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ENERGY SERVICES



Islandmore Wind Farm

Environmental Impact Assessment
Report

Annex 3.4: Planning-Stage
Construction Environmental
Management Plan

Islandmore Wind Farm Limited

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1.0 INTRODUCTION

Galetech Energy Services (GES), on behalf of Islandmore Wind Farm Limited, has prepared this Planning-Stage Construction Environmental Management Plan (CEMP) for the construction of the Islandmore Wind Farm.

1.1 PURPOSE OF THIS REPORT

This CEMP has been prepared to outline the management of activities during the construction of the project to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments made in respect of the project and the measures to be adopted to ensure compliance with legislation and the requirements of statutory bodies.

This CEMP (Planning-Stage/Preliminary) is a live document and will be updated by the appointed contractor prior to the commencement of development. Prior to the commencement of construction, the updated CEMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (ECoW), as necessary, to confirm the appropriateness of the measures set out therein. This CEMP will form part of the main civil construction works contract. The 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 and method statements) as required.

1.2 OBJECTIVES OF THE CEMP

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 address the proposed environmental construction strategies that are to be implemented in advance of and during the construction of the project.

This CEMP aims to define good working practices as well as specific actions required to implement mitigation requirements as identified in the Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), the planning process, and/or other licensing or consenting processes.

1.3 STRUCTURE OF THE CEMP

The CEMP has been structured such that it can be read as consolidated document or as discreet documents addressing specific environmental topics. In particular, we refer to the technical annexes enclosed which address specific matters such as spoil management, surface water management, waste management, and emergency responses.

A copy of the CEMP will be maintained in the site offices for the duration of the construction phase and will be available for review at any time. The contractor's EM will be responsible for the continued development of the CEMP throughout the construction phase.

Where specific construction management plans or method statements are prepared by the contractor, these will be inserted into the relevant section of this CEMP.

1.4 ROLES & RESPONSIBILITIES

Islandmore Wind Farm Limited, and its appointed Project Manager, will be responsible for the overall implementation of the environmental measures and procedures set out in the CEMP. The role of the Project Manager relates to compliance monitoring with the CEMP and other planning/environmental/licensing requirements. Additionally, the Project Manager shall be empowered to halt works where he/she considers that continuation of the works would be likely to result in a substantial environmental risk.

The Project Manager will also carry out site checks that the works are being undertaken in accordance with the CEMP and will prepare a record of same.

The Contractor will appoint an EM who will be responsible for coordination and development of the CEMP and any other surveys, reports or construction management plans necessary for the discharge of the requirements of the CEMP. The EM will also review the contractors construction management plans as required, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group (see below) and required liaisons between Islandmore Wind Farm Limited, the Contractor, and other statutory authorities.

Prior to commencement of construction, the Contractor will identify a core Environmental Management Group, comprising of specific project personnel and including the Project Manager, EM and 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.

1.5 REPORTING PROCEDURES

Appropriate reporting procedures are key to the proper implementation of the measures outlined within this CEMP, and include reporting between parties involved in the construction of the project and also external stakeholders, such as the relevant local authorities.

Emergency and environmental incident reporting procedures are set out in the Environmental & Emergency Response Plan (see **Annex 1**).

2.0 DESCRIPTION OF THE PROJECT

Islandmore Wind Farm Limited intends to construct the Islandmore Wind Farm which will consist of:-

- 10 no. wind turbines, 3 no. with an overall height of 185m and 7 no. with an overall height of 150m;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling;
- Works to the public road network along the turbine component haul route; and,
- 110kV electricity substation and installation of c. 7km of underground electricity line to facilitate connection of the wind farm to the existing Tonroe 110kV electricity substation at Ballaghaderreen, County Roscommon.

The project is located in north County Roscommon; c. 2km north of Ballaghaderreen, c. 13km east of Charlestown (Co. Mayo) and c. 6km southwest of Gorteen (Co. Sligo);

and is located in close proximity to the county boundaries between counties Roscommon, Sligo and Mayo.

Various environmental reports have been prepared in respect of the project and have been utilised in the preparation of this CEMP, including:-

- Environmental Impact Assessment Report (Galetech Energy Services); and,
- Natura Impact Statement (Woodrow/APEM Group).

3.0 GENERAL CONSTRUCTION SEQUENCE

The construction phase is likely to last for approximately 15-18 months from commencement of enabling works through to the installation and commissioning of the turbines and ending with site reinstatement and landscaping.

The construction phase of the development will comprise a 6-day week with normal working hours from 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. It may be necessary to undertake works outside of these hours to avail of favourable weather conditions (e.g. during time of low wind speed to facilitate turbine installation etc.) or during extended concrete pours (e.g. where turbine foundation pours must be completed within 24-hours). Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

3.1 CONSTRUCTION METHOD

The construction of the wind farm will consist of the following general sequence:-

- Preliminary traffic management and surface water protection measures to be implemented;
- Establishment of the site entrances, to be commenced and completed, ensuring that adequate visibility splays are provided;
- Progressive installation of surface water protection measures;
- Establishment and continued management of spoil deposition areas;
- Establishment of the borrow pit;
- Progressive construction of internal on-site access tracks utilising material extracted from the borrow pit, where possible, and imported from local quarries;
- Construction of the temporary construction compounds for off-loading materials and equipment and to accommodate temporary site offices;
- Construction of bunded areas for oil, fuel and lubricant storage tanks;
- As the internal access tracks progress to each turbine location, tree felling will be completed where required and foundation excavations for the turbines will commence and foundations laid. The hardstanding areas will also be constructed;
- Permanent and temporary upgrade works along the turbine component haul route will be commenced;
- Once the on-site access tracks are completed, the trenching and laying of underground cable ducting and cabling will begin;

- Installation of turbines will commence once the on-site access tracks, hardstands, foundations and drainage measures are in place and the haul route upgrade works are complete. It is anticipated that each turbine will take approximately 1-week to install. 2 no. cranes will be used for this operation. As each turbine is completed, the electrical connections will be made; and,
- Progressive site reinstatement, restoration and landscaping including habitat management proposals and re-profiling of borrow pit and spoil deposition areas, removal of turbine storage areas; installation of post-and-wire fencing around turbines, access tracks and at site entrances; installation of gates and vegetation at site entrances; and decommissioning of the temporary construction compounds and temporary equipment storage areas.

The construction method for the electricity substation and underground electricity line will consist of the following general sequence (to be completed concurrently with wind farm construction):-

- Site preparatory and groundworks associated with the substation compound footprint including control buildings;
- Construction of the control buildings;
- Construction of bases or plinths for electrical apparatus;
- Installation of palisade fencing around substation;
- Installation of internal and external electrical apparatus in control buildings and within compound area;
- Installation of underground electricity line (including joint bays, communication chambers, and HDD works) between substation and Tonroe 110kV electricity substation;
- Connection of underground electricity to the respective substations;
- Commissioning of electrical apparatus and underground electricity line; and,
- Progressive site reinstatement, restoration, landscaping and planting proposals including the installation of stockproof fencing and the installation of gates.

Once the turbines are installed, and the substation and electrical system completed, the turbines will be tested and commissioned.

In addition to the roles of the EM and ECoW described above, the construction phase will be supervised by a range of environmental and engineering specialist personnel; including a Project Supervisor for the Construction Stage (PSCS), Archaeological Clerk of Works (ACoW), and Geotechnical Clerk of Works (GCoW), among others; who will liaise closely with the appointed contractor's on-site EM to monitor construction activities and to ensure that all applicable environmental control measures are implemented in full.

3.2 SITE ENTRANCES

A total of 7 no. site entrances will be required to facilitate access to the project site. Of these, 6 no. will be new access points and 1 no. will comprise the upgrade of an existing agricultural entrance; with 4 no. entrances being from the L5501, 2 no. entrances from the L55018 and 1 no. entrance from an unnamed local road.

The construction of site entrances will be carried out by placing geotextile or geogrid within the defined entrance footprint followed by the placement of granular fill (rock) in compacted layers. Drainage features will be installed to manage runoff and prevent sedimentation of adjacent surface water channels. Visibility splays will be cleared and temporary traffic management measures will be implemented during construction to ensure the safety of road users and construction personnel.

Following the delivery of turbine components, the scale of the wind farm (construction phase) site entrances will be reduced but will be reinstated such that they remain capable of accommodating abnormal loads in the event of a major component change-out during the operation phase of development. The reinstatement of the site entrances will comprise the installation of post and rail fencing, gates and the planting of hedgerows (where appropriate and as advised by the ECoW). Hedgerows, where planted, will be appropriately located to allow for future growth while ensuring, at all times, that visibility splays are maintained during the operation phase.

3.3 HARDSTANDING AREAS AND ON-SITE ACCESS TRACKS

The areas of hardstanding for crane operations and on-site access tracks will generally be constructed as follows:-

- Rock/stone will be laid on a geotextile mat and compacted in layers to an appropriate depth. The sub-layers of the hardstanding areas and access tracks will be constructed of rock/stone extracted from the borrow pit insofar as possible, with the upper layer comprising capping material imported from a local quarry (quarries). All such areas of hardstanding will be permeable to avoid significant volumes of surface water run-off;
- Where access tracks are required to cross drainage ditches, these will be piped or spanned with an appropriate bridging structure. At the crossings of the watercourses to the east of turbine T4 and east of turbine T9 respectively, bottomless culverts or clear-span structures will be installed (subject to final post-consent detailed design) to prevent any interference with the hydraulic capacity of the watercourses; and,
- Areas of temporary hardstanding (for turbine component storage and crane assembly) will be reinstated following the construction phase by removing aggregates, placing excavated material and allowing the areas to revegetate naturally. The crane hardstandings and on-site access tracks will be retained during the operation phase to facilitate access for maintenance personnel and in the event of a major component change-out.

3.4 TEMPORARY CONSTRUCTION COMPOUNDS & EQUIPMENT STORAGE AREAS

The compound base, which will be placed on a geotextile mat, will be made up of well graded aggregates, compacted as necessary. A designated waste management area and fuels and chemicals storage area will be provided within the compounds along with site offices, parking, staff welfare facilities and equipment storage areas. The compounds will be fenced with temporary security fencing to restrict access. Following the completion of the construction phase, the compounds will be fully reinstated involving the removal of crushed stone and underlying geotextile, spreading of excavated material (as required) and allowing the areas to revegetate naturally.

3.5 CHEMICAL STORAGE & REFUELLING

Storage areas for oils, chemicals and fuels will comprise bunded areas of hardstand of sufficient capacity within the temporary construction compounds. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any hydrocarbons that may be present. As part of the design process, a 50m buffer has been observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone.

From the construction compounds, fuel will be transported to works areas by a 4x4 with a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. 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 its carrying capacity. As above, a 50m buffer will be observed around all surface water features and no refuelling will be permitted within this zone.

3.6 WASTE MANAGEMENT

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical portaloo toilets;
- Plastics; and,
- Oils and chemicals.

Waste disposal measures proposed include:-

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, bedrock, concrete, bricks, tiles, oils /diesels, metals, dry recyclables e.g. cardboard, plastic, timber;
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left over materials (e.g. timber off-cuts) and any suitable demolition materials shall be re-used on-site;
- Uncontaminated excavated material (rock, topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill;
- Bedrock may be encountered during foundation excavation. If bedrock is encountered it will be utilised for infill during construction;
- All waste leaving the site will be transported by permitted contractors and taken to suitably licensed or permitted facilities and will be recycled, recovered or reused, where possible; and,
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

The contractor shall ensure that all waste generated at the project site is managed in an appropriate manner. The precise methods to be implemented are detailed in the

accompanying Waste & Resource Management Plan (**Annex 2**) which shall ensure that waste is managed in accordance with all relevant legislation, best practice methods, and in accordance with the waste management priority hierarchy.

Excavated spoil material shall be managed in accordance with the provisions of the Peat & Spoil Management Plan. Only material which cannot be re-used for reinstatement or landscaping purposes shall be removed from the project site and disposed of at an approved waste management facility.

3.7 CONSTRUCTION EMPLOYMENT

It is estimated that up to 100 no. people will be employed during the construction phase. The actual number present on site will depend on the activities being undertaken at any given time and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor but it is likely that the workforce will include labour from the local area.

3.8 CONSTRUCTION TRAFFIC

Vehicular traffic required for the construction phase is likely to include:-

- Articulated trucks (HGVs) to bring initial equipment onto site and later to bring the turbine components, electrical cables, steel reinforcement for foundations, anemometer mast, and ancillary equipment;
- Tipper trucks and excavation plant involved in site development and excavation works;
- Cranes to erect the turbines;
- Miscellaneous vehicles and handling equipment, including vehicles associated with construction workforce.

Deliveries of turbine components will take place at times to avoid peak traffic periods and are likely to occur during night-time hours. All abnormal loads will be accompanied by an advance escort vehicle.

Traffic mitigation measures will be implemented during the construction phase, as follows:-

- Signage at site entrances giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads, where restrictions have to be put in place (e.g. along the underground electricity line route);
- Construction traffic management – one way systems where possible and strictly enforced speed limits;
- Provision of a designated person to manage access arrangements and act as a point of contact to the public; and,
- All temporary road alterations and public road upgrades to be carried out in full consultation with the respective planning authorities.

4.0 ENVIRONMENTAL MANAGEMENT MEASURES

4.1 POPULATION & HUMAN HEALTH

A series of measures has been agreed with involved landowners regarding the management of agricultural/forestry activities during the construction phase. These measures have been incorporated into signed legal agreements with the landowners and will be implemented in full.

4.2 BIODIVERSITY

- The direct loss of (FW4) Drainage ditches to construction will be strictly limited to sections essential for the viability of the project, with all feasible measures taken to retain existing ditches where possible and to avoid unnecessary crossings or culverting;
- Medium and high impact invasive species such as cherry laurel, Rhododendron and Japanese knotweed were recorded within the project site. Due to the passage of time from initial site surveys to the start of construction works, a preconstruction invasive species survey must be carried out to determine baseline conditions for the presence of invasive species. Results of this survey will be presented in a site-specific Invasive Species Management Plan (ISMP) which will be prepared by the Appointed Contractor. The management plan will set out strict biosecurity measures with reference to Best Practice guidance to ensure there is no potential for the spread of alien invasive species during the construction works.

Measures within the ISMP will include (but are not limited to) 1) A Method Statement for avoidance of invasive species within the project site; 2) if avoidance is not possible then removal and treatment measures will be required to be used to prevent the spread of invasive species; and 3) A specialist invasive species contractor will be employed during the project life to ensure all removal and treatment is carried under the appropriate licensing and guidance.

While the ISMP will contain specific measures (relevant to specific species) to be employed on site subject to the outcome of the pre-construction invasive species, the following measures will be employed as a matter of course:-

- An invasive species management plan will be developed and implemented. This will include the general prevention and containment measures and species-specific treatment measures as may be required;
- An Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of any invasive and non-native species sensitivities of the project and to undertake pre-construction surveys, enforcing any exclusion zones and mitigation measures as required;
- Use of toolbox talks as part of site introduction to workers, including what to look out for and what procedures to follow if invasive species are observed;
- Signs will be used to warn workers of invasive species contamination;
- Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;
- Unwanted material contaminated with invasive species will be transported offsite by an appropriate licenced waste contractor and disposed of at a suitably licenced facility (NRA, 2010);

- Good hygiene practices will be adhered to including the removal of build-up of soil on equipment; keeping equipment clean; washing vehicles exiting the site using a pressure washer to prevent the transport of seeds; storing wastewater from washing facilities securely and treating to prevent spread of invasive species; checking footwear and clothing of workers for seeds, fruits or other viable material before leaving the site; any plant material arising from cleaning equipment, footwear and clothing will be carefully disposed of following (NRA, 2010) guidelines in such a manner not to cause the spread of invasive species;
- A pre-construction walkover survey of the project will be undertaken during the growing season (April to August). This will search for invasive and non-native species, which could change over time. The extent of invasive plant species will be physically marked out if there have been any changes since baseline surveys;
- If any are identified, then appropriate exclusion zone(s) will be implemented. A buffer will be used to cordon off invasive species outside the works footprint;
- Due to the presence of suitable habitat for otter and badger within the project site and within the Zol of the project site, and the mobile nature of these species, a pre-works ecological constraints walkover survey will be carried out by an appropriately qualified Ecologist. If breeding otter holts are discovered, then construction must stop within 150m until the holt is no longer in use. NPWS can be consulted to obtain a derogation, but this process and criteria is frequently changing and may be difficult to obtain.

The baseline surveys found badger setts adjacent to the works corridor. The following mitigation measures will be applied to avoid disturbance to badgers:-

- Where possible, no works will be undertaken within 50m of active badger sett(s), as measured from all the entrances to burrows;
- Where this is not possible, a method statement will be drafted based on pre-construction badger surveys carried out on site by a suitably qualified Ecologist a minimum of –4-6 months prior to site works. Seasonal restrictions and badger sett closures (temporary or permanent) may be required. And all such work would require approval from the Local Authority and local NPWS ranger;
- Ideally, all heavy machinery will be excluded from areas within 30m of active badger sett(s), as measured from all the entrances to burrows;
- TII guidance and mitigation: 'Guidelines for the Treatment of Badgers Prior to the construction of National Road Schemes' will be followed and form the best practice guidance;
- Exclusion zone buffers of 30m around all sett entrances will be marked off prior to commencement of construction works to ensure protection of these locations. Buffer zones will be appropriately signposted and will be marked out using fencing posts and rope;
- To avoid the period of time when badgers are particularly sensitive to disturbance (birthing and raising young cubs); no heavy construction works, including tree felling will be undertaken during the badger breeding

season (December to June inclusive) if occurring near an active badger sett. This will be assessed by the appointed ECoW 4-6 months prior to works commencing;

- Disturbance to foraging mammals will be avoided by:-
 - Construction works being largely limited to daylight hours allowing nocturnal animals like badgers and otters to forage through the night;
 - Minimising the risk of mammals becoming trapped if falling into excavated holes and trenches through the provision of egress points, e.g. placing escape planks or spoil runs. In addition, the length of time holes will be exposed will be limited;
- In terms of bats, mitigation on a precautionary basis will be applied in the form of pre-construction tree inspections to identify and protect any bats potentially occupying roosts in vegetation designated for removal. Vegetation removal will also be carried out, where possible, during the period when bats are least likely to be using tree roosts (November to March) to further diminish the likelihood of any roosting bats being present.

For any occupied or likely occupied roost sites where vegetation removal is not proposed (around F.1), an exclusion zone will be implemented to prevent disturbance during times of occupancy. provides optimal time periods for works depending on the roost type, and therefore by extension restrictive periods for construction works, during which the exclusion zone for construction work would be applicable. Reporting of pre-construction bat surveys and action taken will be required to demonstrate due diligence regarding avoidance of disturbance to roosting bats.

The principal mitigation measure incorporated into the design of the proposed development to reduce the potential risk of bat collision and barotrauma is the application of bat feature buffers between turbines and habitats used by bats for foraging and commuting.

In accordance with the guidance *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* (NatureScot *et al.*, 2021), a precautionary separation distance has been applied between turbine rotor-swept areas and identified bat habitat features. The required separation distance is calculated based on turbine dimensions and the height of adjacent vegetation or habitat features.

NatureScot guidance recommends that a minimum buffer of 50 m is maintained between the rotor-swept area and features likely to be used by bats, including woodland edges, treelines, hedgerows and other linear landscape features. The buffer distance is measured from the outermost tip of the turbine blade to the nearest bat habitat feature.

Bat feature buffers for the proposed development were calculated using the NatureScot methodology and have informed the turbine layout and vegetation management requirements. Where required, vegetation removal has been incorporated into the design to achieve compliance with the recommended stand-off distances and thereby reduce collision risk for bats during the operational phase.

Removal of hedgerow vegetation and replacement planting will mitigate the impacts of artificial lighting at night on the project site as the replanting has

been designed to encourage foraging and commuting bats away from turbine locations, thereby reducing the attraction effect of lighting for certain collision-risk bat species. The use of screening planting around the substation and motion-sensor controlled lighting will minimise the impact of the lighting installations.

- The mitigation measures relevant to freshwater ecology include:-
 - Avoidance of sensitive aquatic areas where possible by implementing a 50m construction zone buffer;
 - As described in Water specific mitigation measures, incorporated into the design of the development and through implementation of best practice methodologies will be employed where work inside buffer zones is proposed for the watercourse crossings required;
 - Any works for stream crossings will be carried out during the working window for instream works. This working window is defined by Inland Fisheries Ireland (IFI) as 01 July to 30 September to avoid vulnerable spawning salmonids/lamprey that may be present in downstream environments outside of this window. Any works outside of this period would require a derogation under the Local Authorities (Works) Act, 1949 and permissions from Inland Fisheries Ireland after consultation;
 - Work in areas liable to sediment erosion to be carried out only during dry conditions and no excavations to take place during forecasted yellow or higher rain warnings. Topsoil stripping and peat removal to be carried out only during dry conditions. All other work to be undertaken in dry conditions wherever possible, and no works (other than monitoring) to be carried out during heavy rain or snowmelt;
 - There will be no crossing of rivers or streams by machinery during the construction phase, other than by constructed access routes, and all machinery must remain within the works corridor and utilise designated access routes. Constriction machinery to access the project site via alternative means to the river crossing wherever possible;
 - There will be no direct dewatering to watercourses during the construction phase. All outflows from drainage associated with construction will be by diffuse overland drainage at appropriate locations and through settlement ponds/tanks/silt socks;
 - For works taking place within watercourse buffer zones, enhanced sediment control measures including double silt fencing and additional filtration controls will be implemented where required in accordance with the CEMP and SWMP;
 - Cement leachate, hydrocarbon oils and other toxic poisonous materials will require full containment and will not be permitted to discharge to any waters, and control measures to be place will include:-
 - Appropriate bunded storage area for storage of fuels/oils, with onsite storage of hydrocarbons to be kept to a minimum;
 - Mobile double skinned fuel bowser will be used for re-fuelling on-site;
 - No refuelling will be permitted at works locations within the 50m hydrological buffer;

- Spill kits will be readily available to deal with any accidental spillage;
- There is an outline emergency plan for the construction phase to deal with accidental spillages;
- Ready-mixed concrete will be brought to site, with no batching of wet-cement products occurring on site;
- Where possible pre-cast products will be installed, including all watercourse crossings;
- Use of wet-cement products within the hydrological buffer will be avoided, insofar as possible;
- Lined cement washout ponds will be used for chute cleaning, with minimal use of water take will be imported to the project site;
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be permitted;
- Wastewater emanating on-site (sewage, wastewater from site office) will be taken off-site for disposal/treatment at controlled facilities. To this effect, welfare facilities for construction site workers will include self-contained port-a-loos with an integrated waste holding tank. No water will be sourced on the project site, nor will any wastewater be discharged to the project site. Foul drainage from the temporary site offices and facilities is to be properly stored and removed to a suitable treatment facility. Storage facilities should be robust enough to ensure no spillage or leakage occurs.
- **Chapter 7** (Water) also provides details of the Sustainable Drainage Systems (SuDS) that will be implemented to manage surface water taking account of water quantity (flooding), water quality (pollution) and associated ecological receptors. The drainage design will incorporate the following key elements: -
 - Clean water interceptor drains to collect and divert upslope runoff away from construction areas and prevent unnecessary contamination;
 - Swales and drainage channels to collect and convey runoff from construction and operational infrastructure;
 - A treatment train approach comprising interception, attenuation, settlement and controlled discharge measures in accordance with the SWMP;
 - Check dams and other flow attenuation measures to reduce runoff velocities, promote settlement and minimise erosion;
 - Settlements ponds and buffered outfalls to provide attenuation and treatment of runoff prior to diffuse discharge at greenfield runoff rates. No direct discharge of untreated runoff to mapped watercourses will be permitted.

- The project site drainage and attenuation system will be installed prior to the main construction activities and includes excavation of drainage ditches and installation of settlement ponds and soakaways. The site-specific drainage scheme is required to attenuate, hydraulically (flow) and hydro-chemically (pollutants), the projected increase in runoff of ca. 63 m³/day (worst-case scenario) that will arise from the creation of additional areas of hardstanding. **Chapter 7** (Water) also provides details of management of soil/peat deposition areas to avoid impacting on water quality including:-
 - Spoil deposition areas are located outside the 50m stream buffer zone;
 - Silt fences, straw bales and biodegradable matting will be used to control surface water runoff for deposition areas;
 - Deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff.
- Other measures include:-
 - To avoid run-off of silt-laden water impacting upon water quality within surface water features adjacent to the works corridor, reinstatement works including measures to re-vegetate disturbed areas through re-seeding and/or placement of saved turves will be carried out immediately after construction works;
 - During construction, turves will be stored separately from spoil (soil/rock). Separate storage of turves will ensure vegetation is not significantly damaged and that turves can be replaced as a top mat to facilitate rapid re-instatement of the surface vegetation, thereby significantly reducing the likelihood of soil erosion and the likelihood of silt laden surface waters affecting water quality;
 - To ensure control measures are implemented appropriately, an Environmental Manager as part of the construction team will be employed for the duration of the construction works; also an independent Ecological Clerk of Works (ECoW) will be auditing the project site intermittently to report on the efficacy of mitigation measures put in place by the appointed contractor;
 - Water quality monitoring will be undertaken before, during and following construction works in accordance with the Water Quality Monitoring Plan and SWMP. Monitoring will include regular visual inspections, field hydrochemistry measurements and water quality sampling at agreed monitoring locations.
- For Marsh Fritillary, all construction activities at T10 will be scheduled when marsh fritillary butterfly are on the wing (May-July) (NIEA, 2017) insofar as practicable. Adult butterflies only fly in warm, sunny conditions, so construction activities at T10 will only take place in favourable weather conditions between 10.30 and 16.30 (NIEA, 2017), where possible, following a site check by the appointed Ecological Clerk of Works. Construction works must be designed to avoid the peak larval development period (August-April) in order to minimise incidence of mortality (NIEA, 2017). An ECoW will be present to survey for any larval webs within suitable habitat within the project footprint, and will have authority to stop works should marsh fritillary larva be present.

- For drainage ditches, Where works/infrastructure interfaces with drainage ditches, appropriate design measures will be implemented to minimise the effect on the habitat and to avoid any hydraulic change to the channel;
- To avoid construction damage from excavation or compaction to the roots of plants in hedgerows, treelines and woodlands adjacent to the proposed infrastructure that will be retained post-construction, appropriate root protection area (RPAs) will be implemented, in accordance with best practice guidance (NRA 2006). To this effect an appropriately qualified arboriculturist will undertake a pre-construction assessment to ensure impacts to vegetation are avoided;
- To avoid widespread disturbance to (PB4) Cutover bog and other habitats, access within the project site will be restricted to the proposed works corridor. No access between different parts of the infrastructure will be permitted, except via the proposed works corridor. An experienced and suitably qualified ECoW will be employed for the pre-construction, during and completion of construction works. They will be tasked with monitoring work practices, which will ensure that construction activities are tightly constrained to the works corridor and the project footprint, and that all mitigation is appropriately applied on site. They will have the power to stop works and can proposed suitable amelioratory action as required during the works;
- To minimise ecological impacts associated with the direct loss of (WS1) Scrub, clearance works within woody vegetation will be scheduled outside the bird breeding season (March 1st to August 31st, inclusive) insofar as possible, and an ECoW will survey such habitat before it's removal. The ECoW will check for the resting places of protected species in accordance with best practice and legal requirements under the Wildlife Act 1976 (as amended);
- The contractor will be required to implement the following standard practice construction methods and mitigation measures for release of dust:-
 - Preparing and maintaining the project site;
 - Plan construction compound layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
 - Erect a 2m minimum site hoarding around all construction/ contractor compounds;
 - Keep site fencing, barriers and scaffolding clean using wet methods;
 - Cover, seed or fence stockpiles to prevent wind whipping;
- Trees requiring felling and identified as having roost suitability, where surveying proves that features are unoccupied, will be soft felled, as outline in with the National Roads Authority guidelines (NRA, 2005). This procedure involves:-
 - Where tree removal is extensive (T2 and T3), instigate staggering or phasing felling over several days or weeks to reduce sudden loss of habitat and allow for gradual dispersal;
 - Removing the tree in sections, starting with the top branches and then working down the trunk trying to avoid cutting through cavities;

- Any sections with PRFs must be lowered with care and laid on the ground with potential entrances to roosts orientated upwards to allow bat to vacate the roost;
- Sections must be left *in situ* for at least 24 hours in suitable weather conditions to allow any bats to disperse. In addition to leaving sections *in situ* for 24 hours, reattaching or storing felled PRF-containing sections in adjacent retained woodland would act as artificial roost opportunities;
- The contractor will be required to implement standard practice construction methods and mitigation measures for in-stream or near-stream works. The following measures are to be read and implemented in conjunction with the Construction Environmental Management Plan (CEMP) and Surface Water Management Plan (SWMP):-
 - Maintain a minimum 50m buffer from watercourses wherever practicable and a 50m stand-off from wells and boreholes, in order to minimise the risk of impacts arising from tracks, turbine foundations, hardstandings, spoil storage areas and other construction activities. Where works are required within these buffer areas, including at identified watercourse crossings (i.e. near T4 and T9), site-specific mitigation measures will be implemented in accordance with the Water Chapter (**Chapter 7**) and CEMP;
 - Spoil will be stored in line with a spoil management plan, which is included at **Annex 6.2** of the EIAR;
 - Peat and spoil storage areas will be located outside watercourse buffer zones and managed using silt fencing, straw bales, biodegradable matting and settlement infrastructure. Storage areas will be stabilised and revegetated as soon as practicable following placement to minimise sediment mobilisation and erosion.
 - For works occurring within 50m of a watercourse, weather conditions will be continuously monitored (e.g. via Met Éireann) and earthworks scaled back or suspended where forecast rainfall exceeds the trigger thresholds set out in the SWMP, including high-intensity rainfall events (>10mm/hr) and prolonged heavy rainfall (>25mm in 24 hours);
 - In the event of heavy rainfall, open excavations or peat storage works will be secured, and emergency drainage measures will be implemented to prevent water backup and pollution;
 - It will be ensured that the site drainage system does not discharge directly into watercourses, but rather through a riparian buffer area of intact vegetation.
 - All outflows from drainage associated with construction activities will be treated through temporary settlement ponds and associated drainage controls prior to discharge. Treated water will be discharged via buffered outfalls and diffuse overland flow across vegetated areas, in accordance with the SWMP, thereby preventing direct discharge of untreated runoff to mapped watercourses;
 - Watercourse crossings will be constructed during low-flow periods, adhering to any working period restrictions imposed, with filtration measures installed downstream to trap sediments;

- Silt traps and fencing will be placed in working areas that have the potential to carry silt-laden material from the working area to aquatic environments;
- Refuelling of machinery will take place in bunded enclosures, at a minimum of 50m away from watercourses to prevent runoff into nearby watercourses. All machinery must carry an onboard spill kit in the event of an oil/fuel spill during all phases;
- A complete mechanical check of all hoses and fluid reservoirs of machinery will be carried out by a competent member of the construction team before the machinery arrives at the project site;
- To reduce the amount of silt-laden water to be treated, temporary cut-off drains will be created to divert water away from dirty water and construction areas. This will lessen the volume of water to be treated onsite;
- Deposition areas for spoil will be enclosed with silt fencing to prevent mobilisation of solids during adverse weather conditions and no drainage from these areas will be directed into the temporary drainage systems. A Sustainable Urban Drainage System (SUDS) will be implemented to allow controls to be designed for the retention of large volumes of water that may arise from spoil deposition areas;
- Surface water runoff will be managed through a treatment train comprising interceptor drains, swales, check dams, silt traps and settlement ponds, with treated water discharged via buffered outfalls and diffuse overland flow in accordance with the project SWMP;
- Re-seeding of all areas of bare ground or the placement of jute matting will take place as soon as practicable to prevent run-off;
- All onsite welfare facilities will be installed and managed as per regulations to prevent nutrient overloading of aquatic environments;
- In relation to earthworks:-
 - Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable, using appropriate native plant (e.g. heather brash) seed from a local source;
 - Hessian, mulches or tackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable;
 - Vegetation removal and exposure of soils will be minimised as far as possible, with only areas being actively worked on being exposed, to minimise silt mobilisation;
- Following a pre-construction survey in Mid-August/September/October (by a suitably experienced Ecologist) to update the location of webs, the turves supporting the larval webs at turbine T10 will be removed in November-February when the larvae hibernate and become less sensitive to light disturbance (DAERA, 2023). The turves will be translocated to an alternative area, which supports abundant devil's-bit scabious, located to the east of T1. This condition of the habitat in this area was assessed as suitable under-grazed. Further details on translocation can be found in the Habitat Management Plan;

- Approximately 460m of hedgerow habitat and 5m of treeline will be removed as a result of the project. It is proposed that the planting of c. 700m of new and enhanced hedgerow habitat to offset for the direct loss of these features will similarly provide sufficient mitigation for indirect impact upon terrestrial (non-volant) mammal IEFs foraging and commuting within the project site. Replacement planting will occur along lengths removed to facilitate the construction of temporary enlarged access where appropriate on the approaches to T6 and T10. Additional new planting along historic field boundary lengths to the east of the access towards T6 and adjacent peat storage;
- As a short-term mitigation measure, the installation of bat boxes within the woodland and treelines outside of the bat buffer zones (and outside of the project footprint) will take place prior to construction works. To replace potential roosting features being lost, eight Schwegler 2F (or similar woodcrete alternatives) bat boxes will be installed on suitably mature trees. Boxes will be installed at a height of around 3m under the supervision of a Bat Ecologist; and,
- In the long-term mitigation, there will be a like-for-like replacement of treelines lost as a result of the proposed infrastructure or required to be felled in order to achieve sufficient buffers to avoid potential impacts on bats. It is acknowledged that there will be a time lag for replanted treelines to compensate fully for the established treelines that will be removed, therefore compensatory planting will take place as early as possible.

4.3 LAND & SOIL

To help offset the loss of peat at the proposed site, Habitat Management Plan (refer to **Annex 5.3**) has been prepared and comprises the following:-

- Drain management;
- Marginal, cell and contour bunding;
- Forest to bog restoration;
- Bare peat revegetation;
- Scrub removal;
- Cessation of turf cutting; and,
- Prevention of uncontrolled burning;

The following avoidance and design measures are proposed to reduce erosion effects at excavation and spoil storage areas:-

- Mats will be used, as necessary, to support construction plant and machinery on soft ground, thus reducing the likelihood of soil and subsoil erosion and avoiding the formation of rutted areas. This will substantially reduce the likelihood for surface water ponding to occur;
- Excavated material will be side cast and stored temporarily adjacent to excavation areas for use during reinstatement and landscaping. Where material is not required for reinstatement or landscaping, it shall be immediately transported to the spoil deposition areas;

- Silt fences, and all necessary surface water management measures (including upslope interceptor drains), will be installed around all temporary stockpiles to limit movement of entrained sediment in surface water runoff. All slopes will be sealed with the bucket of an excavator;
- In order to minimise erosion during the construction phase, works will not take place during periods of intense or prolonged rainfall (to prevent increased silt laden runoff). Drainage systems, as outlined in **Chapter 7**, will be implemented to limit runoff effects during the construction phase;
- At the designated spoil deposition areas, material will be placed in layers to ensure stability is maintained and works will be undertaken in accordance with best practice construction methodologies. Works at the spoil deposition areas (including the borrow pit) will be monitored, on a weekly basis during the construction phase and monthly for a 6 no. month period thereafter, by an appropriately qualified Geotechnical Engineer. In the event that any ground stability issues arise, the Engineer will have the power to cease works until such time as remedial works have been completed to his/her satisfaction;
- Permanently mounded spoil; for example, berms surrounding turbines and hardstands, berms located along access tracks and the spoil deposition areas; will be seeded and grassed over at the earliest opportunity to prevent erosion; and,
- The underground electricity line (grid connection) trench will be reinstated to the required EirGrid/ESB Networks specification and in accordance with landowner requirements and will be reseeded or allowed to vegetate naturally (on agricultural land) or topped with asphalt (or similar along public roads) at the earliest opportunity to prevent erosion.

The following measures are proposed to specifically prevent contamination of soils and subsoils:-

- The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compound. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor;
- All bunded areas will have 110% capacity of the volume to be stored;
- On site re-fuelling of machinery 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 at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. 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 to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with any accidental spillages within the temporary construction compound and during re-fuelling;

- All waste tar material arising from road cuttings (from trenching in public roads and haul route temporary alteration works) will be removed off-site and disposed of at a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works or to store it within the spoil deposition areas; and,
- An emergency plan for the construction phase to deal with accidental spillages is contained within the Planning-Stage Construction and Environmental Management Plan. This emergency plan will be further developed by the contractor prior to the commencement of construction.

6.5ha of forestry will be felled to accommodate wind farm infrastructure. However, all tree coverage felled will be replaced at a replanting site which will be subject to technical approval through a separate consenting process. No specific measures, other than best-practice felling and replanting methodologies are proposed and the efficacy and appropriateness of these measures will be assessed, separately, through the felling and replanting licensing process.

The key mitigation with regard peat stability risk at the project site was the carrying out of a robust, multidisciplinary site investigation and peat stability risk assessment in accordance with best practice guidance (PLHRAG, Scottish Government, 2017).

The findings of the geotechnical and peat stability assessment demonstrates that the project site has an acceptable margin of safety and is suitable for the development of the project.

The assessment provides a number of mitigation/control measures to reduce the potential risk of peat failure at each infrastructure location.

The following control measures will be incorporated into the construction phase of the project will ensure the management of the risks for this site:-

- Appointment of experienced and competent contractors;
- The site will be supervised by experienced and qualified personnel;
- Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement);
- Prevent undercutting of slopes and unsupported excavations;
- Maintain a managed robust drainage system;
- Prevent placement of loads/overburden on marginal ground;
- Implementation of safety buffers around deep peat areas;
- Adhere to the spoil and peat storage restriction areas detailed in the Geotechnical and Peat Stability Assessment;
- Set up, maintain and report findings from monitoring systems as outlined in the Geotechnical and Peat Stability Assessment;
- Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and,
- Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.

4.4 WATER

Forestry Felling

There is a requirement in the *Forest Service Code of Practice* and in the *FSC Certification Standard* for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document *Forestry and Water Quality Guidelines* are detailed below.

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0–15%)	10m	15m
Steep	(15–30%)	15m	20m
Very steep	(>30%)	20m	25m

A total of 6.5ha of forestry will be permanently felled to accommodate the construction and operation of the project.

During the construction phase, a self-imposed conservative buffer zone of 50m will be maintained for all streams. Only approximately 0.8ha of the total 6.5ha proposed for felling is located inside a 50m watercourse buffer zone.

Where tree felling is required in the vicinity of streams, the additional mitigation measures outlined below will be employed.

Mitigation by Design

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods, as follows:-

- Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance;
- Checking and maintenance of tracks and culverts will be ongoing through any felling operation. No tracking of vehicles through watercourses will occur. Where possible, existing drains will not be disturbed during felling works;
- Ditches which drain from the areas to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (c. 0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients and avoid being placed at right angles to the contour;
- Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the spoil deposition areas. All new silt traps will be constructed on even ground and not on sloping ground;
- In areas particularly sensitive to erosion or where felling inside the 50m buffer is required, it will be necessary to install double or triple sediment traps;
- All drainage channels will taper out before entering the 50m buffer zone. This

ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels;

- Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled;
- Brash mats will be used to support vehicles on soft ground, reducing topsoil and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place before they become heavily used and worn. Provision will be made for brash mats along all off-road (track) routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Timber will be stacked in dry areas, and outside the 50m watercourse buffer. Straw bales and check dams will be emplaced on the down gradient side of timber storage/processing sites;
- Works will be carried out during periods of no, or low, rainfall in order to minimise entrainment of exposed sediment in surface water run-off;
- Checking and maintenance of tracks and culverts will be ongoing through the felling operation;
- Refuelling or maintenance of machinery will not occur within 100m of a watercourse. Mobile bowser, drip kits and qualified personnel will be used where refuelling is required;
- A permit to refuel system will be adopted;
- Branches, logs or debris will not be allowed to build up in the 50m buffer. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors;
- Trees will be cut manually from along streams and using machinery to extract whole trees; and,
- Travel will only be permitted perpendicular to and away from surface water features.

Silt Traps

Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps is to slow water flow, increase residence time and allow settling of silt in a controlled manner.

Drain Inspection and Maintenance

The following items will be carried out during pre-felling inspections and regularly thereafter:-

- Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual waterlogging or

bogging of machines;

- Inspection of all areas reported as having unusual ground conditions;
- Inspection of main drainage ditches and outfalls. During pre-felling inspections, the main drainage ditches will be identified. Where possible, the pre-felling inspection will be carried out during rainfall;
- Following tree felling, all main drains will be inspected to ensure that they are functioning;
- Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- Culverts on drains exiting the site, if impeded by silt or debris, will be unblocked; and,
- All accumulated silt will be removed from drains, culverts and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

Surface Water Quality Monitoring

Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4-weeks of the felling activity commencing, preferably in medium-to-high water flow conditions. The 'during' sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).

Details of the proposed surface water quality monitoring programme are outlined in the Water Quality Monitoring Plan.

The surface water sampling locations used in this EIAR for the project site (i.e. SW1–SW4) will also be used as sampling locations during felling activities.

Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every works site near any watercourse. These will be populated daily and kept on site for record and inspection.

Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

The generally large setback distance from sensitive hydrological features ensures that sufficient space is provided for the installation of drainage mitigation measures (discussed below) and to ensure their effective operation. The proposed buffer zone will ensure:-

- Avoidance of physical damage to watercourses, and associated release of sediment;
- Avoidance of excavations within close proximity to surface water courses;
- Avoidance of the entry of suspended sediment from earthworks into watercourses; and,
- Avoidance of the entry of suspended sediment from the construction phase

drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Mitigation by Prevention

The following section details the measures which will be put in place during the construction phase to ensure that surface water features are protected from the release of silt or sediment and to ensure that all surface water runoff is fully treated and attenuated to avoid the discharge of dirty water.

- Source controls to limit the likelihood for 'dirty water' to occur:-
 - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with clean washed gravel, filter fabrics, and other similar/equivalent or appropriate systems; and,
 - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.
- In-Line controls to ensure appropriate management of silt laden water:-
 - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems to fully attenuate silt laden waters prior to discharge:-
 - Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems.

It should be noted for this site that an extensive network of land, bog and forestry drains already exists and these will be integrated and enhanced as required and used within the wind farm drainage system. The integration of existing land drainage networks and wind farm networks is common practice in wind energy developments and will also result in benefits to surrounding lands.

The main elements of interaction with existing drains will be as follows:-

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction and attenuation for flow management) of runoff from the wind farm drainage into the existing site drainage network. This will reduce the likelihood of any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps will be placed in the existing drains upstream of any streams where construction works is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; and,
- Buffered outfalls, which will be numerous over the site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the

existing drains of the site.

Pre-commencement Temporary Drainage Works

Prior to the commencement of haul route upgrades, access tracks, crane hardstandings and turbine foundations, the following key temporary drainage measures will be installed:-

- All existing dry bog, forestry or agricultural drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps;
- Clean water interceptor drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Water Treatment Train

While the proposed drainage plan is assessed as providing a sufficient level of protection to avoid any deterioration in downstream water quality; a temporary final line of defence can be provided by a water treatment train (i.e. sequence of water treatment processes), if required. If the discharge water from construction areas fails to be of a high quality, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This water treatment train will apply for the entirety of the construction phase.

Silt Fences

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to watercourses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be emplaced within drains down-gradient of all construction areas inside the hydrological buffer zones to provide an additional layer of protection in these areas.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats (sediment entrapment mats, consisting of coir or jute matting) placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

Management of Runoff from Peat/Spoil Deposition Areas

It is proposed that excavated peat/overburden/spoil will be utilised for reinstatement of excavated areas etc. and for landscaping purposes. Excess material, or material which is unsuitable for this purpose, will be stored, permanently, at dedicated peat/spoil deposition areas and in the 1 no. spent borrow pit.

Proposed peat/spoil deposition areas and the borrow pit are located outside the 50m stream buffer zone (refer to **Figure 7.10**).

During the initial placement of peat/spoil in the deposition areas, silt fences, straw bales and biodegradable matting will be used to control surface water runoff. Drainage from overburden deposition areas will ultimately be routed to an oversized swale and a number of silt/settlement ponds with appropriate storage and settlement capacity, designed for a '1-in-100 year 6-hour return' period, before being discharged.

Spoil deposition areas will be sealed with a digger bucket and allowed to vegetate naturally. Once re-vegetated and stabilised, spoil deposition areas will no longer be a likely source of silt laden runoff. Surface water protection infrastructure will be left in place until the areas have stabilised.

Underground Electricity Line Installation Works

Mitigation measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the trenching work does not discharge directly to the water:-

- All existing dry drains that intercept the works area will be temporarily blocked down-gradient of the works using temporary check dams/silt traps (e.g. straw bales);
- Clean water diversion drains will be installed upgradient of the works areas, as required;
- Check dams/silt fence arrangements (silt traps or straw bales) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zones such as at watercourse crossing locations.

Specific mitigation measures relating to the directional drilling at the crossing location are detailed below.

Directional Drilling

The following mitigation will be carried out during directional drilling works:-

- Firstly, the crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance of vegetation;
- A minimum 10 metre vegetative buffer zone will be maintained (if present) between disturbed areas and the watercourse bank. There will be no storage of material/equipment, excavated material (see below) or overnight parking of machinery inside the 10m buffer zone;
- Double silt fencing will be placed upslope of the buffer zone on each side of the watercourse.
- Mats will be used underneath the excavator, inside the 10 metre vegetative

buffer zone, to prevent soil erosion/rutting and potential surface water quality impacts from localised surface water runoff;

- Temporary storage of excavated material will be undertaken outside of the 10m buffer on flat ground or within a local 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;
- Operation of machinery and use of equipment within the 10m buffer will be kept to a minimum to avoid any unnecessary disturbance;
- There will be no refuelling allowed within 100m of the watercourse crossing;
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing; and,
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted.

Mitigation measures relating to the use of a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water for directional drilling include:-

- The area around the Clear Bore™ batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;
- Two or more lines of silt fences will be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;

- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

Pre-emptive Site Drainage Management

The works programme for the initial construction stage of the project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of peat/subsoil or vegetation stripping will be suspended or scaled back if prolonged or intense rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:-

- General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- Meteo Alarm: Alerts to the possible occurrence of severe weather for the next 2-days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3-hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15-minutes. Radar images are not predictive; and,
- Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

The use of safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests either of the following is likely to occur:-

- >10 mm/hr (i.e. high intensity local rainfall events);
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:-

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface runoff; and,
- Avoid working during heavy rainfall and for up to 24-hours after heavy events

to ensure drainage systems are not overloaded.

Timing of Site Construction Works

The construction of the site drainage system will be carried out, at the respective locations, prior to other activities being commenced. The construction of the drainage system will only be carried out during periods of, where possible, no rainfall, therefore avoiding runoff. This will avoid the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and functional for all subsequent construction works.

Monitoring

Prior to the commencement of development, a detailed Site Drainage Plan and SWMP will be prepared to detail the precise siting and composition of the surface water management measures. The respective plans, which will form part of a detailed CEMP, will be prepared prior to the commencement of development.

The CEMP will also include a detailed Water Quality Monitoring Plan for the monitoring of surface waters in the vicinity of the construction site by a designated Environmental Manager. The monitoring programme will comprise field testing and laboratory analysis of a range of agreed parameters. The civil works contractor, who will be responsible for the construction of the site drainage system, and Environmental Manager will undertake regular inspections of the drainage system to ensure that all measures are functioning effectively. The surface water sampling locations used in this EIAR (i.e. SW1–SW4) will be used during construction activities. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels that may decrease the effectiveness of the drainage feature, will be removed and disposed of in an appropriate manner.

Excavation Dewatering and Effects on Surface Water Quality

The management of excavation dewatering (pumping), particularly in relation to any accumulation of water in foundations or cabling and electricity line trenches, and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:-

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations, will be put in place;
- The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters to ensure that greenfield runoff rates are mimicked;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- All pumped water volumes will be discharged to the surface water management system 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 wind farm excavations by the Environmental Manager will occur during the construction phase. If high levels of seepage inflow occur, excavation work at this location will cease immediately and a geotechnical assessment undertaken; and,
- A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies. 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. They will be used as final line of defence if required.

Release of Hydrocarbons during Construction and Storage

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:-

- The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compounds. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor;
- All bunded areas will have 110% capacity of the volume to be stored;
- On site refuelling of machinery 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 at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. No refuelling will be permitted at works locations within the 50m hydrological buffer. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. 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 to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be readily available to deal with and accidental spillages;
- All waste tar material arising from road cuttings (from trenching or other works in public roads) will be removed off-site and taken to a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works or for storage within the spoil deposition areas; and,
- An outline emergency plan for the construction phase to deal with accidental spillages is contained within the Planning-Stage CEMP. This emergency plan will be further developed prior to the commencement of development, and will be agreed with the Planning Authority as part of the detailed CEMP.

Groundwater and Surface Water Contamination from Wastewater Disposal

Measures to avoid contamination of ground and surface waters by wastewaters will comprise:-

- Self-contained port-a-loos (chemical toilets) with an integrated waste holding tank will be installed at the site compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply for the site office and other sanitation will be brought to site and removed after use to be discharged at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

Release of Cement-Based Products

The following mitigation measures are proposed to ensure that the release of cement-based products is avoided:-

- No batching of wet-cement products will occur on site. Ready-mixed concrete will be brought to site as required and, where possible, emplacement of pre-cast products will be utilised;
- All watercourse crossings will utilise pre-cast products and the use of wet-cement products within the hydrological buffer will be avoided
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. Chute cleaning will be undertaken at lined cement washout ponds with waters being stored in the temporary construction compounds, removed off site and disposed of at an approved licensed facility. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to ensure that prolonged or intense rainfall is not predicted during concrete pouring activities; and,
- The concrete pour sites will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Morphological Changes to Surface Water Courses & Drainage Patterns

The following mitigation measures are proposed:-

- The 2 no. proposed new stream crossings will be clear span bridges (bottomless culverts) and the stream beds will remain undisturbed. No in-stream excavation works at the crossing locations are proposed and therefore there will be no impact on the stream at the proposed crossing location;
- Wind farm electrical cabling or the underground electricity line cabling will be installed either above or below an existing culvert and will not directly interfere with the culvert;
- At the time of construction, all guidance/best practice requirements of the Office of Public Works (OPW) or Inland Fisheries Ireland will be incorporated into the design/construction of the proposed watercourse/culvert crossings;
- As a further precaution, in-stream construction work (if/where required) will

only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016)* (i.e., July to September inclusive). This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);

- During the near stream construction works (i.e. within the 50m buffer zone), double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase;
- The 2 no. new watercourse crossings at the wind farm site will require a Section 50 license application to the OPW in accordance with the Arterial Drainage Act 1945. The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent; and,
- No instream works are proposed at the underground electricity line watercourse crossings, with all crossings being carried out via HDD.

4.5 AIR QUALITY

4.5.1 Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues at the site entrances. This may be the environment manager/engineer or the site manager; and,
- Display the head or regional office contact information.

4.5.2 Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and,
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.

4.5.3 Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high likelihood of dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;

- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and,
- Cover, seed or fence stockpiles to prevent wind whipping.

4.5.4 Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary – no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- Impose and signpost a maximum-speed-limit of 25kph on surfaced and 15kph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate);
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing); and,
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

4.5.5 Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and,
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

4.5.6 Waste Management

- Bonfires and burning of waste materials are legally prohibited.

4.5.7 Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable; and,
- Only remove the cover in small areas during work and not all at once.

4.5.8 Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and,
- For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.

4.5.9 Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access tracks and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site logbook;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); and,
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.

4.6 CLIMATE

During the construction phase, the following best practice measures shall be implemented to prevent significant GHG emissions and reduce effects on climate:-

- Procurement of low carbon materials, the majority of GHG emissions from a construction project are associated with embodied carbon within materials. It is understood and accepted that market availability and price mean that it is difficult to commit to alternatives at this early stage in the project's development cycle; however, alternative options are set out below:-
 - Concrete: GGBS (Ground granulated blast-furnace slag), 30% lower clinker content cement, or better, where practicable;
 - Fibre reinforced concrete or similar instead of steel reinforcement;
 - Steel: recycled or electric arc foundry steel, cross laminated timber;
 - Bricks and aggregates: reclaimed or recycled;

- Re-use of materials on site e.g. excavated material;
- Use of EVs during construction;
- Use of mains electricity or batteries during construction rather than diesel generators; and,
- All plant adheres to Euro Stage V or better and all vehicles are Euro VI/Euro 6 (Euro 7 for new vehicles will commence late 2026).

During construction, the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments, method statements and good site management practise. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments, method statements and good site management practise. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

4.7 LANDSCAPE

Aside from mitigation measures to minimise land and vegetation disturbance and dust emissions (which may reduce visual amenity), no specific landscape or visual mitigation measures are proposed in relation to the construction phase beyond adherence to best practice methods to reduce environmental impacts upon the environment.

The appropriate management and reinstatement of excavations in a timely manner will ensure that any adverse effects caused, for example at site entrances or road upgrade locations, are minimised insofar as possible.

The construction methodology has sought to minimise landscape disturbance. All areas affected during construction will be reinstated to their original condition where appropriate to do so or allowed to vegetate naturally. Trees and hedgerow planting, to replace that which may be lost during the construction phase, will be undertaken in accordance with approved landscaping plans and best practice and under the supervision of the ECoW. Overall, there will be no net loss of hedgerow or tree lines as a result of the project. The following standards are widely adopted as representing best practice in landscape operations:-

- *BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces);*
- *BS 5837:2012 – Trees in Relation to design, demolition and construction;*
- *BS 8545 Trees: from nursery to independence in the landscape – Recommendations; and,*
- *BS 3936 – Part 1: Nursery stock specification for trees and shrubs.*

4.8 CULTURAL HERITAGE

In advance of construction, and where site conditions are suitable, targeted non-intrusive geophysical survey will be undertaken to further inform archaeological risk assessment within areas of proposed ground disturbance.

Survey methods may include magnetometry and, where appropriate, Ground Penetrating Radar. The suitability and scope of survey will be determined having regard to peat depth, forestry cover, ground conditions and accessibility, and will be agreed in consultation with the National Monuments Service.

Targeted advance archaeological testing shall be undertaken in the vicinity of the junction of the N5 and R293, where temporary junction upgrade works occur in proximity to recorded monuments RO008-023, RO008-023001, RO008-023002 and RO008-065. The extent and location of testing shall be targeted to areas of proposed ground disturbance and informed by the final construction design, existing ground conditions and the results of any preceding non-intrusive survey, where undertaken. Testing shall be carried out under the appropriate statutory license and in consultation with the National Monuments Service. The objectives of advance testing are to:-

- confirm the presence or absence of archaeological remains;
- determine their character, extent and state of preservation;
- inform refinement of mitigation strategy prior to construction; and,
- reduce residual archaeological risk and uncertainty.

Particular attention shall be given to areas where road carriageway widening intersects historic townland boundaries to identify any surviving boundary features of archaeological significance.

Where archaeological remains are identified, appropriate preservation in situ or preservation by record will be agreed in consultation with the National Monuments Service. Where necessary, micro-siting of turbines or associated infrastructure will be employed to avoid previously unidentified archaeological features which may be identified during pre-construction investigations.

All ground disturbance associated with the project shall be subject to archaeological monitoring by a suitably qualified archaeologist under licence issued by the National Monuments Service. This includes works within both previously undisturbed areas and existing road corridors.

Monitoring will apply to all elements of the project involving ground disturbance, including turbine foundation excavations, crane hardstandings, access track construction, approach road widening, drainage infrastructure, borrow pit excavation, peat removal, electricity substation construction, electricity line installation, and all associated works.

Where archaeological features or deposits are identified, works in the immediate area will cease pending consultation with the National Monuments Service. Appropriate mitigation measures will then be implemented, which may include preservation in situ, preservation by record or controlled archaeological excavation.

Archaeological monitoring will:-

- identify previously unrecorded archaeological remains;
- ensure preservation by record where necessary;
- provide a real-time mitigation response in the event of discovery; and,
- ensure compliance with statutory obligations under the National Monuments Acts.

Particular attention shall be given to areas of road carriageway widening, including locations where works intersect historic townland boundaries, to identify and record any surviving boundary features of archaeological significance.

In the event of archaeological features or material being uncovered during the construction phase:-

- all machine work will cease in the immediate area to allow the archaeologist/s time to inspect and record any such material;
- if any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record; and,
- any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

Although no recorded archaeological monuments occur within the direct wind farm footprint, precautionary measures shall be implemented to ensure protection of heritage assets within the wider study area.

These measures include:-

- a programme of detailed measured and photographic recording shall be undertaken in advance of any alteration, removal or modification of the unrecorded stone bridge along the turbine component haul route;
- avoidance of known archaeological constraints through established design layout;
- maintenance of appropriate separation distances during construction activities;
- marking of exclusion zones where required; and,
- contractor awareness briefings regarding heritage protection obligations and legal responsibilities.

4.9 NOISE & VIBRATION

Construction activities will be completed in accordance with the provisions, where relevant, of BS 5228-1 which offers detailed guidance on the control of noise & vibration from demolition and construction activities. The relevant practices to be adopted during construction shall include:-

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, the Planning Authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration;
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; and,
- Keeping site access tracks even to mitigate the potential for noise and vibration from HGVs.

Furthermore, a variety of practical noise control measures will be employed. These include:-

- Selection of plant with low inherent potential for generation of noise and/or vibration;
- Placing of noisy/vibratory plant as far away from sensitive properties as permitted by site constraints; and,
- Regular maintenance and servicing of plant items.

The various contractors involved in the construction phase will be obliged, under contract, to take specific noise abatement measures and comply with the recommendations of BS 5228-1. The following list of measures will be implemented, as relevant, to ensure compliance with the relevant construction noise criteria: -

- No plant or machinery will be permitted to cause a public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, which may be required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen;
- During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed at **Chapter 12** using methods outlined in BS 5228-1; and,
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations, including the delivery of construction materials, shall be restricted to between 07:00hrs and 19:00hrs Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays, with no operations on Sundays or public holidays. However, to ensure that optimal use is made of good weather periods, at occasional critical periods within the construction programme (i.e. concrete pours, turbine component deliveries and turbine erection) or in the event of an emergency; activities may be necessary outside out of these hours.

The following measures will be implemented, where necessary, to control and mitigate noise emissions associated with blasting operations and the processing of quarried stone:-

- Notification of nearby residents before blasting starts (e.g. 24-hour written notification);
- Carry out blasting using a series of trial blasts, each with progressively increasing charges. Larger charge weights are only to be used if the trial blast shows

acceptable levels of air overpressure;

- If air overpressure from blasting is too high a reduction in the amount of primer cord used, together with the adequate burial of any that is above the ground can greatly reduce;
- Where NSRs are situated close to the blast site and air over pressure levels are cause for complaint, blasting shall be postponed during weather conditions whereby the NSRs are down wind of the blast;
- The firing of blasts at similar times of the day to reduce the 'startle' effect.
- Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency;
- Ensure all air lines are sealed;
- Use a dampened bit to eliminate a 'ringing' sound;
- Erect an acoustic screen between compressors or generators and NSRs. When possible, line of sight between top of machine and NSR will be obscured; and,
- Enclose the breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation.

No specific mitigation measures are proposed in respect of vibration.

The transmission and magnitude of ground vibrations associated with blasting operations at borrow pits are subject to many complex influences including charge type and position, and importantly, the precise nature of the ground conditions (material composition, compaction, discontinuities) at the source, receiver, and at every point along all potential ground transmission paths. Mitigation of the impacts of these activities is best achieved through on site testing processes, with progressively increased charges, carried out in consultation with the Planning Authority.

4.10 TRANSPORT & ACCESS

In order to ensure the avoidance of significant effects and reduce the predicted magnitude and significance of effects to the greatest possible degree during the construction and decommissioning phases, the following mitigation measures will be implemented:-

- Traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00–13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours to avail of favourable weather conditions or during extended concrete pours. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and the respective local authorities;
- All works to the public road shall be undertaken in consultation with, and to the satisfaction of, the Planning Authority. The detailed design process shall also been informed by a further Road Safety Audit to be carried out prior to the commencement of development;
- A Traffic Management Plan shall be agreed as part of the Construction

Environmental Management Plan (CEMP) with the Planning Authority prior to the commencement of development. The Traffic Management Plan shall include *inter alia* confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;

- Traffic restrictions shall be kept to minimum duration and extent;
- Appropriate traffic management; including maintenance of local access, pedestrian access (where safe to do so) and diversions (where required); shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan to be agreed with the Planning Authority prior to the commencement of development;
- The site shall be closed, and strictly secured, to the public during the construction phase;
- All reasonable steps shall be taken to ensure that national and regional routes are used to transport all materials to the site in so far as practicable;
- Prior to, and post, construction; pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials (other than the locally classed routes at the project site which will be subject to upgrade works). Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures. Following the completion of the pre-construction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken, while any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the developer and to the satisfaction of the Planning Authority;
- Appropriate and adequate signage shall be provided at entrances providing access, safety and warning information;
- At the site entrances, roadside hedgerows and vegetation shall be trimmed or removed prior to the commencement of construction to ensure that sightlines are provided in advance of the delivery of construction materials;
- Speed limit compliance; particularly along the L5501, L55018 and L5506 and along the route of the underground electricity line; 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 temporary construction compounds during the construction phase. Additionally, during construction of the underground electricity line, it is likely that agricultural (or other) premises will be used for the temporary storage of materials (e.g. ducting, cabling, etc.) and for the parking of construction plant, machinery, and work vehicles (cars, vans, etc.). 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. All staff will be instructed to ensure that private entrances remain

unobscured (particularly along the route of the underground electricity line);

- The project will involve the delivery of a number of abnormal and exceptionally abnormal loads to the site due to the size of the delivery/load. It should be noted that abnormal weight loads are not expected to feature as part of the project as maximum axle loadings for abnormal/oversized loads shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);
- The timing of oversized/abnormal loads shall be agreed with the relevant local authorities and An Garda Síochána, and all relevant licenses and permits shall be obtained in advance. All oversized/abnormal loads shall be accompanied by escort vehicles to ensure the maintenance of public safety;
- Following the installation of the electricity and communications cable ducting, the trench will be backfilled with appropriate material and temporarily reinstated. Following the installation of the underground electricity line and electrical and communications cabling, all public roads within which it is proposed to install the infrastructure will be subject to a full-width carriageway reinstatement (re-surfacing) of the relevant road section. Road reinstatement specifications and methodologies will be agreed with the Planning Authority prior to the commencement of development and as part of the road opening licencing process;
- Dry wheel washing facilities will be provided at site entrances to prevent any debris being transferred from site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the project site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;
- Road sweeping, particularly along the route of the underground electricity line, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions; and,
- Due to the transient nature of the underground electricity line works, rolling road closures will be implemented where the electricity line is to be installed within the carriageway of public roads. Diversions and traffic restrictions shall be kept to minimum duration and extent.

4.11 AVIATION

A minimum of 30-days prior notification will be provided regarding the commencement of crane operations at the project site. Additionally, as is best practice and implemented as standard, warning lights will be fitted to cranes during the installation of the wind turbines.

4.12 RESOURCES & UTILITY INFRASTRUCTURE

Accidental collision with overhead wires and sub-surface cables/pipes will be mitigated through the implementation of good construction practice and procedures.

The sourcing of aggregates locally, and from facilities which have been subject to EIA, will mitigate against the likelihood of significant effects during the construction phase.

Additionally, during the process of connecting the project to the national grid, EirGrid will balance the loading on the network to ensure that no significant disruption occurs, and likely significant effects do not arise.

5.0 IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT MEASURES

In the first instance, the construction phase of the project shall be undertaken in strict compliance with all measures set out in the EIAR and NIS; unless where revised or where required to be revised in order to ensure compliance which a condition of planning consent. All relevant conditions of consent shall be inserted at **Table 1** below.

Planning Conditions		
Condition No.	Content	Relevance to Construction Phase (Yes/No)

This CEMP; which will be further developed prior to the commencement of construction; all associated documentation, construction management plans, and construction method statements shall be prepared to ensure strict accordance with each of the measures of the EIAR, NIS, and conditions of consent. As stated at **Section 1.4** above, it will be the responsibility of the EM to ensure coordination between this CEMP, all associated construction management plans & method statements, and the requirements set out in relation to the project.

6.0 COMMUNICATION PLAN

Given the multitude of stakeholders to be involved in the construction phase of the project, a clear and concise communications plan will be implemented to ensure that all matters arising are appropriately reported and recorded. The Communications Plan, which will be developed by the contractor will include a reporting strategy including, but not limited to, the following personnel:-

- Islandmore Wind Farm Limited Project Manager;
- Contractor Project Manager;
- Islandmore Wind Farm Limited Project Supervisor Construction Phase (PSCS);
- Contractor Site Foreman;
- Environmental Manager;
- Ecological Clerk of Works;
- Geotechnical Clerk of Works; and
- Archaeological Clerk of Works.

Additionally, Islandmore Wind Farm Limited shall appoint a designated person who shall be responsible for engaging with members of the local community regarding the provision of project updates, etc., and shall also be responsible for relaying any matters raised to the project team.

A list of project contacts, to be developed prior to the commencement of construction and included within the detailed CEMP, shall be made available to all construction staff while a copy shall also be provided at the site offices.

7.0 STAFF TRAINING & ENVIRONMENTAL AWARENESS

Only staff who have received appropriate training and have the necessary safety training/certification shall be permitted on-site.

All construction phase personnel will receive environmental awareness information as part of their initial site induction. The extent of their induction shall be tailored to the scope of their work; however, as a minimum, all environmental protection matters will be addressed in full. This will ensure that staff are familiar with environmental obligations associated with the construction process and the procedures and measures to be implemented. Staff will also be advised of the likely effects of any non-compliance with the relevant environmental measure.

As described at **Section 1.4**, the EM shall provide regular environmental updates to personnel and shall advise of any improvements which can be implemented.

Tool box talks will be held by the EM, or other relevant personnel at the commencement of each day or at the commencement of new activities. The aims of the tool box talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements will be identified and discussed. Additionally, any non-compliance with a measures in this CEMP will also be discussed with the aim of avoiding a re-occurrence of the same non-compliance.

8.0 EMERGENCY RESPONSE PROCEDURES

Prior to the commencement of construction, the Contractor shall prepare a comprehensive emergency response procedure to be implemented by on-site personnel. This on-site procedure shall be incorporated within the Environmental & Emergency Response Plan to ensure that appropriate procedures are in place to manage any incident and report same to the relevant stakeholders.

9.0 RECORDING & REPORTING

Over the course of the construction phase, a significant volume of reporting will be undertaken to record the activities, methodologies, and measures implemented during the construction phase. With regards to environmental recording, the following is a non-exhaustive list of reports/records which are likely to be appended to the CEMP as the construction phase progresses:-

- Site Sign-In Records;
- Weekly Environmental Reports;
- Monthly Environmental Reports;
- Site Visual Inspection Checklists;
- Environmental Audits;
- Ecological Survey Reports;
- Water Quality Monitoring Reports;
- Archaeological Monitoring Reports;

- Geotechnical Monitoring Reports;
- Traffic Management Plans;
- Waste management documentation;
- All relevant licences, consents, and permits;
- All correspondence (internal and external) regarding environmental matters; and,
- Staff Training Records.

10.0 COMPLIANCE & REVIEW PROCEDURES

10.1 SITE INSPECTIONS & ENVIRONMENTAL AUDITS

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Contractor Project Manager, PSCS, Contractor Site Foreman, EM, and ECoW to ensure all environmental controls, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in accordance with this CEMP and all other relevant documentation.

10.2 AUDITING

The contractor will be responsible for ensuring that all construction staff are aware of the requirement to, and understand the importance of, strictly implementing the procedures of the CEMP. Environmental audits will be undertaken during the construction phase of the project. In contrast to monitoring and inspection activities, audits are designed to identify the underlying causes of non-compliances, and not to merely detect the non-compliance itself.

Moreover, audits are the means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the contractor or by external personnel acting on their behalf. The impartiality and objectivity of the audit process is crucial in the identification of improvements to the activities being undertaken at the project site. Environmental audits will be scheduled and conducted at regular intervals to determine whether the CEMP is being appropriately implemented. The findings of the audits will be provided to the Islandmore Wind Farm Limited Project Manager, Contractor Project Manager, PSCS, EM, and ECoW.

A sample Environmental Audit is included within the accompanying Environmental & Emergency Response Plan.

10.3 ENVIRONMENTAL COMPLIANCE

As has been set out in the preceding sections, construction activities will be continuously and rigorously assessed to ensure that works are undertaken in accordance with the provisions of the detailed CEMP (to be prepared prior to construction). Where an environmental 'event/occurrence' has been identified, the following definitions shall apply:-

- Near-Miss: An event which has not resulted in an adverse environmental effect but which, if not addressed, could re-occur and result in adverse effects;

- Incident: An event which has occurred and which, if un-controlled, could result in substantial effects; however, on-site measures/procedures avoided such effects;
- Exceedance Event: Where an event has resulted in identifiable adverse effects which exceed the appropriate limit value (e.g. a deterioration of downstream water quality below acceptable limits). An exceedance event usually triggers the cessation of particular activities until an investigation has been completed and additional measures implemented; and,
- Non-Compliance: The identification of an un-agreed deviation from prescribed procedures/measures set out in this CEMP.

10.4 CORRECTIVE ACTIONS

A corrective action relates to the implementation of revised measures/procedures to rectify an identified environmental matter/concern/issue. Corrective actions will be implemented by the Contractor Project Manager, as advised by the PSCS and EM,

Corrective actions may be required as a consequence of:-

- Environmental Audits;
- Environmental Inspections; Environmental Monitoring;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required. A Corrective Action Notice will describe the cause and effect of the environmental issue/concern and will detail the recommended corrective action to be implemented.

If an environmental matter/concern/issue arises which requires immediate intervention; direct communications between the Contractor Project Manager, PSCS and EM will be conducted. A Corrective Action Notice will be completed subsequently.

ANNEX 1 – ENVIRONMENTAL & EMERGENCY RESPONSE PLAN





GALETECH
ENERGY SERVICES

Islandmore Wind Farm

Environmental Impact Assessment
Report

Annex 3.4: Planning-Stage
Construction Environmental
Management Plan (Environmental
& Emergency Response Plan)

Islandmore Wind Farm Limited

DOCUMENT CONTROL

Stage	Date	Name
Content	21/09/2026	Simon Carleton
Approval	21/09/2026	Gavin Daly

RECORD OF CHANGES

Revision	Issue Date	Summary of Changes	Approved
00	21/09/2026	Content	Simon Carleton
01			
02			

DISTRIBUTION LIST

#	Purpose	Company	Name (Optional)
1	For Planning	An Coimisiún Pleanála	-
2			
3			
Notes:			

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1.0 INTRODUCTION

Galetech Energy Services (GES), on behalf of Islandmore Wind Farm Limited, has prepared this Environmental and Emergency Response Plan (EERP) which should be instigated if an emergency or environmental incident occurs either within the project site or elsewhere linked to the construction of the project.

1.1 PURPOSE OF THIS REPORT

Many construction and industrial sites have the potential to cause environmental harm which could pose threat to public health, water supplies and wildlife in the event of an environmental incident. The purpose of this report is to outline how, in the event of an emergency, effects on humans and the local environment can be limited through quick action.

This EERP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every contractor or sub-contractor at the site.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction Environmental Management Plan (CEMP) for the Islandmore Wind Farm. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

It contains details of:-

- Who should be contacted in an emergency;
- Procedures to be followed in an emergency; and
- Staff responsibilities in an emergency.

1.2 ENVIRONMENTAL INCIDENT

This EERP should be implemented once there has been an emergency or environmental incident on site or elsewhere linked to the construction of the Islandmore Wind Farm. Incidents can be a discharge to air, land or water that could cause environmental damage. Causes of environmental incidents on site include:-

- Land Slide;
- Vandalism;
- Fire;
- Leaking plant or equipment;
- Containment Failure;
- Overfilling of containment vessels;
- Discharge of raw or partially treated effluent;
- Wind-blown waste, litter or dust;
- Flooding on site;
- Leaking Portaloo;
- Fuel drips or spills during refuelling;
- Leak from fuel or chemical containers;
- Failure of pumps and pipelines; and

- Contaminated water or sediment/silt entering a watercourse or drain.

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

1.3 REFERENCE DOCUMENTS

The production of this EERP has been supported by current legislation and will be accounted for in the further development of the appointed contractor's detailed CEMP.

Other guidance documents have been used to develop this EERP; including a Planning-Stage Construction & Environmental Management Plan, Waste & Resource Management Plan, Spoil Management Plan and Surface Water Management Plan.

2.0 REQUIREMENTS OF AN EERP

This EERP provides guidance for environmental incidents and includes:-

- Summaries of local environmental sensitivities;
- An outline of the construction works and sources to relevant existing environmental plans;
- Key mapping reference points for the site;
- Contact information for key external bodies and emergency response numbers who will assist in the event of an emergency;
- An identification of key staff and 24-hour contact details for those who will assist in the event of an emergency;
- An identification of Inventory of Pollution Prevention Equipment;
- Details of an Inventory of Chemical Products and Waste Inventory on Site*;
- Details of reporting requirements;
- Details of staff who are trained in the use of spill kits and booms etc.;
- Procedures to be followed in the event of an emergency and an identification of those responsible for re-positioning and moving the plant; and
- A widely available summary sheet for operatives that outlines the key procedures in the event of an emergency.

3.0 DESCRIPTION OF THE PROJECT

Islandmore Wind Farm Limited intends to construct the Islandmore Wind Farm which will consist of:-

- 10 no. wind turbines, 3 no. with an overall height of 185m and 7 no. with an overall height of 150m;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling;
- Works to the public road network along the turbine component haul route; and,

- 110kV electricity substation and installation of c. 7km of underground electricity line to facilitate connection of the wind farm to the existing Tonroe 110kV electricity substation at Ballaghaderreen, County Roscommon.

The project is located in north County Roscommon; c. 2km north of Ballaghaderreen, c. 13km east of Charlestown (Co. Mayo) and c. 6km southwest of Gorteen (Co. Sligo); and is located in close proximity to the county boundaries between counties Roscommon, Sligo and Mayo.

As well as the reference documents listed in **Section 1.3**, various environmental reports have been prepared for the project including:-

- Environmental Impact Assessment Report (Galetech Energy Services);
- Population & Human Health chapter (Galetech Energy Services)
- Biodiversity chapter (Woodrow/APEM Group);
- Land & Soil chapter (Hydro Environmental Services);
- Water chapter (Hydro Environmental Services);
- Material Assets [Transport & Access] chapter (Galetech Energy Services); and,
- Natura Impact Statement (Woodrow/APEM Group).

4.0 INCIDENT & HAZARD REPORTING

To ensure that all environmental incidents or hazards are accurately recorded, a reporting system has been developed. The logging of environmental incident reports will ensure that regular revisions and reviews can be made. In the event of an accident/incident, a blank environmental incident report has been attached on the last page of this report that includes details of all non-compliance and corrective actions carried out as a result of any incidents.

5.0 WASTE DISPOSAL AFTER ENVIRONMENTAL INCIDENTS

In the event of a pollution incident where a spill kit etc. may be used, operatives must dispose of the used equipment by placing them into a sealed bag or container. Used equipment will then be removed from site by a licensed waste contractor to a licensed waste facility.

6.0 SITE INDUCTION & TOOLBOX TALKS

It is crucial that all contractors, sub-contractors and staff on site are fully familiar with this EERP. Toolbox talks will be regularly given to the workforce on the aspects of health and safety of this project and, during these talks, they will receive regular reminders of the importance of not only the local environment but of the necessary environmental controls that are in place on site.

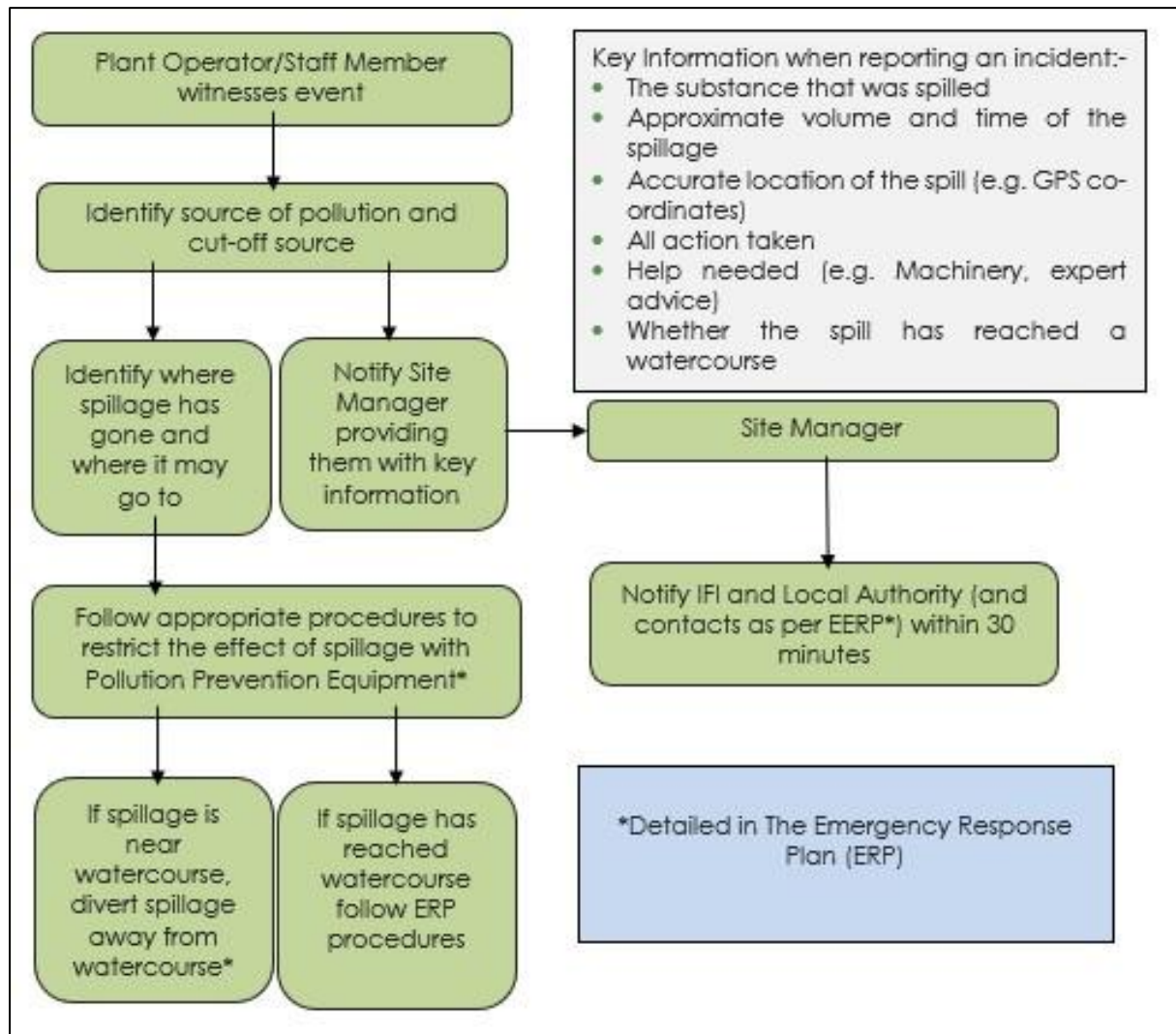
7.0 SUMMARY SHEET FOR MACHINERY & PLANT OPERATORS

The following procedures are a guide when dealing with incidents. To ensure health and safety for yourself and others, this health and safety guidance should be followed at all times alongside applying common sense:-

1. Identify the source of the spillage and cut off source if possible through closing a valve or righting container etc.;
2. Discontinue all work on site and all operatives will assist in placing spill mats correctly on affected area. Immediately contact Site Manager/main contact;
3. Identify the spillage route. If spillage is in close proximity to a watercourse (drainage/ditch/river), divert spillage away from the watercourse through the use of absorbent materials from the spill kit;
4. If a watercourse is at risk of contamination from suspended solids from a slope failure, do the following:-
 - a. Place straws 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 stabilized;
 - b. Stone check dams faced with a layer of geotextile will be constructed at critical points along the watercourse; and
 - c. Small sumps will be formed intermittently between the check dams to reduce the amount of suspended solids contained in the water;
5. If there has been an oil spill in the watercourse, do the following:-
 - a. Place flexible absorbent booms across the 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; and
 - 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 remaining staff present deal with the spill;
7. Dig up all contaminated ground as soon as possible. All contaminated materials should be placed in sealed polythene bags/containers and disposed of appropriately by a licensed waste contractor; and
8. Complete required record of incident and response into reporting system.

8.0 COMMUNICATION PLAN

A detailed Communication Plan will be provided by the Contactor, in liaison with relevant stakeholders, and will be included in the updated EERP prior to the commencement of construction. An outline Communication Plan is set out below.



8.1 ENVIRONMENTAL RESPONSE PLAN

Incident Response Plan for the Islandmore Wind Farm Based on template provided in GPP 21 – Guidance for Pollution Prevention	
Site Address: Largan, Islandmore, Boleysillagh, Cloonmeen, Toobrackan, and Tullaghanrock, County Roscommon. Official Company Address: Islandmore Wind Farm Limited Building 3400 Avenue 3000 Cork Airport Business Park Cork T12 AE76 Key Holders for site (Name and Contact numbers):	Coordinates: Map references:
Overview of the activities on site: Include number of employees at different times of the day: Daylight hours: Dusk to Dawn Weekend Dusk to Dawn: Bank Holidays:	
Description of surrounding area:	
Date and Version of the plan:	Name & position of person responsible for compiling/approving the plan:
Review date:	Date of next exercise:
Objectives of the plan:	
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: <i>Please note that it is recommended that you review and revise this plan regularly</i>	

8.2 EXTERNAL CONTACTS

External Contacts		
Contact	Office Hours	Out of Office
Emergency Services (Fire/Garda/Ambulance)	999 or 112	999 or 112
Local Garda Station	Ballaghaderreen Garda Station: 094 986 0002	999 or 112
Local Hospital (Accident & Emergency)	Sligo University Hospital: 071 917 1111	999 or 112
Environment Section	Roscommon County Council Áras an Chontae Roscommon County Roscommon F42 VR98 090 663 7100	-
EPA Regional Inspectorate	John Moore Road Castlebar County Mayo F23 KT91 094 904 8400	-
Inland Fisheries Ireland	01 884 2600	1890 347 424 (24 hours)
ESB Networks	01 852 9534	-
Telecommunications – Eircom/Eir	1800 475475	-

8.3 INTERNAL CONTACTS

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

8.4 CHEMICAL PRODUCT & WASTE INVENTORY

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

8.5 POLLUTION PREVENTION EQUIPMENT INVENTORY

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

8.6 SITE ENVIRONMENTAL INCIDENT REPORT FORM

Site:		Date:	
Time:		Weather:	
Report By:		Position:	
Islandmore Wind Farm Limited 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	
		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 of Report Completion: _____

Item	Questions	Yes	No	Corrective Action 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?				
3. Materials 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 manage 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 tray 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?				
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 & 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 department, 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 licensed 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)?				
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 authorization from Local Authorities/IFI?				
6.02	Do all watercourses 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 Authorities/ IFI?				
6.04	Has confirmation for the SUDS design for access roads been gained from Local Authorities/				

	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	Has vegetation removal/clearance of the site been minimized to avoid unnecessary areas of bare-ground?				
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	Have buffer-strips been left between working area and watercourses?				
6.9	Is plant operating in the watercourse?				
6.10	Have all culverts been installed at the base of stockpiles situated within close proximity to watercourses?				
6.11	Have silt fences been installed at the base of stockpiles situated within close proximity to watercourses?				
6.12	Are there adequate controls on site construction roads to minimize sediment runoff into watercourses (in particular, are the adequate flow attention measures within surface drain?)				
6.13	Are there any sign of decaying straw bales in watercourses? (this could lead to organic pollution of the watercourse)				
6.14	Are silt traps regularly maintained?				
6.15	Has ease of maintenance been considered in the design of permanent drainage features?				
6.16	Is there evidence of contamination of any watercourse (e.g. with oil, sediment, concrete, waste) in the vicinity of the works?				
6.17	Is monitoring of potential effects on watercourses carried out on a regular basis and fully recorded?				
6.18	Are dewatering operations				

	being carried out in such a way to minimize sediment contamination?				
6.19	Is drainage and run off in concrete batching areas adequate?				
6.20	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	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.)?				
8.03	Have toolbox talks on the subject of ecology and environmental responsibilities on site been delivered? Have attendance records been maintained for these?				
9. Documentation Check					
9.01	Start-up meeting record				
9.02	Full contacts list in 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				
9.08	Water Quality Monitoring Results				
9.09	Safety and Environmental Awareness Reports (SEARs). Filed and entered in				

	database?				
9.10	Safety and Environmental Audit Reports for the site. (If yes, insert date of last audit)				
9.11	Contractor's Environmental Plans (or Construction Method Statements)				



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ANNEX 2 – WASTE & RESOURCE MANAGEMENT PLAN





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Islandmore Wind Farm

Environmental Impact Assessment
Report

Annex 3.4: Planning-Stage
Construction Environmental
Management Plan (Waste &
Resource Management Plan)

Islandmore Wind Farm Limited

DOCUMENT CONTROL

Stage	Date	Name
Content	21/09/2026	Simon Carleton
Approval	21/09/2026	Gavin Daly

RECORD OF CHANGES

Revision	Issue Date	Summary of Changes	Approved
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02			

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1.0 INTRODUCTION

Galetech Energy Services (GES), on behalf of Islandmore Wind Farm Limited, has prepared this Waste & Resource Management Plan (WRMP) to detail the measures to be implemented for the control, management and monitoring of waste associated with the Islandmore Wind Farm.

1.1 PURPOSE OF THIS REPORT

The principal purpose of this WRMP is to ensure efficient use of material resources, reduce waste at source and reduce the quantity of waste that requires final off-site disposal to landfill in accordance with the waste hierarchy. A secondary aim is to facilitate the transition to a more circular economy thereby minimising the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions, and waste management.

This WRMP should be viewed as a live document and will be regularly reviewed and revised as necessary throughout the pre-construction and construction phases so that opportunities to maximise waste reduction are exploited.

The WRMP shall be implemented throughout the construction phase of the project to ensure that:-

- All site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials;
- All waste materials are segregated into different waste factions and stored on-site in a managed and dedicated waste storage area; and,
- All waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed/permitted facilities in compliance with the *Waste Management Act 1996* and all associated waste management regulations.

1.2 SCOPE & REQUIREMENTS

This WRMP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every Contractor or sub-contractor at the site. The Contractor will continually oversee changes to this document and will work alongside the Environmental Manager (EM) prior to any work commencing.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction Environmental Management Plan (CEMP) for the Islandmore Wind Farm. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

1.3 WASTE POLICIES & LEGISLATION

The following legislation and guidance is relevant to the preparation and continued development of this WRMP:-

- *Waste Framework Directive 2008/98/EC (as amended)*;
- *Landfill Directive 1999/31/EC (as amended)*;
- *Waste Management Act 1996 (as amended)*;

- *Waste Management (Facility Permit And Registration) (Amendment) Regulations 2019;*
- *Waste Management (Collection Permit) (Amendment) Regulations 2023 (S.I. No 63 of 2023);*
- *Litter Pollution Act 1997 (No. 12 of 1997) (as amended);*
- *European Communities (Waste Directive) (Amendment) Regulations 2020;*
- *EU Construction and Demolition Waste Management Protocol (European Commission 2018);*
- *Local Government Ireland National Waste Management Plan for a Circular Economy 2024-2030;*
- *By-Product Guidance Note, A Guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) (EPA, 2020);*
- *Circular Economy Action Plan, For a Cleaner and More Competitive Europe (European Commission 2020);*
- *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021);*
- *Draft National Waste Management Plan for a Circular Economy, 2023;*
- *The Circular Economy Programme 2021-2027;*
- *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less';*
- *National Hazardous Waste Management Plan 2021–2027 (EPA 2021);*
- *Guidance Document for the Local Authority Sector: Management of Materials Arising from Roadworks (CCMA 2020);*
- *Guidance on the Interpretation of Key Provisions of Directive 2008/98/EC on Waste (European Commission, 2018);*
- *The Management of Waste from National Road Construction Projects (TII, December 2017); and,*
- *Guidelines for the Waste Audits Before Demolition & Renovation Works of Buildings (European Commission, May 2018).*

The Waste Management Priority Hierarchy, which the developer is obligated to apply in the management of waste, is as follows:-

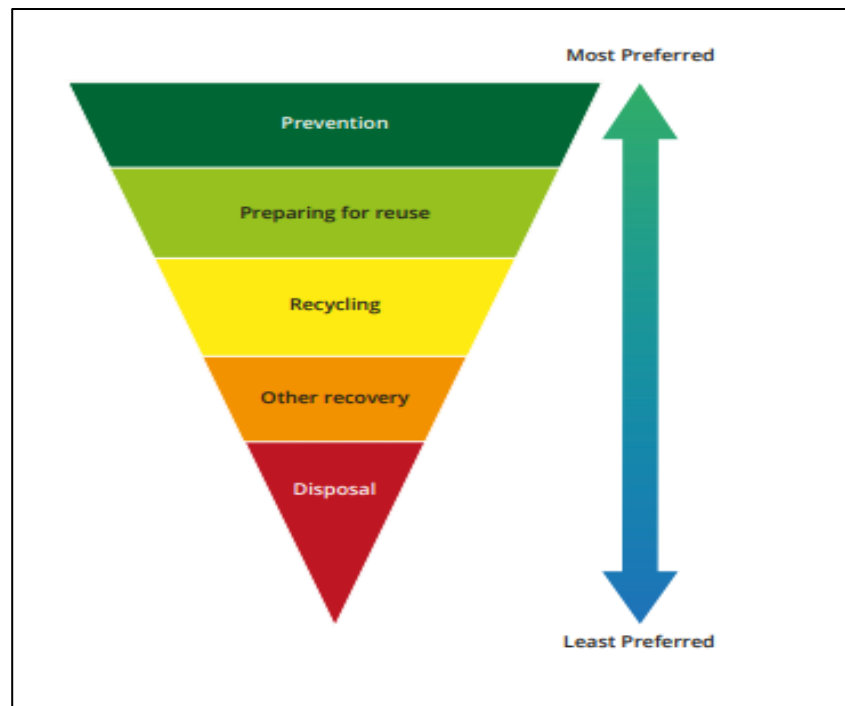


Figure 1: Waste Management Hierarchy

The waste management hierarchy shown above applies to all waste, including hazardous waste. The diagram conveys that above all, the prevention of waste production is the top priority.

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, in accordance with the abovementioned Directives, is legally required to:-

- Prevent waste disposal constituting 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;
- Ensure that the disposal and recovery of waste does not present a risk to water, air, soil, plants and animals;
- Ensure that waste treatment operations are licensed;
- Prepare a Waste Management Plan;
- Require waste collectors to have special authorisation and to keep records; and,
- 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 Annex 3.4: Construction Environmental Management Plan (Waste & Resource Management Plan)

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.

Following the waste hierarchy considerations, the proposed development lays out identified waste streams and their management techniques. The following targets have been established for the management of waste generated during the development:-

- 100% of the topsoil being retained on site and used for site restoration and landscaping;
- >95% of excavated soils/subsoils being reused;
- 100% of packaging material, metals, timber, plastic, paper and cardboard waste to be sent for recycling/recovery;
- >95% of overall waste is to be sent for recycling/recovery; and,
- <5% of waste is to be sent for disposal.

1.4 REFERENCE DOCUMENTS

The production of this WRMP has been supported by best practice manuals, including the *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (Environmental Protection Agency, 2021).

Other guidance documents have been used to develop this WRMP; including a Planning-Stage Construction & Environmental Management Plan, Spoil Management Plan, Surface Water Management Plan, and Environmental & Emergency Response Plan.

2.0 REQUIREMENTS OF A WRMP

There are four stages to be followed in the management of waste:-

- Planning;
- Implementation;
- Monitoring; and,
- Review.

2.1 PLANNING

During the planning/design/development stages of the Islandmore Wind Farm, the nature of the site has been accounted for as well as the environmental considerations and the design of the project. Insightful planning at the early stages will help minimise the quantity of waste produced.

2.2 IMPLEMENTATION

The detailed WRMP, to be prepared prior to construction, will implement the management of the following:-

- A brief of waste types expected to be produced;
- Estimates of quantum of each type of waste expected to be produced;

- An explanation of how the Contractor aims to minimise the different waste types produced prior to any activity that generates this waste; and
- 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).

All workers will be fully briefed of waste management procedures and aware of their requirements under the WRMP. All site visitors will be briefed on appropriate waste storage and disposal units. Littering will not be tolerated and all personnel will have a duty to challenge those who do not comply with WRMP procedures.

2.2.1 Roles & Responsibilities

Person Responsible	Responsibilities	Contact Details
Developer	• To commission a competent Contractor to carry out works and to update WRMP; • To ensure that WRMP is submitted and agreed on by the local authority prior to construction; and • To commission Contractor to produce end-of-project WRMP.	
Contractor	• To update, implement and review the WRMP throughout the construction phase; • To assign relevant duties and responsibilities to the appropriate person; • To hire a responsible Site Manager who will implement the WRMP; • To identify all hauliers engaged to transport each of the resources/wastes off-site; • To identify suitable licensed waste facility site for each type of waste; • To maintain the records of all waste resources for the duration of the development; and, • To prepare an end-of-life WRMP Review Report.	
Site Manager	• To maintain and update WRMP through the planning and procurement phases of the project; • To update record of details and estimated quantities of all projected waste streams; • To deliver all training and induction in relation to resource management; • To conduct waste checks:- ○ To conduct internal audits routinely including as per the requirement of the site; ○ To ensure site infrastructure is supplied and maintained as fit for purpose; ○ To maintain and update the waste register; and, ○ To be available as required for any Local Authority or other audits undertaken	

2.3 MONITORING

2.3.1 Checks and Records

All stores on site of oil, fuel and chemicals should be visually inspected on a regular basis, especially during extreme weather conditions. Visual inspections will reveal evidence of leaks, spills or contamination.

Records of all visual checks must be maintained and be made available upon request for inspection. The topic of waste management will be regularly discussed during team meetings and, as required, waste management practices should be continually revised.

2.3.2 Waste Inventory

A waste inventory should be continually updated and will include a list of all waste materials leaving the site for disposal as well as the name of the appropriately licensed operator and intended disposal facility. A waste inventory will be added to this plan by the Contractor.

2.3.3 Monitoring of WRMP

The Contractor will appoint the EM to implement and monitor the WRMP. The WRMP should include an inventory of the types of estimates of the waste to be produced on site. The aim will be to keep the volumes of waste produced below the estimates of waste to be produced. The EM will ensure that a waste audit is carried out every 6-months.

2.4 REVIEW

Upon completion of the construction phase, a waste management review will be undertaken. The aim will be to measure compliance with the WRMP objectives and to consider lessons learnt. The review will be carried out by the EM in conjunction with the Contractor.

3.0 GENERAL WASTE MANAGEMENT PRINCIPLES

- All personnel will be made aware of the objectives of this WRMP and their responsibilities to minimise the generation of waste and, where it arises, to ensure its appropriate management;
- The generation of waste products will be minimised insofar as possible;
- Appropriate management, storage and disposal procedures will prevent pollution in compliance with legislation;
- All waste storage receptacles shall be secured within the development site;
- All waste receptacles shall be maintained in good condition;
- No waste receptacles shall be stored within 10m of any surface water feature;
- For general waste, wheelie bins should be selected or, where required, covered skips should be obtained;
- All waste to be transported off-site shall only be removed by a licenced waste carrier. Local waste carriers and disposal facilities will be selected where possible;
- Maintain appropriate waste records. Such records shall detail:-
 - An adequate description of the waste;
 - Where the waste came from;
 - The appropriate code from the List of Wastes Regulations for waste (commonly referred to as the EWC or LoW code);
 - Information on the quantity and nature of the waste and how it is contained;

- Names and addresses of the transferor (the person currently in control of the waste) and the transferee (usually either a registered waste carrier or a waste management license 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); and
- 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;
- Only trained operatives should handle hazardous substances. All stored hazardous waste will be clearly labelled;
- No hazardous waste shall be removed from site in the absence of all appropriate documentation;
- No storage of hydrocarbons or any toxic waste chemicals should occur within 50m of a watercourse/drainage ditch;
- All associated hazardous waste residuals (including used oil spill kits), such as oil, solvents, used absorbent materials on minor oil spills, glue and solvent based paint containers will be stored within appropriately covered skips prior to removal by a suitable local authority or EPA approved waste management Contractor for off-site treatment/recycling/disposal;
- Waste storage areas will be clearly located and made known to all operatives;
- Oil waste shall be stored in a double skinned tank. However, if a double skinned tank is not available, the oil waste will be bagged and stored in a secure storage vessel with secondary containment in the form of a drip tray or bund. The oil waste shall then be removed from site by a specialist Contractor;
- Oily wastes, such as rags and spill absorption material, shall be placed in a bag and stored within a secure container within secondary containment which is capable of ensuring no spilled or collected oil waste escapes. The oil wastes shall then be removed from site by a specialist Contractor;
- Obsolete electronic equipment, e.g., computers and associated accessories shall be labelled as WEEE (waste electrical and electronic equipment) and stored safely for a maximum of 12-months prior to sending for recycling;
- All waste will be transported from the site as soon as practicable to prevent over-filling of waste containers; and,
- Frequency of Checks: the Contractor will ensure that all storage facilities are checked on a weekly basis. The checklist for completion is attached below.

Waste Checklist		
Waste area checked	Date Checked	Checked By
General office waste		
Bowser		
Portaloo		
Excavated soil		

Washings		
Concrete		
Oil		
Hazardous Waste		

4.0 TYPICAL WASTE STREAMS

4.1 WASTE INVENTORY

The typical waste arising during the construction of the project is provided below. This inventory will be further expanded upon by the Contractor prior to the commencement of construction.

Waste Item	EWC/LoW	Disposal Method
Re-use		
Non-contaminated spoil arising from groundworks (e.g., topsoil, subsoil, vegetation, stone aggregates, concrete, etc.)	170107 & 170504	Re-use locally within the site for reinstatement or landscaping
Wood Pallets	150103	Return to supplier
Recyclable		
Aluminium Cans	150104	To recycling centre
Cardboard	150101	To recycling centre
Plastic Cups	200139	To recycling centre
Metals	020110	To appropriate recycling centre
Glass (bottles/containers)	200102	To recycling centre
Packaging (general)	150106	To recycling centre
Paper (general)	200101	To recycling centre
Plastics (general)	150102	To recycling centre
Plastics (bottlers, containers, etc.)	200139	To recycling centre
Polystyrene	200104	To recycling centre
Wood/Timber packaging (e.g., crates)	150103	To recycling centre
Disposal		
Food Waste	200108	Disposal by local contractor
General Waste	200301	Disposal by local contractor
Foul Waste	190805	Collection by specialist contractor
Aerosol Cans	160504	Disposal by local contractor
Diesel (hazardous waste)	130701	Collection by specialist contractor
Greases (hazardous waste)	130899	Collection by specialist contractor
Oily water mix from bunds/sumps (hazardous waste)	130507	Collection by specialist contractor
Insulating Oils with PCB contamination (hazardous waste)	130301	Collection by specialist contractor
Synthetic Oils (hazardous waste)	130310	Collection by specialist contractor
Other Oils (hazardous waste)	130203	Collection by specialist contractor

Oil Drums (hazardous waste)	150110 & 150104	Collection by specialist contractor
-----------------------------	--------------------	-------------------------------------

4.2 MANAGEMENT OF WASTE

All waste will be segregated and securely stored at the temporary construction compound, in skips and receptacles, which will be covered to protect the contents from the weather. A licensed operator will collect and transfer the skips/receptacles of both recyclable and non-recyclable wastes as they are filled. Where this is not practicable, or where the quantity of waste is small, the Contractor will remove the waste to his yard on a daily basis for onward disposal.

A list of licensed operators (<https://www.nwcpc.ie/permitsearch.aspx>) for the purposes of the proposed development will be identified provided below. Facilities to which waste is proposed to be removed (<https://facilityregister.nwcpc.ie/>) shall also be listed.

Permit Number	Name of Permit Holder	Address of Waste Facility	Type of Waste Permitted



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ANNEX 3 – SURFACE WATER MANAGEMENT PLAN





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Islandmore Wind Farm

Environmental Impact Assessment
Report

Annex 3.4: Planning-Stage
Construction Environmental
Management Plan (Surface
Water Management Plan)

Islandmore Wind Farm Limited

DOCUMENT CONTROL

Stage	Date	Name
Content	12/10/2026	Simon Carleton
Approval	12/10/2026	Gavin Daly

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1.0 INTRODUCTION

Galetech Energy Services (GES), on behalf of Islandmore Wind Farm Limited, has prepared this Surface Water Management Plan (SWMP) for the construction and operational phases of the Islandmore Wind Farm.

1.1 PURPOSE OF THIS REPORT

This SWMP provides the framework for water management at the site of the Islandmore Wind Farm for contractors and incorporates the measures set out in the various environmental assessment documents associated with the development. The purpose of this report is to detail the practical implementation of these measures such that the construction and operational phases do not have an adverse effect on water quality.

This is a live document and will be updated by the appointed contractor prior to the commencement of development. Prior to the commencement of construction, the updated SWMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (EcoW), as necessary, to confirm the appropriateness of the measures set out therein.

This SWMP aims to:-

- Describe environmental sensitivities of the site and any applicable buffer zones;
- Describe how the system will operate to minimise modification and disruption to the existing site hydrology;
- Outline the proposed maintenance regime; and,
- Outline the proposed drainage management post-construction.

1.2 REFERENCE DOCUMENTS

The production of this SWMP has been supported by best practice manuals and will be accounted for in the further development of the appointed contractor's detailed CEMP.

Other documents have been used to develop this SWMP; including a Planning-Stage Construction Environmental Management Plan, Spoil Management Plan, and Environmental & Emergency Response Plan.

1.2.1 Legislative Background

This plan has been prepared in accordance with the following legislation:-

- *S.I. 10 of 1972 Dangerous Substances Act, 1972, as amended;*
- *S.I. No. 293 of 1988 Quality of Salmon Water Regulations;*
- *S.I. No. 249 of 1989 Quality of Surface Water Intended for Abstraction (Drinking Water);*
- *S.I. No. 94 of 1997 European Communities (Natural Habitats) Regulations;*
- *S.I. No. 41 of 1999 Protection of Groundwater Regulations;*
- *Water Framework Directive (2000/60/EC);*
- *S.I. No. 600 of 2001 Planning and Development Regulations 2001, as amended;*

- S.I. No. 722 of 2003 European Communities (Water Policy) Regulations;
- S.I. 547 of 2008 European Communities (Environmental Liability) Regulations;
- S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations;
- S.I. No. 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010; and,
- S.I. No. 350 of 2014 European Union (Water Policy) Regulations 2014.

1.2.2 Construction Industry Research & Information Association (CIRIA) Manuals

- CIRIA (Construction Industry Research & Information Association) Report C502 Environmental Good Practice on Site;
- CIRIA 521 - Sustainable Urban Drainage Systems; Design Manual for Scotland and Northern Ireland;
- CIRIA Report C532 Control of Water Pollution from Construction Sites;
- CIRIA Report C648 Control of Pollution from Linear Construction Project Technical Guidance;
- CIRIA Handbook C650 Environmental good practice on site;
- CIRIA Handbook C651 Environmental good practice on site checklist;
- CIRIA Report C609 - SuDS - hydraulic, structural & water quality advice;
- CIRIA Report C697 - The SuDS Manual; and,
- Guidelines on Protection of Fisheries during Construction Work in and Adjacent to Water (Inland Fisheries Ireland, January 2016).

2.0 DESCRIPTION OF THE PROJECT

Islandmore Wind Farm Limited intends to construct the Islandmore Wind Farm which will consist of:-

- 10 no. wind turbines, 3 no. with an overall height of 185m and 7 no. with an overall height of 150m;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling;
- Works to the public road network along the turbine component haul route; and,
- 110kV electricity substation and installation of c. 7km of underground electricity line to facilitate connection of the wind farm to the existing Tonroe 110kV electricity substation at Ballaghaderreen, County Roscommon.

The project is located in north County Roscommon; c. 2km north of Ballaghaderreen, c. 13km east of Charlestown (Co. Mayo) and c. 6km southwest of Gorteen (Co. Sligo); and is located in close proximity to the county boundaries between counties Roscommon, Sligo and Mayo.

As well as the reference documents listed in **Section 1.2**, various environmental reports have been prepared for the project including:-

- Environmental Impact Assessment Report (Galetech Energy Services);
- Biodiversity chapter (Woodrow/APEM Group);
- Land & Soil chapter (Hydro Environmental Services); and,
- Water chapter (Hydro Environmental Services), and,
- Natura Impact Statement (Woodrow/APEM Group).

3.0 DESCRIPTION OF BASELINE ENVIRONMENT

3.1 SITE LOCATION

The project site is located in north County Roscommon, c. 2-kilometres (km) north of Ballaghaderreen (**see Figure 3.1**), c. 13km east of Charlestown (County Mayo) and c. 6km southwest of Gorteen (County Sligo). The wind farm will be located in the townlands of Largan, Islandmore, Boleysillagh, Cloonmeen, Toobrakan, and Tullaghanrock, County Roscommon.

According to the Corine 2018 database, land use at the project site is predominately classed as wetlands, forest and semi-natural areas and agricultural areas (pastures). The wider landscape comprises a mosaic of peat bogs, commercial forestry and agricultural scrub; with pockets of improved agricultural pasture generally limited to areas to the southwest of Ballaghaderreen and west and northwest of the town of Frenchpark.

The N5 national primary route is located c. 500m south of the wind farm site; while the N17 national secondary route, along which turbine components will be transported, is located c. 13km to the west. The project site is crossed by a network of local secondary and tertiary classed roads.

Population density at the project site and in its immediate environs is sparse and settlement patterns largely comprise dispersed rural dwellings often accompanied by agricultural holdings and buildings. The town of Ballaghaderreen, located c. 2km south, is the primary settlement in the environs of the project site.

3.2 TOPOGRAPHY

The project site is located in an upland peatland setting where the topography of the local area is generally undulating and sloping. The central portion of the wind farm site is centred on a hill (c. 180m OD [ordnance datum] elevation), which slopes away to c. 160m OD to the east and west, c. 140m OD to the south and c. 150m OD to the north.

3.3 HYDROLOGICAL ENVIRONMENT

On a regional scale, the project site is mapped within 2 no. WFD Catchments. The northern portion of the project site, including 6 no. turbines (T1–T6), are located in the regional Moy and Killala Bay Catchment (HA: 34) and within the Moy_SC_030 sub catchment.

The southern section of the project site is mapped in the Upper Shannon Catchment (HA: 26B) and within Lung_SC_020 sub catchment.

The underground electricity line is located entirely in the Upper Shannon Catchment and within the Lung_SC_020 sub catchment. The electricity substation location sits on the surface water catchment divide between the two regional catchments, with the

majority of the substation footprint draining south into the Upper Shannon Catchment.

On a more local hydrology scale, the northern portion of the project site (within the Moy regional catchment) is located in the Owengarve River catchment (Owengarve (Sligo)_010 river sub basin). The Owengarve River flows in a north-westerly direction for approximately 25km before entering the River Moy.

The southern portion of the project site (within the regional Upper Shannon Catchment) lies within the Lung River catchment (Lung_050 river sub basin). This portion of the project site is drained by 3 no. tributaries of the Lung River that flow in a southerly direction for c. 2.5 to 3km towards the main channel of the Lung River which flows to the south of the project site.

From this point the Lung River flows northeasterly for approximately 4.5km, where it discharges to the Lough Gara middle lake. Lough Gara comprises 3 no. separate lake waterbodies (upper, middle and lower) that drain in a northerly direction into the Boyle River.

The northern portion of the project site (within the Moy and Killala Bay Catchment) is drained by 3 no. headwater streams of the Owengarve River. These streams merge c. 1km to the northwest of the project site. The most westerly stream (EPA Name: Brogher Stream), which emerges from the Bockagh Hill area to the west of the project site, drains the area of turbine location T6, northern portion of the electricity substation location, along with a large portion of the intact bog located to the northwest of the project site.

The most easterly stream (unnamed by the EPA), which emerges 1km to the east of the project site, flows along the northern boundary of the project site close to the locations of turbines T1 and T2, which drain towards this watercourse via forestry drains and bog drains.

The central stream (EPA Name: Owengarve [Sligo]) emerges within the project site to the south of turbine location T4 and drains the area of turbine locations T3, T4 and T5 and the borrow pit. There is a proposed watercourse crossing on the Owengarve [Sligo] Stream located along the proposed wind farm access road between turbine locations T3 and T4.

The southern portion of the project site (within the Lung River Catchment) is drained by 3 no. headwater streams which flow for c. 2.5-3km south towards the Lung River.

The majority of the southern portion of the project site (including turbine locations T7 to T10) is drained by the central stream (unnamed by the EPA) which emerges less than 0.5km to the east of turbine T9 prior to flowing southerly through the project site.

The western stream emerges approximately 0.2km west and downstream of the electricity substation location (unnamed by the EPA) where it continues to flow south and drains the area of turbine location T10 in the southwestern portion of the project site.

The eastern stream (EPA Name: Tullaghanmore Stream or Monstown Demesne) emerges close to the southeastern boundary of the project site and flows southerly adjacent to local road L5501 where road widening is proposed as part of the haul route works (there is no requirement to alter alignment of this watercourse).

The underground electricity line is located entirely within the Lung River Catchment. The underground electricity line intercepts EPA mapped watercourses at 6 no. locations. 5 no. of these locations are on existing public roads where a culvert or

bridge is present; while the 6th location is an existing crossing/culvert located on a private access track near the Tonroe electricity substation.

Bog drains associated with peat cutting are present across the project site, with the larger of these drains located in the central area of the project site, near turbine T8 and T9.

There are also networks of drains associated with forestry on the northeast and southeast of the project site.

3.4 GEOLOGICAL ENVIRONMENT

Land cover within the project site is predominately a mixture of cutover bogs, intact bogs and small pockets of agricultural fields. All 10 no. wind turbines are located on peat bogs.

The GSI have mapped the bogs as cutover raised bogs but some of the bog areas, particularly the northern portion of the project site, have a more blanket bog appearance. The bog on the southern portion of the project site has a raised bog appearance.

There are also pockets of forestry and semi-natural areas on the northeast and southeast of the project site which are planted on peat bogs. Pockets of grassland are located in the northwestern parts of the project site.

3.5 FLOOD RISK ASSESSMENT

No recurring flood incidents within the project site, along the underground electricity line or haul route work areas have been identified from OPW's Past Flood Event Mapping.

The closest mapped recurring flooding event to the project site is situated in a low-lying area c.1.5km west of the project site. This mapped recurring flood event is not downstream of the project site and there are no mapped single or recurring flooding events downstream of the project site within a 10km distance.

Identifiable map text on local available historical 6" or 25" mapping for the project site area do not identify any lands that are "liable to flood".

There is no OPW River Flood Extents (CFRAM) Mapping available for the watercourses draining the project site or underground electricity line and therefore the National Indicative Fluvial Mapping was consulted which has mapped fluvial flood zones for watercourses in both the Owengarve River and Lung River catchments.

Based on the National Indicative Fluvial Mapping (NIFM), no 100-year or 1000-year flood zones encroach the project site, underground electricity line or haul route works areas.

There are fluvial flood zones within the Owengarve River catchment c. 1.2km northwest and downstream of the project site. Fluvial flood zones within the Lung River catchment are mapped 0.5km south and downstream of the project site.

All project infrastructure is therefore located above the mapped 1000-year flood level and therefore all infrastructure is located in Flood Zone C (Low Risk).

It is a key design feature of the project to ensure that all surface water runoff is treated (water quality control) and attenuated (water quantity control) prior to diffuse discharge at pre-existing greenfield rates.

3.6 NATURE CONSERVATION SITES

Within the Republic of Ireland, designated sites include National Heritage Areas (NHAs), proposed National Heritage Areas (pNHAs), candidate Special Areas of Conservation (cSAC), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).

The project site is hydrologically connected to the River Moy SAC (Site Code: 002298). At its closest point, this designated site is located approximately 5.5km to the northwest and downstream of the project site and is hydrologically connected via the Owengarve River which drains the northern portion of the project site.

Lough Gara SPA (Site Code: 004048) and pNHA (Site Code: 000587) are located approximately 6km downstream of the project site and are hydrologically connected via the Lung River which the drains the southern portion of the project site.

Tullaghanrock Bog SAC (Site Code: 002354) and Callow Bog SAC (Site Code: 000595) are located along the banks of the Lung River upstream of Lough Gara and are located c. 1.6km downstream of the project site. Hydrological connectivity with the project site and will be limited to surface water flows in the Lung River (i.e. there is no groundwater flow connectivity with the project site and these designated bogs due to large separation distances and dominant surface water drainage regime).

There are also several pNHA designated sites located along the banks of the Owengarve River, approximately 5.5km downstream of the project site. These bogs include Gowlaun Bog pNHA, Tawnaghbeg Bog pNHA, Kilgarraff Bog pNHA, and Derrynabrock Bog pNHA). Hydrological connectivity with the project site and these designated bogs will be limited to surface water flows in the Owengarve River (i.e. there is no groundwater flow connectivity with the project site and these designated bogs due to separation distances and the surface water flow regime).

4.0 DRAINAGE SYSTEM

4.1 SUSTAINABLE DRAINAGE SYSTEM

Surface water is a valuable resource and this should be reflected in the way it is managed. The appropriate management of surface water should be considered at the early stages of the project design process. It is important, particularly on large developments such as the Islandmore Wind Farm, that surface water is managed in a fashion which prevents significant alterations to the existing hydrological regime whilst ensuring the appropriate drainage of the site.

The project has been designed to implement a Sustainable Drainage System (SuDS) which seeks to:-

- Minimise any change to the surface water and groundwater conditions within the site;
- Avoid sensitive areas where possible by employing hydrological constraints (i.e. buffer zones);
- Replicate the natural drainage of the site;
- Minimise sediment loads in the runoff, with particular attention being given to the construction phase of the project;

- Maintain runoff rates and volumes at Greenfield rates for a range of storm events (to be incorporated into final detailed design); and,
- Avoid high flow velocities internally within new drain networks and at outfall locations to prevent erosion.

The purpose of a SuDS is:-

- To provide sufficient detail to ensure that water pollution will not occur as a result of construction and operational activities at the site and to minimise the risk of any such occurrence;
- To regulate the rate of surface water run-off downslope to prevent scouring and to encourage settlement of sediment locally; and,
- To minimise the quantity of sediment laden stormwater and resulting settlement pond sizes by separating 'clean' water from the 'dirty' development runoff.

4.1.1 SuDS Design

The overarching objective of the SuDS design is to ensure that all surface water runoff is comprehensively attenuated such that no silt or sediment laden waters or deleterious material is discharged into the local drainage system. While the SuDS is, overall, an amalgamation of a suite of drainage infrastructure; the objectives are straightforward. In summary:-

- Clean water drains will be installed upslope of the works area to intercept clean surface water to prevent it becoming contaminated by silt/sediment from construction activities;
- All surface water runoff from construction works areas will be directed to specially constructed downslope dirty-water swales surrounding all areas of ground proposed to be disturbed (including areas for the temporary storage of material);
- The swales will direct runoff into settlement ponds/silt traps where silt/sediment will be allowed to settle; and,
- Following treatment and the settlement of silt/sediment, clean water will be discharged indirectly to the local drainage network via buffered outfalls thus ensuring that no scouring occurs.

The design criteria for the SuDS is as follows:-

- To minimise alterations to the ambient site hydrology and hydrogeology;
- To provide settlement and treatment controls as close to the site footprint as possible and to replicate, where possible, the existing hydrological environment of the site;
- To minimise sediment loads resulting from the development runoff during the construction phase;
- To preserve greenfield runoff rates and volumes;
- To strictly control all surface water runoff such that no silt or other pollutants shall enter watercourses and that no artificially elevated levels of downstream siltation or no plumes of silt arise when substratum is disturbed;

- To provide appropriate retention times such that and no flooding will occur in the vicinity of the project site which may cause a hazard;
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement;
- To reduce stormwater runoff velocities throughout the site to prevent scouring and encourage settlement of sediment locally;
- To manage erosion and allow for the effective revegetation of bare surfaces;
- To ensure that oils, fuels and other contaminants are stored appropriately and bunded to prevent any discharge of such materials. The temporary construction compounds, where such oils and fuels will be stored, shall incorporate an oil/petrol interceptor within its drainage system. Similarly, an oil/petrol interceptor shall be installed at the proposed electricity substation;
- Additional drainage measures will only be added as necessary. The dimensions of these features will avoid intercepting large volumes of water;
- Storm water runoff from hardstandings and access tracks will be managed via filter drains consisting of swales and settlement ponds. Access tracks and hardstandings will crossfall downslope to mimic the natural drainage patterns of the site;
- Temporary erosion protection together with silt fences may be required until the vegetation becomes established (coir matting or similar);
- Access tracks and hardstandings will be constructed from aggregate and will not be surfaced with bitumen materials, thus helping to reduce runoff volumes.
- An additional allowance has/will be included to take account for global warming;
- The stone used for the construction of the check dams will be washed graded stone with a size range between approximately 5mm and 40mm;
- Under track drainage will be provided with associated sumps and silt fences. The under track drainage will provide a means for flows to pass from a swale on the uphill side of the slope to the downhill side of the slope.
- A sump may be required to collect dewaterings from excavations for turbine foundations; water will subsequently be pumped into the settlement pond system and allowed to settle prior to discharging into the swales;
- All swales and ponds will be kept as shallow as possible so that they do not pose any health and safety risk to plant or personnel;
- Field drains/forestry will be piped directly under access tracks through appropriately sized drainage pipes;
- The Office of Public Works (OPW) will be consulted on all stream crossings through the applications for Section 50 consent, prior to works commencing. The design of these crossings follow guidance from Inland Fisheries Ireland;
- Appropriate site management measures will be taken such that runoff from the construction site is not contaminated by fuel or lubricant spillages;
- There will be no discharge of sewage effluent or contaminated drainage into any watercourse system or ditch; and,

- The drainage system will be monitored regularly during the construction phase for effectiveness, and cleaned or unblocked if necessary.

4.1.2 SuDS Design Philosophy

The SuDS design principles are as follows:-

Minimise → Intercept → Treat → Disperse → Dilute

Minimise

The main principle of this SuDS design is to minimise the volume of 'dirty' water requiring treatment through means of informed, integrated and sustainable drainage design. This is achieved by keeping 'clean' water clean by interception and separation, and by collecting the 'dirty' water and treating it by removing the suspended sediments. The resultant outflow is dispersed across vegetation and will become diluted through contact with the clean water runoff before entering the natural drainage system.

Intercept

The key silt/sediment control measure is the separation of construction runoff from the clean water runoff that arises in the undisturbed areas of the project site and surrounding lands. This significantly reduces the volume, and velocity, of dirty water that the control measures are required to manage. To achieve separation, clean water infiltration interception drains are positioned on the upslope and dirty water swales/drains positioned along the verge, with site surfaces sloped towards dirty water swales/drains. The remainder of this clean water will be regularly piped under both the access tracks and dirty water swales/drains to prevent contamination. This process allow for the mimicking the paths which clean water would have taken in the absence of the project.

Treat, Disperse, & Dilute

'Dirty water' swales/drains collect all incident rainwater that falls on the development infrastructure and drain into the silt traps/ponds. Following a period of attenuation, during which time all suspended solids will have 'fallen', the treated water is dispersed through buffered outfalls to prevent erosion.

4.2 DESIGN MEASURES

4.2.1 Planning-Stage Design of Surface Water Management System

A planning-stage drainage/surface water management system has been designed by Jennings O'Donovan & Partners, enclosed at **Annex 1** hereto, and includes preliminary specifications for surface water management infrastructure particularly in relation to the appropriate sizing of silt/settlement ponds. Details of the sizing of each silt/settlement pond, which have been informed by rainfall data for the project site, are provided at **Table 1** below.

Pond Reference (SP)	Drainage Area (m ²)	Length (m)	Width (m)	Depth (m)	Overall Volume of Silt Pond (m ³)
1	6,153	16	9	1.2	172.8

2	4,295	14	7	1.2	117.6
3	7,212	18	9	1.2	194.4
4	2,193	15	4	1	60
5	6,987	19	10	1	190
6	4,014	18	6	1	108
7	1,819	10	5	1	50
8	N/A	N/A	N/A	N/A	N/A
9	1,217	13	2	1	26
10	N/A	N/A	N/A	N/A	N/A
11	4,105	14	8	1	112
12	1,265	11.5	3	1	34.5
13	955	7	4.5	1	31.5
14	4,718	20	6.5	1	130
15	2,419	14	5	1	70
16	2,712	12.5	6	1	75
17	3,474	16	6	1	96
18	2,776	14	5.5	1	77
19	957	25	12	1	300
20	1,863	13	4	1	52
21	4,063	16	7	1	112
22	4,443	19	6.5	1	123.5
23	3,345	15.5	6	1	93
24	4,664	16	8	1	128
25	3,059	17	5	1	85
26	328	13	7	1	91
27	1,146	7	4.5	1	31.5
28	5,163	19	7.5	1	142.5

Table 1: Silt/Settlement Pond Specifications

Prior to the commencement of development, the appointed Contractor; in conjunction with the project design team, EM, and ECoW; shall prepare a detailed SWMP which shall detail the precise specifications and locations of all surface water management infrastructure to be installed.

5.0 CONSTRUCTION PHASE MEASURES

In the first instance, the project seeks to avoid adverse effects on surface water through avoidance. In particular, the project has sought to avoid direct interactions with watercourses; through minimising the number of watercourse crossings and the implementation of a 50m buffer zone around natural watercourses. The design of the project has, where possible, sought to avoid this buffer area.

Best practice measures are also proposed to minimise impacts to water quality, as follows:-

- All site personnel will be made aware of their environmental responsibilities at the site;

- Contractors will be required to include contingency plans to deal with spillages, should they occur;
- Land disturbance will be kept to minimum and disturbed areas will be stabilised as soon as possible;
- In principle, soil excavation should be undertaken during dry periods, whenever possible;
- Site visits by a Design Engineer will be undertaken at various stages of the construction process to ensure that the SuDS scheme is being constructed and implemented appropriately; and,
- In order to verify the efficacy of pollution prevention works during construction, water quality monitoring will be undertaken by a suitably qualified EM, 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 and hydrochemistry monitoring, as described in detail in the Water Quality Monitoring Plan.

Finally, all mitigation measures proposed in the Water chapter of the EIAR will be implemented in full, as set out in the following sections.

5.1 CLEAR FELLING AND SURFACE WATER QUALITY EFFECTS

5.1.1 Avoidance

There is a requirement in the *Forest Service Code of Practice* and in the *FSC Certification Standard* for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document *Forestry and Water Quality Guidelines* are detailed at **Table 2**.

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0–15%)	10m	15m
Steep	(15–30%)	15m	20m
Very steep	(>30%)	20m	25m

Table 2: Minimum Buffer Zone Widths (Forest Service, 2000)

A total of 6.5ha of forestry will be permanently felled to accommodate the construction and operation of the project.

During the construction phase, a self-imposed conservative buffer zone of 50m will be maintained for all streams. Only approximately 0.8ha of the total 6.5ha proposed for felling is located inside a 50m watercourse buffer zone. The large distance between the majority of the felling areas and sensitive aquatic zones means that any poor quality runoff arising from felling areas can be adequately managed and attenuated prior to reaching the aquatic buffer zone and primary drainage routes. Where tree felling is required in the vicinity of streams, the additional mitigation measures outlined below will be employed.

5.1.2 Design

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods, as follows:-

- Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance;
- Checking and maintenance of tracks and culverts will be ongoing through any felling operation. No tracking of vehicles through watercourses will occur. Where possible, existing drains will not be disturbed during felling works;
- Ditches which drain from the areas to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (c. 0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients and avoid being placed at right angles to the contour;
- Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the spoil deposition areas. All new silt traps will be constructed on even ground and not on sloping ground;
- In areas particularly sensitive to erosion or where felling inside the 50m buffer is required, it will be necessary to install double or triple sediment traps;
- All drainage channels will taper out before entering the 50m buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels;
- Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled;
- Brash mats will be used to support vehicles on soft ground, reducing topsoil and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place before they become heavily used and worn. Provision will be made for brash mats along all off-road (track) routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Timber will be stacked in dry areas, and outside the 50m watercourse buffer. Straw bales and check dams will be emplaced on the down gradient side of timber storage/processing sites;
- Works will be carried out during periods of no, or low, rainfall in order to minimise entrainment of exposed sediment in surface water run-off;
- Checking and maintenance of tracks and culverts will be ongoing through the felling operation;
- Refuelling or maintenance of machinery will not occur within 100m of a watercourse. Mobile bowser, drip kits and qualified personnel will be used where refuelling is required;

- A permit to refuel system will be adopted;
- Branches, logs or debris will not be allowed to build up in the 50m buffer. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors;
- Trees will be cut manually from along streams and using machinery to extract whole trees; and,
- Travel will only be permitted perpendicular to and away from surface water features.

Silt Traps

Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps is to slow water flow, increase residence time and allow settling of silt in a controlled manner.

Drain Inspection and Maintenance

The following items will be carried out during pre-felling inspections and regularly thereafter:-

- Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual waterlogging or bogging of machines;
- Inspection of all areas reported as having unusual ground conditions;
- Inspection of main drainage ditches and outfalls. During pre-felling inspections, the main drainage ditches will be identified. Where possible, the pre-felling inspection will be carried out during rainfall;
- Following tree felling, all main drains will be inspected to ensure that they are functioning;
- Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- Culverts on drains exiting the site, if impeded by silt or debris, will be unblocked; and,
- All accumulated silt will be removed from drains, culverts and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

Surface Water Quality Monitoring

Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4-weeks of the felling activity commencing, preferably in medium-to-high water flow conditions. The 'during' sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).

Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every works site near any watercourse. These will be populated daily and kept on site for record and inspection.

5.2 EARTHWORKS (REMOVAL OF VEGETATION COVER, EXCAVATIONS AND STOCK PILING) RESULTING IN SUSPENDED SOLIDS ENTRAINMENT IN SURFACE WATER

The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas by using a 50m buffer.

The following section details the measures which will be put in place during the construction phase to ensure that surface water features are protected from the release of silt or sediment and to ensure that all surface water runoff is fully treated and attenuated to avoid the discharge of dirty water.

- Source controls to limit the likelihood for 'dirty water' to occur:-
 - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with clean washed gravel, filter fabrics, and other similar/equivalent or appropriate systems; and,
 - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.
- In-Line controls to ensure appropriate management of silt laden water:-
 - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems to fully attenuate silt laden waters prior to discharge:-
 - Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems.

It should be noted for this site that an extensive network of land, bog and forestry drains already exists and these will be integrated and enhanced as required and used within the wind farm drainage system. The integration of existing land drainage networks and wind farm networks is common practice in wind energy developments and will also result in benefits to surrounding lands.

The main elements of interaction with existing drains will be as follows:-

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction and attenuation for flow management) of runoff from the wind farm drainage into the existing site drainage network. This will reduce the likelihood of any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps will be placed in the existing drains upstream of any streams where construction works is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; and,

- Buffered outfalls, which will be numerous over the site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site.

Pre-Commencement Temporary Drainage Works

Prior to the commencement of haul route upgrades, access tracks, crane hardstandings and turbine foundations, the following key temporary drainage measures will be installed:-

- All existing dry bog, forestry or agricultural drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps;
- Clean water interceptor drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Water Treatment Train

While the proposed drainage plan is assessed as providing a sufficient level of protection to avoid any deterioration in downstream water quality; a temporary final line of defence can be provided by a water treatment train (i.e. sequence of water treatment processes), if required. If the discharge water from construction areas fails to be of a high quality, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This water treatment train will apply for the entirety of the construction phase.

Silt Fences

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to watercourses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be emplaced within drains down-gradient of all construction areas inside the hydrological buffer zones to provide an additional layer of protection in these areas.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats (sediment entrapment mats, consisting of coir or jute matting) placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to

ensure all water passes through this additional treatment measure.

Management of Runoff from Peat/Spoil Deposition Areas

It is proposed that excavated peat/overburden/spoil will be utilised for reinstatement of excavated areas etc. and for landscaping purposes. Excess material, or material which is unsuitable for this purpose, will be stored, permanently, at dedicated peat/spoil deposition areas and in the 1 no. spent borrow pit.

During the initial placement of peat/spoil in the deposition areas, silt fences, straw bales and biodegradable matting will be used to control surface water runoff. Drainage from overburden deposition areas will ultimately be routed to an oversized swale and a number of silt/settlement ponds with appropriate storage and settlement capacity, designed for a '1-in-100 year 6-hour return' period, before being discharged.

Spoil deposition areas will be sealed with a digger bucket and allowed to vegetate naturally or may be reseeded subject to the advice of the ECoW. Once re-vegetated and stabilised, spoil deposition areas will no longer be a likely source of silt laden runoff. Surface water protection infrastructure will be left in place until the areas have stabilised.

Underground Electricity Line Installation Works

Mitigation measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the trenching work does not discharge directly to the water:-

- All existing dry drains that intercept the works area will be temporarily blocked down-gradient of the works using temporary check dams/silt traps (e.g. straw bales);
- Clean water diversion drains will be installed upgradient of the works areas, as required;
- Check dams/silt fence arrangements (silt traps or straw bales) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zones such as at watercourse crossing locations.

Specific mitigation measures relating to the directional drilling at the crossing location are detailed below.

Directional Drilling

The following mitigation will be carried out during directional drilling works:-

- Firstly, the crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance of vegetation;
- A minimum 10 metre vegetative buffer zone will be maintained (if present) between disturbed areas and the watercourse bank. There will be no storage of material/equipment, excavated material (see below) or overnight parking of machinery inside the 10m buffer zone;
- Double silt fencing will be placed upslope of the buffer zone on each side of the watercourse.

- Mats will be used underneath the excavator, inside the 10 metre vegetative buffer zone, to prevent soil erosion/rutting and potential surface water quality impacts from localised surface water runoff;
- Temporary storage of excavated material will be undertaken outside of the 10m buffer on flat ground or within a local 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;
- Operation of machinery and use of equipment within the 10m buffer will be kept to a minimum to avoid any unnecessary disturbance;
- There will be no refuelling allowed within 100m of the watercourse crossing;
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing; and,
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted.

Mitigation measures relating to the use of a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water for directional drilling include:-

- The area around the Clear Bore™ batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;
- Silt fences will be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;

- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

Pre-emptive Site Drainage Management

The works programme for the initial construction stage of the project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of peat/subsoil or vegetation stripping will be suspended or scaled back if prolonged or intense rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:-

- General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- Meteo Alarm: Alerts to the possible occurrence of severe weather for the next 2-days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3-hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15-minutes. Radar images are not predictive; and,
- Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

The use of safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests either of the following is likely to occur:-

- >10 mm/hr (i.e. high intensity local rainfall events);
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:-

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface

runoff; and,

- Avoid working during heavy rainfall and for up to 24-hours after heavy events to ensure drainage systems are not overloaded.

Timing of Site Construction Works

The construction of the site drainage system will be carried out, at the respective locations, prior to other activities being commenced. The construction of the drainage system will only be carried out during periods of, where possible, no rainfall, therefore avoiding runoff. This will avoid the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and functional for all subsequent construction works.

5.3 EXCAVATION DEWATERING AND EFFECTS ON SURFACE WATER QUALITY

The management of excavation dewatering (pumping), particularly in relation to any accumulation of water in foundations or cabling and electricity line trenches, and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:-

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations, will be put in place;
- The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters to ensure that greenfield runoff rates are mimicked;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- All pumped water volumes will be discharged to the surface water management system 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 wind farm excavations by the Environmental Manager will occur during the construction phase. If high levels of seepage inflow occur, excavation work at this location will cease immediately and a geotechnical assessment undertaken; and,
- A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies. 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. They will be used as final line of defence if required.

5.4 RELEASE OF HYDROCARBONS DURING CONSTRUCTION AND STORAGE

Measures proposed to avoid release of hydrocarbons at the site are as follows:-

- The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compounds. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will

be fitted with a storm drainage system and an appropriate oil interceptor;

- All bunded areas will have 110% capacity of the volume to be stored;
- On site refuelling of machinery 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 at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. No refuelling will be permitted at works locations within the 50m hydrological buffer. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. 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 to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be readily available to deal with and accidental spillages;
- All waste tar material arising from road cuttings (from trenching or other works in public roads) will be removed off-site and taken to a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works or for storage within the spoil deposition areas; and,
- An outline emergency plan for the construction phase to deal with accidental spillages is contained within the Planning-Stage CEMP. This emergency plan will be further developed prior to the commencement of development, and will be agreed with the Planning Authority as part of the detailed CEMP.

5.5 GROUNDWATER AND SURFACE WATER CONTAMINATION FROM WASTEWATER DISPOSAL

Measures to avoid contamination of ground and surface waters by wastewaters will comprise:-

- Self-contained port-a-loos (chemical toilets) with an integrated waste holding tank will be installed at the site compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply for the site office and other sanitation will be brought to site and removed after use to be discharged at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

5.6 RELEASE OF CEMENT-BASED PRODUCTS

The following measures are proposed to ensure that the release of cement-based products is avoided:-

- No batching of wet-cement products will occur on site. Ready-mixed concrete will be brought to site as required and, where possible, emplacement of pre-cast products will be utilised;
- All watercourse crossings will utilise pre-cast products and the use of wet-cement products within the hydrological buffer will be avoided

- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. Chute cleaning will be undertaken at lined cement washout ponds with waters being stored in the temporary construction compounds, removed off site and disposed of at an approved licensed facility. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to ensure that prolonged or intense rainfall is not predicted during concrete pouring activities; and,
- The concrete pour sites will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

5.7 MORPHOLOGICAL CHANGES TO SURFACE WATER COURSES & DRAINAGE PATTERNS

The following measures are will be implemented:-

- The 2 no. proposed new stream crossings will be clear span bridges (bottomless culverts) and the stream beds will remain undisturbed. No in-stream excavation works at the crossing locations are proposed and therefore there will be no impact on the stream at the proposed crossing location;
- Wind farm electrical cabling or the underground electricity line cabling will be installed either above or below an existing culvert and will not directly interfere with the culvert;
- At the time of construction, all guidance/best practice requirements of the Office of Public Works (OPW) or Inland Fisheries Ireland will be incorporated into the design/construction of the proposed watercourse/culvert crossings;
- As a further precaution, in-stream construction work (if/where required) will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016)* (i.e., July to September inclusive). This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);
- During the near stream construction works (i.e. within the 50m buffer zone), double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase;
- The 2 no. new watercourse crossings at the wind farm site will require a Section 50 license application to the OPW in accordance with the Arterial Drainage Act 1945. The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent; and,
- No instream works are proposed at the underground electricity line watercourse crossings, with all crossings being carried out via HDD.

6.0 OPERATION PHASE MEASURES

Following the completion of construction, the generation of 'dirty' water runoff will be significantly diminished. It is important to reiterate that areas of hardstanding will be

impermeable and the majority of incident rainfall will percolate naturally to ground.

Infiltration interceptor drains will be retained for the duration of the project to ensure that up-slope ('clean') runoff is directed away from site infrastructure and managed in an appropriate manner.

Swales, check dams and settlement/silt ponds (i.e. for the management of 'dirty' water) shall be retained for the duration of the project. The swales, having become vegetated, and check dams will act as a filtration feature for the low volume of surface water runoff arising and provide primary treatment and attenuation for runoff.

The following measures will also be implemented.

6.1 REPLACEMENT OF NATURAL SURFACES

The operational phase drainage system of the project is described below:-

- Interceptor drains will be installed up-gradient of all infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;
- Swales/track side drains will be used to collect runoff from access tracks, crane hardstanding areas and substation compound areas which may contain entrained suspended sediment, and channel it to settlement ponds for sediment settling;
- Transverse drains ('grips') will be constructed, where appropriate, in the surface layer of access tracks to divert any runoff into swales/track side drains;
- Check dams will be used along sections of access tracks drains to intercept silts at source. Check dams will be constructed from a 40mm non-friable crushed rock or similar;
- Swales and check dams will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and,
- Settlement ponds will be designed in accordance the greenfield runoff rate requirements; and,
- Imported rock for construction purposes and road surfacing will be strong, well-graded limestone which will be resistant to erosion and have a low likelihood to generate fines in hardstand runoff.

6.2 HYDROCARBONS SPILLAGES/LEAKAGES

Measures relating to oils and fuels are as follows:-

- All storage containers will be labelled appropriately, including hazardous markings;
- Fuels stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction;
- The substation transformer and oil storage tanks will be located in a concrete bund, impervious to rainwater ingress, capable of holding 110% of the stored

oil volume;

- Bunds will be to standard specified in CIRIA Report 163 'Construction of bunds for oil storage tanks' and CIRIA Report C535 'Above-ground proprietary prefabricated oil storage tank systems';
- Barrels and banded containers will be stored upright and internally where appropriate and always on drip trays or sump pallets;
- Appropriate spill kits will be available at all storage locations;
- Turbine transformers will be located within the turbines, and any leaks will be fully contained within the turbine thus eliminating any pathway for leakages to affect land and soil.
- Maintenance vehicles will be regularly inspected for leaks and fitness for purpose;
- All fuel/chemical storage facilities will be subject to weekly inspection; and,
- An emergency plan for the operational phase to deal with accidental spillages will be contained within Environmental Management Plan. Spill kits will be available to deal with accidental spillages.

7.0 DECOMMISSIONING PHASE MEASURES

Prior to decommissioning works, a detailed Decommissioning Plan will be developed to detail the methods and measures to be adopted during that phase of works. The Decommissioning Plan will avail of, and implement, prevailing best practice measures including surface water protection methods.

It is likely that the methods adopted will be similar to those presented above in respect of the construction phase but of a reduced scale. Regardless of the specific practices and methods to be adopted; the overall objective will be the prevention of any silt, sediment or deleterious matter being discharged from the site such that could cause a deterioration in downstream water quality.

8.0 CONCLUSION

This SWMP has been prepared to detail the practical implementation of surface water management infrastructure to address the requirements of measures set out in the EIAR. This is a live document and will be updated by the appointed Contractor prior to the commencement of development. Prior to the commencement of construction, the updated SWMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (EcoW), as necessary, to confirm the appropriateness of the measures set out therein.

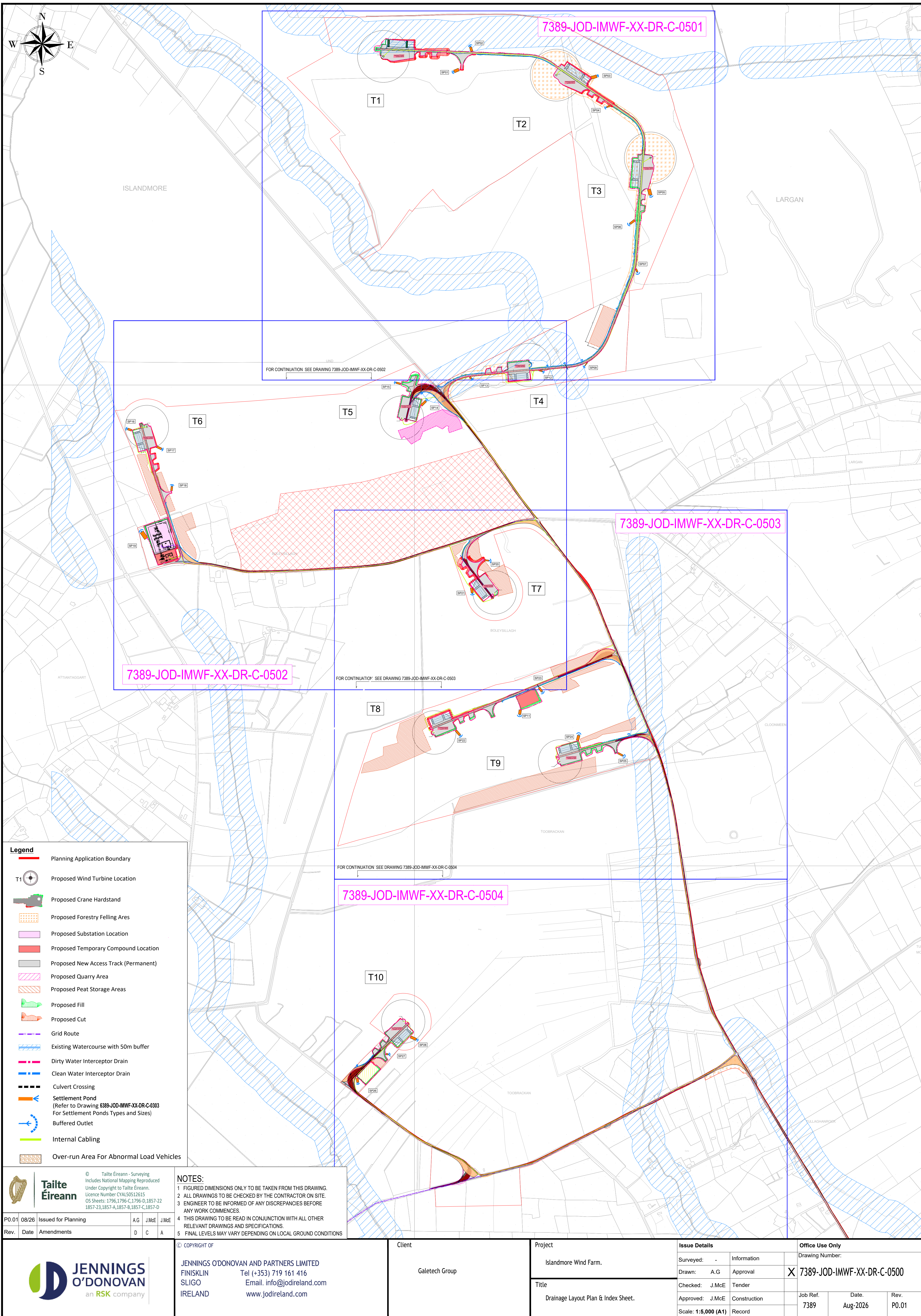
The SWMP incorporates the principles of SuDS; with the overall objective of ensuring that no silt, sediment or other material is discharged from the site to surrounding drainage features; to ensure that the project does not adversely affect the drainage regime within the project site and in its vicinity.

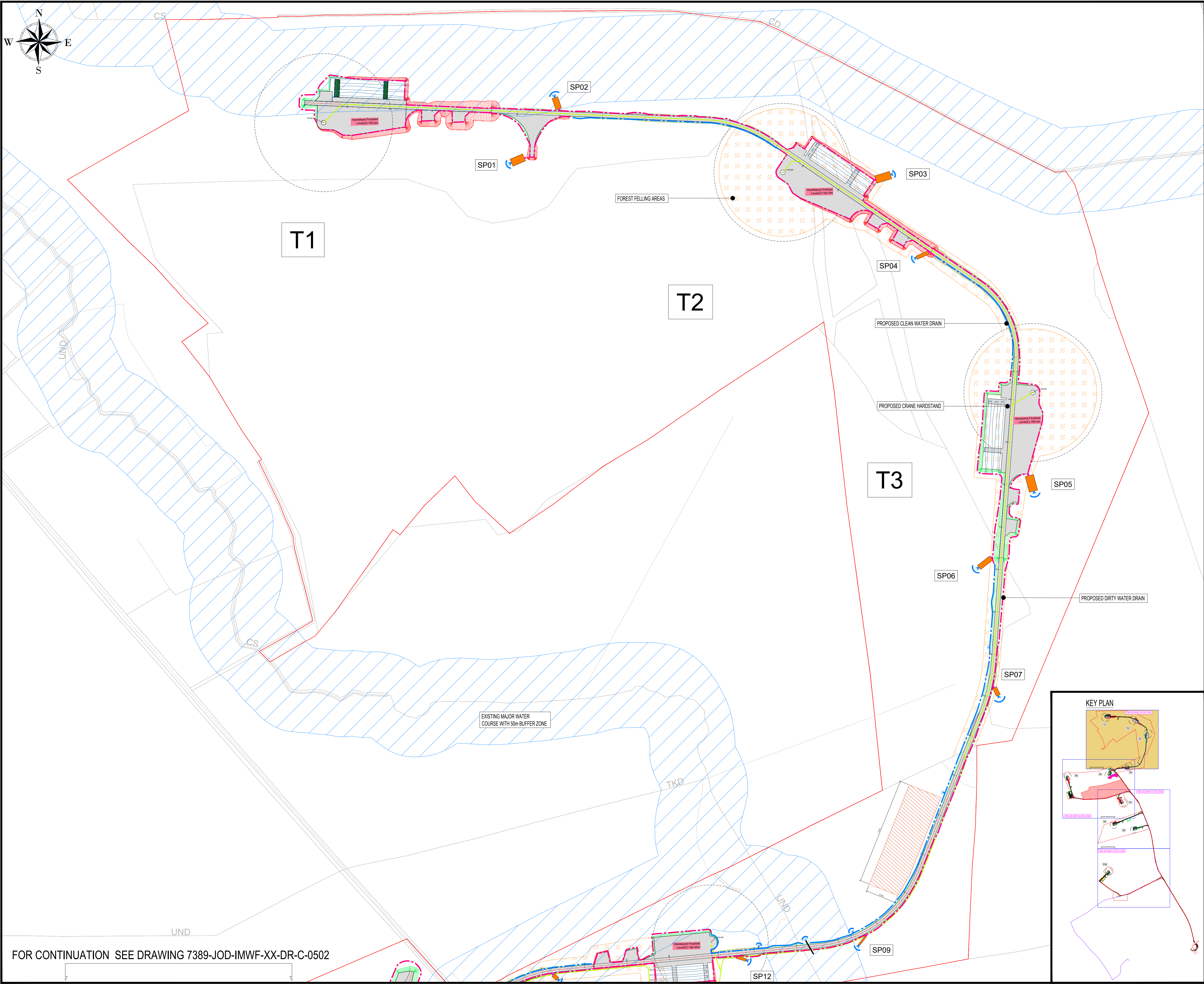
The proposed SuDS comprises drainage infrastructure to intercept and direct 'clean' incidental runoff away from works locations; and a separate surface water management train to effectively control manage and treat 'dirty' water runoff from the works areas.

The efficacy of the measures set out in this SWMP will be regularly monitored and will be supported by water quality monitoring as set out in the Water Quality Monitoring Plan.

ANNEX 1 - PLANNING-STAGE DRAINAGE/SURFACE WATER MANAGEMENT SYSTEM







NOTES:

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- Buffered Outlet
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- Over-run Area For Abnormal Load Vehicles

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Client

Galetech Group

Project

Islandmore Wind Farm.

Stage

Planning

Title

**Drainage Layout Plan
Sheet 1 of 4**

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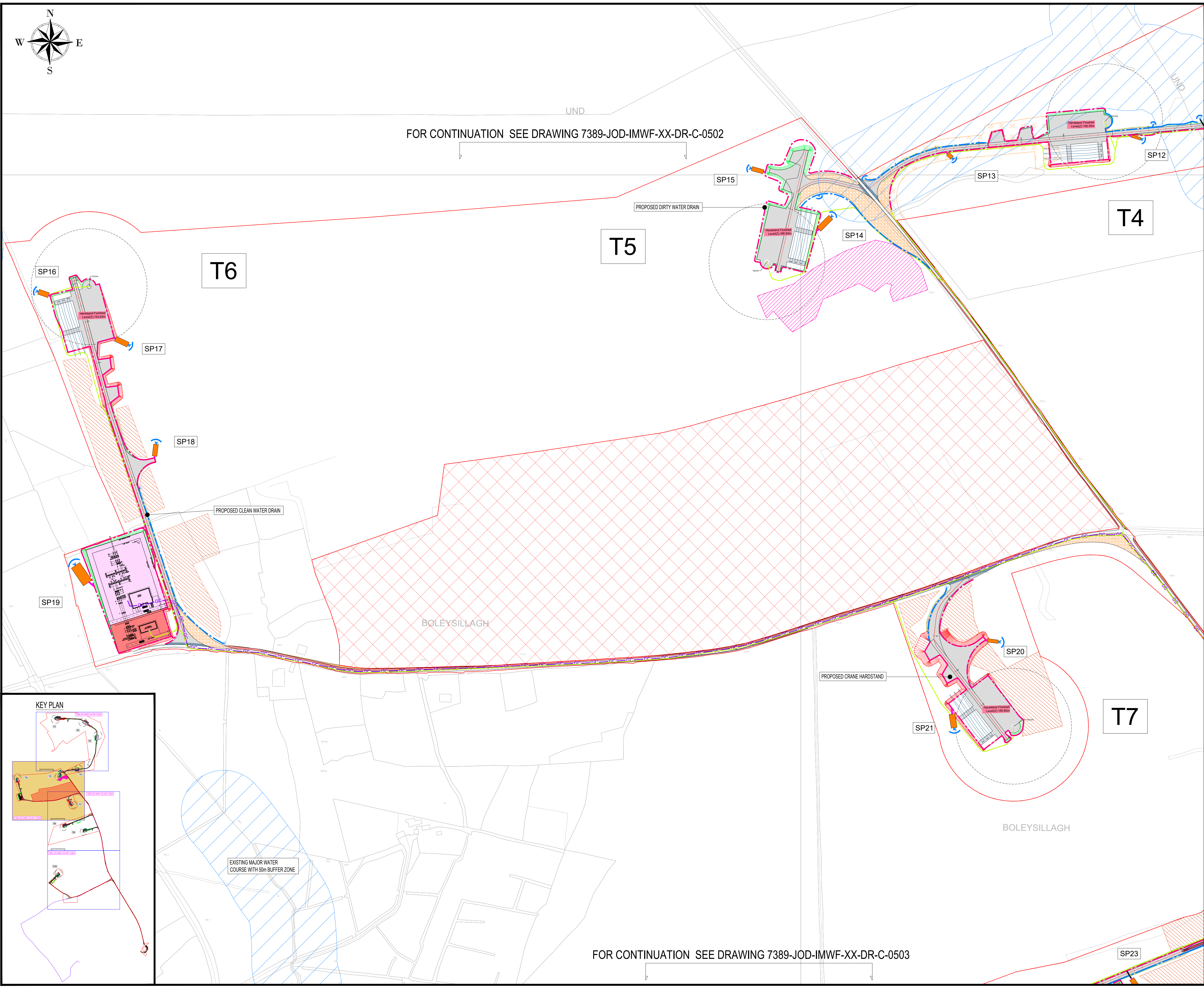
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Client
Galetech Group

Project
Islandmore Wind Farm.

Stage
Planning

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**Drainage Layout Plan
Sheet 2 of 4**

Scales
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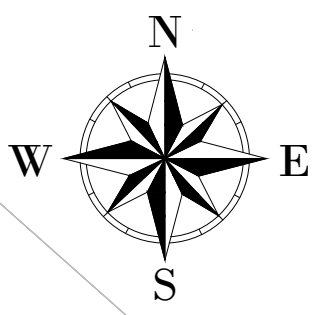
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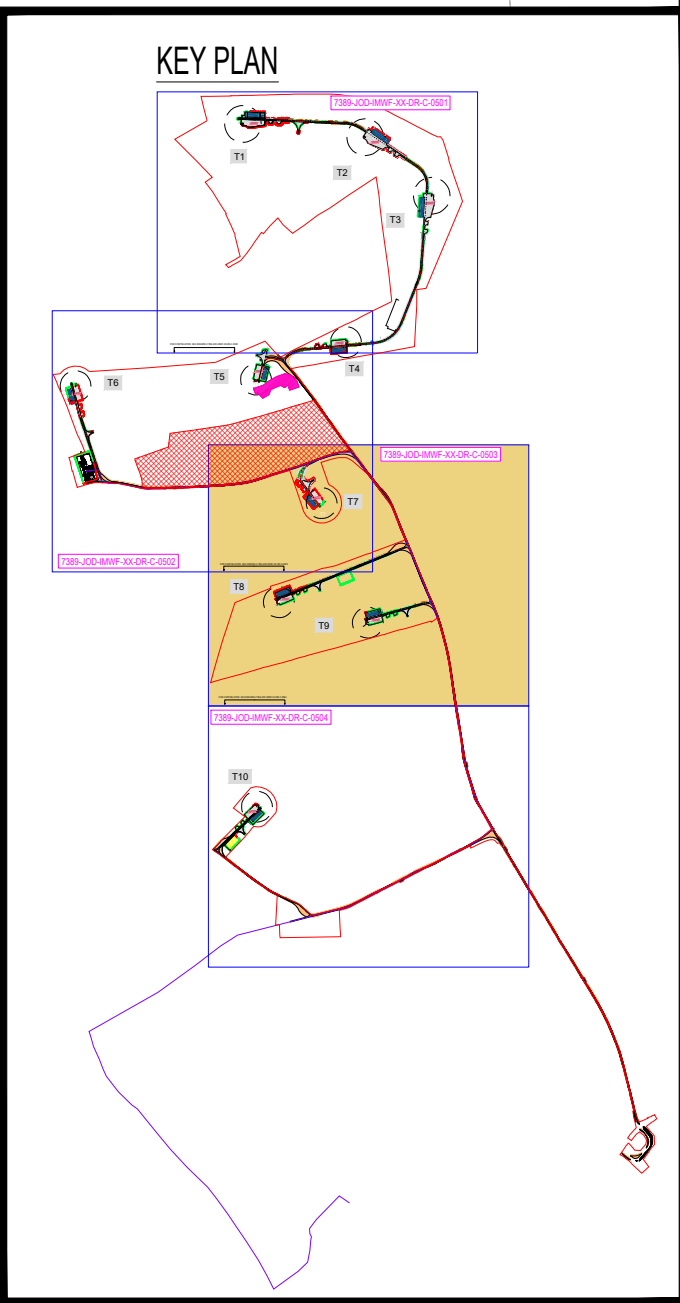
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Project	Islandmore Wind Farm.				
Stage	Planning				
Title	Drainage Layout Plan Sheet 3 of 4				
Scales	1:2,000 @ A1				
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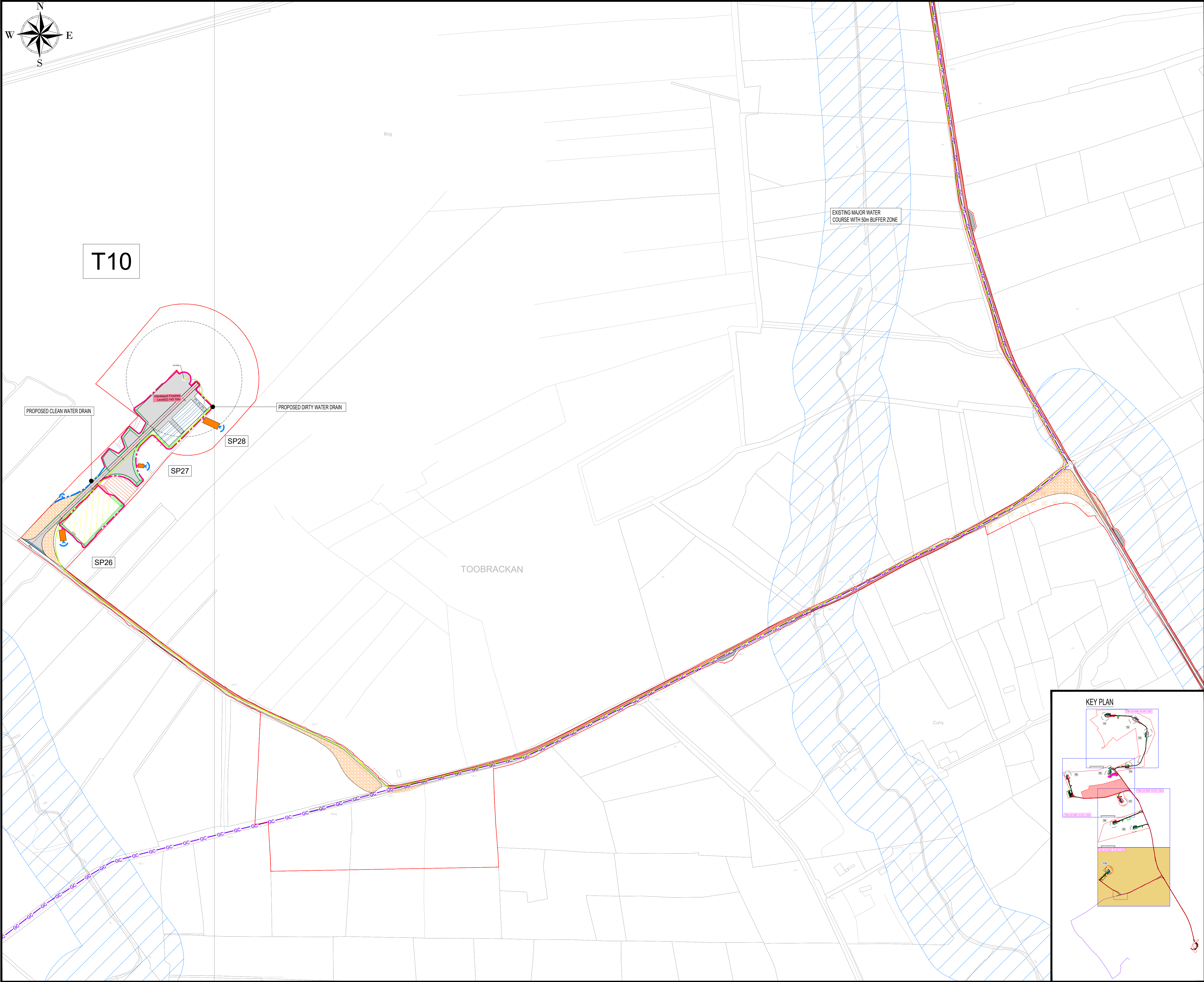


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**Drainage Layout Plan
Sheet 4 of 4**

Scales

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A.G	J.McE	J.McE	J.McE	Aug 2026

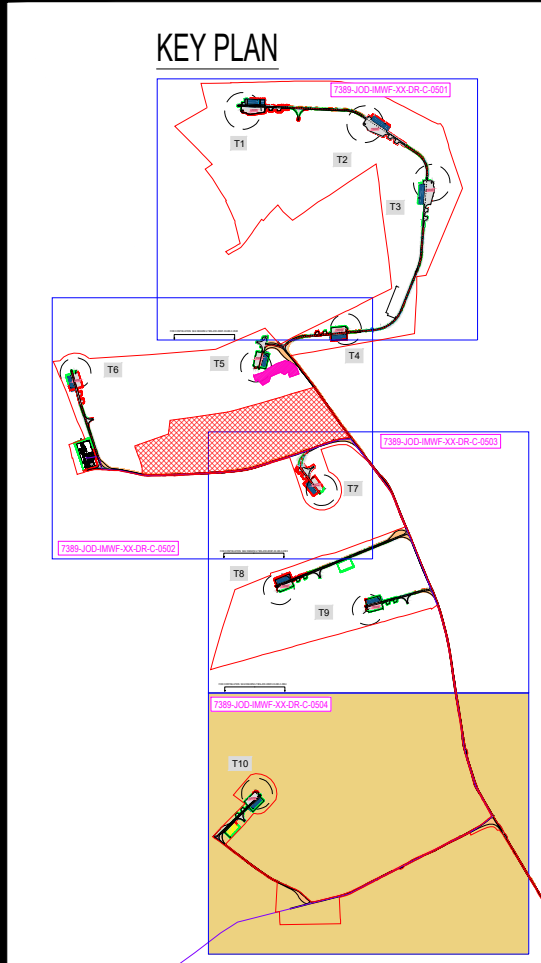
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ANNEX 4 – WATER QUALITY MONITORING PLAN





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Islandmore Wind Farm

Environmental Impact Assessment
Report

Annex 3.4: Planning-Stage
Construction Environmental
Management Plan (Water Quality
Monitoring Plan)

Islandmore Wind Farm Limited

DOCUMENT CONTROL

Stage	Date	Name
Content	21/09/2026	Simon Carleton
Approval	21/09/2026	Gavin Daly

RECORD OF CHANGES

Revision	Issue Date	Summary of Changes	Approved
00	21/09/2026	Content	Simon Carleton
01			
02			

DISTRIBUTION LIST

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2			
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1.0 INTRODUCTION

Galetech Energy Services (GES), on behalf of Islandmore Wind Farm Limited, has prepared this Water Quality Monitoring Plan (WQMP) to outline the procedures to be followed during the monitoring of surface waters prior to, during and post-construction of the Islandmore Wind Farm.

1.1 PURPOSE OF THIS REPORT

Many construction and industrial sites have the potential to cause a deterioration in downstream water quality through pollution events from hydrocarbons and siltation/sedimentation. The purpose of this report is to verify the efficacy of pollution prevention and mitigation measures implemented at the Islandmore Wind Farm during construction.

This is a live document and will be updated by the appointed Contractor prior to the commencement of development. Prior to the commencement of construction, the updated WQMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (ECoW), as necessary, to confirm the appropriateness of the measures set out therein.

1.2 REQUIREMENT FOR WATER QUALITY MONITORING

As described above, construction activities associated with the development of a wind farm can give rise to a risk of pollution. A deterioration in downstream water quality could arise from:-

- Land Slide;
- Fire;
- Leaking plant or equipment;
- Containment Failure;
- Overfilling of containment vessels;
- Wind-blown waste, litter or dust;
- Flooding on site;
- Leaking Portaloo;
- Fuel drips or spills during re-fuelling;
- Leak from fuel or chemical containers;
- Failure of drainage infrastructure; and,
- Failure of pumps and pipelines.

Any of these incidents could affect downstream surface waters which, in turn, could result in adverse effects on water quality, aquatic species and habitats.

1.3 REFERENCE DOCUMENTS

The production of this WQMP has been supported by best practice manuals and will be accounted for in the further development of the appointed contractor's detailed CEMP.

Other guidance documents have been used to develop this WQMP; including a Planning-Stage Construction Environmental Management Plan, Spoil Management

Plan, Surface Water Management Plan, and Environmental & Emergency Response Plan.

2.0 DESCRIPTION OF THE PROJECT

Islandmore Wind Farm Limited intends to construct the Islandmore Wind Farm which will consist of:-

- 10 no. wind turbines, 3 no. with an overall height of 185m and 7 no. with an overall height of 150m;
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and forestry felling;
- Works to the public road network along the turbine component haul route; and,
- 110kV electricity substation and installation of c. 7km of underground electricity line to facilitate connection of the wind farm to the existing Tonroe 110kV electricity substation at Ballaghaderreen, County Roscommon.

The project is located in north County Roscommon; c. 2km north of Ballaghaderreen, c. 13km east of Charlestown (Co. Mayo) and c. 6km southwest of Gorteen (Co. Sligo); and is located in close proximity to the county boundaries between counties Roscommon, Sligo and Mayo.

As well as the reference documents listed in **Section 1.3**, various environmental reports have been prepared for the project including:-

- Environmental Impact Assessment Report (Galetech Energy Services);
- Biodiversity Chapter (Woodrow/APEM Group);
- Land & Soils Chapter (Hydro Environmental Services);
- Water Chapter (Hydro Environmental Services); and,
- Natura Impact Statement (Woodrow/APEM Group).

3.0 RESPONSIBILITIES

3.1 CONTRACTOR

The appointed Contractor will be responsible for employing an independent Environmental Manager (EM) to undertake all water quality monitoring and sampling prior to, during, and post-construction.

3.2 ENVIRONMENTAL MANAGER

The independent EM, to be appointed prior to construction, will be responsible for the implementation and coordination of the methods set out in this WQMP. Prior to construction, the Contractor will be instructed to provide a 'schedule of work' to the EM at the beginning of each week to determine the intensity of monitoring required.

The EM will prepare and deliver site induction and training to all construction personnel, in liaison with the Project Manager and Contractor.

The EM will:-

- Undertake specific monitoring activities and reporting in accordance with best practice;

- Undertake weekly visual inspections for signs of ground damage or solids escaping to nearby drainage features watercourses in vicinity of construction works;
- Undertake weekly visual inspections of the installed surface water management system (e.g. silt traps, silt ponds, settlement lagoons, check dams, and buffered outfalls, etc.) and other drainage features for evidence of contaminated run-off or drainage system failure;
- Collection and analysis of water samples at monitoring locations (upstream & downstream of the project site). The selection of water monitoring locations will be agreed with the local authority prior to the commencement of construction; and,
- Attend critical work phases including installation/construction of watercourse crossings, turbine foundation concrete pours, and underground electricity line Horizontal Direction Drilling (HDD) works.

4.0 WATER SAMPLING METHODOLOGY

The collection and analysis of water samples at the monitoring locations (i.e. upstream & downstream of project site) will be completed prior to, during and post-construction. The precise scope of monitoring will agreed with the local authority prior to commencement of construction works.

With respect to the proposed felling works, it is proposed that 1 no. round of sampling will be undertaken within 4-weeks prior to the commencement of felling which will provide a set of baseline results against which all subsequent samples can be assessed. Weekly-sampling will then be completed for the duration of the felling activities; while a minimum of 1 no. round of sampling will be completed following the felling operations. Sampling locations SW1-SW4, as outlined at **Chapter 7** of the EIAR, will be selected as sampling locations for felling operations.

Additionally, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection

With regards general construction activity, it is proposed that 1 no. round of sampling will be undertaken prior to the commencement of development which will provide a set of baseline results against which all subsequent samples can be assessed. Monthly-sampling will then be completed for the duration of the construction phase; while a further 1 no. round of sampling will be completed following the completion of construction and reinstatement activities. Sampling locations SW1-SW4, as outlined in **Chapter 7** of the EIAR, will be selected as sampling locations for the duration of the construction phase.

As a minimum, the general monitoring programme will include:-

- 1 no. baseline sample (by the EM);
- Daily visual observation in areas of high construction activity (by a suitably trained staff-member) or during high rainfall periods to identify any evidence of siltation, oil or silt. Visual inspections will include details of the colour of the water at the time of inspection;
- Weekly visual inspections and monthly field hydrochemistry (by the EM); and,
- One round of post construction monitoring (by the EM).

Monitoring locations will be identified through grid reference, photographic record and indicated on a drawing. Each location will be marked on the ground (stake/post) to ensure that the correct location is sampled each time. For the duration of the monitoring period, sample locations shall be consistently identified and any additional locations will be recorded and a photograph taken at the time of sampling.

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

4.1 HYDROCHEMISTRY

In addition to the visual inspections described above, all water samples will be subject to hydrochemistry analysis. The parameters to be analysed will be agreed with the local authority (authorities) prior to the commencement of construction, and may include:-

- 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); and,
- Total Petroleum Hydrocarbons (TPH) (Construction Phase only).

5.0 REPORTING

Each month, the EM will prepare a report on the results of the water quality monitoring. The results will assist in determining the requirements for improvements in drainage, surface water management, and pollution prevention measures.

The EM will also present the results to staff and construction personnel to ensure full awareness of any necessary improvements. This shall be carried out at monthly-meetings and reported within the overall Monthly Environmental Report to be prepared by the EM. The monthly reports on water quality will be provided to Islandmore Wind Farm Limited and will be made available to the local authority, as may be necessary.

The monthly reports on water quality will consider all visual results, field monitoring results and results of laboratory analysis undertaken that month. Reports will describe how the results compare with baseline data as well as previous monthly reports on water quality. The reports will 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, or are required to be, implemented.

Upon completion of all post-construction monitoring, the EM will prepare a final report on water quality. This will detail the overall performance against baseline data, details on any impacts attributed to construction works and recommendations for remedial works if required. The final report will be provided to the local authority.

6.0 EMERGENCY RESPONSE

In the event that a pollution incident arises from construction works; such as that resulting from a spill or accidental release of chemicals, oils and fuels or concrete effluent; which 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 and whether remedial measures are required.

Where a pollution incident has occurred as a result of construction works, the EM will consult with the local authority (authorities) to determine sampling requirements and any additional survey requirements. Where it is demonstrated that the pollution occurred as a result of non-compliance with measures set out in project documentation (including the Environmental Impact Assessment Report, Natura Impact Statement, Construction Environmental Management Plan, and Surface Water Management Plan), the costs of any additional sampling or remedial measures shall be borne, in full, by the Contractor.



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