than where proposed infrastructure follows existing constructed trackways or railway lines.

The access tracks shall be constructed to average heights of up to 0.5m above existing ground level. It is expected that floated tracks will constitute the majority of the access roads at the Site, however founded tracks may be used in localised, heavily trafficked areas like entrances and junctions.

Floating track sections will be designed by a geogrid manufacturer, or by a consultant assisted by a geogrid manufacturer. It can also be designed in-house by a contractor with experience in track construction over peat. The design will have a geotechnical input to fully understand the principles at work in the floating track. Design can be by calculation or, more usually by the application of semi-empirical rules based on experience of the European standard (EN) Eurocode 7: Geotechnical design (EN 1997).

5.2.8.4 Floating Access Track Construction Methodology

This methodology includes procedures that are to be included in the construction phase to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations. Note that details of geogrid arrangement will be provided by the specialist geogrid provider/designer.

For temporary floating track sections, the following methodology will be used:

- Temporary access tracks (required due to ground conditions and/or landowner requirements) will consist of timber or aluminium bog mats or crushed rock on a geotextile fabric to spread the weight of machinery over a greater area to prevent damage to the ground.
- If necessary, a low ground pressure equipment may also be utilised to spread weight across a wider area, thereby further reducing the pressure exerted on the ground.
- No invasive works will be undertaken when placing the matting/geotextile.

- Upon completion of the works, all mats, fill and/or geotextile will be removed immediately. Temporary 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 the requirement for bog mats. Any such requirements will be incorporated into the relevant method statement.
- Once all construction works are complete, the work areas will be reinstated and either seeded out with native species, allowed to vegetate naturally or reinstated with excavated grass turves and will be restored to their original condition.
- Transitions between the Site floating tracks and excavated tracks (or other forms of track not subject to long term settlement) will be gentle (e.g., 1:10 basal transition slope) in order to minimise likelihood of track failure at the boundary between construction types.

The typical make-up of new floating access track is generally between 600mm and 1000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator. This may vary depending on designer requirements.

Following the detailed design of the floating access tracks it may be deemed necessary to include pressure berms either side of the access track in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access track will reduce the likelihood of potential bearing failures beneath the access track.

The finished track width will be approximately 6m (to be confirmed by the designer). Stone delivered to the floating track construction shall be end-tipped onto the constructed floating track. Direct tipping of stone onto the peat shall not be carried out. To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating track shall be tipped over at least a 10m length of constructed floating track. Where it is not possible to end-tip over a 10m length of constructed floating track then dumpers delivering stone to the floating track shall carry a reduced stone load (not greater than half full) until such time as end- tipping can be carried out over a 10m length of constructed floating track.

Following end-tipping suitable machinery shall be employed to spread and place the tipped stone over the base geogrid along the line of the track. A final surface layer shall be placed over the floating track, as per design requirements, to provide a track profile and graded to accommodate construction and delivery traffic.

5.2.9 Upgrade of Existing Access Tracks

The general construction methodology for upgrading of existing section of excavated roads or tracks is summarised below:

- The edge of the existing tracks will be cut back by 1m and a Combigrid™ (a geocomposite stabilisation and reinforcement geogrid product) placed over the proposed area to be widened. The cutting back of the existing track allows an anchorage of the Combigrid under the existing track.
- Granular fill will be placed in layers to match the depth of stone on the existing track and in accordance with the contractor's specification. A geogrid will be applied at this level across the existing and widened road area.
- The surface of the existing/widened access track will be overlain with up to a 300mm of selected granular fill.
- A layer of geogrid/geotextile may be required at the surface of the existing access road and in the widened section of road, where excessive rutting is anticipated (to be confirmed by contractor and onsite engineer).

- Where excavations in peat are required, side slopes shall be not greater than 1 (v): 2 or 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.
- The finished road width will be approximately 5m.
- If required, interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.

A final capping layer shall be placed over the existing access track, as per design requirements, to provide a suitable road profile and will be graded to accommodate construction traffic and HGV movements.

5.2.10 Peat Deposition Area

Peat reuses around and within infrastructure areas is an important aspect of the Proposed Development as it allows an opportunity to maintain the integrity of the excavated peat and enhance habitats. Any landscaping or road batters will be limited to the areas of ground already disturbed.

Three Peat Deposition Areas (PDAs) are proposed within the Overall Project (see Chapter 5):

- A permanent PDA is provided on cut-over peatland to the east of the Power Plant Area, as a result of the construction phase of the Power Plant Area, to store excess overburden material which cannot be used in localised landscaping or backfill. Excavated peat and soil arising from the formation of the foundations will be placed in the designed and dedicated deposition area in close proximity on land to the east of the Power Plant Area (refer to planning drawings). Peat deposition in this area will be carried out by an approved contractor, under the management of Bord na Móna, in accordance with the requirements of any planning conditions. The peat and soil deposition area will not exceed 1m above ground level across the 222,410m² main PPA PDA area and will be suitably profiled to eliminate risk of movement or slippage of material. Once excavations are completed and following the commissioning of the project, the PDA will be allowed to naturally revegetate.
- A permanent PDA is provided in the vicinity of the 400kV Substation to store excess overburden material which cannot be used in localised landscaping or backfill. Excavated peat and soil arising from the formation of the substation foundation will be placed in a designed and dedicated deposition area in close proximity on land to the north of the 400kV substation (refer to planning drawins).
- A permanent PDA is provided in the vicinity of the 220kV Substation to store excess overburden material which cannot be used in localised landscaping or backfill. Excavated peat and soil arising from the formation of the substation foundation will be placed in a designed and dedicated deposition area in close proximity on land to the southwest of the 220kV substation (refer to planning drawings).

It is proposed to construct internal access routes within the PDAs, in order to minimise the handling and disturbance of any underlying cut-over peat. The roads will be constructed by laying a geotextile reinforcing material directly on the native peat and depositing compacted rockfill to form the haul roads. Trucks will deliver and unload the peat at the PDA. The peat will then be placed using low ground bearing pressure trailers for dispersal within the deposition area to a maximum thickness of 1 metre.

Reinstatement of vegetation will be focused on natural regeneration utilising peat vegetated turfs. To encourage stabilisation and early establishment of vegetation cover, where available or other vegetation turves in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.

Appropriate drainage will be required where peat is used in reinstatement, so that the deposited peat will be maintained in a saturated condition.

5.2.11 Excavation and Storage of Peat and Soil

It will be necessary to extract peat and subsoil on-site as part of the construction phase. This will largely consist of areas of peat due to the nature of the Site. Bedrock is covered with thick glacial deposits, resulting in local variations in topography such as Derrygreenagh Hill. The majority of the Site is located on relatively flat-lying areas, currently overlain by cutover blanket peat bog.

It is intended that peat and unsuitable founding soils will be side cast, i.e., placed adjacent to works locations, with the balance placed in Peat Deposition areas. Considering the relatively flat topography, it should be appropriate to do this across most of the Site, subject to geotechnical assessment.

The following recommendations / best practice guidelines for the placement of peat and non-peat soil alongside the proposed infrastructure elements will be considered and taken into account during construction.

Any surplus excavated material (peat and non-peat) will be reused, either in profiling/landscaping or constructing berms as close to the excavation areas as possible. The northern 5km of the Electricity Grid Connection route crosses cut-over peatland that has been drained, resulting in extensively trafficked, partly-revegetated peat. Peat present in the north and east of the Power Plant area is largely drained peat covered in a layer of fill material.

The placement of excavated peat and soil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and soil within the placement areas may require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.

The most environmentally sensitive and stable way of handling and moving of peat is its placement across the site and at locations as close as possible to the excavation areas. A peat deposition area and soil deposition area has been included to facilitate the construction phase of the Power Plant Area site.

All placed soil will be allowed to revegetate naturally from the extensive seed source of the plants that have already colonised in the area. Alternatively, if significant areas of bare soil are still evident after a three-year period and possibly in addition, seeding of the placed soil could be carried out which would aid in stabilising the placed soil in the long term.It is a goal of the Proposed Development to incorporate sustainability into its design and construction phases as much as practically possible. Where mineral soils are encountered in the excavation and construction of the Power Plant area, Site roads, Substations, Construction Compounds, bases, etc., this material will be stockpiled for assessment and subsequent reuse, where possible. Where mineral soil is not directly suitable for construction, it will be used for reinstatement works and will be geo-engineered as necessary.

In addition to the Peat Deposition Area, a Soil Deposition area is proposed to the west of the 400kV substation site, for deposition of unsuitable or unneeded mineral soils, which will be deposited to a maximum thickness of 1 m.

5.2.11.1 Excavation and Storage of Arisings Methodology

This methodology includes procedures that are to be included in the construction phase to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction, such as drainage and environmental considerations. Prior to any excavations, the Contractor will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage, and reinstatement of peat will be outlined in the excavation Method Statement. The Contractor will consider potential impacts on downstream receptors and the potential for instability issues with the excavated material.

Some of the requirements to be contained within the Method Statement are outlined below. The majority of the Power Plant Area Site comprises mineral soils, with any areas of peat covered by a layer of fill material, whereas the northern 5 km section of the Electricity Grid Connection route consists of bare or revegetating cut-over peat bog, of varying thickness. Areas of peat or unsuitable soil within the footprint of proposed excavations will have the top layer of made ground or vegetation stripped prior to construction by an experienced specialist sub-contractor. Underlying peat or bare peat will then be removed.

Classification of excavated materials will depend on their identified reuse in reinstatement works. At this Site, it is anticipated that the material to be excavated will comprise granular fill, peat and mineral subsoil.

The handling, management and reuse of excavated materials are of importance during the construction phase of the Proposed Development. Excavated material will arise from all infrastructure elements of the Proposed Development. Areas where the peat is noted to extend to a depth of 2m bgl or greater have been identified on-site (At the northern and eastern edges of the Derrygreenagh Plant at the northern and southern ends of the Overhead Line section of the Electricity Grid Connection route. As such, these areas may not prove suitable for certain aspects of the Proposed Development due to the large quantities of peat that would require removal to avoid instability issues.

It is intended that unsuitable founding soils and peat will be side-casted, bermed and profiled, i.e., placed adjacent to works locations or transported to the designated Peat Deposition or Soil Deposition Areas. It is anticipated that the height of berms and thickness of peat and unsuitably found soils that are either side casted or disposed of in the designated deposition areas will not be greater than 1m in general.).

Excavated peat will only be moved short distances from the point of extraction and used locally for landscaping. In total, approximately 66,410m^3 of peat will be excavated and either reused close to the source or placed in the designated peat deposition area.

Excess material will be used on the Site of the Proposed Development for landscaping and reinstatement. Where contaminants are found, the material will be removed from the Site and disposed at an appropriately licenced facility.

Landscaping areas will be sealed and levelled using the back of an excavator bucket to prevent erosion. Where possible, the upper vegetative layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the landscaped peat. These measures will prevent the erosion of peat in the short and long term. Peat, overburden, and rock will be reused where possible on-site to reinstate excavations where appropriate.

Peat soils will be either side casted on to the existing cutover bog or placed in the Peat deposition area. Where side casting occurs, it is anticipated that the existing vegetation extensive area and existing drainage system will remove any risk from generation of silt to surface water bodies. At the larger excavation locations, such as pylon leg foundations and substations, silt control measures will be incorporated into work area drainage with the discharge onto cutover bog rather than directly to surface water, which will provide additional silt control.

It is anticipated that peat deposition to the designated peat deposition area will be required, which is located on level cut-over peatland east of the Power Plant area. It is anticipated that deposited peat thickness will not exceed 1m. The deposition area will be designed to be completed in phases and will include specific drainage and silt controls. On completion the peat deposition area surfaces will be stabilised by the establishment of natural peat land vegetation.

5.2.12 General Recommendations for Good Construction Practice

The following measures outline an overview of the tasks for the construction phase on peatland:

- Applicant’s Geotechnical Engineer to provide a Geotechnical Induction to all contractor supervisory staff;
- Applicant to appoint a Site Geotechnical Supervisor to carry out supervision of site works as required. The Site Geotechnical Supervisor will be required to inspect that works are carried in accordance with the requirements of the Peat Stability Risk Assessment (PSRA), identifying new risks and ensuring all method statements for works are in place and certified;
- Retain a Site Geotechnical Folder which contains all the information relevant to the geotechnical aspects of the Site including but not limited to Site Investigation information, Method Statements, etc.;
- Contractor to develop a Method Statement for the works to be carried out in each of the PSRA areas cognisant of the required mitigating measures;

- Applicant's Geotechnical Engineer/Site Geotechnical Supervisor to approve the method statement;
- Contractor to provide Toolbox Talks and on-site supervision prior to and during the works;
- Daily sign off by supervising staff on completed works; and
- Implementation of emergency plan and unforeseen event plan by the Contractor.

In addition to the above, the following best practice guidelines for the placement of peat alongside the Proposed Development's different infrastructure elements will be adhered to during construction:

- All excavated peat will be reused where possible for reinstatement or by being placed/spread alongside the proposed infrastructure elements on-site;
- The peat placed adjacent to the proposed infrastructure elements should be restricted to a maximum height of 1m over a 10m wide corridor on both sides of the Proposed Development's elements (pylon footings or underground cable route. It should be noted that the designer should define/confirm the maximum restricted height for the placed peat;
- The placement of excavated peat and spoil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat within the deposition area will likely require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works;
- Where a peat stability analysis following the confirmatory ground investigation reveals areas with an unacceptable risk of peat instability, then no material shall be placed on to the peat surface;
- The surface of any placed peat will be shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the peat should be carried out as placement of peat within the placement area progresses. This will reduce the likelihood of debris run-off;
- Finished/shaped side slopes in the placed peat shall be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat and spoil are encountered then slacker slopes will be required;
- The acrotelm shall be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat within the placement areas;
- Movement monitoring instrumentation may be required adjacent to areas where peat has been placed. The locations where monitoring is required will be identified by the designer on-site;
- An interceptor drain will be installed upslope of the designated peat placement areas to divert any surface water away from these areas. This will help reduce the likelihood of debris run-off; and
- All the aforementioned general guidelines and requirements should be confirmed by the designer prior to construction.

The following outlines an overview of the tasks for the operation and maintenance phase:

- Communication of residual peat risk to appropriate site operatives; and
- Ongoing monitoring of residual risks and maintenance, if required. Such items would consist of regular inspection of drains and culverts to prevent blockages and inspections of specific areas such as settlement ponds and floated access roads after a significant rainfall event.

5.3 Summary of Excavated Peat Volumes On-Site

The breakdown and combined total of excavated peat volume estimated to be required on-site for the completion of the Proposed Development is summarised in Table 8 and Table 9. Note, a factor of 20% (bulking factor of 15% and contingency factor of 5%) has been applied and is included in the excavated peat and soil volumes below to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the site.

Table 8: Excavated Peat Volume Summary

DEVELOPMENT COMPONENT	PLAN AREA (m2)	ASSUMED PEAT/SPOIL DEPTH TO BE EXCAVATED (m)	PEAT/SOIL VOLUME TO BE EXCAVATED (m^3)	PEAT/SOIL VOLUME (m3) FACTORED FOR BULKING (20%)
Power Plant Area – Contractor's Compound (1m of fill over geotextile layer - no peat excavation envisaged)	37,360	0.0	0	0
Power Plant Area – Additional Parking (0.5m of fill over geotextile layer - no peat excavation envisaged)	12,405	0.0	0	0
Power Plant Area – Central equipment area	66,000	1.5	99,000	118,800
Power Plant Area – AGI (2m of fill over geotextile layer - no peat excavation envisaged)	11,000	0.0	0	0
Power Plant Area – Green Areas	39,354	0.5	19,677	23,612
Power Plant Area – Discharge Routes	8,000	1.0	8,000	9,600
Total – Power Pant Area	**174,119**	**0.0 to 1.5m**	**126,677**	**152,012**
Electricity Grid Connection - 220kV Substation (excavations to between 1.0 and 2.0 m)	20,656	1.0 to 2.0	29,756	35,707
Electricity Grid Connection - 220kV Substation access road (excavation to 2.0 m)	1,851	2.0	3,702	4,442
Electricity Grid Connection -Tower bases (3.5m excavation envisaged)	1,701	3.5	5,954	7,144
Electricity Grid Connection -Tower Access roads (1.5m of fill over geotextile layer, floating road - no peat excavation envisaged)	18,235	0.0	0	0
Electricity Grid Connection - Line-cable Interface Compound	1,160	1.65	1,914	2,297
Electricity Grid Connection – Underground Cable Route	2,400	1.5	3,600	4,320
Electricity Grid Connection - 400kV Substation (excavations to between 0.2 and 0.5 m)	31,300	0.2 to 0.5	6,806	8,167
Electricity Grid Connection - 400kV Substation access road (excavation to 2.0 m)	9,785	1.5	14,678	17,613
Total – Electricity Grid Connection	**87,088**	**0.0 to 3.5m**	**66,410**	**79,690**
Totals (PPA and EGC Components)	**261,207**	**0.0 to 3.5m**	**193,087**	**231,702**

The three proposed Peat Deposition Areas have the following plan areas and calculated peat and spoil storage capacities:

Table 9: Peat Deposition Area Summary

DEVELOPMENT COMPONENT	PDA PLAN AREA (m2)	MAXIMUM PEAT/SOIL THICKNESS TO BE DEPOSITED (m)	PEAT/SOIL DEPOSITION CAPACITY AVAILABLE (m^3)	ESTIMATED PEAT/SOIL STORAGE REQUIREMENT (m^3)
Power Plant Area PDA	222,500	1.0	222,500	153,000
Electricity Grid Connection - 220kV Substation PDA	50,200	1.0	50,200	48,000
Electricity Grid Connection - 400kV Substation PDA	75,300	1.0	75,300	33,000
Totals	**348,000**	**1.0 m**	**348,000**	**234,000**

The three peat and soil deposition areas will therefore have sufficient capacity for the total estimated peat and soil storage requirement arising from the PPA and EGC components of the project, even allowing for the bulking and contingency assumptions outlined above, and this conservative conclusion does not assume any on-site re-use of excavated peat and soil.

Peat will be deposited to a maximum height of 1m above ground level in all three PDAs and will be allowed to naturally revegetate once excavations are completed and following the commissioning of the project.

6. Summary

The total volume of excavated peat and soil associated with the Power Plant footprint, substations, Waste water discharge routes and the overhead and underground sections of the Electricity Grid Connections Route, including access routes, has been calculated at about 193,087m^3 (equivalent to approximately 231,702m^3 of material requiring deposition, allowing for excavated materials bulking and contingency assumptions), predominately drained lowland blanket bog in a revegetating cutover bog site.

The potential reuse of excavated peat and soil has been calculated and will be reused on-site. Based on the peat depth, characteristics, and distribution investigations undertaken across the Site and the layout of the Proposed Development, a surplus of peat and soil is expected to be generated by the Proposed Power Plant Development. Where possible, excavated peat will be reused for restoration work during the construction, operation, and decommissioning phases, with any additional peat to be relocated to designed, dedicated Peat Deposition Areas on cut-over peatland.

The three PDAs have a combined peat and spoil deposition capacity of up to 234,000m^3, which exceeds the conservative calculated bulked peat and soil storage requirement of 231,702m^3.

Floating roads and other measures are utilised on-site to minimise the volume of excavation. An ECoW will maintain a record of actual peat volumes excavated and the subsequent peat reuse volumes. This record during the construction, operation, decommissioning phases of the Proposed Development will be made available for review by regulatory authorities as required.

The full Contractor's PSMP will be prepared prior to commencement of construction and with the approval of the Applicant and ABP. Additionally, the PSMP should be read in conjunction with the EIAR and outline CEMP prepared for the Proposed Development.

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