DERREENACRINNIG WEST WIND FARM LIMITED

PROPOSED 20KV GRID CONNECTION TO CONNECT THE PREVIOUSLY CONSENTED DERREENACRINNIG WEST WIND FARM, DRIMOLEAGUE, COUNTY CORK TO THE NATIONAL GRID

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

JUNE 2019

Derreenacrinnig West Wind Farm Ltd
Derreenacreenig West,
Drimoleague
Co. Cork

Jennings O'Donovan & Partners Limited,

Consulting Engineers,
Finisklin Business Park, Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED
Project, Civil and Structural Consulting Engine
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Proposed 20Kv Grid Connection to Connect the Previously Consented Derreenacrinnig West Wind Farm, Drimoleague, Co. Cork to the National Grid	
CLIENT / JOB NO	Derreenacrinnig West Wind Farm Limited	4636
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP)	

	Prepared by	**Reviewed/Approved by**
Document Rev 0	Name Sarah Moore	Name David Kiely
Date June 2019	Signature Sal Moore	Signature David Kiely

DERREENACRINNING WEST WIND FARM LTD., CO. CORK

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

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1 INTRODUCTION

1.1 BACKGROUND TO REPORT

An Application for Substitute Consent is being sought by ESB Networks to regularise planning permission for a partially built gird connection to connect the already consented Derreenacrinnig West Wind Farm to the existing Ballylickey substation in Co. Cork. A separate planning application was submitted to Cork County Council under planning reference 19/10. for that part of the Grid Connection that has not been built.

Jennings O'Donovan & Partners Limited (JOD), on behalf of Derreenacrinnig West Wind Farm Ltd. has prepared this Outline Construction Environmental Management Plan ("CEMP") for the proposed and existing development. This document has been prepared on a preliminary (outline) basis and will be further developed and expanded following the appointment of the Contractor for the main construction works. Some items of this CEMP can only be finalised with appropriate input from the Contractor who will actually carry out the main construction works. This CEMP identifies for the incoming Contractor, the key planning, Environmental Impact Assessment Report (EIAR) and Contract Document constraints that must be adhered to in order to deliver optimum environmental reassurance for the site.

This document should be read in conjunction with the EIAR and Planning Drawings for the various elements of the proposed development.

1.2 PLANNING HISTORY

A planning application was submitted by George O'Mahony for a 10 year planning permission for development of a wind farm comprising seven number wind turbines with a hub height of 55 metres and a rotor diameter of 52 metres, an electrical compound, sub-station building, four number car parking spaces, associated site roads and site works.

Planning permission was granted in October 2011 by Cork County Council under Reg. Ref. 10/857 for a wind farm, comprising 7 wind turbines, an electrical compound and sub-station and all related electrical equipment, subject to 29 conditions. The planning permission was appealed by third parties to An Bord Pleanála who subsequently upheld the grant of planning permission on 05th December 2012, subject to 16 conditions under An Bord Pleanála PL88.239767 Decision.

Following the grant of planning permission, the wind farm developer received a connection offer from ESB Networks in 2014. This connection was accepted as a non-contestable offer which means that the wind farm developers agree that the works would be carried out by the applicant, ESB Networks. ESB subsequently commenced works on the Grid Connection as part of the Overhead Line [OHL] and Under Ground Connection [UGC]. Work to the Grid Connection commenced in October 2017.

Prior to the construction of the grid connection, ESBI carried out an Exempted Development Screening Study for ESBN of the proposed grid connection, to determine whether or not it would fall within the planning exemptions available for such development.

The planning permission for consented Derreenacrinnig West Wind Farm was implemented, and work commenced on site on the 28th August 2017. Civil works at the wind farm site are well advanced although there is no activity at present. Works to the grid connection commenced in October 2017.

1.2.1 Planning History Application Reference 19/0010

A planning application for the construction of the unbuilt grid connection was submitted to Cork County Council in January 2019 under planning application reference 19/10 and is pending consideration. That planning application is for the "*installation of approximately 3.2km of underground cable ducting and associated electrical cabling, approximately 1.2km* of overhead line *…The works, which will take place at separate locations along the 14km grid connection route, are required to completed the grid connection from Derreenacrinnig West Windfarm to the ESB Ballylickey substation."*

The proposals now before the determining authority seek to retain 5 sections of the partially constructed grid connection which consists of overhead lines [OHL] as shown on Drawing No. 4636-P-GCR-00-1.1.

The status of the grid connection which has been partially constructed is as follows:

- OHL already constructed – 9.7 km
- OHL to be constructed 1.2 km
- UGC to be constructed 3.2 km

1.2.2 Statutory Undertaker

Under the Electricity (Supply) Act 1927, ESB were conferred powers as a statutory undertaker to, amongst other things, provide or carry out works for the provision of electricity. Under the Electricity Regulation Act, 1999, which amongst other things established and gave powers to the Commission for Energy Regulation and made amendments to certain provisions of the Electricity (Supply) Act, 1927,

"electricity undertaking" is defined as *"any person engaged in generation, transmission, distribution or supply of electricity, including any holder of a licence or authorisation under this Act,....."*

ESB Networks will design, plan and construct the grid route between the consented Derreenacrinnig West Wind Farm, and the existing ESB Substation at Ballylickey. ESB Networks is an undertaker authorised to provide an electricity service (for the purposes of Class 26 & Class 27 of the Planning and Development Regulations 2001 (as amended) by virtue of its power to provide or carry out works for the provision of electricity.

1.2.3 The Status of The Grid Connection

ESB Networks will carry out the construction of a new 20kV grid connection between the consented Derreenacrinnig West Wind Farm, Derreenacrinnig, Co. Cork and the existing ESB Substation at Ballylickey, Co. Cork. This grid connection route, as shown on Figure 1.1, will cross through the townlands *of Ardrah, Ards More (East), Ards Beg, Barnagowlane West, Ballylicky, Crossoge, Derreenacrinnig West, Dromlickacrue, Derryarkane, Dromclarig, Gortroe, Gortnacowly, Glanareagh, Laharanshermeen, Maulikeeve, Maularaha, and Shandrum More.*

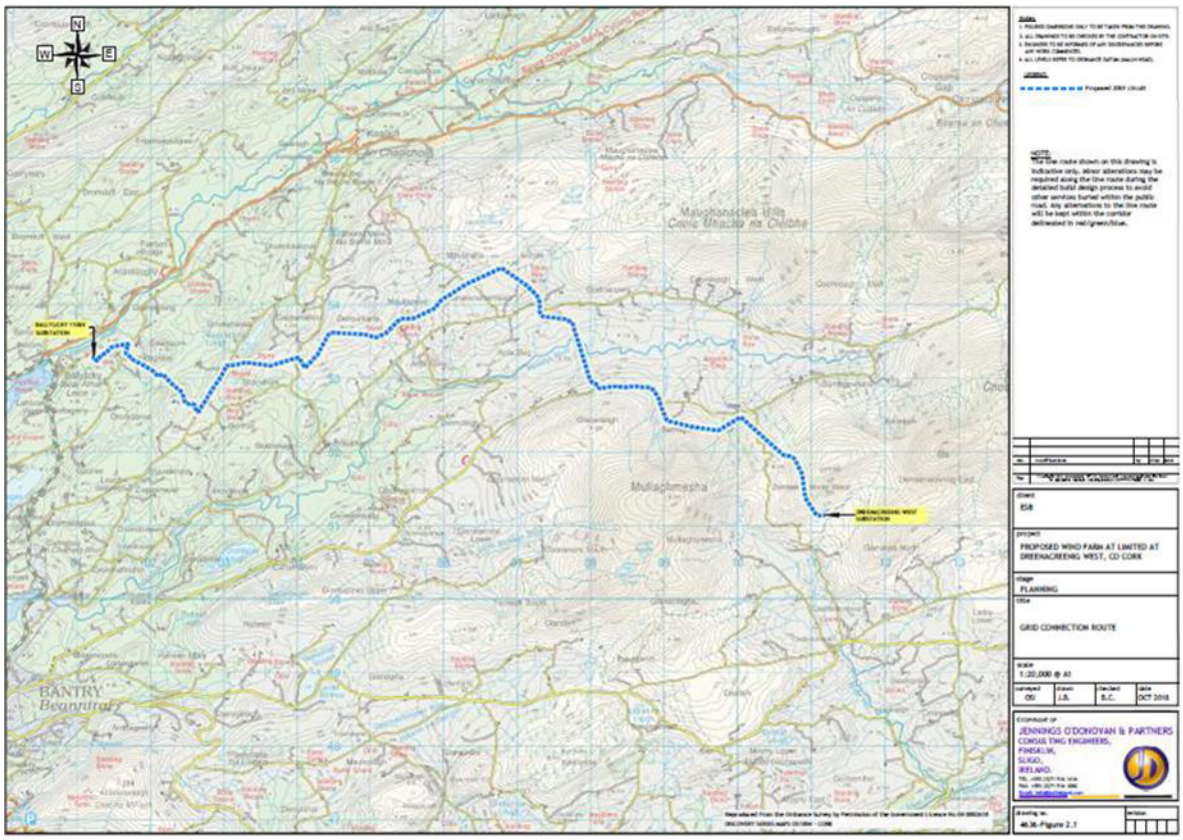

Figure 1.1 Proposed development location of transmission line route

1.2.4 Status of The Grid Connection

The C.13.916 km grid connection is partially complete with most of the poles erected (9.537km) for the overhead lines and wires strung to some poles. Some 1.201 km of overhead line and 3.178 km of underground cables have yet to be constructed as set out on Planning Drawing No. 4636-P-GCR-00-1.1 and Table 1.1.

Table 1.1 Status of the Grid Connection

Element	Total Length (km)	Built (km)	Remaining (km)
OHL	10.738	9.537	1.201
UGC	3.178	0	3.178

1.2.5 Application for Leave to Appeal for Substitute Consent

A separate application for Substitute Consent for the 'existing grid connection' has been made to An Bord Pleanála (Ref: ABP- 302837-18). Therefore, planning permission is being sought only for the proposed grid connection works only. Accordingly, "the project" comprises the permitted turbine and on-site infrastructure development ("the permitted development") and the proposed grid connection development and the existing gird connection.

As set out above the wind farm grid connection consists of a 20kV Electrical Connection (13.916km), of which, 10.738 km is 20kV overhead line (OHL) mounted on single wooden pole sets and 3.178 km is ducted underground power cable in 6 separate locations, so as to connect the Derreenacrinnig West Wind Farm to the existing Ballylickey Substation. The extent of the proposed planning application 'the proposed grid connection is show in **Figure 1.1**

1.3 AIMS AND OBJECTIVES OF A CEMP

This CEMP being prepared to accompany an Application for Substitute Consent under Section 177E of The Planning and Development Act [As Amended].

This CEMP has been developed in accordance with the Institute of Environmental Management and Assessment (IEMA) Practitioner "Environmental Management Plans", Best Practice Series, Volume 12, December 2008 and has been designed to cover the proposed environmental strategies that are to be carried out, before and during the proposed development works. This procedure ensures that whilst work is being carried out that the contractor is solely responsible for ensuring that all aspects of the

environment are managed according to required standards and legislation. It is intended that this outline CEMP will be finalised by the contractor in the form of a detailed CEMP should the works progress to construction stage.

This CEMP aims to define good practice as well as specific actions required to implement mitigation requirements as identified in the Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR), and/or other licensing or consenting processes to include Consultee recommendations. The principal objective is to avoid, minimise and control adverse environmental impacts associated with the development of the proposed 20kV grid connection to the Derreenacrinnig West Wind Farm. This document will act as a continuous link and main reference document for environmental issues between the design, construction and the maintenance and operation stages of the project.

The CEMP is considered to be a live document which will be developed further and / or amended where necessary subsequent to planning consent to take account of planning condition requirements and any information which may be made available from additional consultations, site surveys etc.

The CEMP will form part of the main Civil Construction works Contract. The Civil Contractor will take account of the structure, content, methods and requirements contained within the various sections of this CEMP when further developing this document (to include environmental plans and other related Construction Management Plans) as required by the Contract.

A summary of the CEMP development process and the required input from the main parties involved in the post planning and construction of the wind farm is indicated in Figure 1.2.

As such, the Developer commits to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts associated with the development, construction, operation of the Derreenacrinnig Wind Farm Grid Connection.

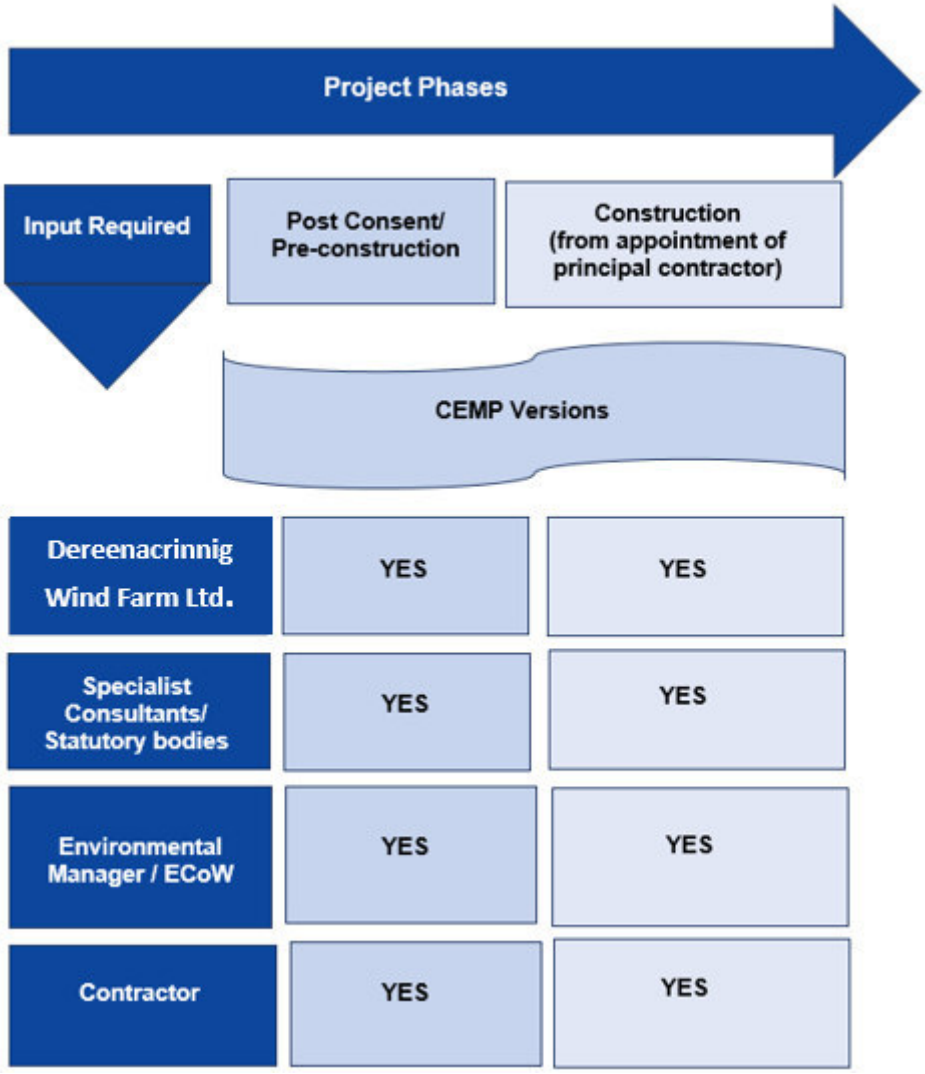

Figure 1.2 Summary of CEMP development process

1.4 CEMP ROLES & RESPONSIBILITIES

Prior to commencement of construction works, the Contractor will identify a core Environmental Management Group, comprising of specific project personnel and including the Ecological Clerk of Works (ECoW). The Environmental Management Group will meet monthly to discuss the monthly environmental report and will advise site personnel on areas where improvements may be made on site. The group will draw on technical expertise from relevant specialists where required and will liaise with other relevant external bodies as required.

The Contractor will appoint an Environmental Manager who will be responsible for coordination and development of the CEMP and any other surveys, reports or construction management plans required for discharge of relevant pre-commencement planning conditions. In conjunction with the ECoW, the Environmental Manager will also review the Contractors construction management plans, method

statements and environmental plans as required by the CEMP, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group and required liaisons between Derreenacrinnig West Wind Limited, the Contractor and other statutory authorities.

The Contractor will appoint an independent Ecological Clerk of Works (ECoW). The main roles and responsibilities of the ECoW relate to compliance monitoring with the CEMP and planning conditions and advice provision in relation to ecological matters. The ECoW will also assist the Environmental Manager.

1.5 REPORTING PROCEDURES

Figure 1.3 provides a diagrammatic outline of the general tasks and communication lines, based on the roles described in Tables 3.2 and 3.3 in Section 3, and tasks detailed in the Management Plans. The Contractor will update this information as part of the detailed CEMP.

The Environmental Incident and Emergency Response Plan (ERP) includes a figure illustrating the communications plan for reporting procedures for all potential environmental risks, hazards or incidents which may relate to ecology, water quality, dust, noise or archaeology.

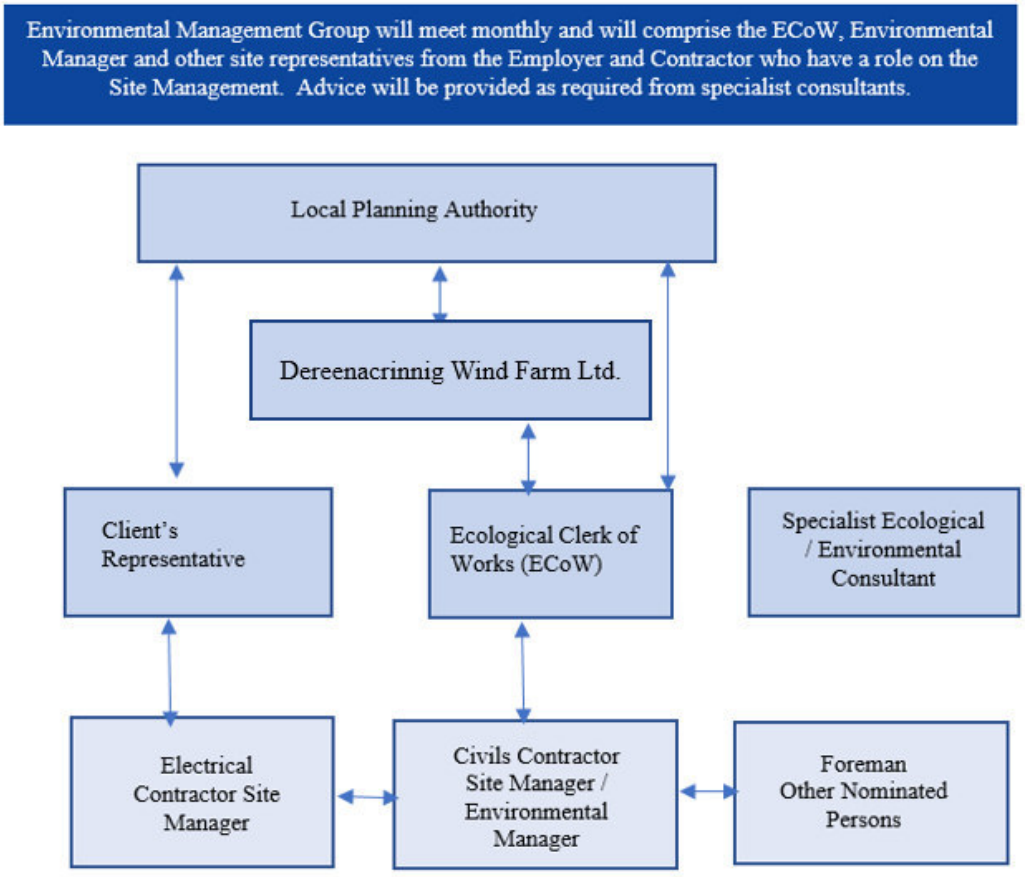

Figure 1.3 General Communication Plan

1.6 CEMP STRUCTURE

The CEMP is divided into discreet Sections which are designed to be filed as separate documents / folders if required. A copy of the CEMP documents / folder(s) will be kept in the site offices for the duration of the site works and will be made available for review at any time. The Contractor's Environmental Manager will be responsible for the CEMP and will keep all sections updated throughout the construction phase.

Where the Contractor has standard documents within his own company / corporate Environmental Management Plans which cover a particular requirement of this CEMP, these will either be inserted, or cross referenced within the relevant Section of this CEMP. An indicative structure of this CEMP is provided at Figure 1.4 below:

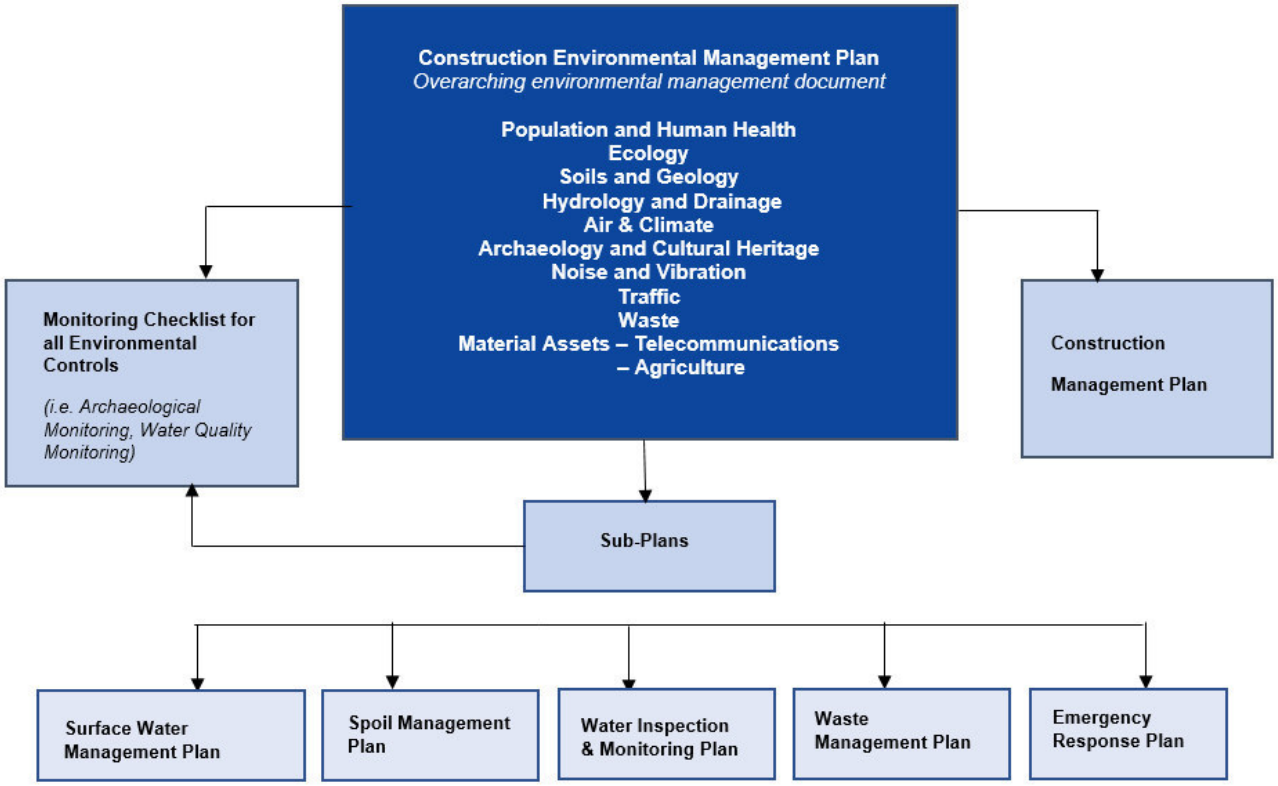

Figure 1.4 Structure of the CEMP and Sub Plans

Sections within the CEMP are listed in Table 1.2 as follows:

TABLE 1.2 OUTLINE OF DOCUMENT STRUCTURE OF THE CEMP

Section	Title & Brief Description	Contractor Development Required
1	Introduction	No (Information purposes only)
2	Project Information Provides details on site location, scheme description. Provides details on relevant Planning History. Any documents prepared by Derreenacrinning West Wind Farm Ltd. in response to Consent will be recorded in Table 2.4. Contains a record of all Scheme Amendments and a Register of Variations.	Yes Any documents prepared by the Contractor in response to Consent Conditions will be recorded by the Contractor in Table 2.4 and inserted in the CEMP where necessary. Any Scheme Amendments and / or Variations to the CEMP required during the works will be recorded by the Contractor in Tables 2.5 and 2.6.
3	Environmental Communications Plan Contains details on specific requirements relating to: • Contact details for Derreenacrinning West Wind Farm Ltd. personnel, technical specialists, Contractor personnel, regulators, landowners, other stakeholders etc. • Meetings, reports and consultations • Roles and responsibilities, and • General reporting procedures and tasks	Yes The Contractor will: i) Insert contact information for regulatory authorities and other stakeholders (where not already provided) into Table 3.1. ii) Refer to Table 3.2 for details on requirements for meetings, reports and consultations. iii) Insert information on Contractor appointments and responsibilities relating to environmental management and implementation of this CEMP into Table 3.3. iv) Refer to Figure 1.3 for a summary of the main communication lines.
4	Correspondence, Records, Reports This Section relates to document control and retention of records. The information at the start of Section 4 provides: • A list of all documents to be retained / filed within the CEMP. Table 4.1 provides a record of all Environmental Consents, Licences and Permits issued for the project.	Yes The Contractor will complete Table 4.1. Throughout the duration of the Contract, the Contractor will insert / file all communication records, data, field records and reports associated with Environmental Management and implementation of this CEMP into this Section 4. This Section may be sub-divided into sub-folders for specific information relating to discrete areas of Environmental Management (such as waste management, pollution prevention, water quality monitoring, ecology etc.). The filing method selected by the Contractor will be made explicit at the start of Section 4.
5	Management Plans & Available Information include the following:	Yes The Contractor is required to develop the Management Plans and/or include additional information or method statements as

TABLE 1.2 OUTLINE OF DOCUMENT STRUCTURE OF THE CEMP		
Section	**Title & Brief Description**	**Contractor Development Required**
	Management Plan 1: Environmental Incident and Emergency Response Plan (ERP) Management Plan 2: Surface Water management Plan (SWMP) As such, the Developer commits to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts associated with the development, construction, operation of the Derreenacrinnig Wind Farm Grid Connection. Management Plan 3: Water Quality Inspection and Monitoring Plan (WQIMP) Management Plan 4: Spoil Management Plan (SMP) Management Plan 5: Waste Management Plan (WMP)	appropriate and where required by the Contract. The development of the Management Plans will generate more site-specific documents which address particular environmental management procedures applicable for works in specified areas of the site. These Management Plans form the Contractor's Environmental Plans (for example, Waste Management Plan). Table 5.1 lists all Management Plans and provides information on Contractor responsibilities.

1.7 CEMP DEVELOPMENT & IMPLEMENTATION

The CEMP takes into account requirements of relevant planning conditions for the construction and operational phases of the development. It is a live document and will be developed further by the Contractor with site specific method statemen and plans as required prior to each phase of the works. It is also effectively a document management system for recording information and data relating to environmental checks, reports, surveys, monitoring data and auditing. Upon completion of the construction works, the Contractor will submit a complete CD/USB pen drive copy of the final CEMP to Derreenacrinnig West Wind Farm Ltd. for their records. This final CEMP will include electronic scans of all hard copy reports, data, field records and correspondence which are gathered over the course of the construction works.

While version numbers will remain fixed depending on the stage of the project, it is acknowledged that the CEMP is a continually evolving document which can be updated in part or whole at any stage of the Project. Hence, revision and document distribution records are included at the front of each CEMP document to enable individual documents to be updated at any time.

A summary of the CEMP development process and the required input from the main parties involved in the post planning and construction of the project is indicated in Figure 1.2.

2 ENVIRONMENTAL CONTROLS

Prior to commencement of construction works the contractor will draw up a detailed Construction Management Plan which will be informed by the guidance documents and best practice measures listed below. This Construction Management Plan will be adhered to by the contactor and will be overseen by the project representative/foreman.

The contractor is required to supply a detailed Construction Management Plan for proposed activities on site which demonstrate how the environmental controls are outlined in the following sections are to be achieved on site. The Construction Management Plan is subject to review and are to be agreed in advance of any works taking place on site. In some instance, with reference to works which may present a risk of sediment release, it will be requirement that the Inland Fisheries Ireland (IFI) are consulted with respect to the development of the Construction Management Plan.

The following documents should contribute to the Construction Management Plan supplemented by specific additional measures proposed below:

- Forestry and Water Quality Guidelines-Forest Service (DMNR, 2000)
- Forest Operations & Water Quality Guidelines (Coillte, 2009)
- Guidelines on Protection of Fisheries during Construction Work in and Adjacent to Water (IFI, 2016).
- Environmental Guidance: Drainage Maintenance & Construction (OPW, 2019).

2.1 POPULATION AND HUMAN HEALTH

Human Health – Air Quality – Mitigation Measures

- Approach roads and construction areas will be cleaned on a regular basis to prevent mud built-up and from migrating around the site and off-site;
- Wheel wash facilities will be provided near the site compound to prevent mud/dirt being transferred from the site to the public road network;
- 'Damping down' will be used if dust becomes an issue on any part of the site;
- Vehicles delivering materials to the site will be covered appropriately when transporting materials that could result in dust, e.g. crushed rock or sand;
- Ready-mix concrete will be delivered to site and it is envisaged that no batching of concrete will take place on site;

- Speed restrictions on access tracks will be implemented to reduce the likelihood to dust becoming airborne;
- Public roads along the construction haul route will be inspected regularly and if dirt/mud is identified that could result in dust generation then the road will be cleaned as necessary;
- Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind where possible and damping down will be carried out where needed; and
- A complaints procedure will be implemented on site where complaints will be reported to the site manager, logged and appropriate action taken.

Human Health – Water Quality – Mitigation Measures

Management of excavation seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:

- Appropriate interceptor drainage, to prevent upslope surface run-off from entering excavations will be put in place;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters;
- The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit;
- There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur;
- Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped and a geotechnical assessment undertaken; and,
- A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites.

Mitigation for hydrocarbon spillages:

- Seal/line sub-soil and bedrock at the Proposed Development Site by laying a proprietary geosynthetic clay liner where infrastructure is to be provided directly on top of bedrock or where the thickness of sub-formation overburden is less than 0.6m;
- On site re-fuelling of machinery at the Proposed Development Site and at those areas of construction works associated with the Haul Route Options will be carried out using a mobile

double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site by a 4x4 jeep to where machinery is located. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. There shall not be any refuelling within a 20m buffer of all site drains. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;

- Fuels stored at the Proposed Development Site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction. No fuel will be stored at those areas of construction works associated with the Haul Route Options;
- The electrical control building should be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;
- The construction plant used should be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages will be contained within Environmental Management Plan. Spill kits will be available to deal with accidental spillages at the Proposed Development Site and at the areas of construction works associated with the Haul Route Options.
- Mitigation for wastewater disposal is as follows: A Wastewater holding tank will be provided at the temporary site compound for the Proposed Development Site, maintained by the providing contractor, and removed from site on completion of the construction works;
- Sewage will be removed twice weekly (or more frequently if required) by a licenced contractor to a designated Wastewater Treatment Plant for treatment and disposal;
- Water supply for the site office and other sanitation will be brought to site;
- No water will be sourced on the site or discharged to the site; and
- No waste water facilities are required at any of the areas where construction work is required associated with the Haul Route Options due to short duration (1-2days) for works at these sites.

Mitigation for release of cement-based products are:

- At the Proposed Development Site, seal/line sub-soil and bedrock by laying a proprietary geosynthetic clay liner where infrastructure is to be provided directly on top of bedrock or where the thickness of sub-formation overburden is less than 0.6m;
- No batching of wet-cement products will occur at the Proposed Development Site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for culverts and concrete works will be used;

- No concrete will be used at those areas where construction works are required for the Haul Route Options;
- No washing out of any plant used in concrete transport or concreting operations will be allowed at the Proposed Development Site;
- Where concrete is delivered to the Proposed Development Site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location;
- Use weather forecasting to plan dry days for pouring concrete; and,
- See that pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

2.2 ECOLOGY

2.2.1 Proposed Grid Connection Route

Originating at the Derreenacrinnig West Wind Farm, the proposed OHL route travels uphill across an area of wet heath occurring on the south-facing slopes of the ridge at Derreenacrinnig West. Descending from the crest of the ridge, the route cuts through 300m of first and second rotation forestry before passing through an area dominated by rough unenclosed grazing and wet heath. The route then travels west along the Mealagh River valley, predominantly through areas of improved pasture and wet grassland. The route turns northwest at Glanareagh hill and crosses the Mealagh River 1km southeast of Ardrah Bridge, before rising up the north side of the valley to Ardrah townland. From here, the route turns southwest again and descends steadily towards Shandrum, crossing areas of improved and unimproved grassland with occasional areas of heath and mature coniferous forestry. Between Shandrum and Ballylickey substation, the route environs are dominated by improved grassland and grassy verge along the margins of the public road in which the underground section of the route will be laid.

2.2.2 Existing Wind Farm Site

The consented wind farm site is located in the townland of Derreenacrinnig West and is situated in West Cork, approximately 5km north-west of Drimoleague. The total area of the site is 121 ha and is characterised by elevations varying from 200mOD to 400mOD. The site consists predominantly of exposed or thinly covered bedrock and upland blanket peat bog/heath. The majority of the study area is underlain by the Gun Point Formation of the Old Red Sandstone Magnafacies (Minerex 2010). Much of the site is grazed by sheep. Peat depth across the majority of the site is >0.5m deep in particular on

the southern slope. Deep peat generally occurs only in pockets with the deepest measuring approx. 3m deep (Minerex 2010).

The northern part of the site drains via a tributary into the Mealagh River, which flows into the sea at Bantry. The southern part of the site is drained by a tributary of the Ilen River which flows into the sea to the west of Skibbereen. The River Ilen is an important salmonid river and contains stocks of salmon and sea trout.

2.2.3 Mitigation

All mitigation measures have been developed in the context of national and international legislative guidance for the protection and management of flora, habitats of conservation importance, fauna and aquatic ecological interest. The description of mitigation measures is provided in terms of mitigation by avoidance, reduction and remediation.

Mitigation by avoidance has therefore sought to maximise the distance to any designated nature conservation sites. This will be achieved as a consequence of avoidance; the actual benign nature of the proposed development; through the implementation of best-practice construction methods; and adherence to all relevant environmental standards and guidance.

Guidelines to be adhered to in the delivery of the CEMP and method statements include the following:

- *'Guidelines on protection of fisheries during construction works in and adjacent to waters'* (IFI, 2016)
- *'Guidelines for the treatment of Badgers prior to the construction of National Road Schemes'* (NRA, 2005)
- *'Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of National Road Schemes'* (NRA, 2006a)
- '*Guidelines for the treatment of bats during the construction of national road schemes'* (NRA, 2006b)
- *'Guidelines for the treatment of Otters prior to the Construction of National Road Schemes' (NRA, 2006c)*
- *'Guidelines for the crossing of watercourses during the construction of national road schemes' (NRA, 2008)*
- *'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* (NRA, 2010)

An Ecological Clerk of Works (ECoW) and Environmental Manager will also be employed for the duration of the construction works.

In advance of works, a detailed CEMP will be prepared by the appointed contractor detailing construction methodologies and appropriate mitigation measures to be implemented across the entire extent of the construction phase. All mitigation measures outlined will be incorporated into the CEMP.

At a more targeted level, method statements will be drawn up by the contractor detailing work practices for precise locations.

2.2.3.1 Proposed Grid Connection Route – Mitigation Measures

- Access roads should avoid crossing large areas of high value habitats such as wet heath and dry heath.

- All construction works should be set back a minimum of 25m from watercourses. No poles or vehicles should be installed or operate within this buffer zone.

- Construction works will be confined to the minimum area possible. Minimum removal of vegetation will take place at pole locations.

- The footprints of all temporary access routes will be kept to the minimum compatible with sound engineering practice.

- Construction traffic and machinery movement will be confined to specific roads and access routes. Construction vehicles to be used on peatland habitats should be of low ground bearing pressure.

- Trampling and the use of machinery on saturated, quaking surfaces will be avoided. The locations of poles will be configured to minimise the number occurring within wet grassland and wet heath and the use of brash mats will be used if required.

- The contractor will provide a method statement for working practices that will be designed to prevent adverse impacts on rivers and other watercourses. Working practices will include standard methods designed to minimise sedimentation and pollution.

- A review of baseline data indicates that the Mealagh River valley at the crossing point of the proposed overhead line is not likely to function as an established commuting route by swans and other vulnerable bird species. However, it is possible that this river valley will be occasionally used by such species. Haas et al (2005) described general principles for protecting birds from collision with overhead lines, including routing of overhead lines as low as possible, for example behind buildings or rows of trees and attach clearly visible markers on the overhead lines posing a high collision risk.

2.2.3.2 Existing Wind Farm Site – Mitigation Measures

Mitigation by Avoidance

Habitats

- Access roads should avoid crossing large areas of intact peat habitats (wet heath/blanket bog) as these are Annex I habitats and in the case of blanket bog Annex I priority habitat. Where peat depths are greater than 0.5m excavations should be avoided in order to avoid impacts to blanket bog and to minimise hydrological impacts to surrounding peat habitats.

Birds

- The Wildlife (Amendment) Act (2000) affords protection to breeding birds by prohibiting the clearance of vegetation during the period 1st March to the 31st of August inclusive except for the clearance of sites for development purposes. As the months of March to June are particularly important for breeding birds, where feasible best practice will be to avoid any clearance of vegetation during this period.

Watercourses

- No turbines will be placed within 50m of any watercourses within the site to prevent any potential impacts on water quality during construction.

- Roads on sloped ground will be positioned so as to cause minimal damage to the natural hydrology by following contours where possible (as opposed to running perpendicular to contours) and by frequent placing of drainage pipes to allow natural diffusion of water.

- The use of sedimentary rocks, such as shale, in road construction should be avoided. This type of material has poor tensile strength and is liable to be crushed by heavy vehicles there by releasing fine sediment materials into the drainage system which are difficult to precipitate and may give rise to water pollution (Murphy, 2000).

- The dispensing of fuel and oil tanks should be confined to one bunded location in order to minimise the risk of damage by spillage.

Mitigation by Reduction

Habitats

- Construction works will be confined to the minimum area possible. Minimum removal of vegetation will take place so as to reduce the area of bare peat. When the foundations for turbines are being excavated, the surface vegetation will be removed in sods which can be

stored (vegetation side up) and later replaced around the foundation platform where bare peat exists. This will ensure a more rapid re-vegetation of bare peat and will help reduce potential soil erosion which could lead to water pollution.

- Excavated peat from turbine and road foundations will not be stored on areas of heath, bog or near streams or drains. The placing of soils on adjacent ground should not be permitted unless the area has been the subject of an in-depth risk assessment. Soil stockpiling operations will only be carried out in confined areas and soils should be vegetated with suitable plants in order to promote stability. If, during excavation, spoil is likely to fall on to adjacent habitats, shuttering boards or geotextile will be used to protect surface vegetation

- Access track and drainage system construction will follow the Coford Forest Road Manual Guidelines 2004. Road width will be kept to the minimum compatible with sound engineering practice.

- Construction traffic and machinery movement will be confined to the roads and tracks that are part of the long-term development in order to minimise unnecessary compaction and erosion of habitats and soil.

Watercourses

- In the event of any watercourse crossing being in excess of 1ft in width Inland Fisheries Board (IFI) should be consulted prior to works commencing. Bridges are preferable to culverts. There will be no drainage or other physical interference with the bed or bank of any watercourse without prior consultation with IFI.

- Sediment control measures will be implemented to prevent the transport of sediment (and other contaminants) into watercourses, by providing a physical barrier or by slowing down the flow rate sufficiently to encourage natural settling.

- On-site attenuation ponds should allow for the settlement of fine/particulate materials. It is particularly important during the construction phase that sufficient retention time in the settlement pond is available to ensure no deleterious matter is discharged to any waters.

- In constructing and designing silt traps particular attention should be paid to rainfall levels and intensity. The silt traps should be designed to minimise the movement of silt especially during intense precipitation events where the trap may be hydraulically overloaded. Silt traps should be located within easy access for monitoring and maintenance.

- Leachate from stockpiles will be treated appropriately and will not drain directly into natural watercourses. Cement leachate, hydrocarbon oils and other toxic poisonous materials will require full containment and should not be permitted to discharge to any waters.

Aquatic Species

- Any watercourses with connections to the Ilen River, which are to be crossed as a result of the proposed development, will be crossed via a free spanning bridge rather than culverted in order to prevent potential impacts to the freshwater pearl mussel. By bridging the watercourses no part of the stream bed or banks will be disturbed minimising the movement of suspended solids. Works in the vicinity of watercourses will be kept to a minimum and will be closely monitored.

2.3 SOILS AND GEOLOGY

2.3.1 Subsoil and Bedrock Removal – Mitigation Measures

Mitigation by Avoidance

- The design of the proposed EIA Development has followed closely the design of the 2010 Permission which took into account the existing geotechnical and hydrological baseline and incorporated the engineering and environmental constraints of the Proposed Development Site at that time. Any variations from the existing design to accommodate the revised turbine dimensions have reflected this, in an updated baseline assessment.
- The soil and subsoil which will be removed during the construction phase will be mounded local to the turbine location and site tracks;
- No turbines or related infrastructure will be constructed in any designated sites such as NHAs or SACs or Features of Geological Significance and such areas have been avoided in the selection of the Haul Route Options; and
- Construction of settlement/attenuation ponds will be volume neutral, and all excess material will be used locally to form pond bunds/walls. These ponds will be retained post construction, i.e. throughout the operational phase to maintain greenfield runoff rates.

Mitigation by Reduction

- The excavation of materials should be minimised as far as possible on-site during the construction phase;
- Spoil removed from turbine locations and access roads will be used for landscaping, cast aside or stored long term at designated storage areas. 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 stored spoil within the storage areas. Re-seeding and spreading/planting of grass will also be carried out in these areas. These measures will prevent erosion of stored spoil in the long term;

- Any excess temporary mounded spoil in storage for long periods will be covered by a polyethylene sheet or seeded at the earliest opportunity. This will prevent erosion of soil. Silt fences will be installed around stockpiles to limit movement of entrained sediment in surface water runoff. The use of bunds around earthworks and mounds will prevent egress of water from the works;
- In order to minimise erosion of mineral subsoils and loss of organic matter, stripping of topsoil will not take place during extremely wet periods (to prevent increased silt rich runoff). Temporary drainage systems will be required to limit runoff impacts during the construction phase;
- Bog mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; and
- Areas to be excavated for widening works along the Haul Routes will be minimised to that required for transport of turbine components. The extent of each area will be verified by a trial run in advance of component delivery.

2.3.2 Storage and Stockpiles – Mitigation Measures

Mitigation by Avoidance

- Apart from designated spoil deposition areas which will be graded, covered in topsoil, and landscaped, there will be no permanent stockpiles of excavated materials left on-site following completion of the EIA Development. Materials will be reused for backfill or landscaping purposes, for example at turbine bases, hardstands and along the edges of access tracks.
- There will not be any permanent stockpiles of excavated materials following completion of the Haul Route widening works.

Mitigation by Reduction

- Any excess temporary mounded spoil in storage for long periods will be covered by a polyethylene sheet or seeded at the earliest opportunity. This will prevent erosion of soil. Silt fences will be installed around stockpiles to limit movement of entrained sediment in surface water runoff. The use of bunds around earthworks and mounds will prevent egress of water from the works; and
- In order to minimise erosion of mineral subsoils, stripping of topsoil will not take place during extremely wet periods (to prevent increased silt rich runoff). Temporary drainage systems will be required to limit runoff impacts during the construction phase.

2.3.3 Vehicular Movements – Mitigation Measures

Mitigation by Avoidance

- Plant and machinery should be restricted to movements within the delineated development footprint.
- In order to minimise erosion of mineral subsoils stripping of topsoil will not take place during extremely wet periods (to prevent increased silt rich runoff). Temporary drainage systems will be required to limit runoff impacts during the construction phase.

Mitigation by Reduction

- On the Proposed Development Site and in areas of works on the chosen Haul Route Option, only plant and machinery selected specifically for construction of the works will be used. Once tasks are completed, plant will be removed from site.

2.3.4 Ground Stability – Mitigation Measures

Mitigation by Avoidance

- Mitigation measures proposed for the Proposed Development Site and the Haul Route Options will involve a geotechnical engineer visiting the sites of works (Proposed Development Site and works on Haul Route) to supervise all excavations and who will also review and approve the appointed contractor's method statement.

Mitigation by Reduction

- Any excavations on identified unstable subsoils (very low likelihood) which could weaken the upslope area of the soil should be supported by a structure such as a buttress, frame or rampart to prevent lateral slippage;
- In any excavations on unstable soil, the pore water pressure should be low at all times. Excessive ponding of water should not be permitted in newly excavated areas and following rainfall events, sumps should be drained to carry water away, thus preventing a build-up of pore water pressure which could potentially lead to instability of the soils; and
- Heavy rainfall events are a catalyst for landslides. Therefore, an emergency response system should be developed for the construction phase. This could involve 24-hour meteorological forecasting where the likelihood of an extreme rainfall event such as a 1:100 year rainfall event, responses such as cessation of construction activity on site until such a time as the runoff has flowed away from the excavations. It is recommended that an automatic rainfall gauge be provided on site for the construction phase.

2.3.5 Soil Contamination – Mitigation Measures

Mitigation by Avoidance

- All construction materials imported to site during the construction period, for example, rock, cement, ducting or cables etc., will be removed from site following completion;
- As far as possible, a balance should be maintained between materials excavated and those brought to site for construction to reduce the need for storage and disposal of waste, particularly foreign materials which may have a different geochemistry or hydrochemistry. Recycling and reuse of materials on-site will be carried out as much as possible. It is envisaged that rock will be sourced from the adjacent quarries to be compatible with the local geochemistry; and
- The appointed contractor will develop the outline Construction Environmental Management Plan (CEMP) specifying the maintenance of plant and equipment, materials storage areas and drainage infrastructure for the duration of the construction phase. The plan will see that the designed measures are operating effectively, outline measures to prevent leakages of substances such as oils, identify issues with the drainage regime, and see that a record is kept of all actions/measures undertaken in the plan for management and audit purposes.
- Hardcore material for use on works along the Haul Route will be sourced from a suitable supplier where the material has a similar geochemistry or hydrochemistry to the area where the works are to take place.

Mitigation by Reduction

- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;
- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;
- On-site re-fuelling will be undertaken using a double skinned bowser with spill kits on the ready for accidental leakages or spillages;
- Fuels volumes stored on site will be minimised. Storage areas where required will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- The electrical compound will incorporate bunded plinths so as to support electrical transformers and other equipment that may contain oils or other potential pollutants. Bunding will have, as a minimum, 110% capacity of the volume of the liquids likely to be stored and will prevent leakage of any associated chemicals and to groundwater or surface water. The compound will be fitted with a storm drainage system and an appropriate oil interceptor;

- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

2.3.6 Subsurface and Underground Effects – Mitigation Measures

- Subsoil and bedrock will be lined with a geosynthetic clay liner where infrastructure is to be laid directly on top of bedrock and where the thickness of sub-formation overburden is less than 0.6m.

2.4 HYDROLOGY AND DRAINAGE

Constructed drainage will be installed **prior** to the main construction activity of the project.

2.4.1 Constructed Drainage – Mitigation Measures

Potential impacts on site hydrology, surface water course hydrology and associated ecologies during construction and operational phases are mitigated by designing a system which causes minimal disturbance to the current hydrological regime and which minimises suspended sediment loading. Reduction of sediment loading is important since the main watercourses drain into the Mealagh River to the north, and the Ilen River to the south which is an important salmonid river. Mitigation measures are required to protect against suspended solid loading of headwater drainage during the construction stage of the project. This is to be achieved by including the following features:

a. Drainage outfall is via indirect buffered outfalls to surface watercourses or onto the bog surface. The drains end by fanning out onto the surrounding vegetation via tapering drains. The tapering drain end should contain hard core material (of local baseline geochemistry) to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, reducing sediment loading to any adjacent water courses and avoiding direct discharge to the watercourse. A minimum buffer width of 50 m should be imposed between the end of the drain fan and water courses. Buffer widths should be designed in line with Forestry Commission Guidelines (Ref. 13, 15) on protection of water courses during forestry operations and management. This method buffers the larger volumes of run-off discharging from the drainage system during periods of high precipitation, reducing the hydraulic loading to water courses and reducing suspended sediment load to surface water courses. Note that any imported hard core or drain material should be of a comparable geochemistry to that at the site, to minimise changes in hydrochemistry.

b. Stilling ponds should buffer the larger volumes of run-off discharging from the drainage system during periods of high precipitation, by retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds should be designed to reduce flow velocity to 0.3 m/s at which velocity silt settlement generally occurs. This reduces the suspended sediment and associated nutrient loading to surface water courses and mitigates potential impacts on plant and animal ecologies.

c. There are a large number of drainage outfalls, discharging either indirectly to surface watercourses or into appropriate wetland habitats via stilling ponds and buffered fanned drains. Discharging at regular intervals mimics the natural hydrology by encouraging percolation and by decreasing individual hydraulic loadings from discharge points.

d. Drainage and associated pollution control measures shall be implemented on site before the main body of construction activity commences. Where possible drainage control should be installed during seasonally dry ground conditions.

2.4.2 Surface Water Flow – Mitigation Measures

Increased Runoff

Additional surface water runoff emanating from the construction phase of the development requires hydraulic runoff buffering. The main reason for concern for additional site runoff is that during the construction phase, surface water drainage is at risk to water quality deterioration. It is essential therefore that an environmental management programme that checks, audits and facilitates repair and in places improvement of the constructed drainage scheme is undertaken as part of mitigation measures for surface water runoff during the operation phase. The following mitigation measures are recommended to protect surface water quality:

a. The site drainage and attenuation system should be installed prior to the main construction activities to control increased runoff in discharging waters from the development areas. This involves the construction of drainage ditches and the installation of settlement ponds and soakaways.

b. A site-specific drainage scheme is required to attenuate hydraulically (flow) and hydrochemically (pollutants) the projected increase in runoff of c.39 m^3/day (worst-case scenario) that would arise from the hardstands created by the proposed development.

c. Exit discharge points from the site should be characterised by stage-discharge curves to provide a baseline reference (at least 12 months) on the range of flows expected from the site. This can be calibrated against rainfall data (site rainfall gauge) for water balance calculations.

d. Surface water flows in all waterways and drainage should not be impeded in any way by the proposed development. Access tracks that intercept existing waterways should have suitably designed culverts installed to maintain baseline flows, large enough to accommodate peak flow in a 50-year return period.

Hydraulic Loading

Hydraulic loading of the existing drainage network by increased runoff discharge from the site will be mitigated by the following:

a. Indirect buffered outfalls to surface watercourses or onto the bog surface. This will reduce individual discharge contributions to the existing drainage network, as well as allow for some percolation of discharge before entering the receptor drainage.

b. Stilling ponds will buffer the larger volumes of run-off discharging from the drainage system during periods of high precipitation, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses.

c. At the access road crossings, culverts / stream crossings that is modelled to take the capacity of a 1 in 50-year storm event with a minimum diameter of 0.9 m should be installed to ensure no blockage or build-up of discharge underneath the road crossings.

Dewatering / Diversion of Drainage

There will be no interception, diversion, infilling or dewatering of water drainage channels by the proposed development; therefore, no mitigation is required.

2.4.3 Surface Water Quality – Mitigation Measures

Release of Suspended Solids

In order to mitigate the impact posed by release of suspended solids to the surface water environment, the following mitigation measures are recommended:

a. Protection of riparian zones around drainage by restricting construction disturbance to outside of 50 m buffer zones from streams and drains. This will protect what vegetation that is in place and provides some filtering of runoff erosion from the site.

b. Buffered drainage outfalls should contain hard core material of similar or identical geology to the bedrock at the site to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, reducing sediment loading to any adjacent watercourses and avoiding direct discharge to the watercourse.

c. Stilling ponds will buffer the larger volumes of run-off discharging from the drainage system during periods of high precipitation, by retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds are designed to reduce flow velocity to 0.3 m/s at which velocity silt settlement generally occurs. This reduces the suspended sediment and associated nutrient loading to surface water courses and mitigates potential impacts on plant and animal ecologies.

d. The drainage and attenuation system should be installed prior to the main construction activities to control increased runoff and associated suspended solids loads in discharging waters from the development areas. This involves the construction of drainage ditches, the installation of silt traps, stilling ponds and the implementation of prescribed buffer zones. Where possible drainage control should be installed during seasonally dry ground conditions.

e. Monitoring of drainage discharge during the construction stage, particularly at all upstream and downstream stream / drain sections relative to stilling ponds is recommended. Monitoring should be undertaken during and immediately following high rainfall events. As part of the construction phase environmental management plan regular checking and maintenance of pollution control measures are required, with an immediate plan for repair or backup if any breaches of design occur.

Risk of Pollution from Hydrocarbons Leakage

- To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, it is recommended where possible to refuel plant equipment off the development site, thus mitigating this potential impact by avoidance.
- If fuelling must occur on site, then a discrete "fuel station" should be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station should be bunded to 110% volume capacity of fuels stored at the site. The bunded area should be drained by an oil interceptor and this drainage will be controlled by a pent stock valve that will be opened to discharge storm water from the bund. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning.
- There is also the risk of leakage from vehicles and plant equipment during construction activity, as opposed to refuelling. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction). This should be part of the site environmental management system (EMS).

Waste Water Sanitation

- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank should be used on site for toilet facilities. This should be maintained by the service contractor on a regular basis and removed from the site on completion of the construction phase. In relation to a water supply for the site office and service area, a drum of fresh water should be brought to the site each day and disposed from the site to a suitable wastewater drainage system. In summary, wastewater of all kinds should be taken off site for disposal / treatment to controlled facilities.

2.4.4 Groundwater Flow – Mitigation Measures

Excavation Seepage / Inflows

- During the construction phase of the project, the development areas should be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots. Any water ingress that may be encountered in the upper weathered zone of the bedrock during the construction phase should be intercepted by a toe drain and diverted after attenuation, to an existing artificial drainage channel or a natural watercourse. The design of the drainage must take into account factors of slope stability and where possible, should be impermeable and closed at the base. Any water ingress that may be encountered in the weathered bedrock / mineral subsoil during the construction phase should be intercepted by an interceptor drain and diverted to the constructed drainage system for pollution control attenuation prior to discharge. This diversion of seepage is likely to be sufficient for most parts of the construction activity. In the case of the turbine bases, some pumping out of the base sumps may be required. All pumped water must be captured and directed to constructed drainage for attenuation. No freshly pumped water must enter the existing drainage network directly or be pumped out onto the adjacent blanket bog habitat.

Lowering of Water Table

- No impact is anticipated on the regional water table as a function of the proposed development; therefore, no mitigation is required.

Dewatering of Wells

- There will be no dewatering or hydraulic impact on groundwater supply as a function of the elevated position of the site and absence of wells from within 2 km of the proposed development. No mitigation is required.

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mineral subsoil during the construction phase should be intercepted by an interceptor drain and diverted to the constructed drainage system for pollution control attenuation prior to discharge. This diversion of seepage is likely to be sufficient for most parts of the construction activity. In the case of the turbine bases, some pumping out of the base sumps may be required. All pumped water must be captured and directed to constructed drainage for attenuation. No freshly pumped water must enter the existing drainage network directly or be pumped out onto the adjacent blanket bog habitat.

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2.4.6 Groundwater Quality– Mitigation Measures

Groundwater Contamination

The main threat to groundwater quality is the introduction of hydrocarbons to the site. In order to mitigate groundwater contamination by hydrocarbons in particular, the following are strongly recommended:

a. No fuel storage should occur on site and that re-fuelling of plant equipment should occur off-site at a controlled fuelling station.

b. If fuelling must occur on site due to logistical reasons, then a discrete "fuel station" should be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station should be bunded to 110% volume capacity of fuels stored at the site. The bunded area should be drained by an oil interceptor and this drainage will be controlled by a pent stock valve that will be opened to discharge storm water from the bund. A suitably qualified management company will manage and maintain the oil interceptor and associated drainage on a regular basis.

c. A construction phase environmental management plan should be in operation to check equipment, materials storage and transfer areas (where applicable), drainage structures and their attenuation ability on a regular basis.

d. If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer must have an approved and certified clean-up consultancy available on 24-hour notice to

contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up.

The following mitigation measures are recommended in relation to non-hydrocarbon potential contamination:

a Wastewater from sanitation facilities will be mitigated by use of temporary and portable sanitary facilities that are self-contained. These facilities will not interact with the existing hydrological environment in any way and they will be maintained, serviced and removed from site at the end of the construction phase.

b Inorganic nutrients such as nitrogen and phosphorus compounds (if present in excavated sediment) will be controlled by attenuation of the suspended solids to which they adsorb to and by retention of discharge waters within stilling ponds to allow peak runoff to recede prior to discharge. It is noted that the baseline surface water chemistry (under low flow regime) indicates low total nitrogen and low, albeit trace concentrations of phosphorus. It is expected overall, that the site is a low nutrient environment; therefore, nutrient loading should not pose a major threat to the site's hydrology or hydrogeology.

c Bacteriological contamination arising from availability of nutrients (e.g. sanitation, livestock etc) will be mitigated by appropriate self-contained sanitation facilities (above) and livestock grazing control on the site overall, but particularly on areas zoned for excavation and development.

d There is low risk of mobilising trace metals that may naturally be present. The potential impact may arise from introduced water percolation with excavated bedrock substrate. Concentrations of trace metals are usually low in the natural environment; however, water quality should be checked for metals concentration before, during and after the construction phase (e.g. S.I. No. 12 of 2001; Ref. 14).

<u>Pollution of Groundwater Supply</u>

Due to the absence of recorded wells proximal to the site, specific measures for resource protection are not required, outside of preventing any deterioration in the existing groundwater body as per requirements of the Water Framework Directive (Ref. 2).

2.4.7 Watercourse Crossings

Watercourses: The proposed electricity line crosses 11 no. watercourses of varied length and order along its journey, c. 13.916km in length. As 9.537 km of the OHL has been built there is only one warter crossing associated with the 1.201 km of OHL cables and 3.178km of UGC "*to be built*". Table 2.1 below details the watercourses crossings by the proposed electricity line, either overhead or

underground. Works will accommodate an underground line for the crossing of the Glanareagh stream order 3.

Table 2.1 Watercourses Crossings for the Proposed Development

River Water Body Code	Name of Watercourse	Segment Code	Order	Overhead / Underground
IE_SW_21M010200	-	21_5455	1	OHL (Built)
IE_SW_21M010200	-	21_5267	2	OHL (Built)
IE_SW_21M010200	Barnagowlane_West	21_5263	2	OHL (Built)
IE_SW_21M010200	**Glanareagh**	**21_5925**	**3**	**UGC (To Be Built)**
IE_SW_21M010200	Mealagh	21-4758	4	OHL (Built)
IE_SW_21M010200	-	21_5329	3	OHL (Built)
IE_SW_21M010400	Maularaha	21_78	1	OHL (Built)
IE_SW_21M010400	Ards_More21	21_79	2	OHL (Built)
IE_SW_21M010400	Maulikeeve	21_3023	1	OHL (Built)
IE_SW_21O070500	Ballylicky	21_1007	1	OHL (Built)
IE_SW_21O070500	Ballylicky	21_21836	1	OHL (Built)

There are a number of methods that can be used in crossing watercourses such as flumes, over-pumping etc. The Contractor will liaise with the IFI to determine which watercourse crossing method is most acceptable.

The Contractor must implement the following to ensure the watercourses are projected during crossings:

- Inland Fisheries Ireland (IFI) have published guidelines relating to construction works along water bodies entitled: 'Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites' and these guidelines will be adhered to throughout the construction of the proposed development.

- Works will not be undertaken during or after heavy rainfall.
- In-stream works at natural watercourse crossings will only be done over a dry period during the months of July, August and September or as advised by the IFI to avoid salmon spawning season.
- Works will only be undertaken during low-flow conditions.
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance to vegetation.
- Where present, a 10m vegetative buffer zone will be maintained between the disturbed area ands and the watercourse bank.
- There will be no storage of materials, equipment, excavated material or overnight parking of machinery within the 10m buffer zone.
- Double silt fencing will be placed upslope of the buffer zone on each side of the watercourse. The silt fencing will have removable 'gates' as required to allow access of the excavator into the site and exit from the site during heavy rainfall or at night.
- The silt fencing will be extended at least 10m upstream and downstream of the crossing location works.
- Bog mats will be used beneath the excavator, inside the 10m vegetative buffer zone, to prevent soil erosion/rutting and potential surface water quality impacts from localised surface water runoff.
- Operation and use of equipment inside the 10m buffer zone will be kept to a minimum to avoid unnecessary disturbance.
- Temporary storage of excavated material will be undertaken outside of the 10m buffer zone on flat ground or within a hollow area. A containment berm will be placed downslope of the excavated material which in turn will be surrounded by secondary silt fence protection to prevent saturated soil from flowing back into the watercourse.
- When in-stream works are complete, the watercourse crossing will be restored to its original configuration and stabilised to prevent bank erosion by means of timber stakes, timber planks and geotextiles as required.
- Disturbance of bankside soils and watercourse sediments will be kept to the minimum required for the cable laying process to avoid any unnecessary impact on the watercourse morphology.

2.4.8 Surface Water Quality Monitoring

- During the construction phase of the project, water quality in the streams and outflow from end points from the drainage and attenuation system should be monitored, field-tested and laboratory tested on a regular basis during different weather conditions. This monitoring along with the visual monitoring outlined below will help to ensure that the mitigation measures that are in place to protect water quality are working.
- During the construction phase of the project, the development areas should be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system to ensure it does not become blocked, eroded or damaged during the construction process

Management Plan 3 in the Appendices outlines the Water Quality Inspection and Monitoring Plan. A detailed version of this plan shall be prepared by the Contractor prior to construction commencing.

2.4.9 Pollution Contingency Plans

An Emergency Response Plan is outlined in the Appendices as Management Plan 1.

2.4.10 Construction Requirements

The Contractor is required to produce a detailed Watercourse Crossing Plan prior to commencement of the works. This plan will take into account the stream crossing information prepared for the Section 50 application from Inland Fisheries Ireland (IFI), as well as any further information that may be obtained during subsequent surveys that may be undertaken prior to construction works commencing (for example further ground investigations, ecological baseline studies etc.).

Specifications of box culverts / pipes to be used in the crossings must comply with the Section 50 an agreed with IFI subsequent to the application being made in advance of works on site.

The Contractor's Watercourse Crossing Plan will be submitted to the Employer (Derreenacrinnig Wind Farm Ltd.), ECoW and IFI for review and approval where appropriate.

The Ecological Clerk of Works (ECoW) will be consulted with regard to all watercourse crossing works. Surveys by the ECoW will be carried out immediately prior to construction so that adequate mitigation is built into the design in respect to fish passage and avoiding impact on downstream ecology.

The Archaeological Clerk of Works (ACoW) will also be consulted with regard to all Watercourse Crossing works. All known sites of Cultural Heritage will be fenced to avoid accidental damage during the construction phase. All groundworks to be undertaken within identified archaeologically sensitive areas will be monitored by the ACoW. All works associated with cultural heritage will be overseen and coordinated by the ACoW.

Prior to the commencement of watercourse crossing works an on-site meeting will be held where deemed necessary. This meeting will be between the *Contractor*, ECoW, EM, ACoW, and Consultees, where appropriate. The purpose of this meeting is to agree specific requirements and working practices at key locations, or for particular structures (culverts).

During the watercourse crossing construction operations, both regular and periodic consultation may be made with the Consultees as required / agreed at this commencement meeting.

2.5 AIR AND CLIMATE

The proposed development may result in a temporary negative impact on local air quality during the construction phase, as a result of localised emissions from construction traffic and dust emissions during dry weather periods.

2.5.1 Air and Climate - Mitigation Measures

Good practice site procedures will be followed by the appointed contractor to prevent dirt and dust being transported onto the local road network. Good practice site control measures are likely to include the following:

- Approach roads and construction areas will be cleaned on a regular basis to prevent mud built-up and from migrating around the site and off-site;
- Wheel wash facilities will be provided near the site compound to prevent mud/dirt being transferred from the site to the public road network;
- 'Damping down' will be used if dust becomes an issue on any part of the site;
- Vehicles delivering materials to the site will be covered appropriately when transporting materials that could result in dust, e.g. crushed rock or sand;
- Ready-mix concrete will be delivered to site and it is envisaged that no batching of concrete will take place on site;
- Speed restrictions on access tracks will be implemented to reduce the likelihood to dust becoming airborne;
- Public roads along the construction haul route will be inspected regularly and if dirt/mud is identified that could result in dust generation then the road will be cleaned as necessary;

- Weather will be monitored so that during periods of dry weather when dust is likely to become airborne, sporadic damping down of access tracks (and other surfaces as necessary) will be undertaken;
- Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind where possible and damping down will be carried out where needed; and
- A complaints procedure will be implemented on site where complaints will be reported to the site manager, logged and appropriate action taken.

2.6 ARCHAEOLOGY AND CULTURAL HERITAGE

- It is recommended that all ground disturbance works required by the scheme in green-field areas be monitored by a suitably qualified archaeologist during the construction phase. This is a standard archaeological mitigation strategy undertaken as part of infrastructure schemes that, while they have no predicted impacts on the recorded archaeological resource, may have a potential impact on unrecorded, sub-surface archaeological deposits or artefacts.
- It is further recommended that archaeological monitoring of the excavation of the underground cable trench in Shandrum Beg townland be undertaken while the trench extends through the combined zones of notification of ringfort (C0105-026----) and radial stone cairn (CO105-058----).

Please note that all mitigation measures are subject to prior approval by National Monuments Service- Department of Culture, Heritage and the Gaeltacht.

2.7 NOISE AND VIBRATION

There are no national Guidelines for construction noise. However, limits for construction noise are generally set below 65 dB LAeq lh with no Sunday operations. The noise from the construction site will be kept well below the aforementioned targets.

The construction of the proposed development will result in some localised noise emissions from construction plant and machinery. Due to the generally transient nature of the construction works, noise will only be experienced on a temporary basis.

2.7.1 Noise and Vibration - Mitigation Measures

Mitigation by Avoidance

- No blasting will be carried out during construction. Heavy construction works such as excavation, rock breaking (if required), use of heavy machinery etc. will be carried out between 08:00 and 18:00 Monday to Friday and on Saturday between 08:00 and 13:00. Heavy construction will not take place on Sundays or Bank Holidays.

Mitigation by Reduction

- Noise levels will be controlled in accordance with the principles of BS 5228:1984 Noise Control on Construction and Open Sites. Construction equipment will be maintained in accordance with the EC (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988, SI 320 of 1988. Heavy equipment will be, where possible, enclosed, located away from sensitive sites and shut down when not in use.

2.8 TRAFFIC

2.8.1 Mitigation Measures

The construction of the proposed UGL within the road network will involve trench excavation, vehicular movements, and traffic diversions. The construction of the UGL is likely to impact traffic flows and movements but will be constructed in accordance with relevant measures discussed below. The following sections discuss the measures which will be implemented to ensure the safety of both construction workers and all road users.

The installation of underground infrastructure is a routine activity and is now a common occurrence in both urban and rural areas. The contractor employed to install the electricity line will liaise with Cork County Council to ensure that traffic management systems are being implemented to the highest standards. The precise method of traffic management applicable to each location of works will be determined by the contractor prior to the commencement of development, following consultation and in agreement with Cork County Council.

The following is a non-exhaustive list of mitigation measures which may be implemented during the construction and installation phases:

- In the first instance, traffic impact has been minimised by designing the cable for installation in pre-laid ducts, rather than directly installing the cable in the ground. The latter would require the entire trench from joint bay to joint bay to be fully open for cable laying. This significantly reduces the period of time during which the trench is open.
- Road traffic management measures such as single lane closures and full road closures will be implemented, as appropriate, on a rolling basis to provide a safe construction environment. The closure method employed will depend on the road width and condition, and minimum width regulations will be adhered to for single lane closures as outlined in "*Guidance for the Control and Management of Traffic at Road Works"* and *"Chapter 8 - Temporary Traffic Measures and Signs for Roadworks*" and in agreement with Cork County Council.
- All work on public roads will be subject to the prior approval of a road opening license application.

- Where a full road closure is required, the contractor, in consultation with Cork County Council and local residents, will implement a suitable and appropriate diversion. The diversion will be accompanied by information signage to advise road users of the diversion route.
- Construction 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.
- All construction vehicles travelling to and from the construction zone (for 'in road' works) will park within the construction zone (approximately 200m long). All drivers will be briefed on general rules associated with the works e.g. no parking in private entrances etc.
- Speed limit compliance will be emphasised to all staff and contractors prior to the commencement of construction during site induction and will be strictly enforced throughout the construction phase.
- Sufficient car parking spaces will be available at the contractor's temporary depot/storage area during the construction phase. No parking of cars by persons associated with the project will be permitted on any part of the public road that is not closed to traffic.
- Road sweeping will be carried out as appropriate to ensure debris does not adversely affect the road condition.
- Appropriate signage will be erected. This will include temporary signage indicating site access, signage notifying locals of the upcoming works, general information signage to inform road users of the nature and location of works and diversions, and signage in local communities providing relevant contact details. Signage will be checked regularly to ensure that it remains in place and is secure. Figure 2.1 below outlines indicative signage for a single lane closure.
- Roads which will be impacted along the proposed route will be reinstated to the agreed specification of Cork County Council.

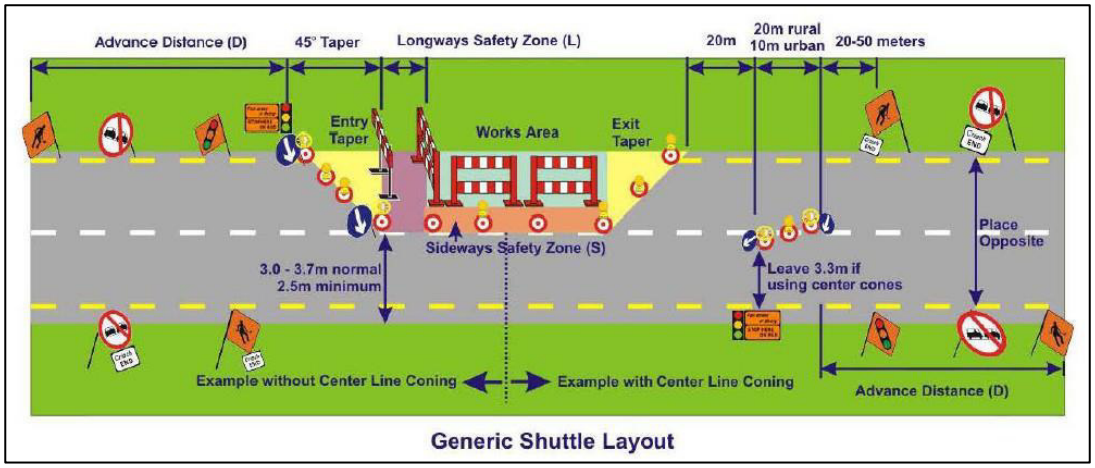


Figure 2.1: Typical Work Zone and Signage for a Single Lane Closure

In summary, there will be intermittent disruption to local traffic during the construction phase of the proposed development. The disruption will be managed to ensure that the level of inconvenience experienced by local receptors is kept to an absolute minimum. Local receptors will be informed of the location and timing of road closures and will be advised of the relevant diversions to be implemented, where required. However, given that direct works within the road network are short, it is unlikely that closures will last in excess of 1 no. day at each crossing location.

2.9 WASTE

There will be some minor instances of waste generation during construction, predominately resulting from packaging associated with materials and products used in the construction phase. Soil excavation and reinstatement methodologies are also relevant to the production of waste. Spoil and excavation have been outlined in Section 2.3 above, and a specific Spoil Management Plan (SMP) has been developed and is outlined in Management Plan 4 of this CEMP. The SMP will be further developed by the contractor prior to the commencement of the development. The following measures will be strictly enforced during construction:

- All waste arising during the construction phase will be managed and disposed of in a manner that complies with the Waste Management Act 1996 and associated amendments and regulations.
- Any excess construction material shall be immediately removed from the area and disposed of to a suitable licensed facility.
- A Waste Management Plan has been prepared (Management Plan 5) and will be further developed by the Contractor prior to the commencement of development.

2.10 MATERIAL ASSETS

2.10.1 Telecommunications-Mitigation Measures

- The contractor will have regard to the detailed design to be provided by the electricity line designer. This design will indicate the location of existing telecommunications infrastructure and services. Appropriate construction methodologies will ensure that the proposed development does not impact upon these services. In the event that the proposed development is located within close proximity to existing services, the service provider will be contacted and consulted with regarding construction methods, realignment or relocation if necessary and reinstatement requirements.

2.10.2 Agriculture – Mitigation Measures

The proposed development is located on private lands which are predominately used for agricultural purposes. The construction phase may result in some minor temporary disruption to landowners during construction but following reinstatement, there will be no long-term impact or significant loss of agricultural land. To ensure environmental impacts do not result, the following measures will be implemented:

- Any required restoration to fences, walls or drains will be completed as soon as practicable following the completion of works.
- Should any fences or walls become damaged, they will be made stock-proof immediately.

2.10.3 Road Network– Mitigation Measures

The developer will be required to lodge a bond with the local authority to offset the full cost of repair to the public roads used for access to the site. Should the local authority deem such a repair necessary the developer would be required to repair any damage to the roads that has arisen as part of the development pending more permanent repair after construction is complete.

However, due to the high standard of roads on the haul route to the site, it is not expected that there will be any significant damage to the roads.

Other measures that should be undertaken to minimise road impact include:

- Any road works/modifications involving the public roads would be discussed and agreed with the roads section of Cork County Council prior to the commencement of the development.
- A structural assessment of all bridges and culverts on the local road should be carried out prior to commencement of construction. Smaller culverts can be temporarily strengthened by placing steel plates on the road surface to give a better distribution of vehicle loads.
- The condition of all bridges, culverts and road surfaces should be continuously monitored throughout the construction period. In the event that any deterioration is observed, appropriate remedial action should be agreed with the roads department of Cork County Council and completed as soon as practical.
- Prior to delivery of turbine components, any overhanging hedgerows should be cut back.
- Abnormal load permits shall be acquired by the turbine supplier prior to delivery, and where necessary, Garda escorts will be utilised to assist the delivery of the largest loads.
- Warning vehicles will be used for the delivery of all large turbine components.
- A trial run to the site with an empty turbine delivery vehicle should be carried out prior to the turbine delivery. Should the trial run highlight any problematic areas, the additional work required would then be discussed and agreed with Cork County Council.

2.10.4 Proposed Grid Connection– Mitigation Measures

- The line route will be designed by ESB to ESB specifications. Within the site, all on site cabling will be underground so no impact is predicted within the landholding boundary.

2.10.5 Borrow Pit– Mitigation Measures

- The borrow pit areas and extraction methodology should be reviewed by a geotechnical engineer prior to construction. Borrow Pit excavations have the potential to undermine the up-slope component of a peat and / or unstable subsoil slope. This should be sufficiently supported by buttress, frame or rampart to resist lateral slippage.
- In the borrow pits pore water pressure should be kept low at all times and careful attention should be given to the existing drainage and how structures might affect it. In particular, ponding of water should not be allowed to occur in excavations. All deliberate or incidental sumps must be drained to carry water away from the sump following rainfall. Prior to excavation, drains should be established to effectively drain grounds before earthworks commence. Such drains should be positioned at an oblique angle to slope contours to provide for ground stability.
- An oil interceptor will be located on the inner perimeter of the borrow pit drainage system to capture accidental hydrocarbon leaks from construction plant within the borrow pit. This is a precaution due to the expected intensity of plant operations within the borrow pit area. Blasting of bedrock will not be carried out in the borrow pit.
- The Borrow Pits will be re-instated with excess peat from the wind farm construction phase. This will allow for regeneration of the natural habitat. By using the uppermost layer (acrotelm layer < 0.3 m) from the excavated peat as the top layer of the re-instated peat, re-vegetation of the area should be accelerated which will also accelerate the stabilisation of the re-instated peat.

2.10.6 Borrow Pit– Mitigation Measures

- Mitigation by avoidance was used by the design team when completing the layout for the proposed Derreenacrinnig West Wind Farm. No turbines were located in the afforested areas; this reduced the number of trees to be felled. No other mitigation measures are required as the forest is of low ecological values outlined in EIAR Chapter 5: Flora and Fauna.

2.10.7 Air Traffic– Mitigation Measures

- Although no significant impacts are predicted, it is standard policy of the IAA Safety Regulation Division to request an Obstruction Survey for wind farms. This survey is designed to collate data on the height, latitude, longitude, elevation and dimensions of any structures or feature that the IAA deems necessary. An Obstruction Survey will be undertaken at the preconstruction phase.

- However, private air traffic, which may not follow routes to or from these airports, may use this airspace and it is considered prudent to fix each wind turbine with flashing warning beacons before they are erected. The IAA will be consulted on the type of beacon and their installation prior to the erection of the turbines and mast. The IAA will also be issued with the grid coordinates of the turbines upon completion of the project.

2.11 CONSTRUCTION SEQUENCE

The outline construction period and the Contractor's proposed sequence of works will take due cognisance of the requirements of any stipulated Planning Conditions and by the Contractors Contractual obligations.

2.11.1 Phasing of Works

Prior to the commencement of construction, the contractor will prepare method statements and work programmes that outline a detailed phasing of works. Due to the nature of the development, it is likely that a number of construction crews will be working along the route at any one time. These crews will be suitably spread across the route to ensure that cumulative traffic related impacts are not experienced by local residents, landowners or businesses. The developer's Project Manager and contractor's Project Manager will ensure that the phasing of work is undertaken in accordance with the prepared method statements and in accordance with a detailed works programme to be prepared and agreed with the Local Authority prior to the commencement of development.

2.11.2 Working Hours

The working hours for the construction and installation of the transmission will typically be between 08.00 and 20.00 Monday to Friday and 08.00 and 18.00 on Saturdays. No works will be undertaken on Sundays or Bank Holidays, except where emergency environmental or safety remedial works are required. Any works which may be required outside of these hours will require the prior approval of the Local Authority.

2.11.3 Site Management Procedures and Methodologies

The contractor will be required to prepare targeted method statements for proposed activities on site which demonstrate how the management requirements set out in this CEMP are to be achieved on site. The following sections outline the construction activities which are proposed during the construction of the proposed grid connection.

2.11.4 Overhead line

The proposed OHL will traverse private lands for c. 10.738km with the OHL crossing over predominantly agricultural lands but also a number of public roads, watercourses and rivers. The OHL will require the erection of 188 no. wooden pole-sets (12-16m) along the proposed route from which the electricity line will be suspended. The proposed OHL will require 3 No. separate cables being suspended from the poles.

Pole and line installation works will be standard for a 20kV ESB overhead line:

- Poles are carried from adjacent roadways to each erection site and placed into an excavated hole using a wheeled or tracked excavator fitted with a pole grab attachment

- The pole hole is manually backfilled and tamped down to a minimum depth of 1.0m until the backfill is capable of supporting the pole; the excavator then continues the backfilling and tamping

- Where rock is encountered, the pole hole is formed using a hydraulic rock-breaker attachment mounted on the excavator

- Where the line changes direction and at pole set locations with poor ground conditions, stay wires will be required. These wires are supported by means of stay blocks, which are made of wooden sleepers and are buried underground

- Stringing of the conductor involves pulling out polypropylene rope along the route by hand, attaching the conductors and then pulling into position with stringing machine.

2.11.5 Underground Line

Six discrete sections of underground ducted line occur along the proposed grid connection route including:

- 201.5 metres of underground cables from Ballylicky Substation
- Approximately 624.5 metres of underground cable in Crossoge and Dromlouglin townlands
- Approximately 1.081km of the grid connection route will be ducted along the verge of the existing local road at Glencreagh
- 112.3 metres in the townland of Gortnacowley
- 1046 metres within the carriageway of the road at Glanareagh
- Approximately 113 metres of Grid Connection at Derreenacrinnig West

The 20k V underground power cable construction type is 20kV XLPe cable to be ducted according to ESB Networks 'Specification for the Installation of Ducts & Structures for Underground 10-20kV Power Cables & Communication Cable'. The 20kV power cable will be laid in a single 125mm diameter uPVC duct in a cable trench.

The proposed UGL will traverse c. 4.95km of 'open country' along the proposed route and generally follows existing hedgerows. Cable ducts will be placed within a trench approximately 1.2m deep and 0.6m wide. An outline of a typical trench is shown in Figure 2.2 All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials (topsoil, subsoil) will be stored separately for use during the reinstatement of the trench or disposal to an appropriate licensed facility as necessary. The trench will then be reinstated with excavated materials. The proposed sequence of works is as follows:

- All trenching works shall be undertaken to ensure that only short sections (approximately 100m) are open at any one time.
- Excavate the trench to the required dimensions, approximately 1.2m deep and 0.6m wide.
- Place a 65mm blinding layer at the base of the trench.
- Place and joint the cable trefoil 110mm HDPE power ducts using cable ties at 3m intervals.
- Lay in and compact a 280mm layer of leanmix concrete CBM4 around and above ducts; and place a 400mm wide red marker strip above.
- Install a single 110mm HDPE communications cable duct.
- Lay in and compact an additional 200mm of CBM4 and place another 400mm wide red marker strip above.
- Final backfill layer (excavated material if suitable) to include 500mm wide yellow warning tape 300mm below the finished surface.
- Appropriate reinstatement.

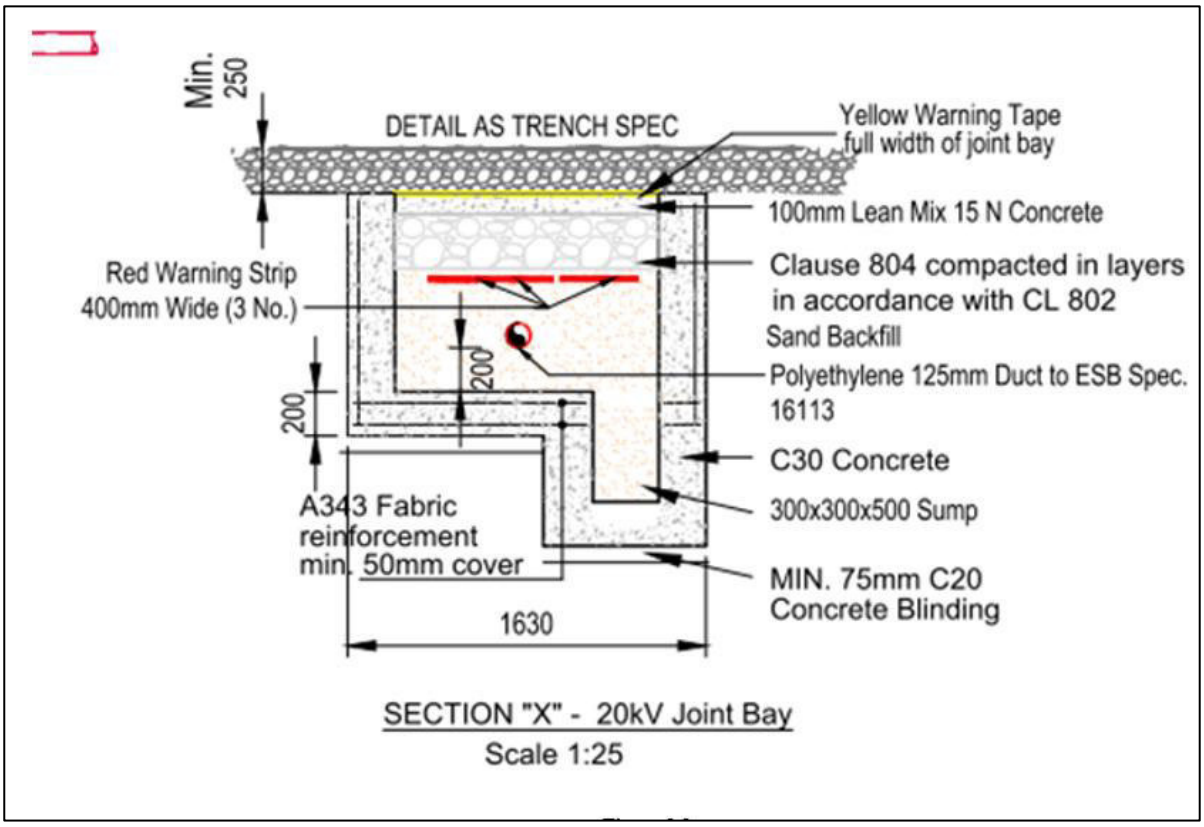


Figure 2.2 Typical Trench Detail

Joint bays and communication bays will be provided approximately every 700m along the UGC route to facilitate the joining of electrical cables and fibre optic communications cables. These bays/chambers consist of precast concrete structures which will be set into an excavated area and surrounded by appropriate fill, see Figure 2.3. The bays will be finished to below road level and reinstated in accordance with the Local Authority requirements. The communications bay will also include an access cover to facilitate access should it be required.

A detailed method statement will be provided by the contractor outlining the precise methodology to be put in place during the ducting phase. This method statement will be reviewed by the Environmental Manager (to be appointed by the contractor) and Ecological Clerk of Works (ECoW) to ensure that the environmental protective measures to be implemented are suitable and to the required standard.

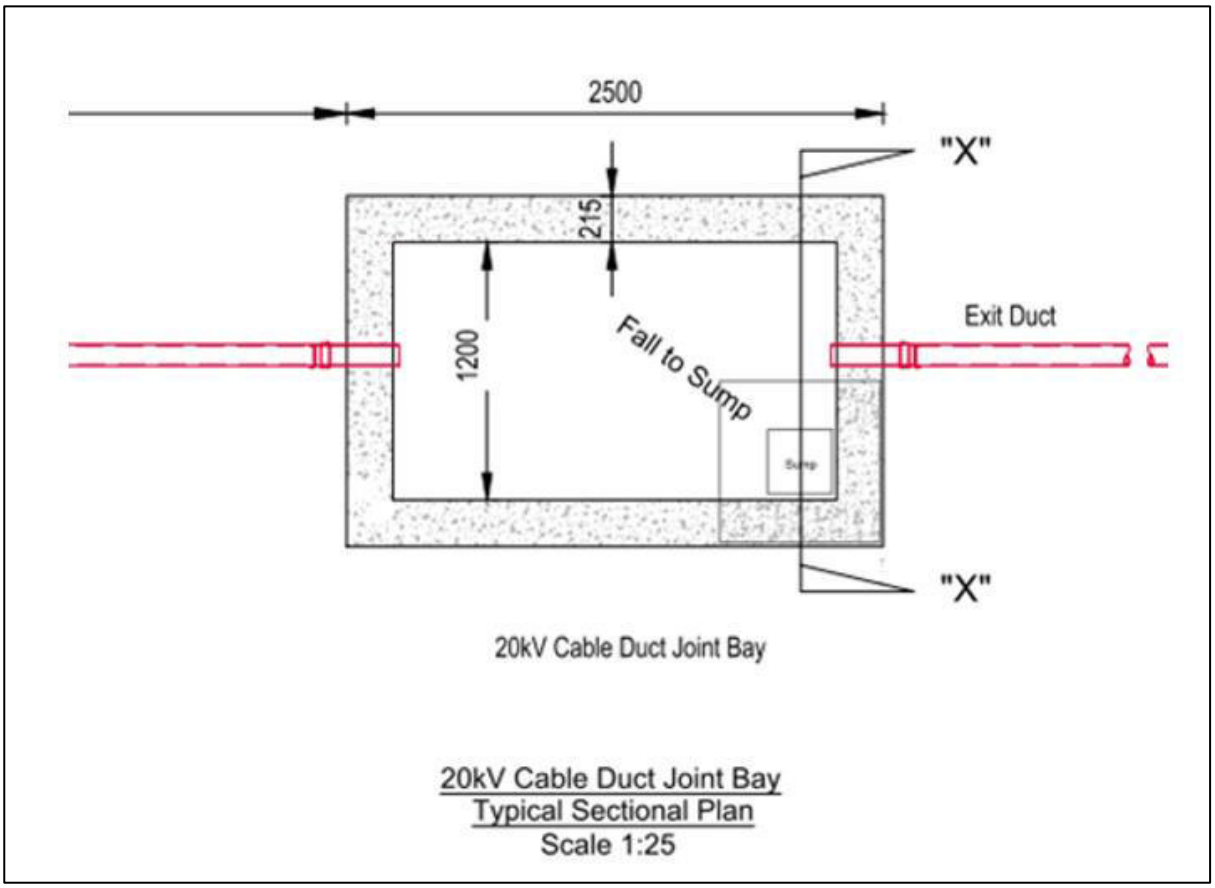


Figure 2.3 Typical Joint Bay Detail

Plates 1 & 2: Typical Trench Construction (Note: Proposed works within public road network relate to road crossings)

2.12 PLANNING CONDITIONS AND OUTLINE CONSTRUCTION MANAGEMENT PLANS

This CEMP and its future versions/revisions will form part of the Contract for Derreenacrinnig Wind Farm Grid Connection. It will therefore be updated and revised during the different stages of the Grid Connection development. Table 2.5 will list all the planning conditions associated with the planning permission should it be granted.

The Contractor will consider all of the mitigation measures and best practice construction methods detailed within the above consents in his design and in any detailed environmental plans as required by this CEMP or the Contract.

Where any mitigation measures or construction methods described in other documents deviate in any way from those contained within this CEMP, the Contractor will abide by whichever is the most onerous and stringent in terms of environmental protection.

TABLE 2.2 RELEVANT PLANNING CONDITIONS AND RELATED DOCUMENTATION		
Condition No.	**Planning Condition**	
1.		
2.		
3.		
4.		
5.		
6.		

2.13 SCHEME AMENDMENTS

Scheme Amendments will be recorded in Table 2.3. These amendments do not include changes to the scheme design which are completed in accordance with the existing planning consent; instead, this refers to changes in the design of the grid connection for which additional approvals and / or consents may be required from Cork County Council. For example, amendments to track layouts or pole locations outside of approved micrositing boundaries as per the current planning application.

The purpose of recording Scheme Amendments here is to provide a record of any changes in the design and siting of the grid connection infrastructure such that any associated environmental impacts and mitigation measures may be appropriately instigated through this CEMP.

TABLE 2.3 SCHEME OF AMENDMENTS			
Reference	**Date**	**Scheme Amendment Description**	**Environmental Sensitivities Potentially Impacted by Scheme Amendment.**

2.14 REGISTER OF VARIATIONS

Where any amendments and variations to the Management Plans and CEMP are required (either as a result of Scheme Amendments or through corrective actions or improvements noted and undertaken on site) these will be recorded in Table 2.4, Register of Variations. Furthermore, all changes to construction methods, design, mitigation and the implications of these changes and authorising personnel will be recorded in Table 2.4.

TABLE 2.4 REGISTER OF VARIATIONS			
No.	**Variation Description**	**Authorising Personnel**	**Completion Date**

3 COMMUNICATION PLAN

3.1 INTRODUCTION

Both the Contractor and the Client will appoint Project Managers to the Derreenacrinnig Wind Farm grid connection project. These Project Managers will be the main points of contact between the two parties. The Contractor's team will report directly to the Construction Project Manager, with all Derreenacrinning West Wind Farm Ltd.'s staff reporting directly to the Project Manager.

It is envisaged that main project communications will take the form of structured reporting arrangements and meetings.

All issues in relation to environmental management/monitoring will be reported to the Site Environmental Manager/Engineer. The Site Environmental Manager/Engineer shall report to the Contractor and Derreenacrinning West Wind Farm Ltd. on a regular basis.

3.2 COMMUNICATIONS CONSULTANT

In advance of any works commencing on site, the developer will appoint a dedicated Project Liaison Officer (PLO) for the duration of construction works. The PLO will be responsible for advising local residents of impending works, road closures, traffic diversions, and any other queries which may be forthcoming from local residents, landowners or businesses.

It is proposed that the PLO will conduct house-to-house calls at all dwellings along the proposed route to advise of the upcoming works and to inform residents of traffic diversions, if necessary. Signage will be erected during the works to inform the general public that works are ongoing. These signs/posters will include information about the project and the PLO's contact details to ensure that any queries from the public can be responded to in an appropriate manner.

All staff will be advised to direct any queries from the public to the PLO or developer's Project Manager and to ensure that all interactions are recorded on the site register.

Relevant departments, including the Environment Section, Roads Department and Planning Department, within Cork County Council will be contacted in advance of the commencement of works and will be consulted throughout the duration of construction activities. In addition, where it is deemed necessary to consult with statutory consultees (e.g. Inland Fisheries Ireland), such consultations will take place in advance of and throughout the duration of construction.

3.3 CONTACT SHEETS

Table 3.1 provides a list of all Derreenacrinning West Wind Farm Ltd., Contractor and relevant third-party contact details. This table will be updated prior to construction and kept current by the Contractor for the duration of the Contract.

TABLE 3.1 CONTACT SHEETS

Company	Position	Name	Telephone
Derreenacrinning West Wind Farm Ltd.	Client Project Manager		
Contractor	Site Manager / Environmental Manager		
Contractor	Contracts Manager		
Contractor	General Manager		
Contractor	Foreman		
Contractor	Ecological Clerk of Works		
Contractor	Environmental Clerk of Works		
TBC	Construction Project Manager		
Contractor	Project Liaison Officer		

3.4 MEETINGS REPORTS AND CONSULTATIONS

Table 3.2 lists all meetings and consultations as required by the Contract. The table also provides details on the schedule/frequency, scope & objectives and attendees / responsibility for each meeting.

All Contractors and their appointed Environmental Manager (EM) /Resident Engineer (RE) and the ECoW shall coordinate and collaborate fully with all other Contractors and their appointed EM/RE for the duration of the works.

3.5 ROLES & RESPONSIBILITIES

Roles and responsibilities for environmental management, monitoring and reporting are detailed in Table 3.3.

The Contractors Site EM/RE will be responsible for the delivery of all elements of the Environmental Management Plan.

The Site EM/RE will retain all responsibility for issuing, changing and monitoring the Environmental Management Plan.

TABLE 3.2 - MEETINGS, REPORTS AND CONSULTATIONS			
Meeting/Report	**Schedule/Frequency**	**Scope & Objective**	**Attendees/Responsibilities**
A Record of all meetings, checks, permissions and licenses will be retained within Section 4 of this CEMP			
Site Inductions	All new site personnel and visitors	To provide that all entrants to the site are aware of safety, environmental and managerial requirements and procedure.	Contractor to organise and maintain records
Weekly Environmental meetings	Weekly	To provide updates on environmental mitigation measures and performance and identify actions for improvement. The EM is required to maintain a Pollution Prevention Measures Register (PPMR) in which mitigation measures put into place will be listed and checked weekly to assess the requirement for maintenance. The results of these checks will be discussed at the meeting and corrective actions agreed as required.	Attendance required: ECoW, EM, Site Manager, and any other relevant personnel or statutory consultees where necessary.
Monthly Environmental Report & Monthly Environmental Management Group Meeting	Monthly	To provide a compiled record of weekly meeting minutes and environmental performance and monitoring results (e.g. air, noise or water quality monitoring as appropriate). To identify any areas / action for improvement.	To be prepared by EM. Report to be issued to the Contractor and Construction Project Manager before the end of each calendar month. Report to be discussed at the monthly meeting with recommendations for improvement passed to the Contractor in written format.
Final Environmental Report	Upon completion of construction works	The final report will document the environmental and ecological effects of the construction period. The evidence for effects will be based on findings included in the minutes of weekly meetings and monthly meetings, together with other recording information maintained by the EM. The report will relate results to residual effects predicted in the EIS.	The Final Report will be prepared by the EM. The report will be made available to the Contractor, Construction Project Manager and Planning Authority, if required.
Environmental Checks and Monitoring of Mitigation Works	As required in advance of construction works regular checks should also be made at least every 14 days	Environmental Checks are to be carried out in advance of construction works. This will comprise an on-site meeting / inspection to confirm the appropriate use of identified mitigation measures and highlight any further issues /	Environmental checks will be undertaken by the Contractor, supervised by the ECoW and EM where appropriate. The ECoW/EM may also undertake regular checks, either independently or

TABLE 3.2 - MEETINGS, REPORTS AND CONSULTATIONS			
Meeting/Report	**Schedule/Frequency**	**Scope & Objective**	**Attendees/Responsibilities**
		measures which may be relevant prior to commencement of works in any area. As a minimum, Environmental Checks will be completed at each main piece of site infrastructure (construction compounds, sub-station, control room) prior to works commencing in that area. Advance checks will be undertaken no less than every 100m of constructed or upgraded access track. Environmental Checks will include: • Checks for visual evidence of contamination / sediment alongside watercourses, nearby working areas and in areas of surface water discharge. • Regular checks of all plant and equipment to identify any oil or fuel leaks to confirm the condition of the plant. • Inspection of drainage and erosion and sediment control measures. Additional checks should be made before, during (where safe to do so) and immediately following anticipated storm events or periods of continuous or heavy intermittent rainfall over one or more days. • Environmental checks will also encompass a review of – Waste management procedures – General site tidiness –Temporary materials storage (extracted materials stockpiles) and restoration works and – Land stability – Signs of any mammal activity on site	in conjunction with the Contractor's checks as required. The Contractor and ECoW/EM will retain a record of all inspections / findings of Environmental Checks within Section 4 of this CEMP. All records will be made available for audit / review. All records will also be made available for discussion during regular meetings as scheduled herein.

TABLE 3.2 - MEETINGS, REPORTS AND CONSULTATIONS			
Meeting/Report	**Schedule/Frequency**	**Scope & Objective**	**Attendees/Responsibilities**
		–Buffer zones (if any) are being maintained – Monitoring of any new Third Schedule Part 1or 2 species within the entire route of the grid connection and all access to sites, tracks, roads and substations.	
Environmental Audit	At least once every month		Environmental Audits may be carried out by the Contractor, Derreenacrinning West Wind Farm Ltd. at any time during the works. Audit procedures and forms are included within Section 4 and 1. These will be followed / completed by the Employer when undertaking environmental audits and may also be adopted by the Contractor, unless alternative procedures and forms are submitted and approved as part of the Contractor's detailed CEMP.
Liaison with regulator / Statutory Consultees	As Required	Provide regular updates to relevant authority on environmental performance and maintain good working relationships with the regulatory bodies.	Contractor and ECoW/EM where required. Meetings will be initiated as required by Planning Condition, Management Plans or as agreed throughout the duration of the construction phase. The Contractor is responsible for obtaining all relevant permissions, consents, licenses and permits. Some permits may require application and implementation by an appropriately qualified person. In these instances, the Contractor will consult with the ECoW, or other specialist Environmental Consultants where required.

TABLE 3.3 - ROLES AND RESPONSIBILITIES	
Position	**Roles and Responsibilities**
Construction Project Manager	The Construction Project Manager will: See that the Contractor has obtained the relevant approvals and licenses and consents from regulatory bodies and statutory consultees where required. Ensure that the Contractor has submitted all relevant documentation to the ECoW and Project Environmental Manager, liaise with the Site Manager and the ECoW/EM and ensure that corrective actions and variations to the CEMP have been instigated.
Project Site Manager/Engineer	The Site Manager will provide liaison between the ECoW/EM and the Contractor where environmental sensitivities, instruction for environmental performance improvements or corrective actions are requested by the ECoW, EM or other appropriate person(s) as a result of environmental checks or audits conducted by these person(s). The Site Manager will see that all notifications of environmental sensitivities and incidents as well as other general observations on environmental performance are reported back to the Construction Project Manager. The Project Site Manager is responsible for review and further development of the CEMP.
Environmental Manager	The Environmental Manager will work alongside the ECoW and will be a member of the Environmental Management group and will work with the Contractor to ensure compliance with best practice and with all environmental mitigation and monitoring requirements as detailed within the relevant planning conditions, compliance documents and CEMP during both the pre-construction and construction phases. The main roles of the EM are as follows: • Organise start-up meeting / Toolbox talks with the Contractor to agree working methods, specifically including communications; schedules; monitoring of data storage; and preparation of plans indicating location of key features including mitigation measures, monitoring points and sensitive habitats (where not previously highlighted and approaches agreed). • Give toolbox talks as agreed with the site contractor to address key areas, including water pollution prevention, protected species management, and on-site biodiversity. Highlight to staff the requirement for compliance with planning conditions. • Undertake a pre-construction walkover with the Site Engineer / Site Manager to confirm that access routes remain appropriate to the conditions present at the time of construction • Delineate any sensitive habitats or features with wooden stakes and high visibility tape • Undertake or delegate to an appropriately qualified person, a pre-construction Invasive Alien Species survey along the works route • Monitor the installation of poles and infrastructure • Inspect pollution control measures during the works • Maintain a presence on site during the pre-construction and construction works, including setting out of access routes. • Organise a minimum of weekly meetings with the Site Environmental Supervisor and / or Foreman, to allow briefing on the programme of works on site and to provide on-site guidance during construction. • Identify environmentally sensitive areas and ecological hazards for demarcation by the Contractor. • Develop written reports / audits and submit to the Contractor and present findings at meetings as required. Prepare updated reports and a final report on mitigation measures, procedures and monitoring. • Monitor potential environmental impacts and the successful implementation of all mitigation as detailed in the NIS and this CEMP.

TABLE 3.3 - ROLES AND RESPONSIBILITIES	
Position	**Roles and Responsibilities**
	The Contractor will provide comprehensive information on all proposed works and all scheduling to the EM in advance, in order to anticipate and address any issues, especially access to new areas including areas where Invasive Alien Species (IASs) may occur, vegetation clearance, setting out of buffer zones, excavation and silt mitigation measures, temporary compound works, watercourse crossings and vegetation reinstatement. **Note:** If failures occur and actions are taken which contravene legislation then the Project Ecologist has the power to stop works in the affected area with immediate effect. These actions will only be taken where appropriate. Notification to stop works will be by verbal means, followed up with written confirmation recording the time and date of the instruction, personnel involved and reasons for the instruction. Upon recommencement of works, details of any corrective actions and / or remedial measures implemented will be recorded within Section 4.
ECoW: Ecological Clerk of Works and/ or Water Quality Specialist	The ECoW will work with Derreenacrinning West Wind Farm Ltd., the Contractor and the EM to see that compliance is achieved with best practice and with all environmental mitigation and monitoring requirements as detailed within the NIS and CEMP, relevant planning conditions, FEI and CEMP. The EM will delegate and oversee the work of the ECoW to ensure competency of tasks achieved. Where a particular ecological concern exists at the site, or specific habitat management activities are to be undertaken in conjunction with the main civils construction works, a Specialist Ecologist / Environmental Consultant may also be required unless the ECoW is suitably qualified to undertake the particular ecological responsibilities. The main roles of the ECoW are as follows: • Maintain a weekly presence on site during the main construction works • Prepare a pre-construction Invasive Alien Species survey along the works route • Identify environmentally sensitive areas and ecological hazards for demarcation by the Contractor. • Produce written reports to the Contractor following site visits and meetings. This includes monthly reports and a final report.
Specialist Ecologist/ Environmental Consultant	Where a Specialist Ecologist / Environmental Consultant is employed, this person(s) will: • Provide advice and maintain regular liaison with the Project Site Manager, Project Manager, ECoW, EM, and Contractor and / or other specialist Environmental Consultant as and when required. • Undertake specific monitoring activities and reporting as defined in agreed documentation prepared as part of the planning process. • The ECoW or a Water Quality Specialist will be appointed and report to the EM. They will have responsibility for fulfilling the requirements of the Water Quality monitoring Plan, including: • Daily visual inspection of access tracks for signs of ground damage or solids escape to nearby watercourses in vicinity of construction works

TABLE 3.3 - ROLES AND RESPONSIBILITIES	
Position	**Roles and Responsibilities**
	•The ground between the structure under construction and the nearest downslope watercourse for signs of solids escape or ground damage • Surface water features in vicinity of construction works • Any pollution control measures at structures and along access tracks (e.g. silt fences, drain or stream crossings etc.) for evidence of contaminated run-off or mitigation failure • Attendance at the critical work phases including, access track construction, foundation excavation, watercourse crossings, concrete pouring and back-filling. • Collection and analysis of water samples at a number of monitoring locations (i.e. upstream & downstream of the 5 no. instream work locations) before, during (if potential pollution visually identified) and after construction works at that location • EPA Q Value Biological Monitoring at 5 no. monitoring locations (i.e. upstream & downstream of instream construction work locations) before and after construction works.
ACoW Archaeological Clerk of Works	The main roles of the ACoW (licenced) are as follows: • Maintain regular liaison with the Project Site Manager, Project Manager, Ecologist and Environmental Manager as appropriate. • Maintain liaison with officers of the Local Planning Authority, specifically the Council Archaeologist and Planning Officers as appropriate. • Where applicable apply for licence application; the Minister for Dept of Culture Heritage and Gaeltacht can approve and issue a licence under Section 26 of the National Monuments Act 1930. • Facilitate compliance with planning conditions and agreed Archaeological Programme of Works. • Demarcate any archaeologically sensitive areas and set up exclusion zones as required on site. • Immediately notify the relevant authorities in the event of the discovery of archaeological finds or remains and suspend works in the immediate area pending consultation. Allowance should also be made for full archaeological excavation if required; • Complete a full report for submission to the Planning Authority and the Department of Arts, Heritage and the Gaeltacht on completion of the works.
GCoW Geotechnical Clerk of Works or Appointed Geotechnical Consultant	The GCoW will be responsible for preparation and monitoring of a geotechnical risk register as well as specific duties relating to geotechnical issues as they may arise during site construction works. Soil instability and the potential for slide even can have a significant impact on environmental receptors. In completing the geotechnical risk register, the GCoW will work with the Contractor to identify suitable mitigation and monitoring methods. Where possible, construction works will avoid causing change to local hydrological and hydrogeological flow patterns and water levels.

Contractor Appointments	
Construction Manager	[The Contractor is required to specify roles and responsibilities for each individual below]
Site Agent	[To Be Confirmed]
Foreman	[To Be Confirmed]
Environmental Manager	[To Be Confirmed]
Other Nominated Person(s)	[To Be Confirmed]

3.6 TRAINING, AWARENESS AND COMPETENCE

All site personnel will receive environmental awareness information as part of their initial site briefing. The detail of the information should be tailored to the scope of their work on site. This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The CEMP will be posted on the main site notice board during the project. The environmental performance at the site will be on the agenda of the monthly project management meetings for the project. Elements of the CEMP will be discussed at these meetings including objectives and targets, the effectiveness of environmental procedures etc. Two-way communication will be encouraged by inviting all personnel to offer their comments on environmental performance at the site.

3.7 EMERGENCY PREPAREDNESS AND RESPONSE

An emergency preparedness and response procedure is required to prevent environmental pollution incidents. Suitable spill kits and absorbent material for dealing with oil spills will be maintained on site. In the event of pollution or potential risk of pollution, Cork County Council and Inland Fisheries Ireland will be informed immediately. In the case of water pollution, in addition to the above the Environmental Protection Agency will also be informed immediately. In the case of new developments in relation to badgers on site, the Department of Culture, Heritage and the Gaeltacht will be informed by the local NPWS ranger.

4 CORRESPONDENCE, RECORDS & REPORT

4.1 REQUIREMENTS

The Contractor will insert / file all communication records and reports associated with Environmental Management and implementation of this CEMP under this Section 4. As a guide, the following sub-sections of filed information will be required (at a minimum):

4-A) Meeting minutes and attendance record

4-B) Weekly Environmental Reports

4-C) Monthly Environmental Reports

4-D) Environmental Checks

4-E) Audit Reports

4-F) Ecology documentation and monitoring records

4-G) Pollution Prevention, including a Pollution Prevention Measures Register

4-H) Water Quality documentation and monitoring records

4-I) Archaeology documentation and monitoring records

4-J) Ground Risk, including a Geotechnical Risk Register

4-K) Waste Management documentation

4-L) Licensing and Consents: copies of all permissions, consents, licenses and permits and related correspondence. A summary record of all such documents shall also be provided as per Table 4.1 of this CEMP.

4-M) General Correspondence: all other relevant internal and external communication records relating to environmental management issues and implementation of the CEMP.

4-N) Training Records

4-O) Toolbox Talk Records

4-P) Environmental Manager Reports

4-Q) Weekly report for daily haul route inspections

All of these documents and records will be made available for inspection in the site office. The documentation will be maintained and will be reviewed on a regular basis with revisions controlled in accordance with the site quality plan.

TABLE 4.1 RECORD OF ENVIRONMENTAL CONSENTS, LICENSES AND PERMITS ISSUED		
Consents, Licenses & Permits	Governing Legislation	Licensed Activity
Pollution Control & Hydrology		
Biodiversity		
Waste Management / Contaminated Land		
Noise / Vibration		
Archaeology		
Transport		
Other		

4.2 ENVIRONMENTAL AUDITS

The Contractor's EM will consult and assist with the Client EM in evaluating compliance with applicable legislation by means of a monthly Environmental Audit.

A blank Environmental Audit Report form is included in Management Plan 1 – Emergency Response Plan (ERP).

All completed audit report forms and records of corrective actions (and close outs) must be filed within this Section of the CEMP.

4.3 ENVIRONMENTAL CONSENTS, LICENSES & PERMITS

The Contractor's EM (or otherwise nominated responsible person(s), in conjunction with the ECoW and ACoW, will complete the summary record for all applicable permissions, consents, licenses and permits obtained for the site. This record will follow the format provided in Table 4.1.

4.4 ENVIRONMENTAL MONITORING AND MEASURING

The Contractor will put in place a program of environmental monitoring for dust, noise, vibration and water sampling in accordance with the requirements of the CEMP.

Copies of all records will be maintained in the site office and will be reviewed by the Contractor.

4.5 NON-CONFORMANCE, CORRECTIVE AND PREVENTATIVE ACTION

Non-Conformance Notices will be issued where there is a situation where limits associated with activities on the project are exceeded, or in the case of an internal/external complaint associated with environmental performance.

Non-Conformance is the situation where essential components of the Environmental Impact Assessment report (EIAR) and Construction Environmental management Plan (CEMP) are absent or dysfunctional, or where there is insufficient information on or control of the activities and processes to the extent that the functionality of the EIAR and CEMP, in terms of the policy, objectives and management programmes, is compromised.

Correction will be required in order to improve the identified non-conformance. The EIAR and CEMP and all components must conform to Management Plans, objectives and targets and the requirements of the ISO 14001 management standard. In the event of non-conformance with any of the above, the following must be undertaken:

- Cause of the non-compliance
- Develop a plan for correction of the non-compliance
- Determine preventive measures and ensure they are effective

- Verify the effectiveness of the correction of the non-compliance

- See that any procedures affected by the corrective action taken are revised accordingly.

Responsibility must be designated for the investigation, correction, mitigation and prevention of non-conformance.

5 MANAGEMENT PLANS & AVAILABLE INFORMATION

5.1 MANAGEMENT PLANS

Various Management Plans have been prepared as listed in Table 5.1 and attached at the end of this CEMP. These are intended to provide a benchmark for best practice and to define Derreenacrinning West Wind Farm Ltd.'s minimum requirements for environmental management and mitigation.

5.2 CONTRACTOR REQUIREMENTS

The Contractor is required to further develop the Management Plans into detailed site and works specific environmental plans, method statements and procedural documents. Table 5.1 provides a summary of the content of the Management Plans and the Contractor's obligations for their further development.

TABLE 5.1 - LIST OF MANAGEMENT PLANS

Management Plan 1	Emergency Response Plan (ERP)	The Contractor will prepare a detailed Emergency Response Plan. This will include procedures for dealing with containment of accidental chemical or fuel spills, potential overload of the drainage system by silt during unforeseen adverse weather conditions. *The Contractor will also prepare an Emergency Communication Plan for emergency response in the event of a pollution spillage.
Management Plan 2	Surface Water Management Plan	The Contractor will further develop the Water Quality Management Plan outlining measures to prevent run-off of silt or any other pollutants from the site to watercourses. The proper storage and bunding of any oils/hydrocarbons will be outlined and buffer zones from watercourses. *The Contractor will carry out a detailed survey of the one remaining watercourse crossing at the detailed design stage and prepare a detailed Watercourse Crossing Plan. The Contractor is responsible for liaison with the OPW and IFI to determine all authorisations required. *The Contractor will develop detailed method statements for the protection of waters at each precise location within this development. *Detailed method statements will also be prepared for the underground line crossing for the watercourse in this development. *Detailed method statements will be prepared for the proposed instream works in this development.

TABLE 5.1 - LIST OF MANAGEMENT PLANS		
Management Plan 3	Water Quality Inspection and Monitoring Plan (WQIMP)	The Contractor is required to produce a detailed version of the WQIMP which shall be submitted to Inland Fisheries Ireland for approval prior to commencement of construction. The Contractor will carry out a detailed survey of all remaining watercourse crossings at the detailed design stage and prepare a detailed Method Statements for each crossing. The Contractor is responsible for liaison with IFI to determine all authorisations required.
Management Plan 4	Spoil Management Plan	The Contractor will further develop the SMP. It will include the details of all spoil to be excavated, monitoring during construction, storage, disposal and reinstatement methods to avoid water pollution. * An Invasive Alien Species (IAS) survey should be carried out by the ECoW or appropriately qualified invasive species personnel on the footprint of the entire site, inclusive of all access tracks and areas where vegetative disturbance will occur, prior to works commencing. Where IAS are encountered, a follow-up IAS Management Plan will follow.
Management Plan 5	Waste Management Plan (WMP)	A WMP is intended to implement reduction and effective management of resources and waste during the early design stages of the Grid Connection construction, through to completion, such that legal compliance is met; project build costs are minimized; a framework for continuous improvement and best practice is implemented and maintained; and carbon emissions and other negative environmental impacts associated with the production and management of waste materials are minimized. The WMP provides an outline of the minimum requirements to be contained within the Contractor's detailed WMP. It also provides an outline of the anticipated waste management procedures and routes that may apply during construction. In preparation of the detailed WMP, the Contractor will liaise with Cork County Council to determine requirements for, and to obtain, licenses and consents associated with waste management and foul water discharge from the site where appropriate.
na	Induction Schedule	* The Contractor is required to produce detailed Site Induction Procedures.

MANAGEMENT PLAN 1

Emergency Response Plan

DERREENACRINNIG WEST WIND FARM LIMITED

PROPOSED 20KV GRID CONNECTION TO CONNECT THE PREVIOUSLY CONSENTED DERREENACRINNIG WEST WIND FARM, DRIMOLEAGUE, COUNTY CORK TO THE NATIONAL GRID

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Emergency Response Plan (ERP)

June 2019

Derreenacrinnig West Wind Farm Ltd
Dreenacreenig West,
Drimoleague
Co. Cork

Jennings O'Donovan & Partners Limited,

Consulting Engineers,
Finisklin Business Park, Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED
Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Proposed 20Kv Grid Connection to Connect the Previously Consented Derreenacrinnig West Wind Farm, Dimoleague, Co. Cork to the National Grid	
CLIENT / JOB NO	Derreenacrinnig West Wind Farm Limited	4636
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP) Emergency Response Plan (ERP)	

	Prepared by	**Reviewed/Approved by**
Document Draft	Name Sarah Moore	Name David Kiely
Date	Signature Sal Moore	Signature David Kiely

CONTENTS

1. INTRODUCTION

1.1 Why have an Environmental (Incident & Emergency) Response Plan?

Many construction and industrial sites intrinsically have the potential to cause significant environmental harm which could threaten water supplies, public health and wildlife in the event of an environmental incident. The aim of this plan is to see that in the event of an emergency, quick action will limit any impacts on humans and the local environment.

This response plan forms part of the conditions of work for staff, and for every contractor or sub-contractor at the site.

1.2 Outline of this Environmental (Incident & Emergency) Response Plan

The information contained in this plan forms the Environmental Incident & Emergency Response Plan (ERP), part of the Outline/Preliminary[1] Construction Environmental Management Plan (CEMP) for Derreenacrinnig West Wind Farm Grid Connection.

It contains details of:

- Who should be contacted in an emergency?
- Procedures to be followed in an emergency
- Staff responsibilities in an emergency

1.3 What is an Environmental Incident?

This plan should be instigated once there has been an emergency or environmental incident on site or elsewhere linked to the construction of Derreenacrinnig West Wind Farm Grid Connection. Such an incident is a discharge to air, land or water that could cause environmental damage. Causes of environmental incidents on site include:

- Leaking plant or equipment
- Containment Failure
- Fire
- Land Slide
- Vandalism
- Overfilling of containment vessels
- Flooding on site
- Leaking Portaloo
- Discharge of raw or partially treated effluent

[1] The terms 'Preliminary' and 'Outline' are used interchangeably throughout this report.

- Wind-blown waste, litter or dust
- Fuel drips or spills during refuelling
- Leak from fuel or chemical containers
- Contaminated water or sediment/silt entering a water course or drain
- Failure of pumps and pipelines

Any of these incidents could affect drainage systems, surface waters, aquatic ecosystems, groundwater and soil. These incidents could also affect air quality by producing toxic fumes and airborne pollutants which may damage human health, wild and domestic animals and ecosystems.

1.4 Reference Documents

Current legislation has been taken into account into the production of this Plan and will be accounted for in the further development of the Contractor's Construction Management Plan.

This plan has been developed alongside other Management Plans that form part of the preliminary Construction Environmental Management Plan (CEMP) including a:

- Surface Water Management Plan (SWMP)
- Water Quality Inspection and Monitoring Plan (WQIMP)
- Spoil Management Plan (SMP) and a
- Waste Management Plan (WMP)

2. GENERAL REQUIREMENTS OF AN ERP

As mentioned, environmental incidents may include flooding, spillages (oil and chemicals), contaminated run-off, riverbed disturbance, damage to underground services, damage to habitats, poor waste disposal and storage.

This ERP provides:

- An outline of the construction works and references to relevant existing environmental plans
- Summarises local environmental sensitivities
- Identifies key mapping reference points for the site
- Identifies key staff and 24-hour contact details to be contacted in the event of an emergency

- Identifies key external bodies and emergency response numbers who should be contacted in the event of an emergency
- Details an Inventory of Chemical Products and Waste Inventory on Site*
- Details an Inventory of Pollution Prevention Equipment
- Provides details of staff trained in the use of spill kits and booms etc.
- Provides details of reporting requirements
- Provides detailed procedures to be followed in the event of an emergency and details staff responsible for re-positioning and moving of plant
- Provides a summary sheet for operatives outlining key actions in the event of an emergency. This will be available to all operatives on site.

*****_Because of the nature of wind farm grid connection construction operations and the nature of works on site, the potential pollutants will vary. Therefore sections 4 and 5 will be continually updated at the site office_.

3. CONSTRUCTION WORKS AT DEREENACRINNIG WIND FARM GRID CONNECTION

Derreenacrinnig Wind Farm grid connection will comprise of a 20kV Electrical Connection (13.916km), of which, 10.738 km is 20kV overhead line (OHL) mounted on single wooden pole sets and 3.178 km is ducted underground power cable in 6 separate locations, so as to connect the Derreenacrinnig West Wind Farm to the existing Ballylickey Substation. The c.13.916 km grid connection is partially complete with most of the poles erected (9.537km) for the overhead lines and wires strung to some poles. Some 1.201 km of overhead line and 3.178 km of underground cables have yet to be constructed

The consented Derreenacrinnig Wind Farm consists of 7 wind turbines, an electrical compound and sub-station and all related electrical equipment. Civil works at the wind farm site are well advanced although there is no activity at present.

In addition to the reference documents listed in Section 1.4 of this document, various site investigation reports have been written. These include:

- John Cronin Associates (EIAR Archaeological and Cultural Heritage Chapter
- Doherty Environmental (EIAR Biodiversity Chapter)
- Jennings O' Donovan (Natura Impact Statement, 2017)
- ESB International (Natura Impact Statement, 2016)

- Jennings O' Donovan (Environmental Impact Assessment Report)

4. INCIDENT & HAZARD REPORTING

A reporting system has been developed for reporting environmental incidents or hazards for the site. These reports will be logged so that they can be regularly revised and form part of the response plan procedural review.

The last page on this report has attached a blank environmental incident report that should be completed in the event of an accident/incident. This includes details of all non-compliance and corrective actions carried out as a result of any incidents.

5. WASTE DISPOSAL AFTER ENVIRONMENTAL INCIDENCES

If spill kits etc. are used in the event of a pollution incident, operatives need to carefully dispose of used equipment by carefully placing them in a sealed bag or container. They should then be removed from site by a licensed waste contractor as per the Waste Management Plan (WMP).

6. SITE INDUCTION AND TOOLBOX TALKS

It is imperative that all contractors, sub-contractors and staff on site are fully familiar with this ERP and it will be detailed regularly in Toolbox Talks. During these talks, they will also receive regular reminders of the importance of the local environment and of the necessary environmental controls that are in place on site.

7. SUMMARY SHEET FOR MACHINERY & PLANT OPERATORS

This summary sheet is for all site personnel. A laminated copy will be kept on all site vehicles/ machinery.

7.1 Procedures to be followed in the event of an incident:

The following procedures are intended as a guide in dealing with incidents. Health & Safety guidance should be followed at all times applying common sense and ensuring the health & safety of yourself and others:

1. Identify the source of the spillage and cut off source if possible, e.g. by closing valve, righting container etc.
2. Work on site will cease and all operatives will assist in placing spill mats on the affected area. Site Manager/ Main Contact should be notified.
3. Identify where spillage may go. If spillage is near a watercourse (drainage/ditch/ river) divert spillage away from the watercourse through the use of absorbent materials from the spill kit.
4. SUSPENDED SOLIDS CONTAMINATION OF WATERCOURSE. If watercourse is at risk of contamination from suspended solids from a slope failure, do as follows:

   a) Place straw bales wrapped in geotextile or sand/gravel bags with geotextile curtains **immediately** in the watercourse(s) at regular intervals downstream from the incident. These sand/straw bags and bales will be removed and replaced with stone filters once water quality is stabilised.

   b) Stone check dams faced with a layer of geotextile will be constructed at critical points along the watercourse.

   c) Small sumps will be formed intermittently between the check dams to reduce the amount of suspended solids contained in the water.
5. OIL SPILL IN WATERCOURSE. If spill has reached the watercourse, do as follows:

   a) Place flexible absorbent booms across watercourse, ahead of the contamination within a quiet stretch of water.

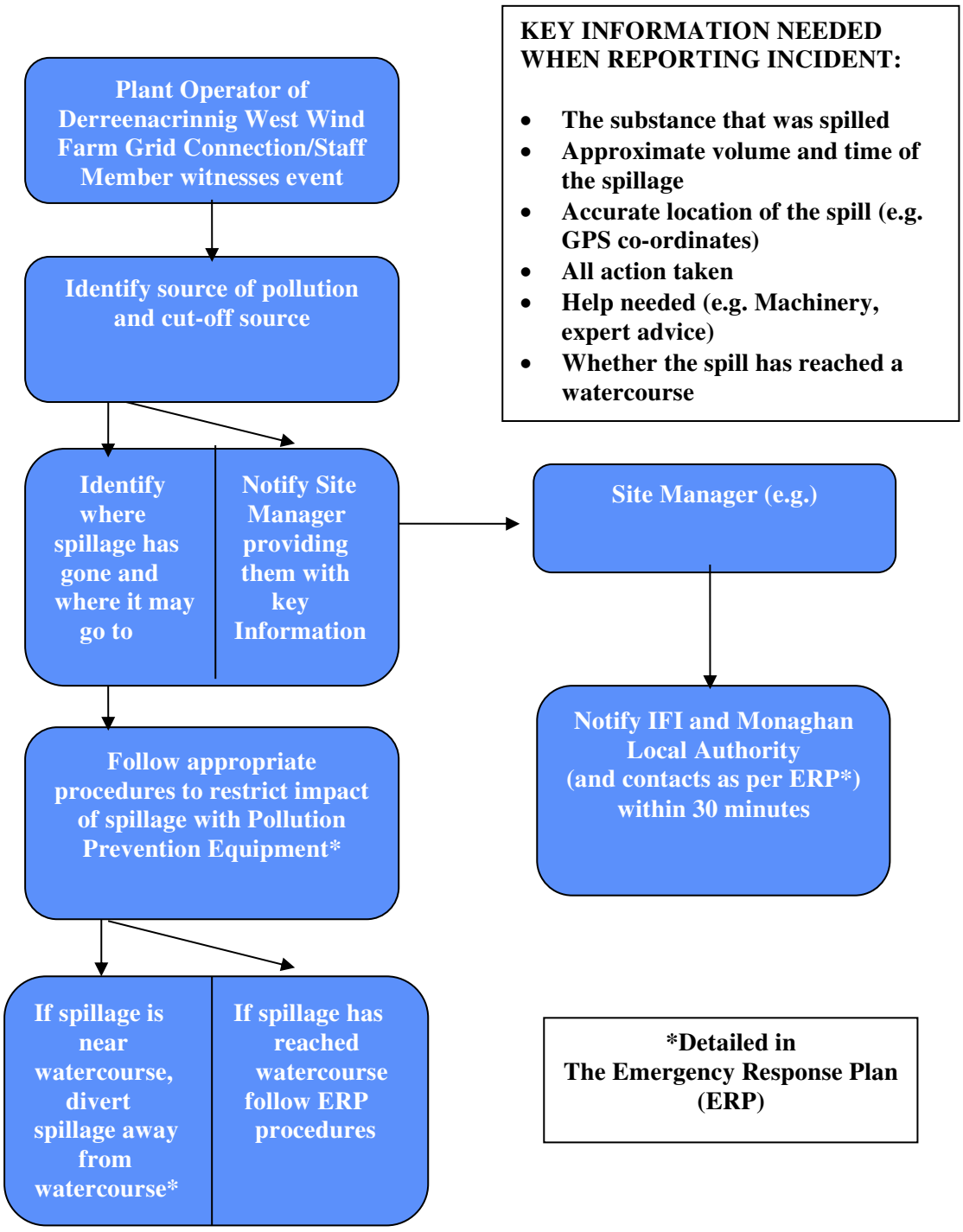
   b) Place absorbent cushions in the water immediately upstream of these booms as well as downstream of the booms.

   c) Remove and replace saturated absorbent material as required. Please ensure removed cushions are placed in sealed polythene bags/containers and disposed of by the principal waste contractor.
6. Notify all parties in the order listed overleaf. Notification should be made by one member of staff whilst remainder of staff present deal with the spill.

7. Dig up all contaminated ground as soon as possible/immediately. All contaminated materials should be placed in sealed polythene bags/containers and disposed of appropriately by an appropriate licensed waste contractor.
8. Complete required record of incident and response into reporting system

7.2 Communication Plan

A Communication Plan (to be followed in the event of a spillage) will be provided by the Contactor, in liaison with relevant stakeholders and will be included in the updated ERP prior to commencement of site development works. An outline Communication Plan is proposed below:



7.3 Environmental Response Plan for Derreenacrinnig West Wind Farm Grid Connection

INCIDENT RESPONSE PLAN FOR DEREENACRINNIG WEST WIND FARM GRID CONNECTION ***Based on template provided in PPG 21 – Pollution Prevention Guidelines.***	
Site Address: Ardrah, Ards More (East), Ards Beg, Barnagowlane West, Ballylicky, Crossoge, Derreenacrinnig West, Dromlickacrue, Derryarkane, Dromclarig, Gortroe, Gortnacowly, Glanareagh, Laharanshermeen, Maulikeeve, Maularaha, and Shandrum More Co. Cork. **Official Company Address:** Derreenacrinnig West Wind Farm Ltd Dreenacreenig West, Drimoleague Co. Cork. **KEY HOLDERS FOR SITE – NAME & CONTACT NUMBERS:**	**NGR:** Easting 110.946, Northing 51.782 **Map references:** OSI Discovery Sheet 85
Overview of the activities on site: **Include number of employees at different time of the day:** Daylight Hours: Dusk to Dawn: Weekend Dusk to Dawn: Bank Holidays:	
Date & Version of the plan:	**Name & position of person responsible for compiling/approving the plan:**
Review Date	**Date of next exercise:**
Objectives of the plan: To limit any potential harmful impact to the local environment through swift and appropriate actions in the event of an emergency.	
List of external organisations consulted in the preparation of this plan with contact details	
Distribution list of who has received this plan and which version. *Please note that it is recommended that you review and revise this plan regularly:*	

7.4 External Contacts

Contact	Office Hours	Out of Office
Emergency Services (Fire/Police/Ambulance)	999 or 112	999 or 112
Local Garda Station Bantry Garda Station	+353 (0) 2720860	
Local Hospital. Bantry General Hospital	+353 (0) 2750133	
The Environmental Section, Inniscarra, Co. Cork.	021 4532700	
EPA	053-916 0600	1850 365 121
Inland Fisheries Ireland	01 8842600	**1890 347 424 (24 hours a day)**
Roads Service (Blocked/Flooded Roads)	021 4924000	021 4966512
ESB- Electricity Company	01 8529534	
Telecommunications – Eircom	1800475475	

7.5 Internal Contacts

Names and position of staff authorised and trainers to activate and co-ordinate the plan. Staff to be contacted if need to move or evacuate the site		
Other Staff:		
Managing Director		
Site Manager		
Environmental Manager		
Health & Safety Manager		

7.6 Chemical Product & Waste Inventory

Trade name/ substance	Solid/liquid/ gas or powder	UN number	Max amount	Location marked on site plan	Type of Containment	Relevant health & Environmental properties

7.7 Pollution Prevention Equipment Inventory (On/Off-Site Resources)			
Type	**Location**	**Amount**	**Staff contact**

For example:

- *Personal protective Equipment (PPE) available that should be worn*
- *absorbents*
- *drain mats/covers*
- *pipe blockers*
- *booms*
- *pumps*
- *sandbags*
- *silt fencing*
- *over drums*

IF ANY OF THIS EQUIPMENT REQUIRES SPECIALIST TRAINING – STATE WHO HAS BEEN TRAINED IN ITS USE AND DATE OF TRAINING (attach evidence where possible).

7.8 Site Environmental Audit Form

Site		Date	
Time		Weather:	
Report By:		Position:	
Derreenacrinnig Wind Farm Grid Connection personnel present:		Position:	
Contractor Personnel Present:		Position:	

Description of Incident

Item Spilled	
Estimate of Volume of Spillage	

List of actions followed once incident was noted	Time	Corrective Action By	
		Action	By
Who first observed incident?			
First action			
Next Action			
Time Pollution Hotline was contacted			
Other			

Details of Clean-Up contractor or how contamination was removed from site:

Details of how this could be avoided in future:	
Details of review of internal procedures as result of this incident:	

DATE REPORT COMPLETED_____

7.9 Site Environmental Incident Report Form

Site:		**Date**:	
Time:		**Weather conditions:**	
Report by:		**Position**:	
Dereenacrinnig West Wind Farm Grid Connection personnel present:		**Position:**	
Contractor personnel present:		**Position:**	

Item	**Questions**	**Yes**	**No**	**Corrective Action Required**	
				Action	**By**
1. Miscellaneous					
1.01	Does the contractor carry out regular internal environment audits on the site? Are recommendations recorded and is corrective action monitored?				
1.02	Have any environment incidents occurred and have these been reported as per on site procedure?				
1.03	Does the site induction contain a section on environmental requirements, including spill procedures, and is this communicated effectively?				
2. Land					
2.01	Are areas of hard standing (excluding bunded and refuelling areas) appropriately drained?				
2.02	Have local roads been inspected and cleaned where necessary?				
2.03	Has all test pitting and soil stripping been monitored by an archaeologist?				
2.04	Have all site clearance works been checked by an ecologist prior to works?				

Item	Questions	Yes	No	Corrective Action Required	
				Action	By
3. Material and equipment					
3.01	Is there knowledge of the IFI |Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016) and OPW Environmental Guidance: Drainage Maintenance & Construction (2019)				
3.02	Are transformers/ generators located in secondary containment bunds?				
3.03	Are all bunds capable of containing 110% of the volume of the largest container?				
3.04	Is refuelling carried out in a designated refuelling bay?				
3.05	Does all site drainage on hard standing drain to an oil interceptor?				
3.06	Is the designated area for oil, fuel and chemical storage appropriately sited (i.e. on hard standing at least 10m from a watercourse)?				
3.07	Are there procedures in place to monitor bund integrity and mange bund rainwater levels? Are these followed and recorded?				
3.08	Is there awareness that oil or residue from contaminated water removed from bunds should be disposed of as special waste and not discharged to land or the water environment? (oil absorbent materials (pads etc.) should be used first)				
3.09	Are all drums and mobile plant (e.g. generators) placed on drip trays more than 10m from any watercourse?				
3.10	Is all plant maintained in a good state of leaks? Are there records of this?				
3.11	Are there adequate spill kits available and stored in close proximity to potential risks?				
3.12	Are all refuelling browsers double skinned, locked when not in use, and in a good state of repair?				

Item	Questions	Yes	No	Corrective Action Required	
				Action	By
3.13	Is there evidence of unmanaged/ unrecorded fuel / oil spillages on site?				
3.14	Are dry or wet wheel washing facilities fully operational and effective?				
3.15	If wet wheel washing facilities are required, are these closed systems with no discharge to the water environment?				
3.16	Are there laboratory certificates (accredited by the Irish National Accreditation Board) to confirm that imported material stone aggregate brought onto site is free from any contamination?				
4. Noise, Dust and Light					
4.01	Are there facilities to dampen stockpiles and site working areas/roads to suppress dust?				
4.02	Are vehicles carrying loose material sheeted at all times?				
4.03	Are construction works, or deliveries of materials to and from the development, audible at noise sensitive premises?				
4.04	Has all external construction lighting received the approval of the planning authority?				
5. Waste					
5.01	Is the site tidy and free from litter?				
5.02	Is there evidence of waste beyond the site boundary?				
5.03	Is waste segregated and kept securely in containers in clearly designated areas?				
5.04	Does all waste leaving the site have the appropriate duty of care paperwork?				
5.05	Is all waste leaving the site being taken to an appropriately licenced site?				
5.06	Does all special/ hazardous waste (e.g. oil contaminated soils, waste oil) have the appropriate Special Waste Consignment Note?				
5.07	Is material re-used/recycled on site where possible?				
5.08	Are waste management practices in line with the site waste management plan?				
5.09	Are relevant Waste Management Exemptions in place for use of waste on site (e.g. use of waste concrete to create foundation sub-base)?				

Item	Questions	Yes	No	Corrective Action Required	
				Action	By
5.10	Is there any evidence of burning on site?				
5.11	Is there any evidence of unlicensed burial of waste?				
6. Water					
6.01	Do all discharges to land or watercourses have appropriate authorisation from Local Authorities /IFI?				
6.02	Does all watercourse engineering (bank protection, crossing etc.) have the appropriate authorization from Local Authorities / IFI?				
6.03	Do any abstractions from a watercourse or groundwater body have the appropriate authorization from Local Authority / IFI?				
6.04	Has confirmation for the SUDS design for access roads been gained from Local Authority / IFI?				
6.05	Are cut-off ditches installed on the uphill side of the working area to avoid contaminated surface water run-off?				
6.06	Have field drain been diverted where necessary?				
6.07	Is adequate treatment (e.g. settlement tank/lagoons/discharge to land) provided to prevent silt contaminated water entering watercourses and groundwater?				
6.08	Has vegetation removal/ clearance of the site been minimised to avoid unnecessary areas of bare ground?				
6.09	Have buffer-strips been left between working area and watercourses?				
6.10	Is plant operating in the watercourse?				
6.11	Have all culverts been installed at the base of stockpiles situated within close proximity to watercourses?				
6.12	Have silt fences been installed at the base of stockpiles situated within close proximity to watercourses?				
6.13	Are there adequate controls on site construction roads to minimize sediment runoff into watercourses (in particular, are there adequate flow attenuation measures within surface drain)?				
6.14	Are there any sign of decaying straw bales in water courses? (this could lead to organic pollution of the water course)				
6.15	Are silt traps regularly maintained?				

Item	Questions	Yes	No	Corrective Action Required	
				Action	By
6.16	Has ease of maintenance been considered in the design of permanent drainage features?				
6.17	Is there evidence of contamination of any watercourse (e.g. with oil, sediment, concrete, waste) in the vicinity of the works?				
6.18	Is monitoring of potential impacts on watercourses carried out on a regular basis and fully recorded?				
6.19	Are dewatering operations being carried out in such a way to minimise sediment contamination?				
6.20	Is drainage and run off in concrete batching areas adequate?				
6.21	Are adequate pollution prevention measures considered and put in place during concrete pours?				
7. Landscape					
7.01	Have earthworks been designed to promote successful re- instatement of vegetation?				
7.02	Are reinstatement and restoration works being implemented in a timely manner as per the requirements of the Contract?				
8. Ecology					
8.01	Have storage sites (soil, plant etc.) been sited on areas of lower quality habitat where possible?				
8.02	Is the ECoW a member of the institute of Ecology and /or Environmental management as required by planning conditions?				
8.03	Have buffer zones been constructed and maintained around designated protected species exclusion areas (e.g. red squirrel dreys, water vole habitats, otter holts, badger holts etc.)?				
8.04	Have toolbox talks on the subject of ecology and environmental responsibilities on site been delivered? Have attendance record been maintained for these?				

Item	Questions	Yes	No	Corrective Action Required	
				Action	By
9. Documentation Check					
9.01	Start-up meeting record				
9.02	Full contacts list in Section 3, Table 3.0 of CEMP				
9.03	Induction records				
9.04	Pollution Prevention Measures Register				
9.05	Geotechnical Risk Register				
9.06	Weekly meeting minutes				
9.07	Records of environmental checks and routine monitoring of mitigation measures				
9.10	Water Quality Monitoring Results				
9.11	Safety and Environmental Awareness Reports (SEARs). Filed and entered on database?				
9.12	Safety and Environmental Audit Reports for the site. (If yes, insert date of last audit_____)				
9.13	Contractor's Environmental Plans (or Construction Method Statements):				

MANAGEMENT PLAN 2

Surface Water Management Plan

DERREENACRINNIG WEST WIND FARM LIMITED

PROPOSED 20KV GRID CONNECTION TO CONNECT THE PREVIOUSLY CONSENTED DERREENACRINNIG WEST WIND FARM, DRIMOLEAGUE, COUNTY CORK TO THE NATIONAL GRID

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

SURFACE WATER MANAGEMENT PLAN

JUNE 2019

Derreenacrinnig West Wind Farm Ltd
Dreenacreenig West,
Drimoleague
Co. Cork

Jennings O'Donovan & Partners Limited,

Consulting Engineers,
Finisklin Business Park, Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED
Project, Civil and Structural Consulting Engineers
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Proposed 20Kv Grid Connection to Connect the Previously Consented Derreenacrinnig West Wind Farm, Dimoleague, Co. Cork to the National Grid	
CLIENT / JOB NO	Derreenacrinnig West Wind Farm Limited	4636
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP) Surface Water Management Plan (SWMP)	

	Prepared by	**Reviewed/Approved by**
Document Rev 0	Name Sarah Moore	Name David Kiely
Date June 2019	Signature Sal Moore	Signature David Kiely

CONTENTS

1 INTRODUCTION

This document concerns the proposed operations required for the protection of surface water during the construction of the proposed Derreenacrinning West Wind Farm Grid Connection (the Site). The information contained herein will be used by the Contractor in developing the detailed Surface Water Management Plan (SWMP) for the Site. The detailed SWMP will also incorporate any specific planning conditions relating to the development, Section 50 consent and the requirements of the Construction Method Statement (to be prepared prior to construction), notably those relating to protection of water quality and fisheries.

2 PROPOSED DEVELOPMENT

The wind farm grid connection consists of a 20kV Electrical Connection (13.916km), of which, 10.738 km is 20kV overhead line (OHL) mounted on single wooden pole sets and 3.178 km is ducted underground power cable in 6 separate locations, so as to connect the Derreenacrinnig West Wind Farm to the existing Ballylicky Substation.

The C.13.916 km grid connection is partially complete with most of the poles erected (9.537km) for the overhead lines and wires strung to some poles. Some 1.201 km of overhead line and 3.178 km of underground cables (UGC) have yet to be constructed.

Table 2.1 Status of the Grid Connection

Element	Total Length (km)	Built (km)	Remaining (km)
OHL	10.738	9.537	1.20
UGC	3.178	0	3.178

The principle of a wind farm development at the Proposed Development Site with a total of 7 no wind turbines with a tip height of up to 81 metres has already been approved by An Bord Pleanála with the grant of the existing permission on the 05th December 2012.

2.1 Overhead Line

The proposed OHL will traverse private lands for c. 10.738km with the OHL crossing over predominantly agricultural lands but also a number of public roads, watercourses and rivers. The OHL will require the erection of 188 no. wooden pole-sets (12-16m) along the proposed

route from which the electricity line will be suspended. The proposed OHL will require 3 No. separate cables being suspended from the poles.

2.2 Underground Line

Six discrete sections of underground ducted line occur along the proposed grid connection route including:

- 201.5 metres of underground cables from Ballylicky Substation
- Approximately 624.5 metres of underground cable in Crossoge and Dromlouglin townlands
- approximately 1.081km of the grid connection route will be ducted along the verge of the existing local road at Glencreagh
- 112.3 metres in the townland of Gortnacowley
- 1046 metres within the carriageway of the road at Glanareagh
- approximately 113 metres of Grid Connection at Derreenacrinnig West

The 20k V underground power cable construction type is 20kV XLPe cable to be ducted according to ESB Networks 'Specification for the Installation of Ducts & Structures for Underground 10-20kV Power Cables & Communication Cable'. The 20kV power cable will be laid in a single 125mm diameter uPVC duct in a cable trench.

The proposed UGL will traverse c. 4.95km of 'open country' along the proposed route and generally follows existing hedgerows. Cable ducts will be placed within a trench approximately 1.2m deep and 0.6m wide. An outline of a typical trench is shown in Figure 2.1 All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials (topsoil, subsoil) will be stored separately for use during the reinstatement of the trench or disposal to an appropriate licensed facility as necessary. The trench will then be reinstated with excavated materials. The proposed sequence of works is as follows:

- All trenching works shall be undertaken to ensure that only short sections (approximately 100m) are open at any one time.
- Excavate the trench to the required dimensions, approximately 1.2m deep and 0.6m wide.
- Place a 65mm blinding layer at the base of the trench.
- Place and joint the cable trefoil 110mm HDPE power ducts using cable ties at 3m intervals.

- Lay in and compact a 280mm layer of leanmix concrete CBM4 around and above ducts; and place a 400mm wide red marker strip above.
- Install a single 110mm HDPE communications cable duct.
- Lay in and compact an additional 200mm of CBM4 and place another 400mm wide red marker strip above.
- Final backfill layer (excavated material if suitable) to include 500mm wide yellow warning tape 300mm below the finished surface.
- Appropriate reinstatement as discussed above.

Joint bays and communication bays will be provided approximately every 700m along the UGL route to facilitate the joining of electrical cables and fibre optic communications cables. These bays/chambers consist of precast concrete structures which will be set into an excavated area and surrounded by appropriate fill. The bays will be finished to below road level and reinstated in accordance with the Local Authority requirements. The communications bay will also include an access cover to facilitate access should it be required.

A detailed method statement will be provided by the contractor outlining the precise methodology to be put in place during the ducting phase. This method statement will be reviewed by the Environmental Manager (to be appointed by the contractor) and Ecological Clerk of Works (ECoW) to ensure that the environmental protective measures to be implemented are suitable and to the required standard.

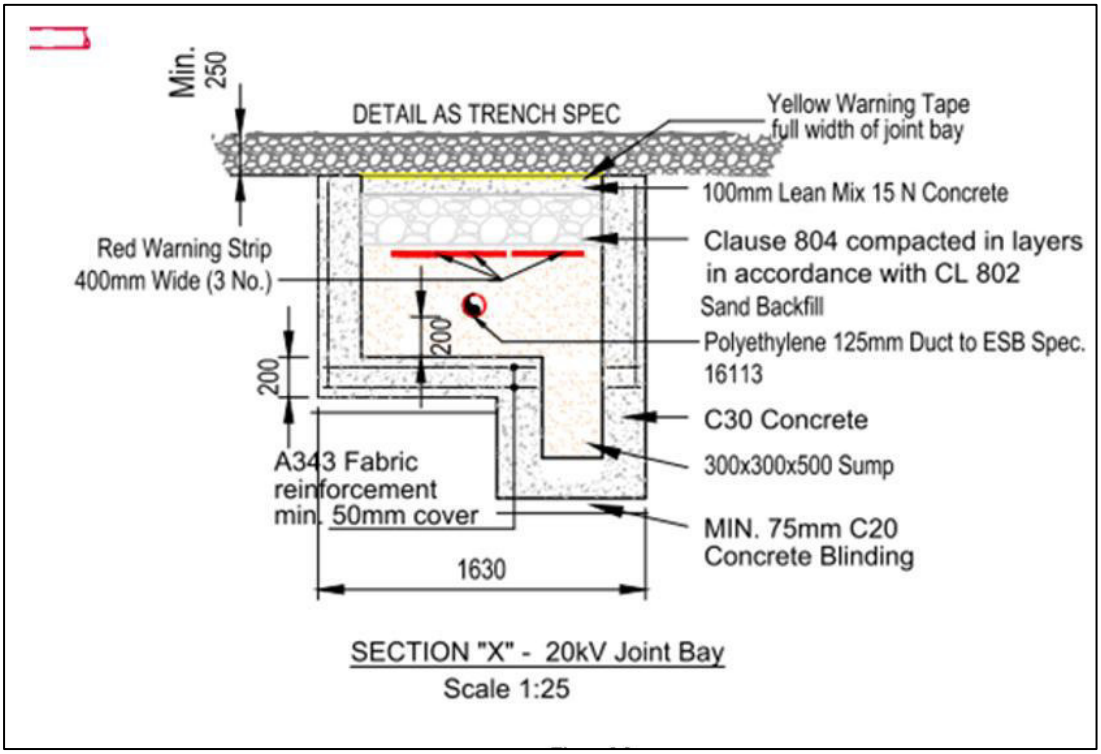


Figure 2.1 Typical Trench Details

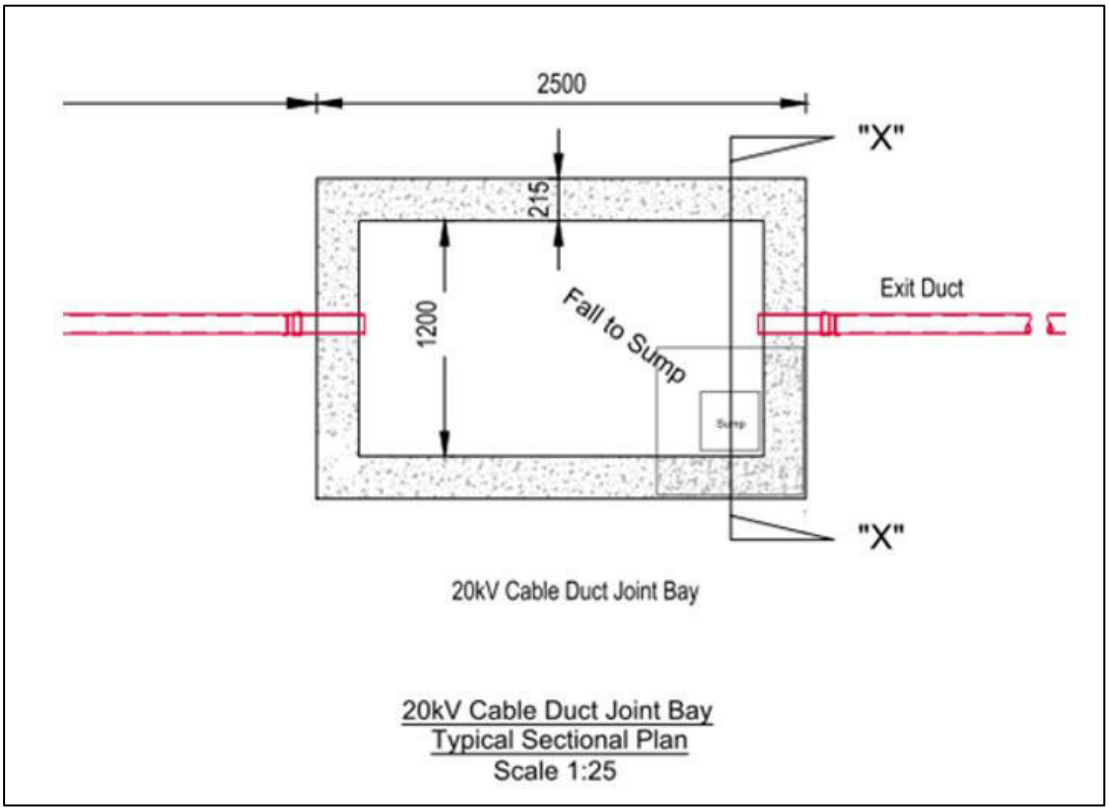


Figure 2.1 Typical Joint Bay Details

3 SITE HYDROLOGY

The proposed grid route passes through three separate surface water catchments, the Ilen River Catchment to the east of the alignment; the Mealagh River Catchment along the majority of the alignment and the Owvane River Catchment to the west of the alignment. Eroding upland (FW1) watercourses intersect the route corridor at various locations along the route. The route crosses the Mealagh River at one location in the townland of Ards Beg towards the east of the route corridor. Aside from this, only minor watercourses are crossed by the route corridor.

3.1 Surface Water Buffer Zones

Prior to works commencing, a Water Quality Specialist will be retained by Derreenacrinnig West Wind Farm Limited with a responsibility to implement the Water Quality Management Plan and the Water Inspection and Monitoring Plan. Among other requirements, the latter requires a full baseline survey to be undertaken prior to the commencement of construction and requires the contractor to provide a 'schedule of work' to the water quality specialist at the beginning of each week.

The Environmental Manager (EM) or the Ecological Clerk of Works (ECoW) will ensure that a 50m watercourse buffer zone will be implemented to ensure the protection of watercourses. Where the 50m buffer zone is not possible, simply due to the location of the proposal, the contractor must implement the following measures:

- Works will not be undertaken during or after heavy rainfall. Works will be planned when a dry spell of weather is forecasted.
- Where the cable trench / access road / works are is running adjacent and parallel to a watercourse, a minimum 5m buffer will be maintained between the works area and the watercourse edge.
- Silt fencing will be placed down-gradient of the works during construction at all locations within the 50m watercourse buffer. No construction activities or side casting of excavated material will be permitted outside of the fenced area.
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered.
- In a case where only a 5-10m buffer is being maintained, double silt fencing will be put in place on the downslope side.

- Additional silt fencing or temporary straw bales (rectangular bales, pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards a local watercourse.
- Where the cable trench/ access road route slopes down perpendicular towards a watercourse regularly spaced, temporary bunds or shallow swales will also be put in perpendicular across the route corridor to dissipate surface water run-off from the works area and onto adjacent vegetated ground. Additional silt fencing will be put at the outfall location of the bunds/swales.
- Temporary check dams / silt fencing arrangements will be placed in any local artificial watercourses/drains within 30m of the works corridor (this will also include existing road drains).
- The check dams / silt fencing arrangements will be placed every 10m.

3.2 Watercourse Crossings

There is eleven (11) watercourse crossing along the entire route, incorporating both overground and underground cabling. However, there is only one water crossing associated with the "*To Be Built*" section of the route, as shown on Drawing 4636-WCC-00-1, attached as Appendix I.

There are a number of methods that can be used in crossing watercourses such as flumes, over-pumping etc. The Contractor must liase with the IFI to determine what watercourse crossing method is acceptable.

The Contractor must implement the following to ensure the watercourses are projected during crossings:

- Inland Fisheries Ireland (IFI) have published guidelines relating to construction works along water bodies entitled: 'Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites' and these guidelines will be adhered to throughout the construction of the proposed development.
- Works will not be undertaken during or after heavy rainfall.
- In-stream works at natural watercourse crossings will only be done over a dry period during the months of July, August and September or as advised by the IFI to avoid salmon spawning season.

- Works will only be undertaken during low-flow conditions.
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance to vegetation.
- Where present, a 10m vegetative buffer zone will be maintained between the disturbed area ands and the watercourse bank.
- There will be no storage of materials, equipment, excavated material or overnight parking of machinery within the 10m buffer zone.
- Double silt fencing will be placed upslope of the buffer zone on each side of the watercourse. The silt fencing will have removable 'gates' as required to allow access of the excavator into the site and exit from the site during heavy rainfall or at night.
- The silt fencing will be extended at least 10m upstream and downstream of the crossing location works.
- Bog mats will be used beneath the excavator, inside the 10m vegetative buffer zone, to prevent soil erosion/rutting and potential surface water quality impacts from localised surface water runoff.
- Operation and use of equipment inside the 10m buffer zone will be kept to a minimum to avoid unnecessary disturbance.
- Temporary storage of excavated material will be undertaken outside of the 10m buffer zone on flat ground or within a hollow area. A containment berm will be placed downslope of the excavated material which in turn will be surrounded by secondary silt fence protection to prevent saturated soil from flowing back into the watercourse.
- When in-stream works are complete, the watercourse crossing will be restored to its original configuration and stabilised to prevent bank erosion by means of timber stakes, timber planks and geotextiles as required.
- Disturbance of bankside soils and watercourse sediments will be kept to the minimum required for the cable laying process to avoid any unnecessary impact on the watercourse morphology.

3.3 Excavated Spoil & Dewatering

Excavated spoil and trench dewatering must be managed to prevent impact to local watercourses. The Contractor is obliged to implement the Spoil Management Plan (CEMP, Appendix 4) and the following:

- Excavated topsoil and subsoil will be side cast separately during construction for appropriate use during reinstatement of the proposed development or removed to a licensed disposal facility.
- All excavated material will be reused in the reinstatement or landscaping or the proposed development. Where excess material arises, it will be disposed of to an appropriate licensed facility.
- Tarmac road cuttings will be disposed of at a licensed facility.
- Excavated soil will not be left on site following completion of construction.
- Ground around excavations will be appropriately graded and reinstated to ensure soil erosion cannot occur following the completion of construction.
- Sediment laden water from trench dewatering will not be discharged directly to a watercourse.
- Runoff from excavations will not be pumped directly to watercourses. Where dewatering of excavations is required, water shall be pumped to the head of a treatment train (swale or concrete sump in the case of turbine bases) in order to receive full treatment prior to re-entry to the natural drainage system.
- Any pumped water from the trench dewatering will be discharged onto a well vegetated, flat, dry area at least 50m from a watercourse via a straw bale dewatering structure or silt bags. Silt fencing will also be place downslope of the outfall.
- Clay bunds will be placed within the trench backfill on either side of the watercourse to prevent the trench as acting as a drain towards the watercourse, thus preventing potential water quality impacts.

3.4 Release of Cement-Based Pollutants

The Contractor is obliged to implement the following control measures to avoid the release of cement-based pollutants

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible, pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse

will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location;

- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water, and plastic covers will be ready in case of sudden rainfall event.
- Disposal of raw or uncured waste concrete will be controlled to ensure that watercourses or other sensitive areas will not be impacted

3.5 Release of Other Pollutants

All precautions will be taken to avoid spillages of diesel, oil or other polluting substances during the construction phase. The Contractor is obliged to implement the following measures to prevent contamination of watercourses:

- No refuelling of construction vehicles or plant will take place within the 50m surface water buffer zone.
- Undertaking refuelling of plant, equipment and vehicles will only be undertaken on impermeable surfaces.
- No maintenance of construction vehicles or plan will take place along the proposed route, except in a case of emergency.
- All potentially hazardous chemicals, fuel, hydraulic oils and lubricants will be stored in bunded areas (in accordance with established best practice guidelines) at the Contractor's Temporary Compound.
- In order to reduce the risk of contamination arising as a result of spills or leakages, all fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces.
- If there is a requirement to store hazardous chemicals on site, they will be stored within a bunded, locked COSHH container, with upkeep and security ensured by the contractor (Drawing MW-WF-001).
- All tanks and drums are to be bunded in accordance with established best practice guidelines.
- Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated bunded areas within the main construction compound and not on-site where reasonably practicable. If it is not possible to bring machinery to the refuelling point, fuel will be brought to site by a 4x4 in a double skinned bowser with drip trays. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal

with any accidental spills. The bowser will be bunded appropriately for the fuel usage volume for the time period of the construction.

- The plant and machinery used will be regularly inspected for leaks and fitness for purpose.
- Spill kits will be readily available to deal with accidental spillage at all times.
- A segregated waste storage will be available at the Derreenacrinnig West Wind Farm construction site.
- All plant and machinery will be fully stocked with spill kits, hydrocarbon absorbent packs and absorbent material and operators will be fully trained in the use of this equipment.
- An inventory of all chemicals on site will be kept. It will include:
  - Procedures for storage of all materials listed
  - Location details of all materials listed
  - Volume and description of all substances stored on-site
  - Waste disposal records, including copies of all Waste Transfer Notes (WTN) detailing disposal routes and waste carriers used. Where waste is being shipped abroad, a copy of the Trans Frontier Shipping (TFS) document must be obtained from Dublin City Council and kept on site along with details of the final destination and any relevant permits, licences or other relevant documentation.
- Chemical storage details will be part of routine site audits.
- Only where absolutely necessary should any hazardous waste be stored on site. If so, Hazardous Waste should be stored in a COSHH store. Only trained operatives should handle hazardous substances. Please note that COSHH data sheets are NOT risk assessments and all risk assessment should be carried out separately. All stored hazardous waste will be clearly labelled. All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g. where a drip tray is full of rainwater.

3.6 Pollution Contingency Plans

An Emergency Response Plan is outlined in the Appendix of the outline CEMP.

4 REFERENCE DOCUMENTS

All construction works on the site, and specifically design and construction works to be undertaken within and in the vicinity of any watercourses, will be completed in compliance with current legislation and best practice as detailed within the EIAR, CEMP and associated

Management Plans, Construction Method Statements (to be prepared prior to construction), , current legislation and published guidance, including (non-exhaustive list):

- CEMP Appendix 1 Emergency Response Plan. This provides information on best practice to be implemented in the event of a pollution incident.
- CEMP Appendix 3 Water Inspection and Monitoring Plan outlines a monitoring programme for relevant watercourses within the development footprint.
- CEMP Appendix 4 Spoil Management Plan. This provides information on best practice spoil management on site to prevent water pollution.
- CEMP Appendix 5 Site Waste Management Plan. This provides information on best practice for mitigation of risks to watercourses from storage and handling of waste materials.
- Water Framework Directive (2000/60/EC)
- Groundwater Daughter Directive (2006/118/EC)
- Environmental Liability Directive (2004/35/EC)
- Local Government (Water Pollution) Acts 1977-1990
- S.I. No. 9 of 2010 EC Environmental Objectives (Groundwater) Regulations 2010
- S.I. No. 272 of 2009 EC Environmental Objectives (Surface Waters) Regulations 2009
- S.I. No. 722 of 2003 EC Water Policy Regulations 2003
- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes, NRA, 2008.
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters, IFI, 2016.
- CIRIA (Construction Industry Research & Information Association) Report C502 Environmental Good Practice on Site
- CIRIA Report C532 Control of Water Pollution from Construction Sites
- CIRIA Report C648 Control of Water Pollution from Linear Construction Projects: Technical Guidance
- CIRIA Handbook C650 Environmental Good Practice on Site
- CIRIA Handbook C651 Environmental Good Practice on Site Checklist
- Engineering in the Water Environment, Good Practice Guide, Construction of River Crossings, First edition, SEPA, April 2008.
- Culvert Design Guide, Report 168, CIRIA, 1997.

5 CONSTRUCTION REQUIREMENTS

The Contractor will be required to produce a detailed Method Statement for each Watercourse Crossing Plan prior to commencement of the works. The Crossing Plans and Method Statements will take into account all relevant documents, guidelines and best practice manuals outlined in Section 4 above as well as any further information that may be obtained during subsequent surveys that may be undertaken prior to construction works commencing (for example further ground investigations, ecological baseline studies etc.).

Specifications of crossings to be used in the crossings must comply with the Schedule 50 and agreed with Inland Fisheries Ireland (IFI) subsequent to the application being made in advance of works on site.

The Contractor's Watercourse Crossing Plan will be submitted to the Employer (Derreenacrinnig West Wind Ltd.), ECoW and IFI for review and approval where appropriate.

The Ecological Clerk of Works (ECoW) will be consulted with regard to all watercourse crossing works. Surveys by the ECoW will be carried out immediately prior to construction so that adequate mitigation is built into the design in respect to fish passage and avoiding impact on downstream ecology.

The Archaeological Clerk of Works (ACoW) will also be consulted with regard to all Watercourse Crossing works. All known sites of Cultural Heritage will be fenced to avoid accidental damage during the construction phase. All groundworks to be undertaken within identified archaeologically sensitive areas will be monitored by the ACoW. All works associated with cultural heritage will be overseen and coordinated by the ACoW.

Prior to the commencement of watercourse crossing works an on-site meeting will be held where deemed necessary. This meeting will be between the *Contractor*, ECoW, ACoW, and Consultees, where appropriate. The purpose of this meeting is to agree specific requirements and working practices at key locations, or for particular structures (culverts).

During the watercourse crossing construction operations, both regular and periodic consultation may be made with the Consultees as required / agreed at this commencement meeting.

Further details relating to locations, descriptions and agreed approaches to watercourse crossings are contained in the following appendices to this document:

Appendix I

Drawing 4363-WCC-00-1

Watercourse Number	River Water Body Code	Name of Watercourse	Segment Code
WC1	IE_SW_21M010200	-	21_5455
WC2	IE_SW_21M010200	-	21_5267
WC3	IE_SW_21M010200	Barnagowlane_West	21_5263
WC4	**IE_SW_21M010200**	**Glanareagh**	**21_5925**
WC5	IE_SW_21M010200	Mealagh	21-4758
WC6	IE_SW_21M010200	-	21_5329
WC7	IE_SW_21M010400	Maularaha	21_78
WC8	IE_SW_21M010400	Ards_More21	21_79
WC9	IE_SW_21M010400	Maulikeeve	21_3023
WC10	IE_SW_21O070500	Ballylicky	21_1007
WC11	IE_SW_21O070500	Ballylicky	21_21836

Notes

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. ALL LEVELS REFER TO ORDNANCE DATUM (MALIN HEAD).
5. THE GRID CONNECTION PLANNING APPLICATION BOUNDARY (SOLID RED LINE) SHOWS THE FULL EXTENT OF THE GRID CONNECTION BETWEEN DREENACREENIG WEST WINDFARM AND BALLYLICKY 110 KV SUBSTATION. WITHIN THAT RED LINE, SEVEN SEPARATE LOCATIONS ARE THE SUBJECT OF THIS PLANNING APPLICATION TO CORK COUNTY COUNCIL (THESE ARE LABELLED AS AREA 1, 2, 3, 4, 5, 6 AND 7). THE REMAINING AREAS WITHIN THE RED LINE ARE THE SUBJECT OF AN APPLICATION FOR LEAVE TO APPLY FOR SUBSTITUTE CONSENT TO AN BORD PLEANÁLA REFERENCE 302837-18. THE GRID CONNECTION PLANNING APPLICATION BOUNDARY ENCOMPASSING BOTH THE APPLICATIONS, TO CORK COUNTY COUNCIL AND AN BORD PLEANÁLA, IS BEING SHOWN WITHIN ONE SOLID RED LINE SO AS TO GIVE A FULL UNDERSTANDING TO THE PUBLIC OF THE PLANNING STATUS OF ALL ASPECTS OF THE GRID CONNECTION.

LEGEND:

- Overhead Line to be built (subject to planning application 19/000/10)
- Existing Overhead line already built (subject of to appeal for substitute consent to An Bord Pleanála Reference 302837-18)
- Underground cable to be built (subject to planning application 19/000/10)
- Windfarm Boundary
- Grid connection planning application boundary

0 600 1200
SCALE 1:20,000

rev.	modifications	by	chkd	date
file	P:\Jod-John\4636 Dreenacreenig WF\700 Drawings\Grid Connection\Planning Appeal Application 2019\Watercourse Crossing\4636-WCC-00-1 _Watercourse Crossing.dwg			

client
ESB

project
EXISTING GRID CONNECTION AT DERREENACRINNIG WEST WIND FARM CO CORK.

stage
SUBSTITUE CONSENT

title
SITE LOCATION MAP
GRID CONNECTION ROUTE
WATERCOURSE CROSSINGS

scale
1:20,000 @ A1

surveyed	drawn	checked	date
OSI	P.MD./ J.B.	S.M.	JUNE 2019

JENNINGS O'DONOVAN & PARTNERS
CONSULTING ENGINEERS,
FINISKLIN,
SLIGO,
IRELAND.
TEL. +353 (0)71 916 1416
FAX. +353 (0)71 916 1080
Email: info@jodireland.com

drawing no. 4636-WCC-00-1
revision

MANAGEMENT PLAN 3

Water Quality Inspection and Monitoring Plan

DERREENACRINNIG WEST WIND FARM LIMITED

PROPOSED 20KV GRID CONNECTION TO CONNECT THE PREVIOUSLY CONSENTED DERREENACRINNIG WEST WIND FARM, DRIMOLEAGUE, COUNTY CORK TO THE NATIONAL GRID

OUTLINE CONSTUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

WATER QUALITY INSPECTION AND MONITORING PLAN

JUNE 2019

Derreenacrinnig West Wind Farm Ltd
Dreenacreenig West,
Drimoleague
Co. Cork

Tel.: +353 (0) 49 555 5050

Jennings O'Donovan & Partners Limited,
Consulting Engineers,
Finisklin Business Park, Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED

Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Proposed 20Kv Grid Connection to Connect the Previously Consented Derreenacrinnig West Wind Farm, Dimoleague, Co. Cork to the National Grid	
CLIENT / JOB NO	Derreenacrinnig West Wind Farm Limited	4636
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP) Water Quality Inspection and Monitoring Plan (WQIMP)	

	Prepared by	**Reviewed/Approved by**
Document Rev 0	Name Sarah Moore	Name David Kiely
Date June, 2019	Signature Sal Moore	Signature David Kiely

CONTENTS

1. INTRODUCTION

1.1 Scope and Requirements

1.1.1 The *Contractor* is solely responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed.

1.1.2 In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring is required to be undertaken by a suitably qualified Environmental Manager(s), prior to, during and post completion of construction works. This will include all watercourses within the catchment of the construction area. The monitoring will comprise visual, hydrochemistry and grab sample monitoring.

1.1.3 The details of the monitoring will be contained within a detailed Water Quality Inspection and Monitoring Plan (WQIMP) (i.e. Rev 2 of this plan) to be prepared by the Contractor and submitted to the Local Authority for approval prior to commencement of construction. The approved plan will be coordinated and implemented on site by the Environmental Manager.

1.2 Reference Documentation

1.2.1 Construction works have the potential to cause pollution of the water environment. All construction works on site, and specifically construction works to be undertaken within and in the vicinity of any watercourses, will be completed in compliance with current legislation and best practice as detailed within the CEMP and in particular the Waste Management Plan and the Surface Water Management Plan.

1.2.2 The following reports (along with any further surveys conducted) will be used to inform the scope of the construction phase WQIMP.

- Environmental Impact Assessment Report (EIAR)
- Natura Impact Statement (NIS)
- CEMP

2. RESPONSIBILITIES

2.1 General

2.1.1 Responsibility for the water quality monitoring programme, and coordination thereof, will lie with the independent Environmental Manager appointed at the start of the programme.

2.1.2 Prior to works commencing, a Water Quality Specialist will be retained by Derreenacrinnig West Wind Farm Limited with a responsibility to implement this WQIMP. Among other requirements, the WQIMP requires a full baseline survey to be undertaken prior to the commencement of construction and requires the contractor to provide a 'schedule of work' to the water quality specialist at the beginning of each week.

2.1.3 The Water Quality Specialist will prepare and deliver site induction and training to all construction personnel, in liaison with the Site Engineer and Environmental Manager (EM)/ Ecological Clerk of Works (ECoW).

2.1.4 As outlined in the Section 3.5, Table 3.3 of the outline CEMP, the Water Quality Specialist will:

- Undertake specific monitoring activities and reporting as defined in agreed documentation prepared as part of the planning process.
- The Water Quality Specialist will be appointed and report to the EM. They will have responsibility for fulfilling the requirements of the WQIMP, including:
- Daily visual inspection of: access tracks for signs of ground damage or solids escape to nearby watercourses in vicinity of construction works
- The ground between the structure under construction and the nearest downslope watercourse for signs of solids escape or ground damage
- Surface water features in vicinity of construction works
- Any pollution control measures at structures and along access tracks (e.g. silt fences, drain or stream crossings etc.) for evidence of contaminated run-off or mitigation failure
- Attendance at the critical work phases including: access track construction, foundation excavation, watercourse crossings, concrete pouring and back-filling.

- Collection and analysis of water samples at a number of monitoring locations (i.e. upstream & downstream of the 5 no. instream work locations) before, during (if potential pollution visually identified) and after construction works at that location
- EPA Q Value Biological Monitoring at 5 no. monitoring locations (i.e. upstream & downstream of instream construction work locations) before and after construction works.

2.1.5 Collection and analysis of water samples at a number of monitoring locations (i.e. upstream & downstream of construction work locations) before, during (if potential pollution visually identified) and after construction works.

2.2 Hydrochemistry Monitoring

2.2.1 Field Monitoring

Field monitoring of water quality parameters and collection of samples will be undertaken by the Water Quality Specialist (WQS). The WQS will be appropriately qualified on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used.

2.2.2 Laboratory Analysis

Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory to be appointed by the Environmental Manager.

2.2.3 Coordination of the laboratory sampling and analytical programme will be undertaken by the WQS/EM. Samples will be dispatched for analysis under chain of custody procedures. Laboratory analytical results will be sent directly to the EM.

2.2.4 Interpretation and reporting of both the field and laboratory data will be the responsibility of the Environmental Manager.

2.3 Reporting

2.3.1 Monthly Water Quality Reporting

Results of water quality monitoring shall assist in determining requirements for improvements in drainage and pollution prevention measures implemented on site. A monthly report on water quality will be prepared by the EM.

2.3.2 It will be the responsibility of the EM to present the ongoing results of water quality and weather monitoring at site meetings and with outside bodies. This shall be done at weekly meetings and reported within the overall Monthly Environmental Report to be prepared by the EM.

2.3.3 The monthly reports on water quality will consider all visual, field monitoring and results of laboratory analysis received that month. Reports will describe how the results compare with baseline data as well as previous monthly reports on water quality. The reports will also describe whether any deterioration or improvement in water quality has been observed and whether any effects are attributable to construction activities and what remedial measures or corrective actions have been implemented.

2.3.4 Monthly reports on water quality will be provided to the Client Project Manager and will be made available to the Planning Authority.

2.3.6 Final Report on Water Quality

Upon completion of all post-construction monitoring, the EM in collaboration with the Water Quality Specialist will prepare a final report on water quality. This final report will cover the overall performance against baseline data, details on any impacts attributed to construction works and recommendations for remedial works if required.

2.3.7 The final report will be provided to the Local Authority and Inland Fisheries Ireland.

2.4 Contingency Sampling & Emergency Response

2.4.1 In the event that a pollution incident arises from the construction works, such as that resulting from a spill or accidental release of chemicals, oils and fuels or concrete effluent, threatens to enter, or has entered a watercourse, additional sampling and analysis of surface water samples will be undertaken to determine the level of impact to the surface water receptor and remedial requirements, where necessary.

2.4.2 Where a pollution incident has occurred as a result of construction works, the Water Quality Specialist, EM and Cork County Council shall be consulted to determine sampling requirements and any additional survey requirements where potentially significant impacts are identified. Where it is demonstrated that the pollution occurred as a result of non-compliance with this CEMP, the costs of any additional sampling or survey requirements shall be borne by the Contractor.

2.4.3 The results of any monitoring or survey work undertaken by the Contractor shall be made available to the EM and the Local Authority and copies of all correspondence and test certificates shall be retained on site.

3. WATER QUALITY MONITORING: OUTLINE SCOPE

3.1 General

3.1.1 The full scope of monitoring and precise monitoring locations will be agreed with the Local Authority and Inland Fisheries Ireland prior to commencement of construction works.

3.1.2 Water Quality Monitoring locations will be identified through grid reference, photographic record and indicated on a plan. For repeat sampling locations, each location will also be marked on the ground (stake/post) to ensure that the correct location is sampled each time.

3.1.3 Sample locations shall be labelled consistently for the duration of the monitoring period. Where any additional locations are sampled during the works, the location (grid reference) of the sampling point will be recorded and a photograph will be taken at time of sampling.

3.1.4 'Control' sample locations may also be included in the scope of any monitoring.

3.1.5 A water sampling location map will be developed and included in the detailed method statements for precise locations at water crossings within this development.

3.2 Hydrochemistry Monitoring

3.2.1 The detailed scope will be determined and agreed with the Local Authority prior to commencement of construction.

3.2.2 Sample locations, monitoring frequency and precise hydrochemistry parameters will be specified and agreed with Cork County Council and Inland Fisheries Ireland.

3.2.3 As a minimum, the monitoring programme will include:

3.2.3.1 At least one baseline monitoring visit.

3.2.3.2 Daily visual observation in areas of high construction activity or during high rainfall periods to identify any evidence of siltation, oil or silt. Visual inspections will include details of the color of the water at the time of inspection.

3.2.3.3 Weekly visual inspections and monthly field hydrochemistry monitoring.

3.2.3.4 One round of post construction monitoring, to be agreed with Cork County Council. Post construction will be defined as when the reinstatement phase is completed.

3.2.4 Analytical determinants (including limits of detection and frequency of analysis) will be specified and agreed with the Local Authority and Inland Fisheries Ireland for each sample location. The agreed suite of grab sample determinants may include the following:

Parameters for hydrochemistry analysis

- pH
- Temperature
- Total Suspended Solids (TSS)
- Dissolved Organic Carbon (DOC)
- Conductivity
- Dissolved Oxygen (DO)
- Total Oxidized Nitrogen (TON)
- Ammoniacal Nitrogen
- Ammonia
- Potassium
- Phosphate
- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Petroleum Hydrocarbons (TPH) (*Only during construction phase)

MANAGEMENT PLAN 4

Spoil Management Plan

Client:

Mr George O'Mahony

Project:

Derreencrinnig Wind Farm

Report:

Spoil Management Plan

Date:

August 2011

Jennings O'Donovan & Partners Consulting Engineers,
Finisklin Business Park,
Sligo.

Tel: 071 916 1416
Fax: 071 916 1080
Email: info@jodireland.com
Web: www.jodireland.com

DERREENACRINNIG WEST WIND FARM

OUTLINE SPOIL MANAGEMENT PLAN

1 INTRODUCTION

This Outline Spoil Management Plan contains details of the sourcing of materials together with a plan for the storage and management of the spoil that will be excavated around the site. This section will serve as a framework for the final construction methodologies and is based on the site assessments completed thus far. Further site investigations will be carried out at preconstruction stage.

The site is located approximately 12 km west of Dunmanway. The site can be located on Discovery Series Map No. 85 at approximate grid reference W113 521. The site is irregular in outline, approximately 1.7 kilometres in width and 1.6 kilometres in length.

The site is currently used to graze sheep. There is an area of commercial conifer forestry located to the north of the site. There is an existing small borrow pit located in the northern part of the site of the site.

The site has 1.51km of an existing road network which has been predominately constructed with stone from the on-site borrow pit. These roads are used for works associated with the commercial forestry on the site. The wind farm layout has been designed to utilise the existing infrastructure as much as possible and 1,260m of existing road will be used. However, there will be a requirement for some 3,050m of new access roads to be built. The minimum finished road width will be 4.5m. There will also been a requirement for a crane hardstand at each turbine location. Each crane hardstand will cover an area of 650m^2, or 4,550m^2 in total. The turbine bases will also be excavated, each turbine base covers an area of 155m^2, or 1,085m^2 in total. The electrical compound and car park will also be excavated; this will cover an area of 1,500m^2.

All new hardstands on the site will be excavated to a suitable formation level and layers of stone are compacted to form the road. The method is described in more detail in the Outline Construction Method Statement in **Appendix I**.

2 SOURCING OF MATERIALS FOR ROAD CONSTRUCTION

2.1 QUANTITY OF STONE REQUIRED

Stone will be required for the construction of the wind farm. It is proposed to source this stone from an on-site borrow pit and from bedrock extracted during the construction of the internal access roads.

Table 1 gives a breakdown of where the stone will be used. The following parameters were applied when quantifying the volume of stone that will be required:

- New Roads: A finished width of up 4.5m is generally provided on straight stretches of road however, a wider finished width will be required on bends. An overall width of 5m was used in the volume calculation for new roads to allow for verges/slopes to formation level.

- Existing Roads: The existing roads have a minimum running width of 3.5m. These roads will have to be widened to a finished road width of 4.5m on straight stretches of road, and wider on the bends. Refer to **Figure 1 – Road Cross-sections**.

- Hardstands: The hardstands will be 43m x 15m wide, or 650m^2.

- Electrical Compound and Car Parking: The Electrical Compound and Car Park and will be 50m x 30m wide, or 1500m^2.

Description	Number of Units	Unit Area (m^2)	Total Area (m^2)	Depth of Stone Required for Base Course (m)	Depth of Stone Required for Wearing Course (m)	Total Volume (m^3)
Hardstands	7	650	4,550	0.5	0.1	2,730
Electrical Compound, substation & Car Parking	1	1,500	1,500	0.5	0.1	900
Upgrade of Existing Roadway	1,258	1.5	1.887	0.5	0.1	1,132
Construction of new roads	3,050	5.0	15,250	0.5	0.1	9,150
Construction of site entrance splays and additional access road areas	Various	Various	300	0.5	0.1	180
Stilling Ponds	48	12.5	600	0.2	0	120
Total						14,212

Table 1 Volume of stone required for the roads and electrical compound and hardstands and stilling ponds

From **Table 1,** it can be seen that 14,212m^3 of stone will be required for the wind farm construction. Some 2,350m^3 of this will be imported onto the site for a wearing course as the stone from the on site borrow pit and the bedrock to be extracted is susceptible to degradation under cyclical loading. The remaining 11,862m3 will be sourced from the onsite borrow pit and the road cutting during construction.

2.2 PROPOSED BORROW PIT

Investigations were carried out on the potential to win stone on site. The investigations included a walk over survey of the site together with the excavation of three trial pits and a geophysical seismic survey; refer to **Appendix C** of the main report – **Borrow Pit Site Investigations**. These investigations and an examination of the mass balance for the site and expected rock profile led to the alteration of the size and area of the original borrow pit viz. BP1a.

The location of the borrow pit is shown in **Figure 2 – Borrow Pit Location**. The borrow pit, located in the north western part of the site, has previously been used as a source of stone for on-site road construction. It is proposed to further develop this borrow pit to source the stone for the wind farm development. There is an existing site road running along the western boundary of the borrow pit. A summary of the main characteristics of the proposed borrow pit BP1a is as follows:

- Rock Type – Slightly weathered, fine grained sandstone, refer to the trial pit logs in **Appendix C** of the main report **– Borrow Pit Evaluation,**
- Suitable for Road and Hardstand sub-base and Base Course.
- Approximate area – 2,025m^2.
- Depth of Peat – up to 1.0m.
- Maximum depth of extraction – 9.0m.
- Possible supply volume from borrow pit – 11,700m^3.
- Maximum volume of peat to be temporarily removed – 2,025 m^3.

The total volume of rock which could potentially be supplied from the borrow pit is 11,700m^3 which is 2,512m^3 less than the volume of rock required in the wind farm construction. Some 2,350m^3 of this will be imported onto the site as the stone from the on site borrow pit and the bedrock to be extracted is susceptible to degradation under cyclical loading. The remaining 162m^3 will be sourced from the road cutting during construction. The bedrock will have to be cut in certain areas to give the internal access roads the required gradient. From preliminary calculations there will be an excess of bedrock extracted from the construction of the internal access roads. This will make up the 162m^3 of stone required, refer to **Section 3.4** of this report. The extraction methodology for the borrow pit is discussed in **Section 2.3**.

2.3 EXTRACTION METHODOLOGY

The method of extraction shall be by tracked excavator using large toothed bucket, rock breaking hammer or an environmentally friendly chemical agent as required. Blasting will not be undertaken at the site. The method of extraction for the borrow pit will be as follows:

- Borrow pit BP1a has been used as a source of stone for on-site road construction previously. An entrance to the borrow pit from the access road to the west and the borrow pit area will be set out and any vegetation will be cleared.

- An interceptor drain will be excavated around the southern and eastern boundary of the borrow pit. This will prevent surface run-off entering the borrow area.

- The area around borrow pit BP1a will be temporarily fenced off and suitable warning signage erected to warn of the nearby borrow pit.

- The peat will be stripped from the surface of the borrow pit and mounded into a berm adjacent to the borrow pit area. This material will stay in this location until final reinstatement.

- Once the rock is exposed after the stripping of the peat, the rock will be extracted. The rock at borrow pit BP1a is slightly weathered sandstone. A 25T tracked excavator with a rock breaker attachment or ripping bucket will be sufficient to extract this sandstone. Consideration should also be given to using a chemical agent to break down the rock. The agent used should be non explosive, non toxic and environmentally friendly controlled demolition agent e.g. Dexpan or equivalent. Please refer to **Appendix 1** of this report **– Borrow Pit Extraction Technologies**.

- Chemical break down of the rock is achieved by drilling holes at uniform spacing in the rock face, removing all dust from the hole, mixing the agent with water, filling the hole with the slurry and leaving until the rock has cracked. The rock can then be excavated using a tracked excavator with a ripping bucket.

- Borrow pit BP1a will be dug to a maximum depth of 9m below ground level. The level of the bottom of the borrow pit will have the same level as the existing road. The borrow pit will have a 9m high sloped back face, refer to **Figure 2** and **Figure 3** – Borrow Pit BP1a Plan and Borrow Pit Section.

- Overland flows in the vicinity of the borrow pit will be directed/diverted around the works so that only drainage of rainwater entering the footprint of the borrow pit will be necessary. An internal drain will be installed within borrow pit BP1a, refer to **Figure 3** for the detailed drainage of borrow pit BP1a. An internal drain will be installed within borrow pit BP1a, refer to **Figure 3** for the detailed drainage of borrow pit BP1a. Prior to discharge from the borrow pit, all surface water collected by the internal drain in the borrow pit will be diverted into a sump within the borrow pit and will then pass through a coalescing media oil water separator e.g. Siltbuster to reduce the suspended solids material in the surface runoff. Refer to **Appendix 1 – Borrow Pit Extraction Technologies.** The outfall from the coalescing media oil water separator will then flow, via gravity, under the road and will pass through a pair of stilling ponds, sized for 6 hour retention, before discharge via buffered outfalls on the western side of the road.

- The excavated rock will then be loaded by either a loading shovel or directly by the excavators to a mobile crusher so as to achieve the correct grading/stone size for use on-site. Crushed rock will be loaded into trucks for transportation to the area under construction.

2.4 REINSTATEMENT METHODOLOGY

- When work in the borrow pit is complete, peat that has not been used to construct roadside berms (which will be temporarily stored next to the borrow pit) will be reinstated into borrow pit BP1a. The top layer will comprise of the peat extracted from the development of the borrow pit. A rock berm with an overall height of 2m and base width of 4m will be constructed along the lower slope of the borrow pit to impound the peat. The slopes in the reinstated borrow pit will be limited to 7^{o}. Using this constraint, the borrow pit can accommodate up to 5,400m^3. This includes a bulking factor of 1.3.

- Peat will be spread in thin layers, not greater than 400mm, over a large area.

- The berm will be constructed using rock and a nonwoven woven geo-fabric with an effective opening size of less than 0.1mm will be used in the construction of the rock berm, e.g. Secutex 251-GRK-4 or similar, **Appendix 2 – Geotextile Technologies**. This will allow the berm to act as a filter for any water flowing from the reinstated borrow pit. A drain will be provided downhill of the berm.

- All reinstatement areas will be suitably fenced and signs warning the public will be erected.

- Reinstatement of vegetation on exposed soils will also be undertaken immediately following completion of construction (or in tandem where feasible) using a combination of techniques, turving, artificial planting and reseeding.

3 ESTIMATED QUANTITY OF PEAT AND BEDROCK REMOVAL AND REUSE

3.1 APPROACH

The soil type on the site is classified as peat. The quantity of peat to be removed is based on the geotechnical surveys carried out on site. These surveys consisted of probes at various locations around the site. The peat depth across the site varies from 0.1 to 3.15m in depth. Please refer to **Chapter 6 – Soils and Geology** of the EIS. However, the peat depth underneath the development footprint ranges from 0.0 to 2.1m in depth.

An estimation of the volume of peat to be excavated has been established as being 8,930m^3, refer to **Table 3** – Total Volume of Peat to be Excavated. This is estimated by considering the footprint of each element of the development and the peat depth for that element taken from the probes taken around the site.

The excavated material will be reinstated in one of three ways. These are as follows:

- Roadside Berms/Side Casting.
- Reinstatement of the Borrow Pit.
- Landscaping

The borrow pit shall be reinstated with:

- Any peat excavated from turbine bases and hardstands.
- Any peat material removed from the location of the borrow pit.

Berms of excavated material will not be located within the following areas:

- Within 50 metres of natural watercourses.
- Within areas of gradient greater than or equal to 10 degrees.
- Any location that has a peat depth greater than 1m deep.

3.2 PEAT REMOVAL

Introduction

The limited, existing on-site road network has been incorporated into the wind farm design as much as possible. An additional 3,050m of new road will have to be constructed to service the development.

Roads

Approximately 1,511m of existing road will be upgraded. The existing roads have a minimum running width of 3.5m. These roads will have to be widened to a finished road width of 4.5m on straight stretches of road, and wider on the bends. Approximately 3,050m of new access roads will have to be constructed. These roads will have a finished width of 4.5m but an overall width of 5.0m is used in this calculation to allow for verges/slopes to formation level. Peat depth under the road footprint varies from 0.0 to 2.1m in depth, the quantity of peat excavated from the construction of access roads will be c. 4,840m^3.

The peat excavated from the widening of existing roads will be sidecast as it is being excavated. With the exception of the roads on slopes greater than 10 degrees, the material will be sidecast upslope of the road. Once peat has been sidecast into the roadside berms, the peat will not be handled again.

The roadside berms will be trapezoidal in cross-section with approximate dimensions of 3.5m wide at the base, 1.5m wide at the top with a maximum height of 1m. The maximum angle of repose of the berms will be 45^o.

The locations of the roadside berms are shown in **Figure 4** – Roadside Berm Locations. There will be c. 2km of roadside berms on the site. Peat will only be excavated from 1,760m of road. Thus all **4,840m^3** of peat excavated from the road construction will be used in the construction of the roadside berms.

The uppermost layer excavated should be placed on top of the berms to encourage vegetation to grow.

Turbines/Hardstands

Only two of the seven turbine bases and five of the seven crane hardstands are located in areas are located in areas of peat. The remaining are located on areas of exposed bedrock. **Table 2** shows the volume of peat that will have to be excavated from the turbine bases and hardstands.

Turbine	Peat Depth at Hardstand (m)	Volume Excavated from Hardstand (m^3)	Peat Depth at Base (m)	Volume Excavated from Base (m^3)	Total Volume of Peat to be Excavated (m^3)
T1	0.3	195	0.35	55	250
T2	0.2	130	0.2	30	160
T3	0.0	0.0	0.0	0.0	0.0
T4	0.3	195	0.0	0.0	195
T5	0.0	0.0	0.0	0.0	0.0
T6	1.85	1200	0.0	0.0	1200
T7	0.4	260	0.0	0.0	260
Total		**1980**		**85**	**2,065**

Table 2 – Volume of Peat at each Turbine Location

Some 85m^3 of peat will be excavated for all the turbine bases and some 1,980m^3 of peat will be excavated from all of the hardstands. The peat excavated from the turbine and hardstand locations will be temporarily stored in berms adjacent to the hardstands.

Turbine bases will be reinstated and landscaped to a depth of 0.5m. At least 72m^3 of peat will be required at each turbine base to achieve this. This 72m^3 will be reconciled from the temporary berms. The peat for recovering T3 and T5, where no peat will be excavated, will be sourced from the excavations around T6. Some **71m^3** of peat will be used to landscape around each turbine base.

The remaining peat excavated from the turbine and hardstand locations, temporarily stored adjacent to the hardstands, will be stored here until the borrow pit has been exhausted. This material will then be used to reinstate the borrow pit. Some **1,565m^3** of peat from the turbine and hardstand excavations will be used to reinstate the borrow pit.

Electrical Compound

There will be an electrical compound and control building located in the eastern part of the site. The overall area will be approximately 50m x 40m or 2,000m^2. The electrical compound is located on exposed bedrock therefore, there will be peat excavated from this location.

Total Peat Excavation

Table 3 shows a summary the footprint area and of the volume of peat that will be excavated. The total volume of peat excavation is estimated to be 8,930m^3.

Description	Total Area (m^2)	Depth of Peat to be Excavated (m)	Total Volume (m^3)	Method of Re-use / Disposal
Turbine Bases	1,085	0.0 – 0.35	85	Temporarily mounded around base for landscaping. Excess will be moved to a temporary storage area adjacent to the turbine before being used to reinstate the borrow pit.
Hardstands	4,550	0.0 – 1.85	1,980	Temporarily mounded around hardstand for landscaping. Excess will be moved to a temporary storage area adjacent to the turbine before being used to reinstate the borrow pit.
Electrical Compound, substation & Car Parking	2,000	0.00	0.00	No peat to be excavated.
Construction of roads	-	0.00 – 2.1	4,840	Sidecast into roadside berm,
Peat Overlying the Proposed Borrow Pits	2,025	1.0m – Maximum	2,025	Temporarily mounded adjacent to the borrow pit, will be reinstated into borrow pit at the end of construction, after all other material is moved to the borrow pit.
Total			**8,930**	

Table 3 – Volume of Peat to be Excavated

3.3 SUBSOIL

A discussion on the use of subsoil within the site is requested in the request for further information. Throughout all the site visits and site investigations there has been no indication or evidence showing any subsoil on the site except for pockets along the southern access track. It is anticipated that the subsoil will provide an adequate formation layer for the access road, plate bearing and CBR tests will have to be carried out at preconstruction stage to confirm this. Therefore there will be no subsoil excavated. The site is covered in peat overlying bedrock or exposed bedrock. Please refer to **Figure 5** – Site Subsoil Geology Map.

3.4 BEDROCK REMOVAL AND RE-USE

The exposed bedrock covering the majority of the development footprint will also be cut at certain locations to provide an acceptable gradient for turbine delivery traffic. The bedrock will provide a suitable formation level for the road and hardstands, including the electrical compound.

The total volume of rock which could potentially be supplied from the borrow pit is 11,700m^3 which is 2,512m^3 less than the volume of rock required in the wind farm construction. Some 2,350m^3 of this will be imported onto the site as the stone from the on site borrow pit and the bedrock to be extracted is susceptible to degradation under cyclical loading. The remaining 162m^3 will be sourced from the road cutting during construction. The bedrock will have to be cut in certain areas to give the internal access roads the required gradient. From preliminary calculations there will be an excess of bedrock extracted from the construction of the internal access roads. Therefore the estimated deficit of 162m^3 of stone will be sourced from excess cut volumes during construction. This bedrock material will be used as the base course of the roads.

3.5 TOTAL VOLUME OF EXCAVATION

The total volume of peat excavation is estimated at **8,930m^3**.

3.6 TOTAL VOLUME OF RE-USE / DISPOSAL:

In summary:

- **4,840m^3** of peat will be used to construct the roadside berms.
- **500m^3** of peat will be used to reinstate and landscape the turbine foundations.
- **3,590m^3** of peat will be stored in the borrow pit.

- All the bedrock removed will be re-used on site as road base material or as structural backfill around the turbine bases.

These total **8,930m^3** (4,840 + 500 + 3,590) of peat re-use / disposal around the entire site.

The borrow pit will be able to accommodate up to 5,400m^3 of peat, some 1,810m^3 more than will be required. As the calculated peat excavation volume is less than that which may be accommodated in reinstatement, disposal of excess material off site will not be required.

4 CONCLUSION

Dereenacrinnig West Wind Farm layout has been designed to utilise the existing road network as much as possible. This will lessen the extent of work required to construct the wind farm. It is proposed to source the stone for the construction of the wind farm from an on-site borrow pit. The stone from the borrow pit is suitable for road construction.

Spoil management and disposal will not result in significant or adverse environmental impact.

The peat excavated on site will be permanently stored in one of three different ways, as follows:

- Reinstatement of Borrow Pit.
- Berms along the roadside, no greater than 1m in height.
- Landscaping, backfilling around the turbine bases.

A mass balance calculation was carried out and it was found that there will be no excess excavated material to be disposed off-site.

MANAGEMENT PLAN 5

Waste Management Plan

DERREENACRINNIG WEST WIND FARM LIMITED

PROPOSED 20KV GRID CONNECTION TO CONNECT THE PREVIOUSLY CONSENTED DERREENACRINNIG WEST WIND FARM, DRIMOLEAGUE, COUNTY CORK TO THE NATIONAL GRID

OUTLINE CONSTUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

WASTE MANAGEMENT PLAN

JUNE 2019

Derreenacrinnig West Wind Farm Ltd
Dreenacreenig West,
Drimoleague
Co. Cork

Jennings O'Donovan & Partners Limited,
Consulting Engineers,
Finisklin Business Park,
Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com

JENNINGS O'DONOVAN & PARTNERS LIMITED
Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 91 61416
Fax (071) 91 61080

Email info@jodireland.com
Web Site www.jodireland.com

DOCUMENT APPROVAL

PROJECT	Proposed 20Kv Grid Connection to Connect the Previously Consented Derreenacrinnig West Wind Farm, Dimoleague, Co. Cork to the National Grid	
CLIENT / JOB NO	Derreenacrinnig West Wind Farm Limited	4636
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP) Waste Management Plan (WMP)	

	Prepared by	**Reviewed/Approved by**
Document Draft	Name Sarah Moore	Name David Kiely
Date June 2019	Signature Sal Moore	Signature David Kiely

CONTENTS

1. INTRODUCTION

1.1 Scope and Requirements

This Management Plan is a 'live' document that can be reviewed and updated at regular intervals throughout the project life cycle. The Contractor is required to develop and adapt this document in line with the activities of the project being undertaken at Derreenacrinnig Wind Farm Grid Connection. The contractor will approve this Plan (and any future amendments of the document) with the Environmental Manager (EM) prior to any work commencing.

The information in this document forms part of the Construction Environmental Management Plan (CEMP) and is the Site Waste Management Plan (WMP) for Derreenacrinnig West Wind Farm Grid Connection.

The CEMP and the measures detailed in this WMP are part of the main requirements for consents for planning permissions. As such, the contractor (and all sub-contractors) on site are obligated to incorporate these waste requirements (contained herein) in all operations.

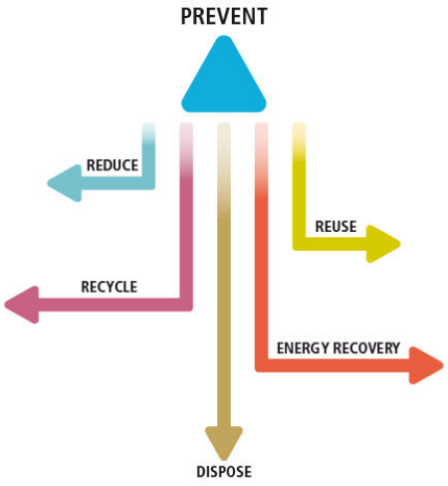
The general methods and principles detailed within this document will be adhered to by the contractor as they are committed to reduce the resources it uses in the construction work of Derreenacrinnig West Wind Farm grid connection.

1.2 Waste Prevention & Waste Regulations:

In 2012, the Department of the Environment, Community and Local Government published the Waste Management Policy in Ireland (DoECLG, 2012). One of its guiding principles is to minimise waste. It is therefore important that the Contractor has an efficient time management plan in place, so that where possible, excavated materials can be reused immediately elsewhere on site.

S.I. No. 315/2016 - European Union (Waste Directive) (Amendment) Regulations 2016 infers a duty on all waste producers to take measures to apply the waste hierarchy priority order. In these Regulations, the "Act of 1996" means the Waste Management Act 1996 (No. 10 of 1996) and "Principal Regulations" means the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011). The "Waste Directive" means Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste.

The Waste Management Priority Hierarchy which contractors are obligated to apply: (Source: EPA):



The Waste Hierarchy

The waste management hierarchy applies to all waste, including hazardous waste. The top of the hierarchy indicates that the priority should be in preventing waste being produced in the first place.

The PCB/PCT Directive (Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls) deals with the disposal of certain hazardous chemicals that represent a particular threat to the environment and to human health.

The European Communities (Carriage of Dangerous Goods By Road and Use of Transportable Pressure Equipment) (Amendment) (No. 2) Regulations 2017 (S.I. No. 282 of 2017) shall be adhered to in the case of transportation to and from the site of any dangerous goods.

The Contractor under the above mentioned Directives is legally required to:

- Ensure that the disposal and recovery of waste does not present a risk to water, air, soil, plants and animals
- Not allow waste disposal to constitute a public nuisance through excessive noise levels or unpleasant odours, or to degrade places of special natural interest
- Prohibit the dumping or uncontrolled disposal of waste
- Prepare WMPs
- Ensure that waste treatment operations are licensed
- Require waste collectors to have special authorization and to keep records
- Ensure that the waste which cannot be prevented or recovered is disposed of without causing environmental pollution.

The EU Integrated Pollution Prevention and Control (IPPC) Directive (Directive 96/61/EC) provides for a permit system for activities including waste management. In adherence with this Directive the Contractor must:

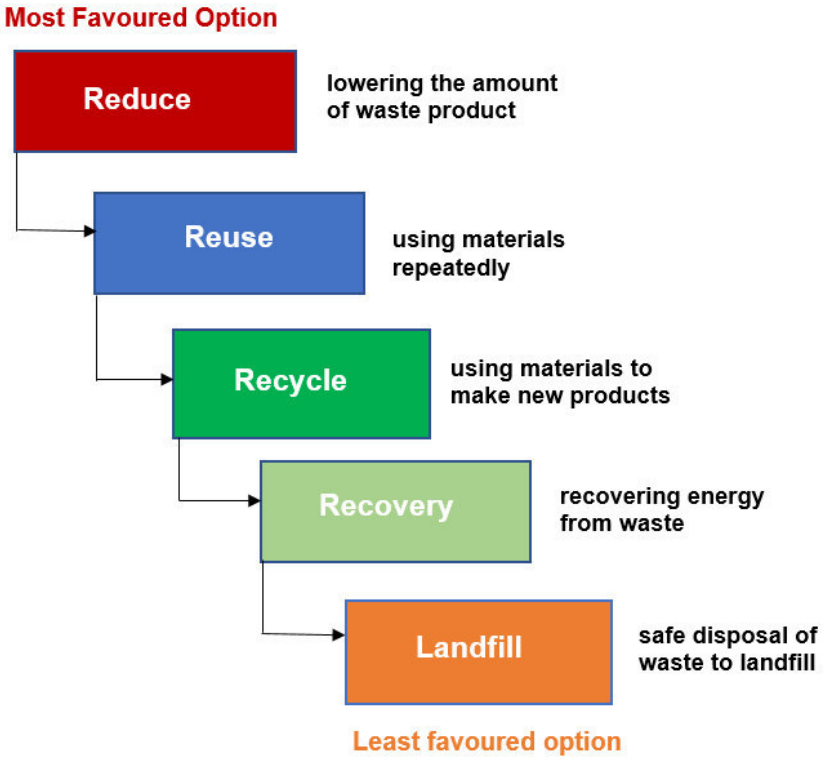
- Be in possession of a waste permit for waste disposal and
- Be prepared at all times for inspection regarding monitoring of waste activities.

1.3 Benefits of Waste Prevention

The contractor must be committed to preventing waste through implementing reduction and effectively managing resources from the design stage of construction to the completion of the construction of the project. This will ensure that:

- Legal obligations are met
- Waste production is minimised
- Build costs are minimised
- A framework for continuous assessment and best practice is implemented
- Carbon emissions and negative environmental impacts of and from waste materials are reduced

The following image explains this in more detail. The least favoured option is to dispose of waste to landfill where embodied energy is not recovered. The Waste Hierarchy (EU Waste Framework Directive, 2008) is outlined below:



1.4 Reference Documentation

As well as the Waste Management Act 1996-2008 other guidance documents have been used to develop this plan. These include:

Pollution Prevention Guidelines:

Best Practice Guidelines on the Preparation of WMPs for Construction and Demolition Projects, Dept. of Environment, Heritage & Local Government, July 2006.

EU Directive:

Article 4 of Waste Framework Directive (Directive 2008/98/EC)

This sets out the five steps for dealing with waste.

2. WMP MINIMUM REQUIREMENTS

A Site WMP involves the following stages:

- Planning
- Implementation
- Monitor
- Review

2.1 Planning

The planning stage of the development of Derreenacrinnig Wind Farm grid connection has taken into account the nature of the site, design of the wind farm, environmental considerations and construction methods to minimise the quantity of waste produced on site during its construction.

2.2 Implementation

This WMP will include:

1. An inventory of waste type expected to be produced in the course of the project.
2. Estimates of each type of waste that will be produced in the construction of this wind farm.
3. A statement showing how the contractor will minimise each type of waste to be produced prior to any activity generating this waste.
4. Procedures for identification of the waste management actions proposed for each different waste type, including re-using, recycling, recovery and disposal (as per the waste hierarchy priorities).

2.2 Monitoring

2.2.1 Checks and Records

All stores on site of oil, fuel, chemicals etc should be regularly checked (in particular in extreme weather conditions) for evidence of leaks or spills. The timing of each of these checks is detailed in Section 3. These checks will be visual inspections to look for evidence of contamination.

Records of all visual checks must be maintained and be available for inspection on request. Waste Management will be a regular item on team meetings as required by the CEMP. Waste Management Practices should be revised at these meetings. There should be a site waste audit carried out every six months (Section 2.3.3).

2.2.2 Waste Inventory

A waste inventory should be maintained and kept up to date. It will include an inventory of all waste materials leaving the site for disposal and the name of the licensed operator and intended disposal facility. A Waste Inventory Spreadsheet should be added to this plan by the Contractor.

2.2.3 Monitoring of Site Waste Management Plan

The contractor will appoint a person to implement and monitor the WMP. This will be the Environmental Manager (EM).

As stated, the WMP should include an inventory of the types and estimates of the waste to be produced on site. The aim will be to keep volumes of waste produced below the estimates of waste to be produced. The appointed person should ensure that a Site Waste Audit is carried out every six months.

2.3 Completion, Audit and Review

Upon completion of construction works but before the end of the defects correction period, a Waste Management Review should be undertaken. The aim of this is to identify project progress, measure compliance with licenses and to consider lessons learnt.
A Waste Management Review will be carried out at the end of construction.

2.4 Site Waste Management as Part of Site Induction process

All workers on-site at Derreenacrinnig West should be fully briefed with the WMP. All site visitors will be briefed on appropriate waste storage and disposal units. Littering on site will not be tolerated. All personnel have a Duty of Care to challenge others noted littering on site.

3. GENERAL WASTE MANAGEMENT PRINCIPLES

3.1 The contractor will avoid or minimise the volume of waste generated.

3.2 Waste including spoil, will be stored a minimum of 50m from nearby watercourses or drains at Derreenacrinnig West.

3.3 Waste storage and disposal will be carried out in a way which prevents pollution in compliance with legislation.

3.4 All waste to be transported off-site to a licensed disposal site. Duty of Care Waste Control dockets must be produced and filed on site with each load. These **MUST** detail:

- An adequate description of the waste
- Where the waste came from
- The appropriate code from the List of Wastes Regulations for the waste (commonly referred to as the EWC code)
- Information on the quantity and nature of the waste and how it is contained
- Names and addresses of the transferor at Derreenacrinnig West Wind Farm (the person currently in control of the waste) and the transferee (usually either a registered waste carrier or a waste management licence holder (waste manager)
- The Standard Industry Classification (SIC) code (2007 or 2003 for hazardous waste only) of the business from where the waste was received
- Where applicable, indicate that the Waste Hierarchy has been complied with
- The place, date and time of transfer of the waste. If using a season ticket, the period for which it is valid (i.e. valid from dd/mm/yyyy to dd/mm/yyyy)
- If the waste is being taken to landfill the transfer note **must** also contain details of any treatments or processes that have already been applied

3.5 Only trained operatives should handle hazardous substances. All stored hazardous waste will be clearly labelled.

3.6 All oil storage facilities of over 200 litres need secondary containment facilities of 110% storage capacity (e.g. bund, enclosure, drip tray). All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g. a drip tray full of rainwater.

3.7 Waste storage areas will be clearly located and signed. If space allows, key waste streams will be separated.

3.8 All waste should be transported from site at appropriate frequency by a registered waste contractor to prevent over-filling of waste containers.

3.9 Frequency of Checks. The contractor will ensure that all storage facilities are checked on a weekly basis. The checklist for completion is attached below.

VISUAL WASTE STORAGE CHECKLIST		
Waste Area Checked	**Date Checked**	**Initials of Checker**
GENERAL OFFICE WASTE		
BOWSER		
PORTALOO		
EXCAVATED SOIL		
WASHINGS		
CONCRETE		
OIL		
HAZARDOUS WASTE		

4. ANTICIPATED CONSTRUCTION WASTE STREAMS

As stated previously, the contractor will outline prior to commencement of construction all anticipated waste streams to be produced at the construction site at the Derreenacrinnig West Wind Farm Grid Connection.

4.1. Waste from Staff Facilities

4.1.1 General Waste Generate at Staff facilities.

There will be the typical waste generated in an office such as left-over food and sandwich wrappers. All such waste should be stored appropriately and safely from wind, rain and wild animals that often tear apart rubbish bags. Provision for separation of waste streams will be provided so that e.g. paper and cardboard waste and bottles may be recycled.

4.1.2 Sewage

In addition, the facility will comprise self-contained port-a-loo units which will be managed and serviced regularly (by removal of the contents by tanker to a designated sewage treatment plant) and removed off site on completion of construction.

4.2 Concrete

4.2.1 Concrete Waste and wash-out water

Methods for dealing with/avoiding concrete waste and wash out water are provided in the CEMP Surface Water Management Plan (SWMP), Sections 2.5.1 and 3.3.

4.2.2 Treatment of Suspended Solids from Concrete Batching

Any wastewater generated from concrete batching will be adequately treated to deal with suspended solids and high alkalinity before discharge.

4.3 Chemicals, Fuel and Oils

Engine and hydraulic waste oil will be stored on site in compliance with the Surface Water Management Plan (CEMP, Appendix 2). All storage containers of over 200 litres will have a secondary containment of 110% capacity to ensure that any leaking oil is contained and does not enter the aquatic environment.

As part of this WMP there will be a **Chemical and Waste Inventory kept**. This inventory will include:

- List of all substances stored on-site (volume and description);
- Procedures and location details for storage of all materials listed; and
- Waste disposal records, including copies of all Waste Transfer Notes (WTN) detailing disposal routes and waste carriers used.
- Any tap or valve permanently fixed to the mobile unit through which oil can be discharged to the open or when delivered through a flexible pipe which is fitted permanently to the mobile unit, must be fitted with a lock and locked shut when not in use.
- Sight gauges must be fitted with a valve or tap, which must be shut when not in use. Sight gauge tubes, if used must be well supported and fitted with a valve.
- Mobile units must have secondary containment when in use/out on site.

Where mobile bowers are used on site guidelines will be followed so that:

- Any flexible pipe, tap or valve **will** be fitted with a lock where it leaves the container and be locked shut when not in use;
- Flexible delivery pipes **will** be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Where possible, a nozzle designed to dispense oil is used;
- The pump or valve will have a lock and be locked shut when not in use.

4.3.1 Transport of Diesel/Oils to the site

Diesel is now classified as a dangerous substance. Under the EU Directive 95/55/EC all such dangerous substances should be conveyed in a container that compiles with the ADR. As such the manufacturer of each bowser should provide certification to contractors that the following:

- A leak-proof test certificate
- A copy of the IBC approval certificate
- An identification plate attached to the container

For loads in excess of 1000 litres (220 gallons), the bowser vehicle driver will have undergone training and hold a special license.

4.3.2 Refuelling on Site

Where possible all refuelling on site will be within the temporary compound within the re-fuelling area. Only essential refuelling (e.g. cranes) will be carried out, outside of this area, but not within 50m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during

filling and disconnection. This membrane will be inspected and if there is any sign of oil contamination, it will be removed from site by a specialist licensed waste contractor.
All vehicles will be well maintained and free from oil or hydraulic fuel leaks.

4.4 Packaging

Packaging will be brought on site and can include cardboard, wood and plastics used to package turbine components. As per the waste hierarchy, packaging will be returned to the originator ahead of re-use or recycling. Where this is not possible, waste should be separated as appropriate and safely stored on site appropriately site in anticipation of recycling.

4.5 Waste Metals

Waste metals from concrete reinforcing etc should have commercial value and will be re-used or recycled with the appropriate licensed waste contractor.

5. EXCAVATED MATERIALS

The Spoil Management Plan (SMP) details the methods, storage and use of excavated materials. These excavated materials will be required for habitat and ecological restoration, reprofiling and backfilling as per the SMP. But whilst they are being stockpiled on site, they need to be classified in order to comply with waste legislation. The National Waste Collection Permit Office (NWCPO) maintains a register for waste facility permits and certificates of registration issued by local authorities.

5.1 Anticipated materials to be excavated on site.

It is anticipated that c. 4,624m^3 of topsoil and 2,039m^3 of subsoil will be excavated during construction.

5.1.1 Classification and Plan for Excavated Materials on site

The contractor will liaise with the Local Authority on all aspects of waste management relating to excavated soil to ensure compliance during construction. The Environmental Manager will ensure all mitigation measures outlined are adhered to.

5.2 Estimated Volumes of Soil

Volumes are outlined in a Spoil Management Plan (SMP) and provided in Appendix 4 of the CEMP. Whilst there will be significant volumes of soil to be excavated on site during the construction of Derreenacrinning West Wind Farm Grid Connection, where possible excavated material will be used for reinstatement and restoration works.

The SMP outlines the re-use proposals for excavated materials. Not all excavated materials can be appropriately re-used on site and some will be disposed of at a licensed waste facility.

5.3 Waste or Not Waste

Any excavated materials which are not intended to be disposed of, or discarded, will NOT be considered as waste. It will not be regulated under waste management controls where the following six criteria are ALL met:

i) Use is a necessary part of the planned works
ii) Material is suitable for that use
iii) Material does not require any processing or treatment before it is reused
iv) No more than the quantity necessary is used
v) Use of the material is not a mere possibility but a certainty and
vi) Use of the soil will not result in pollution of the environment or harm to human health

If excavated materials do not meet any one of the above criteria unless it is treated to recover the waste, it will have to be classified as waste initially. But following treatment and re-use on site it will no longer be classified as waste.

If excavated soil on site does not meet all of the six criteria listed above, for the purposes of waste description, it would fall under chapter 17 of the European Waste Catalogue (EWC) Construction and Demolition wastes and the EWC code ’17,05’04 soil and stones (non-hazardous) waste would apply.

The principles of the waste hierarchy will be strictly adhered to avoid and minimise production of excavated soil, and to ensure that all materials are recovered and reused on site.

WASTE INVENTORY

THE CONTRACTOR WILL PREPARE AND UPDATE REGULARLY A WASTE INVENTORY FOR INCLUSION IN THE WASTE MANAGEMENT PLAN