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# Tullaghmore Wind Farm

## Screening Report for Appropriate Assessment

DEC Ltd.

September 2022

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**Tullaghmore Wind Farm**

**Co. Galway**

**Screening Report in support of Appropriate Assessment**

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

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## 1.0 INTRODUCTION

Doherty Environmental Consultants Ltd has been commissioned by Tullaghmore Wind Farm Ltd. to undertake a Screening Statement in support of an Appropriate Assessment (AA), under Article 6 of the EU Habitats Directive, for a proposed:

- six turbine wind farm at Tullaghmore, Maam Cross, Co. Galway;
- proposed Peat Storage and Restoration (Habitat Enhancement) Area to the west of the proposed wind farm at Maam Cross;
- grid connection route between the proposed wind farm site and the existing ESB substation at Screebe, Co. Galway; and
- a haul route along the R336 and N59 between Galway Port and the proposed wind farm site and the widening of the haul route at four no. locations along the R336.

**Figure 1.1** and **1.2** show the location of the proposed wind farm site and the proposed peat storage and restoration (habitat enhancement) area, while **Figure 1.3** shows the location of the proposed grid connection route and the four no. haul route widening locations along the R336.

This Screening Report for Appropriate Assessment forms Stage 1 of the Habitats Directive Assessment process and is being undertaken in order to inform the competent authority's assessment under Article 6(3) of the Habitats Directive 92/43/EEC (as amended). The function of this Screening Report is to identify the potential for the project to result in likely significant effects to European Sites and to provide information so that the competent authority can determine whether a Stage 2 Appropriate Assessment is required for the project.

### 1.1 STATEMENT OF AUTHORITY

This Natura Impact Statement has been prepared by Mr. Pat Doherty BSc., MSc, MCIEEM, of DEC Ltd. Mr. Doherty is a consultant ecologist with over 20 years' experience in completing ecological impact assessments and environmental impact assessments. Pat has been involved in the completion of assessment reports for proposed developments and land use activities under the EIA Directive and Article 6 of the Habitats Directive since 2003 and 2006

respectively. He has extensive experience completing such reporting for projects located in a variety of environments and has a thorough understanding to the biodiversity issues that may arise from proposed land use activities. Pat was responsible for completing one of the first Appropriate Assessment reports for large scale infrastructure developments in Ireland when he prepared the Appropriate Assessment for the N25 New Ross Bypass in 2006/07. Since then, Pat has completed multiple examinations of both plans and projects in Ireland. He has completed Natura Impact Statements for national scale plans such as Ireland's CAP Strategic Plan and National Seafood Development Plan and regional and county scale plans including County Development Plans, Local Area Plans, Tourism Strategies and Climate Action Plans. Pat has completed multiple Natura Impact Statements for a range of development types that include large scale infrastructure developments in sectors such as transport and energy as well as industrial, commercial and residential developments.

Pat has completed focused certified professional development training in Appropriate Assessment as well as in a range of ecological survey techniques and assessment processes. Training has been completed for National Vegetation Classification (NVC) and Irish Vegetation Classification (IVC) surveying, bryophyte survey for habitat assessment and identification, professional bat survey and assessment training, mammal surveying and specific training for bird and bat survey techniques. Ongoing training has been completed by approved training providers such as CIEEM, British Trust for Ornithology, the Botanic Gardens and the Field Studies Council.

## 1.2 LEGISLATIVE CONTEXT

Legislative protection for habitats and species is provided within the European Union by the Habitats Directive. The Habitats Directive has been implemented in Ireland and throughout Europe through the establishment of a network of designated conservation areas known as the Natura 2000 (N2K) network. The N2K network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive 2009/147/EC (as amended). SACs are designated in areas that support habitats listed on Annex I and/or species listed on Annex II of the Habitats Directive. SPAs are designated in areas that support: 1% or more of the all-Ireland population of bird species listed on Annex I of the EU Birds Directive; 1% or more of the population of a migratory species; and more than 20,000 waterfowl.

The European Communities (Birds and Natural Habitats) Regulations 2011 – 2021 (hereafter referred to as the Habitats Regulations) requires competent authorities, to carry out a Screening for Appropriate Assessment of plans and projects that, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site’s conservation objectives. This requirement is transposed into Irish Law by Part 5 of the Habitats Regulations and Part XAB of the Planning and Development Act, 2000 (as amended).

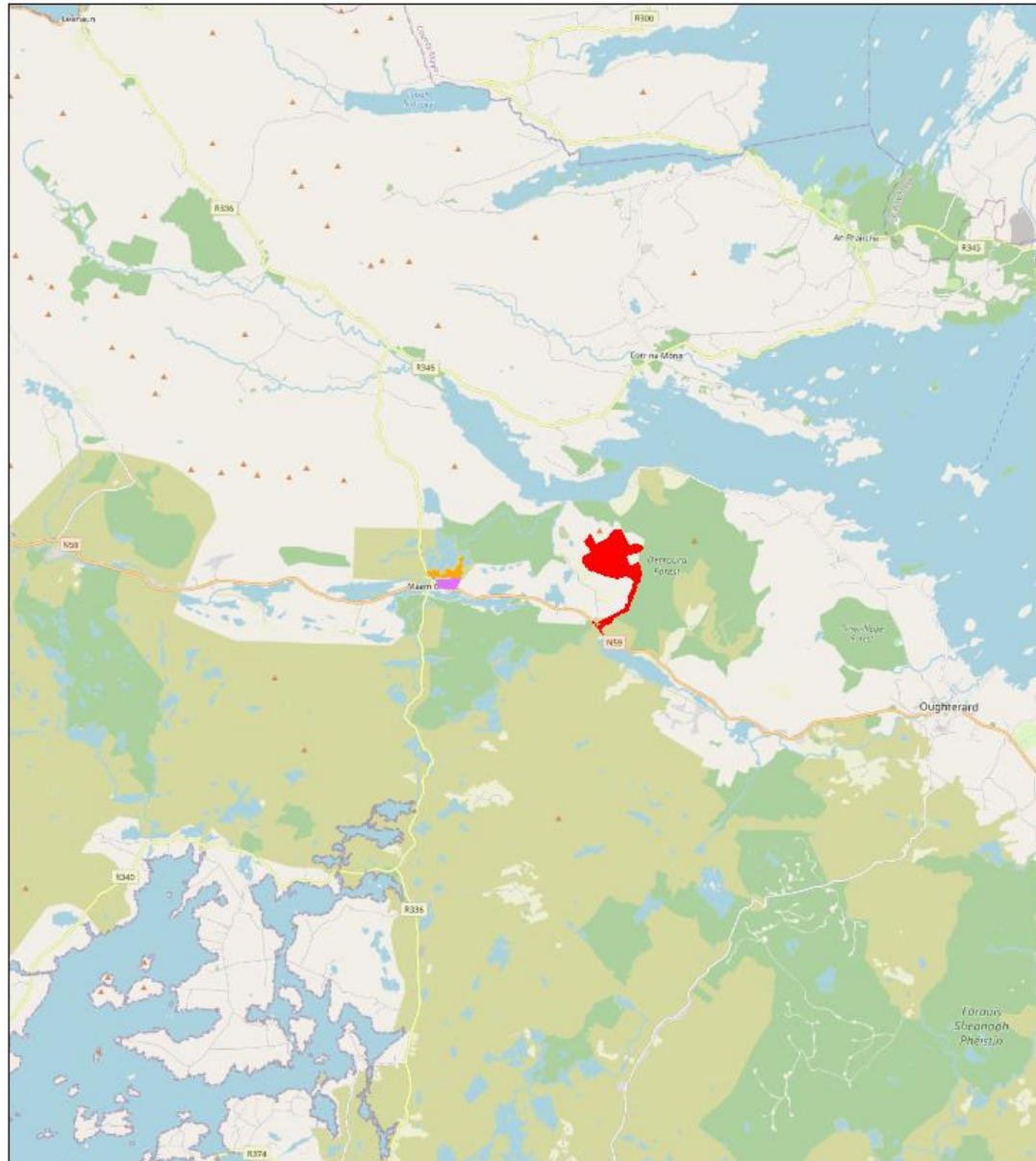
Under the Habitat Regulations all sites that have been identified as part of the N2K Network, including SACs, SPAs, candidate SACs (cSACs) and proposed SPAs (SPAs) are referred to as European Sites.

This Screening Report for Appropriate Assessment is being prepared in order to enable the competent authority to comply with Article 6(3) of Council Directive 92/43/EEC (The Habitats Directive). It is prepared to assess whether or not the project alone or in combination with other plans and projects is likely to have a significant effect on any European Site in view of best scientific knowledge and in view of the conservation objectives of the European Sites and specifically on the habitats and species for which the sites have been designated. Measures intended to avoid or reduce the harmful effects of the proposed project on European sites (i.e. “mitigation measures”) or best practice measures have not been taken into account in this screening stage appraisal.

### **1.2.1 Requirement for an Assessment under Article 6 of the Habitats Directive**

According to Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2021 and: s177U(1) of the Planning and Development Act 2000 (as amended) the competent authority has a duty to:

- Determine whether the proposed Project is directly connected to or necessary for the management of one of more European Sites; and, if not,
- Determine if the Project, either individually or in combination with other plans or projects, would be likely to have a significant effect on the European Site(s) in view of best scientific knowledge and the Conservation Objectives of the site(s).



**Tullaghmore Wind Farm**

**Figure 1.1**

**Location of the Proposed Development**

**Area**

- Proposed Wind Farm Site
- PMEAs - North
- PMEAs - South



Drawn By	PD
Date	10/09/2022
Data Source	Bing

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


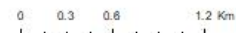
### Tullaghmore Wind Farm

Figure 1.2

#### Location of the Proposed Development

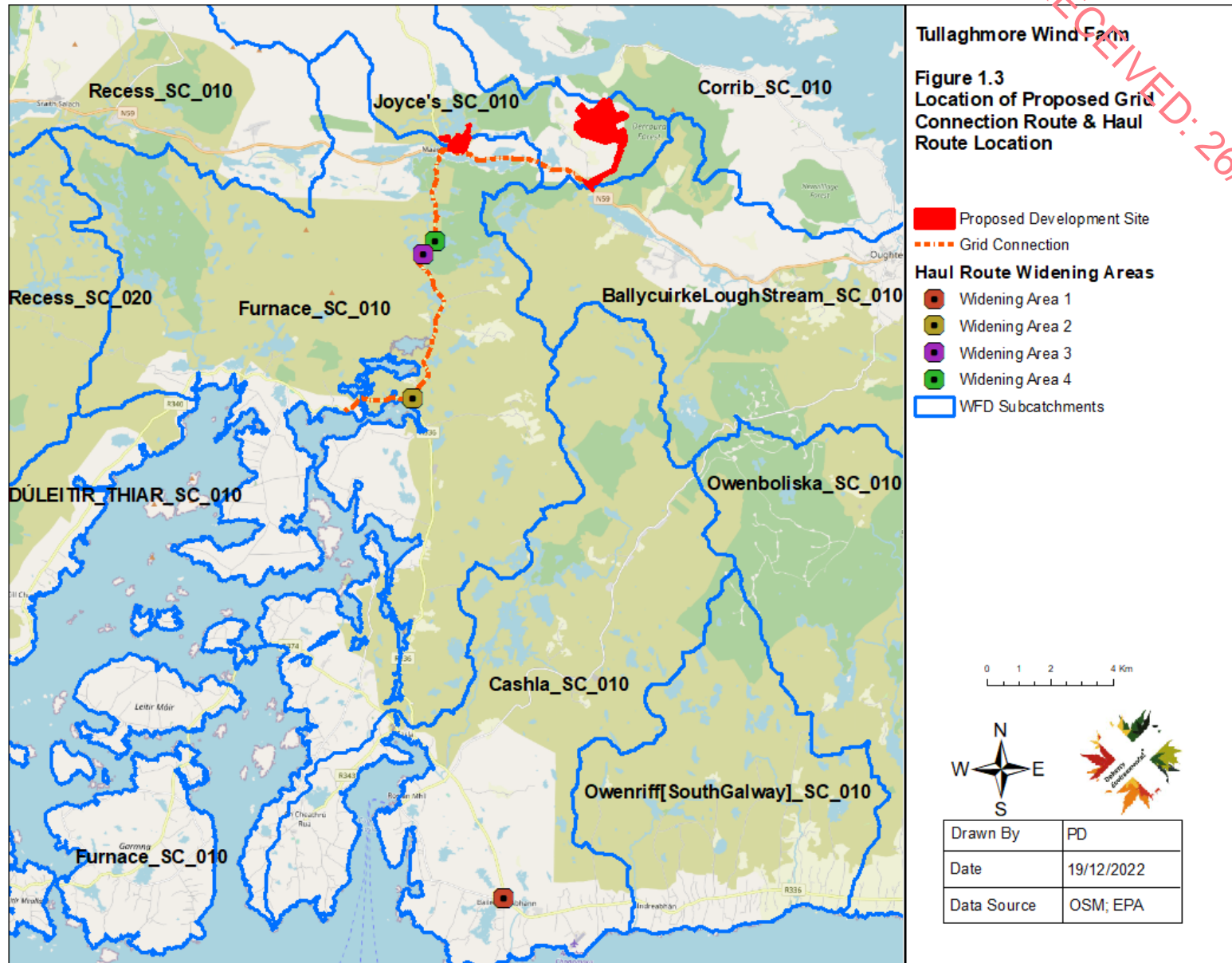
##### Area

-  Proposed Wind Farm Site
-  PME A - North
-  PME A - South



Drawn By	PD
Date	10/09/2022
Data Source	Bing

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This report contains information to support a Screening for Appropriate Assessment and is intended to provide information that assists the competent authority when assessing and addressing all issues regarding the construction and operation of the Project and to allow the competent authority to comply with the Habitats Directive. Article 6(3) of the Habitats Directive defines the requirements for assessment of projects and plans for which likely significant effects on European Sites may arise. The Birds Directive and the Habitats Directive together list habitats and species that are of international importance for conservation and require protection. The Habitats Regulations requires competent authorities, to carry out a Screening for Appropriate Assessment of plans and projects that, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. This requirement is transposed into Irish Law by, inter alia, Part XAB of the Planning and Development Act, 2000 (as amended). Section 177U(4) of Part XAB of the Planning and Development Act states:

*"The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. "*

### 1.3 SCREENING METHODOLOGY

This Screening Report has been prepared in order to comply with the legislative requirements outlined in Section 1.1 above and aims to establish whether or not the proposed project, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. In this context "likely" means a risk or possibility of effects occurring that **cannot** be ruled out based on objective information and "significant" means an effect that would undermine the conservation objectives of the European sites, either alone or in-combination with other plans and projects (Office of the Planning Regulator (OPR), 2021) .

The nature of the likely interactions between the proposed development and the Conservation Objectives of European Sites will depend upon the:

- the ecological characteristics of the species or habitat, including their structure, function, conservation status and sensitivity to change; *and/or*
- the character, magnitude, duration, consequences and probability of the impacts arising from land use activities associated with the plan, in combination with other plans and projects.

This Screening Report for Appropriate Assessment has been undertaken in accordance with respective National and European guidance documents: Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG 2010) and *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*; Office of the Planning Regulator – OPR Practice Note PN01: *Appropriate Assessment Screening for Development Management* (2021), and recent European and National case law. The following guidance documents were also of relevance during the preparation of this Screening Report:

- A guide for competent authorities. Environment and Heritage Service, Sept 2002. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010). DEHLG.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/42/EEC. European Commission (2021).
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European commission (2018).

The EC (2021) guidelines outline the stages involved in undertaking a Screening Report for Appropriate Assessment for projects. The methodology adopted during the preparation of this Screening Report is informed by these guidelines and was undertaken in the following stages:

1. Describe the project and determine whether it is necessary for the conservation management of European Sites;
2. Identify European Sites that could be influenced by the project;

3. Where European Sites are identified as occurring within the zone of influence of the project identify potential effects arising from the project and screen the potential for such effects to negatively affect European Sites identified under Point 2 above; and
4. Identify other plans or projects that, in combination with the project, have the potential to affect European Sites.

#### 1.4 SCIENTIFIC INVESTIGATIONS

A range of scientific site investigations have been completed for the project and these are relied upon in this Natura Impact Statement. The primary investigations include ecological field surveys, hydrological field surveys and geotechnical field surveys.

Desk-based investigations were completed to identify pathways connecting the proposed development to European Sites. Datasets used to assist with the desk-based investigations include:

- NPWS European Sites and site-specific conservation objectives datasets;
- EPA Rivers and Lakes dataset;
- EPA surface water catchment and sub-catchment datasets
- NPWS Article 17 Habitats and Species datasets;
- OSI Geohive and OSI Historic townlands online mapping portal; and
- National Biodiversity Data Centre (NBDC) online mapping portal.
- NPWS Protected Species Dataset for the proposed development site and surrounding area.

The ecological field surveys that have been completed include:

- Habitats and vegetation surveys and mapping at the proposed development site

- Ornithological surveys which included non-breeding season and bird species vantage point surveys, transect surveys and hinterland surveys
- Bat surveys over spring, summer and autumn 2020
- Aquatic surveys including habitat assessment, fish habitat suitability assessment surveys, fisheries surveys, biological water quality surveys and physio-chemical water sampling.
- Detailed hydrological and geotechnical surveys were also completed at the proposed development between 2020 and 2022.

The methods used during the completion of these site investigations are described in full in Chapter 6, 7 and 8 of the Tullaghmore Wind Farm EIAR (Jennings O'Donovan, 2023).

## **2.0 PROJECT DESCRIPTION**

### **2.1 PROJECT OVERVIEW**

The Project will comprise of the following main components:

- Erection of 6 no. wind turbines with an overall ground to blade tip height of 185m. The candidate wind turbine will have a rotor diameter of 162m and a hub height of 104m
- Construction of site access roads, crane hardstand areas and turbine foundations.
- Improvement of existing site entrance with access onto the N59
- Construction of one no. temporary construction compound with associated temporary site offices, parking areas and security fencing
- Installation of 1 no. permanent meteorological mast with a height of 104m
- Construction of new internal site access tracks and upgrade of existing Site track, to include all associated drainage
- Development of a site drainage network

- Construction of one no. permanent 38kV substation
- All associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation
- All works associated with the connection of the wind farm to the national electricity grid, which will be via 38kV underground cable connection approximately 18.65km in length to the existing ESB Screebe 110kV GIS Substation.
- Biodiversity enhancement measures
- Peat storage and restoration areas

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## 2.2 WIND TURBINE GENERATOR

The proposed turbines will be of typical modern design and will be a three-bladed, rotor up wind of the tower, variable speed, pitched blade regulated machine. Turbine appearance will be a matt non-reflective finish in a white, off-white or grey colour. The foundation-to-tip height will be 185m.

The turbine will have a circular based tower, sitting on a reinforced concrete foundation. The tower will support the nacelle, rotor hub, and rotor blades. Commercial wind turbine towers are made of steel or a hybrid of steel and concrete. The nacelle is mainly metal (steel, copper, aluminium, etc.) with a metal/plastic/glass-reinforced plastic (GRP) body, while the blades can be made of a matrix of glass-fibre reinforced polyester or wood-epoxy or similar composite materials.

Each turbine will have a generator with a maximum capacity of 6.8MW giving an overall capacity of 40.8MW. The turbines may be direct drive machines or may contain a gearbox. The final turbine will be chosen in a competitive tendering process as part of the Project financing process, after all necessary consents have been secured.

The final choice of turbine model is unknown at this stage, but the candidate turbine model used for assessments at this stage is a Vestas V162.

For the purposes of the assessments, the dimensions of the candidate turbine is presented in **Table 2.1**. These are the proposed dimensions of the turbines for which planning permission is being sought.

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**Table 2.1: Turbine Parameters**

Turbine Parameter	Assessment Envelope
Turbine Blade Tip Height	185m
Rotor Diameter	162m
Hub Height	104m

### 2.3 TURBINE FOUNDATION AND TURBINE HARDSTANDS

All turbine suppliers have a requirement for a Turbine Hardstand area to be constructed beside each turbine. The general layout of the Turbine Hardstand is designed to accommodate the delivery, laydown, and assembly of turbine components (in particular rotor assembly) prior to turbine lifting and assembly. The Turbine Hardstands are needed to support the cranes during turbine construction, the operational and maintenance phase, and for decommissioning. The Turbine Hardstands will be constructed in advance of the Turbine Foundation and will be used to facilitate foundation construction, such as steel reinforcement delivery and pouring of concrete.

Construction of the turbine and met mast hardstands will require the excavation of overburden material to the noted area and depth, the laying of a geotextile material on the formation surface and placing engineered stone and a top dressing. The main Turbine Hardstands will be 3,395m<sup>2</sup> and will be 0.6m in depth depending on the local bedrock profile and the varying soil depth giving a surface area of 20,370m<sup>2</sup> for 6 turbines and a material volume requirement of approximately 12,222m<sup>3</sup>.

The Turbine Foundations will be approximately 25.5m in diameter and have a depth of approximately 3m. The Turbine Foundation design will depend on the turbine type and will be decided by the structural engineers at detailed design stage but will fall within the above



dimensions. The central part of the foundation will be approximately 6m in diameter, will be raised from the main Turbine Foundation below ground level and will encompass cast-in bolts to connect to the bottom of the turbine tower and reinforced bar structural elements.

The volume of concrete and steel required for each Turbine Foundation will be 590m<sup>3</sup> and 86 tonnes respectively. The area around and above the Turbine Foundation will be backfilled with compacted granular material and the only portion exposed in the long term will be the central foundation section. Material will be sourced from a local quarry such as one of those identified in **Table 2.2** below.

**Table 2.2: Local Quarries and Concrete Suppliers**

Quarry	ITM (Easting)	ITM (Northing)	Distance (km)	Direction	Comments
<b>Rock Aggregates</b>					
Maam Cross	497388	744878	4.7	SW	Rock aggregates
Recess	485245	747775	16.5	W	Rock aggregates
Mannions, Recess	473449	749314	28	W	Stone aggregates
Killola Quarries, Gortnagroagh	515758	739801	13.5	SE	Stone aggregates
Kyne's Sand and Gravel, Lahardane	519397	735806	18.8	SE	Sand and gravel only
Mairtín O Flatharta Teo, An Spideál	515151	723083	25.5	SE	Granite rock aggregates
KG Fuels Menlo, Galway	530381	728317	32	SE	Stone aggregates
<b>Concrete</b>					
Harrington Quarries	538145	740396	35	E	Stone aggregates and Concrete

Coshla Quarries, Athenry	542651	728567	42.7	SE	Stone aggregates and Concrete
Esker Readymix, Athenry	554460	726236	54.7	SE	Concrete
McGraths, Cong	514093	756055	13	NE	Concrete, limestone rock and aggregates

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Site investigations are required post consent to facilitate detailed design. Depending on the results of these further confirmatory site investigations, the possibility of installing rock anchors will be explored as a means of reducing the footprint and material volumes of the Turbine Foundations. Traditional gravity foundations are considered for EIA purposes as this represents a worst-case scenario due to the amounts of concrete required (c.750-800m<sup>3</sup> v c.300m<sup>3</sup> for rock anchors), but it should be noted that the predicted environmental effects, such as loss of habitats and/or impacts on water quality, could be reduced where rock anchor foundations could be used for some of the Turbine Foundations where there is solid competent rock at the foundation level.

Based on the results of peat probing and geotechnical assessments to date, peat depths are not deep enough to require piling of Turbine Hardstands. Therefore, the construction method for all the Turbine Hardstands will be via excavated approach.

The construction methodology for the wind Turbine Foundations will depend on the strength and depth of the substrata (layers of rock or soil beneath the surface) specific to each location. Turbine Foundations will need to be taken down to competent bearing strata by excavating through the peat / soil, subsoil and rock if necessary.

The method of construction for gravity Turbine Foundation is described as follows:

- Set out turbine foundations and required finish levels etc.
- Construct formation and/or supporting structures e.g. piles.

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- Construct drainage as required.
- Provide a minimum of 100mm concrete blinding.
- Place bottom mat of steel reinforcing.
- Place free issue turbine base insert or anchor cage.
- Fix cable ducting and foundation earthing.
- Complete reinforcing steel.
- Fix shuttering to base sidewalls.
- Fix ducts and earthing wires between insert and walls of base.
- Carry out any corrective works as directed by Engineer.
- Check weather conditions and schedule concrete deliveries.
- Place concrete and take quality control slumps and cubes.
- Concrete surface finishing.
- Apply curing and protection of concrete.
- Strip formwork.
- Placing of any earthing wires around and over the base.
- Backfill base sides and place overburden.
- Confirm that cube results are satisfactory<sup>1</sup>.
- Grout the top flange.
  
- The method of construction for rock anchor Turbine Foundation is described as follows:
  - Set out turbine foundations and required finish levels etc.

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<sup>1</sup> Concrete cubes made during the pouring of the base are crushed to confirm that the required concrete strength has been reached.

- Construct temporary coring drilling platform
- Drill cores for rock anchors to the required levels.
- Insert rock anchors and grout into position.
- Construct drainage as required.
- Provide a minimum of 100mm concrete blinding.
- Place bottom mat of steel reinforcing.
- Place free issue turbine base insert or anchor cage.
- Fix cable ducting and foundation earthing.
- Complete reinforcing steel.
- Fix shuttering to base sidewalls.
- Fix ducts and earthing wires between insert and walls of base.
- Carry out any corrective works as directed by Engineer.
- Check weather conditions and schedule concrete deliveries.
- Place concrete and take quality control slumps and cubes.
- Concrete surface finishing.
- Apply curing and protection of concrete.
- Strip formwork.
- Placing of any earthing wires around and over the base.
- Backfill base sides and place overburden.
- Confirm that cube results are satisfactory.
- Grout the top flange.

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### **2.1.1 Access to the Site**

The site access will be from the existing entrance on the N59 which will be upgraded to allow vehicles to turn in and out and to achieve the required sightlines. This entrance will be used for delivery of both turbine components and building materials such as rock and concrete.

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed in Galway Port. From there, they will be transported to the Site via the R336 to Maam Cross and then the N59 east to the upgraded site entrance. The delivery of the turbines will require co-ordination with a number of statutory bodies including Galway County Council, An Garda Síochána.

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There are four areas on the haul route that will require works in third party lands. These are shown on **Table 2.3**.

**Table 2.3: Areas of Works on Haul Route in Third Party Lands**

No.	Area	ITM (Easting)	ITM (Northing)	Description
1	R336	497440	743302	Third Party Lands to east of R336.
2	R336	497060	742884	Third Party Lands to east of R336
3	R226/R340	496715	738300	Third Party Lands to the west of the R336 and north of R336
4	Baile na hAbhann	499618	722390	Third Party Lands to the west of the R336

### 2.1.2 Site Access Tracks

The Site Access Tracks are necessary to allow access for cranes and delivery trucks during construction of the Development and also during servicing/repairs to the wind turbines. The existing access track from the N59 will be upgraded and used to minimise additional land take. The Site Access Tracks will be upgraded and constructed so that the width will be 5m, but will be wider at bends where a width of 5.5m is to be provided. The maximum gradient on the site will be approximately 15% with the exception of the access track to the Met Mast which has a gradient of approximately 22%. A stone layer will be provided so as to provide a good grip during wet weather. Gradients above 12-14% will usually require components to be towed by a specialist towing vehicle. The maximum gradient on site is 15.3% with a gradient of 21.94% leading to the Met Mast location, and therefore towing of delivery vehicles is likely to be required.

Approximately 1,450m of the existing Site Access Track length will be used for the Development. The upgraded Site Access Tracks will be approximately 2,900m<sup>2</sup> in surface area and will require approximately 1,740m<sup>3</sup> of stone material.

There will also be 5,530m of new Site Access Tracks required for the Development. These will be constructed to provide a width of 5m and will cover an area of 27,650m<sup>2</sup> and require c.16,590m<sup>3</sup> of rock. These roads will be excavated to firm bearing strata and constructed using rock from the turbine foundation excavations or imported to Site from a nearby quarry as outlined in **Table 2.2**.

The Site Access Track layout follows the existing access track into the Site as far as possible, avoids environmental constraints, and follows the natural contours of the land. Every effort has been made to minimise the length of track necessary.

The Site Access Tracks will be upgraded to carry a minimum 12 tonne axle construction loading. The design will consist of 150mm of 50mm Down Quarried Rock / Gravel Pavement on an average of 400mm Down Crushed Run Rock.

Sections of the Site Access Tracks will need to be of a floated road design where areas of deeper peat (>1.5m depth with a crossfall of less than 1 in 10) are encountered. This means they will not be excavated but will be laid directly on the peat using geogrid and crushed stone. Pipes will be installed at intervals to allow the existing runoff regime on site to continue. Sections of the track that are proposed to be floated are from chainage 1200 on the access track from the N59 to T6 and from the junction on the access track between T1 and T6 and the junction with the access track to T2.

The surface of the Site Access Tracks will have to be maintained during the construction phase. Harmful constituents such as hydrocarbons pose a risk of environmental contamination and also a risk to human health if found in drinking water sources. All imported stone to the Site will have undergone appropriate quality testing to TII specifications.

Various Turbine Hardstand areas in addition to turning areas are required in the vicinity of each turbine location. Turbine Hardstand areas must allow two cranes to work in the vicinity of a turbine.

There are four crossings of natural streams/flushes along the Site Access Tracks. The existing crossing over the Owenwee River on the main access Track from the N59 will be upgraded for the increased Site Access Track widths for the Development and to allow heavier vehicles to traverse it. The upgrade will involve the construction of a clear span bridge to the north of the existing bridge location and the crossings have been designed in accordance with the detail shown in Figures 2.6(a), (b), (c) and (d) of Volume III of the EIAR and reproduced in Appendix 2 of the NIS.

### **2.1.3 Met Mast**

As part of the grid code<sup>2</sup> requirements, all wind farms with an installed capacity of greater than 10MW are required to supply continuous, real-time data for the wind farm location. The data required is the wind speed and wind direction at turbine hub height, air temperature and air pressure. The data required for the Development will be provided by a dedicated meteorological mast of 104m in height.

The Met Mast will be located on the west of the Site and will be a free-standing lattice type structure. The Met Mast foundation will be approximately 12m by 12m, with a depth of 2.25m and will be designed and constructed similar to the turbine foundations. It will encompass a cast-in insert or bolts to connect to the bottom of the met mast and reinforced bar structural elements. The area around and above the foundation will be backfilled with compacted granular material. The Met Mast will be linked to the 38kV Substation via buried Internal Cabling for power and communication and will be required for the full operational duration of the Development.

### **2.1.4 Electrical Substation, Control Building and Associated Compound**

It is proposed to construct a 38kV electricity substation on the Site. This will provide a connection point between the wind farm and the grid connection point at the existing Screebe

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<sup>2</sup> EirGrid (22 July 2005). EirGrid Grid Code Version 6

110kV substation. Electricity transmitted between the turbines and the substation on the Site will be at 38kV.

The substation will serve two main functions:

1. provide housing for switchgear, control equipment, monitoring equipment, and storage space necessary for the proper functioning of the wind farm; and
2. provide a substation for metering and for switchgear to connect to the national grid.

The construction and electrical components of the substation will be to ESB specifications within the parameters assessed. The substation compound will be c.837m<sup>2</sup> and will be 0.6m in depth and will be constructed from engineered stone material using similar construction techniques as for the crane hardstands. The overall compound will be enclosed by a 2.65m high fence and will contain a single building, ancillary equipment, including the transformers, switch gear, fault protection, metering, car parking and other ancillary elements necessary for the operation of the Development.

The substation building will contain control elements of the Development. The control components housed at the substation will include metering equipment, switchgear, the central computer system and electrical control panels. The control building will be a single story pitched roof structure with traditional rendered finishes and measure approximately 15.275m x 6.12m with a floor area of approximately 93.48m<sup>2</sup>. The appearance and finish of the substation building will be similar to an agricultural building with a slated roof and nap plaster finished proposed. It will have a suitably sized footpath around it and an adjacent parking area. The final finish of the control building will be an off-white or grey colour.

The control building will contain an ESB room, control room, switchgear room, small store, an office and toilet. There will be two lightning monopole protection masts which will be approximately 17m in height and associated site works. Warning / health & safety signage will be displayed as is normal practice for such installations. Motion sensitive lighting only will be used. It is proposed to install a rainwater harvesting system as the source of water for toilet and welfare facilities, a potable water being brought onsite in bottles. Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. This is a device installed in a fuel storage tank that is capable of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank. All wastewater



will be tankered off-site by a licensed waste collector to Oughterard wastewater treatment plant. There will be no onsite treatment of wastewater.

A telecommunication antenna will be fixed externally to the substation control building for communication and control purposes (e.g. for the Supervisory Control and Data Acquisition (SCADA) System) for the Developer, turbine suppliers and ESB networks. There will be a small area outside the compound and adjacent to the access road that will be a hard-surfaced area for operational and maintenance for 4 parking spaces and will measure approximately 122m<sup>2</sup>.

### **2.1.5 Transformers and Internal Cabling**

The power generated by each wind turbine will be transmitted via underground Wind Farm Internal Cabling to the new electrical Substation, at either 20kV or 33kV, as will the communication signals whose cables will be installed in the same trench. The Wind Farm Internal Cabling network will be installed in trenches approximately 0.6m wide by 1m in depth and there will be approximately 5,530m of Wind Farm Internal Cable trenching (giving a surface area of approximately 3,152m<sup>2</sup>). The cable ducting will be installed to ESB Networks Limited requirements as per the design.

The electrical and fibre-optic cables running from the turbines to the substation compound will be run within the Site Access Tracks and/or their verges. Where the cables are located in blanket bog habitat, they will be laid in the Site Access Tracks themselves to minimise land take in this habitat. This will be the case for the cables between T1 and T2 and from T6 to the site entrance at the N59.

The Wind Farm Internal Cabling routes will be bedded in surplus excavated soil material. Danger tape, incorporating a metallic strip, will be laid during backfilling. Where the Wind Farm Internal Cabling is to cross Site Access Tracks, suitable electrical ducting will be provided. Permanent posts up to approximately 0.5m in height will mark the trenches at regular intervals and at all changes in direction. An as built layout plan showing the location of underground Wind Farm Internal Cabling will be on permanent display within the control building.

Clay plugs or concrete cut offs will be installed at regular intervals in the cable ducting trenches where they are located on slopes to prevent the trenches from becoming preferential flow paths for runoff from the Site.

Transformers will be located inside each turbine.

Excavated material will be stored uphill of the trench excavations which will prevent any sediments from being washed downhill as they will be contained in the trench. Silt fences will be installed downgradient of the excavations on steeper slopes to prevent silt runoff.

### 2.1.6 Grid Connection

Connection will be sought from the grid system operators by application to ESB Networks Limited. Mullen Grid Limited assessed possible connection options for the Development and found that a 38kV connection to Screebe was the best option which would require the uprating of the existing 31.5MVA transformer to 63MVA. The substation will connect via underground 38kV cable to the ESB 110kV Screebe substation. The overall length of the grid connection between the substation and the existing Screebe 110kV substation is 18.65km, of which, 1,450m is within the site of the Development with the remainder being located in the N59 and R336. The grid connection can be summarised as follows:

- UGC Option A - UGC from Screebe SS to Tullaghmore WF utilising sections of UGC in public road, primarily regional roads, and private lands. [18.65km]

The route of the above grid connection is provided in **Figure 1.3**.

The Grid Connection will be constructed to the requirements and specifications of ESB Networks Limited. The three conductors will be laid in separate ducts which will be laid in accordance with the ESB functional specifications for 38kV Networks Ducting/Cabling. The width of a 38kV cable trench with a trefoil formation will be 600mm. The depth of the trench for 38kV cables is 1.22m. A separate duct will be provided within the trench for fibre optic communications.

The following is a summary of the main activities for the installation of ducts:

- All relevant bodies i.e. ESB Networks Limited, Gas Networks Ireland, Eir, Galway County Council, Irish Water etc. will be contacted and up to date drawings for all existing services will be sought so that the grid connection ducting does not damage or interfere with existing services. This will be rechecked by the Contractor prior to excavations taking place.
- Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CATSCAN (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected.
- Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.
- A silt fencing filtration system will be installed on all existing drainage channels for the duration of the cable construction to prevent contamination of any watercourse.
- A 13-tonne rubber tracked 360-degree excavator will be used to excavate the trench to the dimensions of 600mm wide by 1.22m deep.
- Once the trench is excavated, a 50mm depth base layer of sand (in road trench) or 15 Newton CBM4 concrete will be installed and compacted. All concrete will be offloaded directly from the concrete truck into the trench.
- uPVC ducts will be installed on top of the compacted base layer material in the trench.
- Once the ducts are installed, couplers (a device used for joining pipes) will be fitted and capped to prevent any dirt entering the unjointed open end of the duct.
- The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts.
- The co-ordinates will be plotted on as-built record drawings for the grid connection cable operational phase.
- When ducts have been installed in the correct position on the trench base layer, sand (in road trench) or Lean-mix CBM4 (CL1093) (off road trench) will be carefully installed in the trench around the ducts so as not to displace the duct and will be compacted.
- Timer spacer templates will be used during installation so that the correct cover of duct surround material is achieved above, below and at the sides of the duct in the trench.
- A red cable protection strip will be installed above duct surround layer of material and for the full length of the cable route.

- A layer of Lean-mix CBM4 (CL1093) (in road) will be installed on top of the duct surround material to a level 300mm below the finished surface level.
- Yellow marker warning tape will be installed for the full width of the trench, and for the full length of the cable route, 300mm from the finished surface level.
- The finished surface of the road will then be reinstated on a temporary basis to the requirements of the Guidelines for Managing Openings in Public Roads, 2017.
- Precast concrete cable joint bays (junction boxes) will be installed within the excavated trench.
- The junction boxes will be backfilled and the finished surface above the junction box reinstated on a temporary basis as per the requirements of the Guidelines for Managing Openings in Public Roads, 2017. The cable junction boxes will be re-excavated a second time during cable pulling and jointing, after which the finished surface above the joint bays will be reinstated again to its original condition.
- When trenching and ducting is complete, the installation of the grid connection cable will commence between the substation and the existing 110kV substation at Screebe.
- The underground cable will be pulled through the installed ducts from a cable drum set up at one joint bay and using a winch system which is set up at the next joint bay, the cable will be pulled through.
- The cables will be jointed together within the precast concrete cable junction box (Joint Bay).
- The finished surface above each cable joint bay is reinstated on a permanent basis to the requirements of the Guidelines for Managing Openings in Public Roads, 2017.

#### **2.1.6.1 Joint Bays**

Joint Bays are pre-cast concrete chambers where individual lengths of cables will be joined to form one continuous cable. A joint bay is constructed in a pit. Each joint bay typically will be 6m long x 2.5m x 2.3m deep. A reinforced concreted slab will be constructed on top of the bay.

The joint bay locations have been dictated by suitable terrain and access to facilitate the operation of cable pulling equipment at any phase of the development and future operation of the installation in accordance with the ESB Networks Limited specifications.

Communication chambers, which are similar to small manholes, will be installed at the joint bay locations to facilitate connection of fibre-optic communication cables.

### 2.1.6.2 Trench Layout

The trench layout will be as per the appropriate ESB Networks Limited Specifications. The specification of Galway County Council will be followed for the excavation and reinstatement of the ducted cable trenches which is expected to be in accordance with the requirements of the Guidelines for Managing Openings in Public Roads, 2017.

### 2.1.6.3 Joining Ducts

All joining ducts shall be laid in straight lines to even gradients. Once the ducts have been installed and backfilled with lean-mix concrete and with Clause 804 stone the duct run will be thoroughly cleaned by pulling the appropriate size of ESB Networks Limited approved duct brush through the duct.

Details of the construction methodology are summarised below:

- Preparatory Works
  - Preparatory Trial Pit Survey along the cable route
  - Access to the start point and setting out
  - Access to joint bays
  - Silt Attenuation Features and watercourse set back buffer
  - Joint Bay Excavation
- Trenching Works
  - Storage of Materials
  - Trench Operations
  - Managing excess material from trench works

### 2.1.6.4 Directional Drilling Works

There are 22 no. watercourse crossings along the grid connection route. From the bridge survey carried out by JOD, the majority of the crossings have sufficient cover in the road to allow the excavation of the cable ducting within the roadway or bridge. However, five of the crossings will be constructed by means of directional drilling technology. Directional drilling is the practice of drilling holes in a non-vertical direction for the laying of ducts which contain cables beneath features such as watercourse. The directional drilling commences at the launch pit

which is the entry point for pipes and ducts to be placed. Pipes and ducts are brought through the drilled hole to a receiving pit on the opposite side of the hole to the launch pit. The crossings will comprise 4 x 110mm High Performance Polyethylene (HPPE) pipes/ducts each directionally drilled. Two separate excavations will be made to a depth of 2 metres to accommodate the directional drilling launch and reception pits in the road on either side of the crossing (no third-party lands either side of the road are anticipated to be required). Spoil arisings will be loaded onto trucks for disposal off-site as soil is excavated. The excavation launch and reception pits will be reinstated using compacted layers of crushed stone on completion of drilling and jointing operations.

The Drill head will be placed in the open excavation (launch pit) and it will be guided in by the operator for the first 1-2 metres. A series of drill rods will be connected to the head as it travels further along the shaft.

The drill position is always known to the operator and the drill can be manoeuvred in 3 planes / axis. A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded. A drilling lubricant will be required and this will be delivered directly to the drill head by hydraulics. The lubricant will be chemically inert bentonite slurry mixture which lubricate the drill head and remove the drilled earth and stone. Once the conduit is completed, the drill head is exposed at the reception pit and removed. Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side. The drill rods are connected to the duct pipe and the drill is reversed pulling the pipe back through the conduit.

A spoil volume of 5m<sup>3</sup> will be excavated for each 100m run of 4 pipes. This spoil will be largely subsoil material. This material will exit the launch pit within the bentonite slurry mixture. A mobile bunded tank will be located next to the launch pit into which the material/slurry mixture will be pumped. This will be stored outside of the 25m watercourse buffer zone.

The following measures will be implemented during the directional drilling works:

- No in-stream works will be permitted
- Works shall not take place at periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast

- A floating hydrocarbon boom and spill kit will be employed
- Silt fencing will be erected at a setback distance of 5m during excavation
- Any excess construction material shall be removed from the works areas and disposed of in a fully licensed landfill
- No re-fuelling of machinery will take place on site or within 50 metres of any watercourse
- All construction workers will be given a toolbox talk addressing the environmental topics concerning the drilling prior to commencement of construction.

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### **2.1.7 Borrow Pit**

Due to the prevalence of bogland habitat on site, no borrow pits are proposed to minimise land take on site. While some, rock for the construction of Site Access Tracks and Turbine Hardstands will be sourced where rock is encountered during the excavations for Site Access Tracks and Turbine Hardstands or Turbine Foundations, the bulk is to be imported to the Site from a nearby quarry as shown on **Figure 14.1** of the EIAR.

### **2.1.8 Turbine Foundation Rock Breaking**

Weaker rock will be extracted using a hydraulic excavator and a ripper. Upon the completion of further confirmatory site investigation, where stronger rock is encountered and cannot be extracted using an excavator, then rock breaking equipment will be employed. This will involve the use of a 40-60 tonne 360 degree hydraulic excavator with a rock breaker. The rock breaker is supported by a smaller 30-40 tonne rock breaker which breaks the rock down further for feeding into the rock crusher machine. The larger rock breaker breaks out the rock in a progressive manner from the turbine foundations and the smaller rock breaker breaks it down further.

The broken-down rock is loaded into mobile crusher using a wheeled loading shovel machine and crushed down into the correct grade for use in the civil construction of Site Access Tracks and Turbine Hardstands.

### 2.1.9 Onsite Drainage

The surface water runoff contained within natural and artificial drainage channels includes stream and river waterbodies, drainage ditches, and other minor natural and artificial manmade drainage features. Drainage measures will be provided to attenuate runoff, guard against soil erosion, soil compaction, and safeguard local water quality. Details of the drainage system are outlined in detail in the Surface Water Management Plan, part of the CEMP attached as **Appendix 2.1** to the EIAR or the proposed development.

There is one river, the Owenwee River, which runs along the boundary of the site and next to the exiting access track into the site from the N59. A buffer zone of at least 50m will be in place for the Owenwee River where possible, with the exception of the section of existing access track to be upgraded near the Owenwee River. There will be upgrade works on this access track which will take place inside the buffer zone. Other watercourses on site consist of manmade drainage channels and headwaters of the Owenwee and Owenree Rivers, some of which are ephemeral. Sustainable Urban Drainage System (SuDS) principles will be employed as follows:

#### Source controls for surface water

- Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sandbags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems
- Small working areas, covering stockpiles with geotextiles layering to protect against water erosion and runoff in rainy weather, and/or cessation of works in certain areas such as working on a high gradient during wet and windy weather.

#### In-line controls for surface water

In line controls are controls which are directly applied to the surface water body, including interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sandbags, 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



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**Treatment systems for surface water:**

Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbusters and/or other similar/equivalent or appropriate systems.

When heavy rainfall is predicted, then works will be suspended or scaled back.

**2.1.10 Table of Key Development Infrastructure Metrics**

The Key Development Infrastructure Metrics are contained in **Table 2.4**.

**Table 2.4: Key Development Infrastructure Metrics**

Description	Length [m]	Width [m]	Depth [m]	No.	Area [m <sup>2</sup> ]	Volume of Excavation [m <sup>3</sup> ]
Upgraded Site Access Track	1,450	2	0.6	1	2,900	1,740
New Site Access Track	5,530	5	0.6	1	27,650	16,590
Internal Cabling (power & communications)	5,530	0.57	1.05	1	3,152	3,310
Turbine Hardstands - cranes	-	-	0.6	6	20,370	12,222
Turbine Foundations (25.5m diameter)	-	-	3	6	3,064	9,192
Met Mast foundation	12	12	2.25	1	144	324
Electrical Substation	-	-	0.6	1	837	502

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Description	Length [m]	Width [m]	Depth [m]	No.	Area [m <sup>2</sup> ]	Volume of Excavation [m <sup>3</sup> ]
Site Compound	30	45	0.3	1	1,350	405
38kV Cable Grid Connection (Option A)	18,650	0.6	1.220	1	11,190	13,652
<b>Total</b>					<b>70,657</b>	<b>57,937</b>

Taking the above figures into consideration, the permanent land take from the Development will be 54,965m<sup>2</sup> (5.9ha) which is the sum of the figures above which are to be retained following construction e.g. Site Access Tracks, Turbine Foundations, Met Mast Foundation, Turbine Hardstands, Met Mast Hardstand and 38kV Substation. Temporary land take on Site will be 4,502m<sup>2</sup>. The grid connection will involve works on 11,190m<sup>2</sup> of area on the public roads to be reinstated following the laying of the ducts and so is classed as temporary land take. Therefore, the total land take required for the Development will be approximately 5.4ha.

### 2.1.11 Site Signage

Signs will be placed on the N59 showing directions to the Site. Additional signage will be placed on the road, warning of construction vehicles entering and egressing the Site for road safety measures. The Site entrance on the N59 will have a sign confirming that it is the entrance to the Site and the speed limit of 30 km/h. There will also be additional signs during the construction phase confirming that construction works are taking place and proper precautions must be taken by anyone entering the Site. There will be no entry to unauthorised persons or the general public during construction.

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## **2.1.12 Peat and Spoil Management**

### **2.1.12.1 Spoil Quantities**

The quantities of spoil likely to be generated at the Development have been calculated by Jennings O'Donovan & Partners. It is estimated that based on site surveys carried out by Andrew Garne Geotechnical Services using peat probes that the amount of peat spoil predicted to be generated during construction of the wind farm is approximately 84,760m<sup>3</sup> of peat spoil.

The total amount of cut material below the peat layer estimated from the Development is approximately 218,635m<sup>3</sup> with the amount of fill being estimated at 174,526m<sup>3</sup>. This leaves a surplus of 44,109m<sup>3</sup> that it is envisaged can be used as structural fill in Site Access Tracks, Turbine Hardstand and Turbine Foundation construction.

### **2.1.12.2 Landscaping & Reinstatement**

Due to the nature of the peat habitats on site, berms or large designated storage areas for the storage of spoil will not be permitted. A waste licence will be procured for handling and storage of the excess spoil from the Site. However, peat spoil will be used to reinstate exposed areas around infrastructure such as slopes/graded ground around Site Access Tracks and Turbine Hardstands and on the Turbine Foundations or where there is degraded bog that can be enhanced by depositing peat on it. Peat that cannot be used for reinstatement around the Site, will be taken off site to the designated spoil storage area to the east of Maam Cross, approximately 3.5km to the west of the wind farm site. The designated spoil area has an area of approximately 65,182m<sup>2</sup> (6.5ha) and a capacity of approximately 97,000m<sup>3</sup> assuming that the areas of cutover peat can be filled in and berm constructed in cells so that spoil can be stored up to a total height of approximately 1.5m. This will allow the total estimated amount of spoil to be stored taking into account a bulking factor of 10% (total of approximately 93,236m<sup>3</sup>). These areas are shown on **Figure 1.1** and **Figure 1.2** of the EIAR and the existing site conditions are shown in **Plates 2.1** and **2.2**.



**Plate 2.1 – Site of Spoil Storage and Biodiversity Enhancement**



**Plate 2.2 – Site of Spoil Storage and Biodiversity Enhancement**

European Communities (Waste Directive) Regulations 2011 presents a number of options to manage waste – Article 27 allows for material to be classed as a by-product and not a waste where the following conditions are met:

- a) further use of the substance or object is certain;
- b) the substance or object can be used directly without any further processing other than normal industrial practice;
- c) the substance or object is produced as an integral part of a production process; and

- d) further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

It is considered that the spoil material is classed as a by-product under By-Product (Regulation 27) as the material will be used to restore areas of cutover bog at the Spoil Storage Areas without any further processing and will not lead to overall adverse environmental or human health impacts. The production of peat spoil from the wind farm is an integral part of the construction process as peat will need to be removed to allow construction of the wind farm.

The areas of cutover peat were historically used as turbary by local residents and were not used for large scale commercial peat harvesting purposes. Peat harvesting on site took place on site prior to 21st September 2011 in line with Point 9 of Table 2 of the The Regulatory Framework Applying to Peat Extraction - A Guidance Document. Point 9 states the following:

*“Development commenced prior to 21 September 2011 and completed prior to 21 September 2012 unless, immediately before 21 September 2011 the development was being carried on in contravention of the Planning Act of 2000 or Regulations under that Act.”*

It is also likely that peat harvesting took place on the site prior to 1<sup>st</sup> October 1964 in accordance with Point 1 of Table 2 of the Guidance in which case planning permission is not required. Point 1 states the following:

*“Extraction commenced prior to 1 October 1964 and no subsequent material change of use i.e., works are a continuation of works commenced prior to 1 October 1964.”*

Works at the spoil storage areas will involve the machinery similar to that used for peat excavation. A 40-60 tonne 360 degree long reach hydraulic excavator and tractors and trailers will be used to place the spoil in areas of cut away to create level surface. Where these areas are less than 1.5m deep (expected to be the majority), they will be filled with peat to the adjoining ground level and then a containment berm will be created to create cells. The cells will be bermed and will measure a maximum size of approximately 30m x 30m and have

outfalls blocked and overflow management with the creation of drainage channels for excess water and sphagnum inoculation. Where the storage is on areas of non cutover peat, then the cells will be provided on the surface of the existing degraded/de-vegetation peat surface. The width of the cell, in an east to west orientation will be dictated by the width of the existing areas of cutover blanket bog either side of the degraded/de-vegetated area, but will not be wider than 45m in width. The length of the cells along their broadly north to south axis will not be longer than 60m in length.

### **2.1.12.3 Non Peat Spoil**

Non peat spoil will consist of glacial till from granite bedrock / rock. It is envisaged in the design that all the non-peat material won on Site can be used as fill on site in the following places:

- Subsoil to be used around the blade laydown areas where load capacities required are less; and
- Rock won from excavations to be used within Site Access Track and Turbine Hardstand build up.

There will also be spoil generated from the grid connection works. This will be in the form of tarmacdam/asphalt, Clause 804 running layer material, compacted rock fill material and subsoils. The total amount of spoil material from the grid connection works is estimated to be 12,590m<sup>3</sup>. This material will need to be taken off site and recycled/disposed of at Carrowbrowne Recycling Centre which is an appropriate licenced facility to deal with inert waste.

### **2.1.13 Peatland Management & Enhancement**

A proposed peat storage and restoration (habitat enhancement) area of approximately 296,625m<sup>2</sup> (29.6ha) has been designated around the peat spoil storage areas identified above that will be used as a biodiversity enhancement area. The land use restrictions that would be required for peatland restoration in this area will comprise:

- Cessation of turbary activity
- Cessation of drainage: Drain blocking with control of water levels

- Cessation of inappropriate livestock grazing levels and no grazing between 1<sup>st</sup> November and 28<sup>th</sup> February
- Active seeding with peat vegetation such as Sphagnum moss or heather brashing

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### **3.0 DESCRIPTION OF THE PROPOSED TULLAGHMORE WIND FARM & GRID CONNECTION ROUTE**

The proposed wind farm Development is located near the townland of Tullaghmore, approximately 9 kilometres west of Oughterard in County Galway. The Site is located across land which is predominantly Atlantic blanket bog and upland heath and blanket bog (>200m in altitude) situated to the west of the Derroura Forest which is managed by Coillte. To the south of the Site is the N59 Road, Lough Bofin and the Connemara Bog Complex Special Area of Conservation (SAC). North of the Site there are additional areas of blanket bog, forestry, Curraun Lough, the Western Way long-distance walking trail and the Lough Corrib SAC. To the west/south-west of the Site flows the Owenwee River, Loughaunierin and Tawnaghbeg Lough.

The Site contains a number of small streams, all of which are headwaters of the Owenwee and Owenree Rivers, the latter of which ultimately flows into Lough Corrib Upper to the north of the Site. There are no lakes located within the Site boundary where the predominant land use is agricultural grazing land for both sheep and cattle. The land within the Site boundary has also been utilised for peat extraction purposes. The Site is serviced by a pre-existing access road off the N59 road along the southern Site boundary and adjacent to the Owenwee River.

The main Site extends to 161.88 hectares (ha), the majority of which consists of peat and heath habitats used for grazing sheep and is in the ownership of three local landowners. The area designated for spoil storage and ecological enhancement extends to 29.86ha. Therefore, the total site area is 191.74ha.

The topography of the Site is variable, and it is broadly surrounded by or is partially overlapping three elevated areas. These include Knockbrack to the east of the Site (299m OD (metres above Ordnance Datum)) near Lough Beg in the Derroura Forest and Cappanaurabaun (273m OD) at the northern extent of the Site. Further north beyond the Site boundary is Curraun Hill at

252m OD. The southern and western extents of the Site are low lying areas ranging from 50 – 60m OD. The topography beyond the southern and western extent of the Site is characterised by low lying surface water features such as the Owenwee River, Owenree River, Lough Bofin, Loughanaduff, Loughaunierin and Tawnaghbeg Lough. The N59 road which traverses the proposed southern Site boundary is also generally low lying.

The Site is generally topographically elevated in the north / north-west and generally topographically low lying in the south and east. The steepest incline across the Site occurs at the north-western extent of the Site near the proposed T4 position. Elevations typically range from between 100m and 200m OD across the majority of the Site with areas of relatively flat ground existing within the central areas of the Site between elevations of 110m – 150m OD. The proposed Peat Storage and Restoration (Habitat Enhancement) Area located approximately 3.4km to the west of the main site is located on relatively flat low-lying peatland at approximately 43m OD.

The proposed wind farm Site, peat storage and restoration (habitat enhancement) area and current grid connection route are located within the Corrib and Galway Bay North catchment areas in Hydrometric Area 30 and 31 respectively. . The proposed wind farm Development and grid connection to Screebe are located within four WFD sub-catchments. These include the Corrib, Joyce's and Furnace sub-catchments with a small section of the EIAR boundary overlapping into the Ballycuirke Lough Stream sub-catchment.

The proposed Site and its surrounds are located upstream of Lough Corrib Upper which is located approximately 850m from the Site boundary at the closest extent near the proposed T3 turbine position. The Site has indirect hydraulic connectivity to Lough Corrib Upper via the headwaters of the Owenwee and Owenree Rivers which drain the site. Lough Corrib is the second largest lake in Ireland in terms of area (176 km<sup>2</sup>) and is designated as the Lough Corrib SAC. The western portion of the Site is primarily hydraulically characterised by a number of unnamed rivers and streams that are headwaters of the Owenree River which ultimately discharges into Lough Corrib Upper.



#### **4.0 IS THE PROJECT NECESSARY FOR THE CONSERVATION MANAGEMENT OF EUROPEAN SITES**

The project has been described in Section 2 of the Screening Report and it is clear from the description provided that the project is not directly connected with or necessary for the future conservation management of any European Sites.

#### **5.0 IDENTIFICATION OF EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE OF THE PROJECT**

##### **5.1 WITHIN/ADJOINING EUROPEAN SITES**

In order to identify European Sites that could potential be located within the zone of influence of the project, the current digital mapping (shapefile) of European Sites in Ireland<sup>3</sup>, as published by the NPWS, was reviewed to identify the European Sites that could conceivably be connected to the project site via pathways. During this review, elements of the proposed development were identified as occurring within or adjoining four European Sites. The boundary of the proposed peat storage and restoration (habitat enhancement) area overlaps with the boundary of the Maumturk Mountains SAC. The proposed grid connection route and the haul route are both located within the mapped extent of the Connemara Bog Complex SAC, while the proposed haul route adjoins sections of the Connemara Bog Complex SPA and the Kilkieran Bay and Islands SAC along the R336. The proposed grid connection route also adjoins the boundary of the Kilkieran Bay and Islands SAC along the R340 approaching the existing Screebe substation. Given that these European Sites overlap with/adjoin the proposed development they are considered to occur within its zone of influence.

##### **5.2 SOURCE-PATHWAY-RECEPTOR MODEL**

Current guidance informing the approach to screening for Appropriate Assessment defines the zone of influence of a proposed development as the geographical area over which it could affect

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<sup>3</sup> Current SAC shapefile layer dated April 2022; current SPA shapefile layer dated October 2021

the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. It is recommended that this is established on a case-by-case basis using the Source-Pathway-Receptor (SPR) model.

Under the SPR model the proposed development, the works associated with the construction and decommissioning phase and the operation of the proposed development represent the source of potential impacts.

Pathways that can arise as a result of develop projects and lead to offsite/downstream impacts are listed below and an appraisal of the potential for these pathways to connect the proposed development to European Sites and their qualifying features of interest (which represent the receptors under the SPR model) is also provided:

- Emissions to surface water: In the absence of a suitable design and control measures the proposed development will have the potential to result in emissions to surface waters. Where receiving surface waters establish a connection between the proposed development and European Sites downstream then a hydrological pathway will be established. EPA sub-catchment and rivers and streams digital baseline mapping was used to identify hydrological pathways between the proposed development and European Sites. The potential for hydrological pathways to function as an impact pathway is examined further in Table 5.1 below.
- Emissions to groundwater: Infiltration of surface waters to ground is not considered to be high at the proposed development site (see Tullaghmore Wind Farm EIAR Chapter 9) and there are no proposals to discharge surface waters generated at the project site to ground via infiltration. There will be no groundwater emissions pathways with the potential to connect the proposed development to European Sites.
- Noise and vibration emissions: Noise and vibration emissions are considered to have the potential to result in negative impacts to biodiversity up to a 300m distance from the emission source. This distance is based on the maximum disturbance zone of 300m for wetland bird species, as specified by Cutts et al. (2013). Noise and vibration effects for other qualifying species as well as qualifying habitats of European Sites are less than 300m. For mammal species listed as qualifying features of interest for SACs in the surrounding area this distance is set at 150m, as per the NRA (2009). For qualifying

aquatic species a potential noise and vibration impact pathway will only arise where works such as piling or blasting are proposed at instream or bankside locations within adjoining SACs. No such proposals form part of the proposed development. There are European Sites occurring within 300m of the proposed development and the potential for noise and vibration emissions to function as a pathway is examined further in Table 5.1 below.

- Emissions to air: Air emissions that have been identified as arising from the proposed development relate to the generation of dust emissions during the construction phase (see EIAR, Chapter 15). Dust emissions can have the potential to result in negative impacts to biodiversity up to 50m from the source of the emission. This is supported by the guidance outlined by Holman et al. (2014), which provides a risk assessment for ecological impacts arising from dust deposition. European Sites are ranked as high sensitive sites and the risk to high sensitive sites ranges from high (at less than 20m from source) and medium (at less than 50m from source), while low risks, representative of insignificant and de-minimis effects arise at distances greater than 50m from source.
- Light emissions: the proposed development will include for the provision of night time beacon lights on turbines. The potential for this operation phase lighting to result in a negative effect to European Sites is examined further in Table 5.1 below.
- Visual emissions: Certain qualifying species of European Sites can be sensitive to visual changes in the landscape and visual disturbance as a result of new structures. Species that are sensitive to such disturbance are wildfowl in the form of geese and swans. The proposed six turbines at the wind farm site will represent the only prominent structures in the landscape. The potential zone of sensitivity arising from turbines for geese and swans is 600m (as per McGuinness et al., 2015). The potential for visual disturbance during the operation phase to result in a negative effect to European Sites is examined further in Table 5.1 below.
- Mobile Species Pathway: Development projects that are located outside of European Sites can also result in impacts to mobile qualifying species of European Sites in the event that such species rely on habitats occurring within the proposed development site. For the purposes of including such a scenario in the consideration of potential pathways

this screening report refers to the reliance of mobile qualifying species of European Sites on the proposed development site as a “mobile species pathway”. When considering the mobile species pathway the following publications were used to identify their presence within the zone of influence of the project:

For bird species, the following were used to identify connectivity between the project site and SPAs in the wider surrounding area:

- Scottish Natural Heritage (SNH, now Natural Scotland) guidance document “Assessing connectivity with Special Protection Areas (SPA) (2016) and McGuinness et al. (2015) for a range of waterbirds were used as the principal sources for establishing foraging range distances. Where no distances for certain species are reported in these two sources, the other sources listed below were used;
- The Bird Foraging Table (version 6<sup>th</sup> Jan. 2020), prepared for DAFM, Forestry Division, available at <https://assets.gov.ie/96741/2601fdb4-420a-45da-948a-ac2b5b0babe3.docx>;
- Thaxter et al. (2012) for seabirds;
- Gillings & Fuller (1999) for golden plover and lapwing; and
- Shackleton (2012) for great northern diver.

For lesser horseshoe bats, associated SACs were included where the project site was identified as occurring within the core sustenance zone, which is defined as a 2.5km radius surrounding an SAC designated for lesser horseshoe bat roost (NPWS, 2018).

For marsh fritillary, associated SACs are included within the initial list of European Sites to be examined where suitable marsh fritillary habitat occurs within the proposed development footprint and where the project site is located within a 10km radius of a marsh fritillary population designated as a qualifying feature of interest of a SAC.

- Disturbance pathway: Human disturbance, ex-situ of a project site, to a European Sites is representative of an indirect impact arising as a result of land use activities generated by a project. An example of such an indirect impact is an increase in human presence and associated pressures within a European Sites. New developments in areas outside of, but proximate to European Sites, can result in an increase in the presence of people

within European Sites, such as for recreational activities. However given the nature of the proposed development, which will not generate increased levels of human activity within surrounding European Sites this example of a human disturbance pathway will not arise.

Human disturbance in the form of noise and visual emissions arising from activities (e.g. from construction activities) to qualifying species can also arise from areas outside of European Sites if activities are located within the disturbance zone of sensitivity for these species. The qualifying species of surrounding European Sites that could be sensitive to this are special conservation interest bird species and otters. The zone of sensitivity of special conservation interest bird species are set out in Table 5.1 below, while the zone of sensitivity of otters to human activities is dependent on the type of activity and ranges up to a maximum distance of 150m from the activity source (NRA, 2009). The potential for such a human disturbance pathway to affect these species is considered under the noise and visual pathways listed above.

In order to identify a list of European Sites in the wider area surrounding the proposed development site that require examination for pathway connectivity a variety of distance criteria were used to establish a preliminary list of European Sites to be considered.

With respect to SACs, the criteria that requires examination of SACs over the greatest distance is the surface water catchment criteria. As such all SACs occurring within the Corrib and Owenboliska-Cashla-Screeb-Coastal surface water catchments have been included in the preliminary list of SACs to be considered. The location of these European Sites with respect to the proposed development is shown on Figure 5.1.

With respect to SPAs, the preliminary list of SPAs that require to be considered for pathway connectivity is based upon the species that have been identified as key ornithological receptors of the proposed development. The key ornithological receptors of the proposed development are set out in Table 7.21 of Chapter 7 of the Tullaghmore Wind Farm EIAR for the proposed development. The key ornithological receptors that are special conservation interest bird species of SPAs are listed below in Table 5.1. It is noted that the BirdWatch Ireland Bird Sensitivity to Wind Energy Toolkit has identified the proposed wind farm site to overlap with an area of sensitivity for breeding common scoter and breeding common tern. However, neither of these species were recorded during detailed baseline bird surveys completed at the wind farm

site (see Chapter 7 of the Tullaghmore Wind Farm EIAR) and have not been identified as ornithological receptors for the proposed development. As such these two species do not establish a mobile species pathway between the proposed development and SPAs in the surrounding area.

Table 5.1 also identifies the distance from the proposed development site over which each of special conservation interest bird species that have been identified as key ornithological receptors could range. The ranging distances identified in Table 5.1 are based on the referenced sources listed above for the mobile species pathway with respect to bird species.

**Table 5.1: Foraging Ranges for special conservation interest bird species recorded during baseline bird surveys**

Special conservation interest bird species	Zone of Sensitivity (m) (McGuinness et al., 2015)	Within Zone of Sensitivity (Bird Sensitivity Tool)	SNH Foraging Range (km)	Other Publication Foraging Range (km)
Golden Plover	800	No	3	-
Greenshank	600	No	15	-
Grey heron	NR	No	NR	10.5*
Mallard	600	No	8	-
Greylag Goose	NR	No	20	-
White-fronted goose (Greenland)	600	No	8	-
Whooper Swan	NR	No	5	-
Mute swan	800	No	3	-
Cormorant	NR	No	2	5.2*
Common gull	NR	No	NR	25*
Great black-backed gull	NR	No	NR	70*
Herring gull	NR	No	NR	10.5*
Lesser black-backed gull	NR	No	NR	70*
Great Northern Diver	NR	No	NR	10 <sup>^</sup>
Red-breasted merganser	NR	No	NR	3.5 <sup>†</sup>
Peregrine	NR	No	2	-
Hen harrier	2000	2	2	-

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Merlin	NR	5	5	-
<b>Colour Key</b>				
	Species recorded in winter non-breeding season only			
	Species recorded in winter non-breeding season and summer breeding season			
	Species recorded in summer breeding season only			

\*Thaxter et al. (2012) for seabirds;  
 ^Shackleton (2012) for great northern diver  
 †Craik & Titman (2008)

The species listed in Table 5.1 above that are included as special conservation interest bird species of SPAs and whose foraging ranges overlap with the proposed development are identified in Table 5.2 above. The SPAs that include these species as special conservation interest bird species are also identified on Table 5.2 below. These SPAs are included within the preliminary list of SPAs to be screened and are shown on Figure 5.2.

**Table 5.2: SPAs to be Considered**

Special conservation interest bird species	Zone of influence (Km) (as per greatest distance set out in Table 5.1)	Proposed development element within zone of influence	SPAs
Golden Plover	3	Wind farm site; proposed peat storage and restoration (habitat enhancement) area; grid connection route; haul route	Connemara Bog Complex SPA; Lough Corrib SPA
Greenshank	15	Na	No SPAs within ZoI
Grey heron	10.5	Na	No SPAs within ZoI
Mallard	8	Na	No SPAs within ZoI
Greylag Goose	20	Na	No SPAs within ZoI
White-fronted goose (Greenland)	8	Wind farm site; proposed peat storage and restoration (habitat enhancement) area; grid connection route; haul route	Lough Corrib SPA
Whooper Swan	5	NA	No SPAs within ZoI
Cormorant	2	Grid connection route; haul route	Connemara Bog Complex SPA
Common gull	25	Wind farm site; proposed peat storage and restoration (habitat	Connemara Bog Complex SPA; Lough Carra SPA

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		enhancement) area; grid connection route; haul route	
Herring gull	10.5	NA	No SPAs within ZoI
Lesser black-backed gull	70	Wind farm site; proposed peat storage and restoration (habitat enhancement) area; grid connection route; haul route	Lough Mask SPA
Great Northern Diver	10	NA	No SPAs within ZoI
Red-breasted merganser	3.5	NA	No SPAs within ZoI
Peregrine	2	NA	No SPAs within ZoI
Hen harrier	2	Wind farm site; grid connection route, haul route	Lough Corrib SPA
Merlin	5	Grid connection route, haul route	Connemara Bog Complex SPA

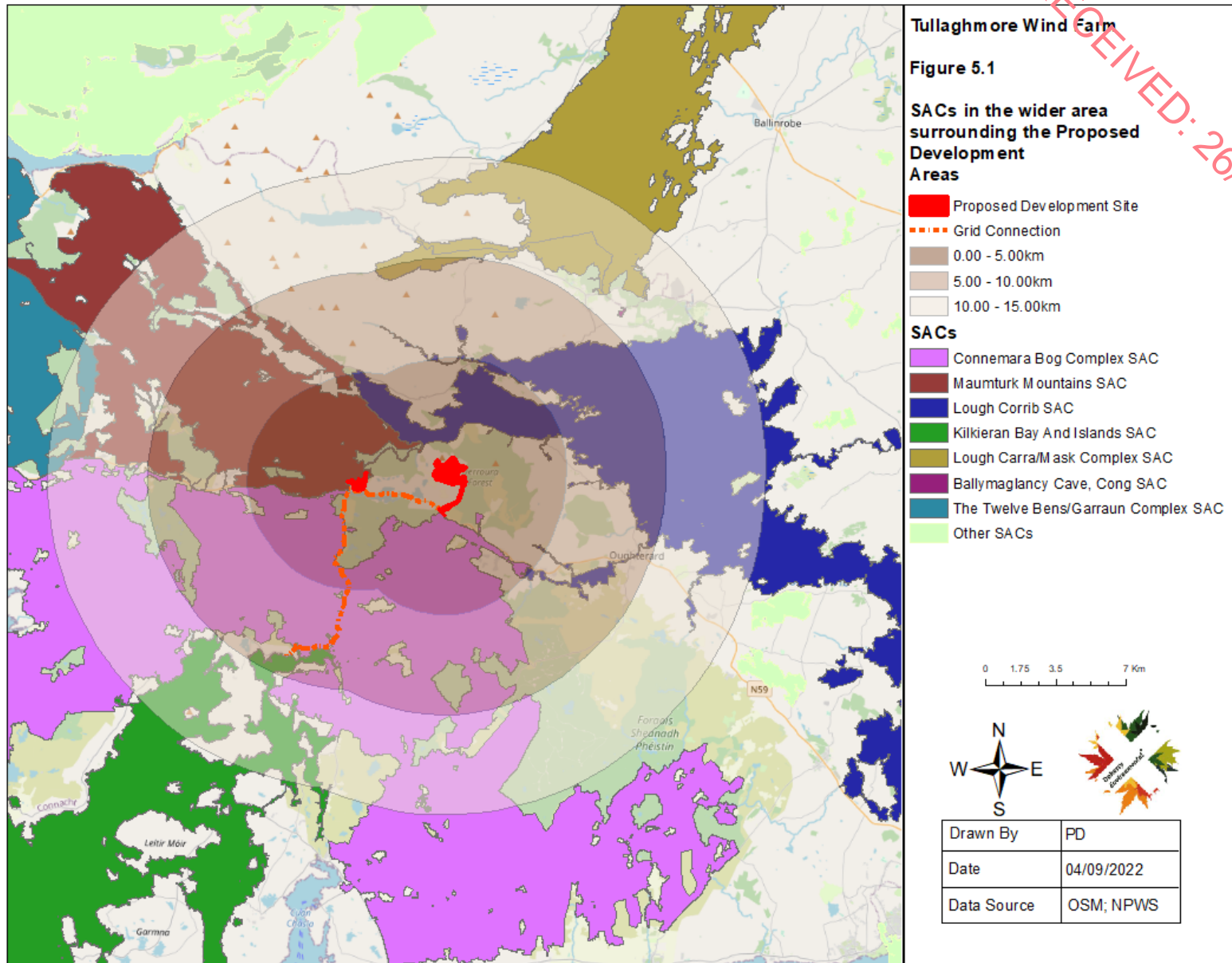
### 5.3 EUROPEAN SITES IN THE ZONE OF INFLUENCE

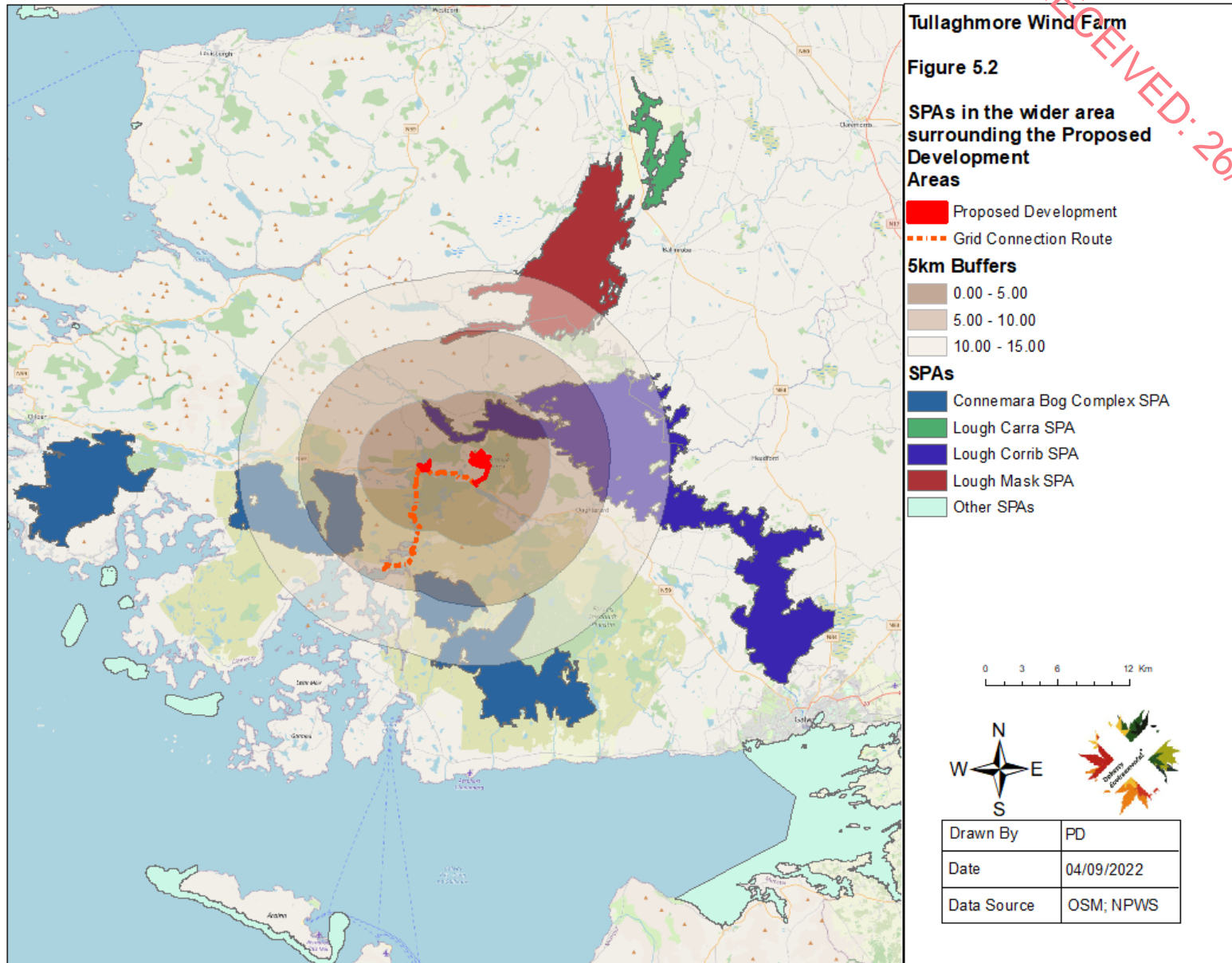
Table 5.3 provides an evaluation as to whether the European Sites identified on Figure 5.1 and Figure 5.2 below occur within the proposed development's zone of influence by virtue of pathways that could establish a connection between them.

In line with Section 5.1 above all European Sites that occur within or adjoin the proposed development are automatically considered to occur within the zone of influence of the project. For those other European Sites listed on Table 5.3 and shown on Figure 5.1 and 5.2 the pathways set out in Section 5.2 above are used to examine whether or not these European Sites occur within the zone of influence of the project.



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**Table 5.3: identification of European Sites within the Zone of Influence of the Proposed Development**

European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Connemara Bog Complex SAC (Site Code: 2034)</p> <p><i>Qualifying features of interest</i></p> <p>Coastal lagoons [1150]</p> <p>Reefs [1170]</p> <p>Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]</p>	<p>Within</p>	<p>There is a minor overlap between the boundary of the proposed wind farm site and this SAC along the existing N59 national road. The proposed development haul route is located within the boundary of this SAC. As such this SAC is considered to occur within the zone of influence of the project.</p>	<p>Yes.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Northern Atlantic wet heaths with Erica tetralix [4010]</p> <p>European dry heaths [4030]</p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Depressions on peat substrates of the Rhynchosporion [7150]</p> <p>Alkaline fens [7230]</p> <p>Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</p> <p>Euphydryas aurinia (Marsh Fritillary) [1065]</p> <p>Salmo salar (Salmon) [1106]</p> <p>Lutra lutra (Otter) [1355]</p>			

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
Najas flexilis (Slender Naiad) [1833]			
<p><b>Maumturk Mountains SAC (Site Code: 2008)</b></p> <p><i>Qualifying features of interest</i></p> <p>Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]</p> <p>Northern Atlantic wet heaths with Erica tetralix [4010]</p> <p>Alpine and Boreal heaths [4060]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Depressions on peat substrates of the Rhynchosporion [7150]</p> <p>Siliceous rocky slopes with chasmophytic vegetation [8220]</p> <p>Salmo salar (Salmon) [1106]</p> <p>Najas flexilis (Slender Naiad) [1833]</p>	Within	There is minor overlap of sections of the proposed peat storage and restoration (habitat enhancement) area boundary and the boundary of this SAC. The proposed development haul route is located within the boundary of this SAC. As such this SAC is considered to occur within the zone of influence of the project.	Yes.

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p><b>Lough Corrib SAC (Site Code: 0297)</b></p> <p><i>Qualifying features of interest</i></p> <p>Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]</p> <p>Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]</p> <p>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]</p>	<p>1km north of the proposed wind farm site</p> <p>2km north of the proposed peat storage and restoration (habitat enhancement ) area</p> <p>2.1km north of the haul route and grid connection route</p>	<p><b>Hydrological pathway</b></p> <p>There is a hydrological pathway between the proposed development and this SAC. The proposed wind farm site drains to the Owenwee River, which in turn drains to this SAC.</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>This SAC is circa 1km from the nearest point of the proposed development site and lies outside the maximum distance (150m) of the zone of sensitivity of features of interest supported by this SAC. No noise emission pathway connects the proposed development to this SAC.</p> <p><b>Air Emission Pathway</b></p> <p>This SAC is circa 1km from the nearest point of the proposed development site, which is beyond the distance of air emission risks. No air emission pathway connects the proposed development to this SAC.</p>	<p>Yes</p> <p>A hydrological pathway and mobile species pathway have been identified as pathways connecting this SAC to the proposed development.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]</p> <p>Active raised bogs [7110]</p> <p>Degraded raised bogs still capable of natural regeneration [7120]</p> <p>Depressions on peat substrates of the Rhynchosporion [7150]</p> <p>Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210]</p> <p>Petrifying springs with tufa formation (Cratoneurion) [7220]</p> <p>Alkaline fens [7230]</p> <p>Limestone pavements [8240]</p> <p>Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</p> <p>Bog woodland [91D0]</p>		<p><b>Light Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to light emissions. As such no light emission pathway connects the proposed development to this SAC.</p> <p><b>Visual Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to visual emissions. As such no visual emission pathway connects the proposed development to this SAC.</p> <p><b>Mobile Species Pathway</b></p> <p>Mobile species pathways in the form of a hydrological pathway occur between the proposed development and freshwater dependent species of this SAC.</p> <p><b>Human Disturbance Pathway</b></p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]</p> <p>Austropotamobius pallipes (White-clawed Crayfish) [1092]</p> <p>Petromyzon marinus (Sea Lamprey) [1095]</p> <p>Lampetra planeri (Brook Lamprey) [1096]</p> <p>Salmo salar (Salmon) [1106]</p> <p>Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]</p> <p>Lutra lutra (Otter) [1355]</p> <p>Najas flexilis (Slender Naiad) [1833]</p> <p>Hamatocaulis vernicosus (Slender Green Feather-moss) [6216]</p>		<p>This SAC is circa 1km from the nearest point of the proposed development site and given the nature of the proposed development, there will be no potential for it to result in changes to human activity in the wider surrounding area and within this SAC.</p>	
<p><b>Kilkieran Bay And Islands SAC (Site Code: 2111)</b></p> <p><i>Qualifying features of interest</i></p>	8	<p>The haul route and the proposed grid connection route adjoin sections of this SAC along the R336 and the R340 respectively.</p>	Yes.

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
Mudflats and sandflats not covered by seawater at low tide [1140]  Coastal lagoons [1150]  Large shallow inlets and bays [1160]  Reefs [1170]  Atlantic salt meadows (Glauco-Puccinellietalia maritima) [1330]  Mediterranean salt meadows (Juncetalia maritimi) [1410]  Machairs (* in Ireland) [21A0]  Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510]  Lutra lutra (Otter) [1355]  Phoca vitulina (Harbour Seal) [1365]  Najas flexilis (Slender Naiad) [1833]			

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p><b>Lough Carra/Mask Complex SAC (Site Code: 1774)</b></p> <p><i>Qualifying features of interest</i></p> <p>Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]                      Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]                      Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]                      European dry heaths [4030]                      Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) [6210]                      Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210]                      Alkaline fens [7230]                      Limestone pavements [8240]                      Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion,</p>	9	<p><b>Hydrological pathway</b></p> <p>This SAC is located within a separate surface water sub-catchment to the proposed development and there is no hydrological pathway connecting the proposed development to this SAC</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>This SAC is circa 9km from the nearest point of the proposed development site and lies outside the maximum distance (150m) of the zone of sensitivity of features of interest supported by this SAC. No noise emission pathway connects the proposed development to this SAC.</p> <p><b>Air Emission Pathway</b></p> <p>This SAC is circa 9km from the nearest point of the proposed development site, which is beyond the distance of air emission risks. No air emission pathway connects the proposed development to this SAC.</p>	No.

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Alnion incanae, Salicion albae) [91E0]                      Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]                      Lutra lutra (Otter) [1355]                      Hamatocaulis vernicosus (Slender Green Feather-moss) [6216]</p>		<p><b>Light Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to light emissions. As such no light emission pathway connects the proposed development to this SAC.</p> <p><b>Visual Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to visual emissions. Given this and the distance to this SAC no visual emission pathway connects the proposed development to this SAC.</p> <p><b>Mobile Species Pathway</b></p> <p>This SAC is designated for its role in supporting three qualifying species, two of which are mobile, namely otters and lesser horseshoe bats. Given that the proposed development site is located within a separate surface water sub-catchment to this SAC as well as the distance of circa 9km from this SAC, there are no pathways connecting the proposed development site to the otter population of this SAC.</p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p>The IpoII development is located well outside the core sustenance zone and thus the zone of sensitivity for the lesser horseshoe bat population supported by this SAC.</p> <p><b>Human Disturbance Pathway</b></p> <p>This SAC is circa 9km from the nearest point of the proposed development site and given this distance and the nature of the proposed development, there will be no potential for it to result in changes to human activity within this SAC.</p>	
<p><b>Ballymaglancy Cave, Cong SAC (Site Code: 0474)</b></p> <p><i>Qualifying features of interest</i></p> <p>Caves not open to the public [8310]</p> <p>Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]</p>	11	<p><b>Hydrological pathway</b></p> <p>This SAC is located within a separate surface water sub-catchment to the proposed development. There is no hydrological pathway connecting the proposed development to this SAC.</p> <p><b>Noise &amp; vibration Pathway</b></p>	No.

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p>This SAC is circa 1km from the nearest point of the proposed development site and lies outside the maximum distance (150m) of the zone of sensitivity of features of interest supported by this SAC. No noise emission pathway connects the proposed development to this SAC.</p> <p><b>Air Emission Pathway</b></p> <p>This SAC is circa 11km from the nearest point of the proposed development site, which is beyond the distance of air emission risks. No air emission pathway connects the proposed development to this SAC.</p> <p><b>Light Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to light emissions. As such no light emission pathway connects the proposed development to this SAC.</p> <p><b>Visual Emission Pathway</b></p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p>This SAC does not support features of interest that are sensitive to visual emissions. As such no visual emission pathway connects the proposed development to this SAC.</p> <p><b>Mobile Species Pathway</b></p> <p>No mobile species pathway connects the proposed development to this SAC. Lesser horseshoe bats, which is the principal feature of interest for which this SAC is designated is a mobile species. However the proposed development site is located well outside the core sustenance zone and thus the zone of sensitivity for the lesser horseshoe bat population supported by this SAC.</p> <p><b>Human Disturbance Pathway</b></p> <p>This SAC is circa 11km from the nearest point of the proposed development site and given the nature of the proposed development, there will be no potential for it to result in changes to human activity in the wider surrounding area and within this SAC.</p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p><b>The Twelve Bens/Garraun Complex SAC (Site Code: 2031)</b></p> <p><i>Qualifying features of interest</i></p> <p>Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]            Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]            Alpine and Boreal heaths [4060]            Blanket bogs (* if active bog) [7130]            Depressions on peat substrates of the Rhynchosporion [7150]            Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]            Calcareous rocky slopes with chasmophytic vegetation [8210]            Siliceous rocky slopes with chasmophytic vegetation [8220]            Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]            Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]</p>	<p>13</p>	<p><b>Hydrological pathway</b></p> <p>This SAC is located within a separate surface water catchment to the proposed development and there is no hydrological pathway connecting the proposed development to this SAC.</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>This SAC is circa 13km from the nearest point of the proposed development site and lies outside the maximum distance (150m) of the zone of sensitivity of features of interest supported by this SAC. No noise emission pathway connects the proposed development to this SAC.</p> <p><b>Air Emission Pathway</b></p> <p>This SAC is circa 13km from the nearest point of the proposed development site, which is beyond the distance of air emission risks. No air emission pathway connects the proposed development to this SAC.</p>	<p>No.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Salmo salar (Salmon) [1106]                      Lutra lutra (Otter) [1355]                       Najas flexilis (Slender Naiad) [1833]</p>		<p><b>Light Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to light emissions. As such no light emission pathway connects the proposed development to this SAC.</p> <p><b>Visual Emission Pathway</b></p> <p>This SAC does not support features of interest that are sensitive to visual emissions. Given this and the distance to this SAC no visual emission pathway connects the proposed development to this SAC.</p> <p><b>Mobile Species Pathway</b></p> <p>This SAC is designated for its role in supporting freshwater dependent qualifying species, only two of which are mobile, namely otters and Atlantic salmon. Given that the proposed development site is located within a separate surface water catchment to this SAC as well as the distance of circa 13km from this SAC, there are no pathways connecting the proposed development site to the mobile species of this SAC.</p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p><b>Human Disturbance Pathway</b></p> <p>This SAC is circa 13km from the nearest point of the proposed development site and given this distance and the nature of the proposed development, there will be no potential for it to result in changes to human activity within this SAC.</p>	
<p><b>Connemara Bog Complex SPA (Site Code: 4181)</b></p> <p><i>Special conservation interests (key ornithological receptors highlighted in bold)</i></p> <p><b>Cormorant (Phalacrocorax carbo) [A017]</b>  <b>Merlin (Falco columbarius) [A098]</b>  <b>Golden Plover (Pluvialis apricaria) [A140]</b>  <b>Common Gull (Larus canus) [A182]</b></p>	<p>Adjoins the haul route.</p> <p>1km from the grid connection route.</p> <p>5.5km from the proposed peat storage and</p>	<p><b>Hydrological pathway</b></p> <p>There is no hydrological pathway between the proposed wind farm site, the proposed peat storage and restoration (habitat enhancement) area or the grid connection route and this SPA. The haul route adjoins sections of this SPA along the R336.</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>The haul route adjoins the boundary of this SPA and as such the SPA is located within the zone of sensitivity (As set out in Table 5.1 above) for the special conservation interest bird species of this SPAs.</p>	<p>Yes.</p> <p>Hydrological pathway between haul route and SPA.</p> <p>Noise &amp; vibration pathway between haul route and SPA.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
	restoration (habitat enhancement ) area.  8km from the wind farm site.	<p><b>Air Emission Pathway</b></p> <p>This SPA adjoins the haul route and as such there is potential for an air emission pathway to connect the haul route to this SPA.</p> <p><b>Light Emission Pathway</b></p> <p>The zone of sensitivity for the populations of golden plover, merlin, and cormorant supported by this SPA does not overlap with the proposed wind farm site and the proposed peat storage and restoration (habitat enhancement) area. The zone of sensitivity for common gull population of this SPA overlaps with the proposed wind farm site and proposed peat storage and restoration (habitat enhancement) area. Lighting will be provided on turbines at the proposed wind farm site. As such there is a potential light emission pathway connecting the proposed wind farm site to the common gull population of this SPA.</p> <p><b>Visual Emission Pathway</b></p>	<p>Air emission pathway between haul route and SPA.</p> <p>Light emission pathway between turbines and common gull.</p> <p>Mobile species pathway between common gull and wind farm site and proposed peat storage and restoration (habitat enhancement) area.</p> <p>Mobile species pathway between all special conservation interest bird species and the grid</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p>Visual emissions that will arise as a result of the project are restricted to the presence of the turbines at the proposed wind farm site. Common gull is the only special conservation interest bird species of this SPA whose zone of sensitivity overlaps with the proposed wind farm site. This species is not sensitive to disturbance as a result of changes in the visual setting of the wider surrounding landscape. No visual pathway connects the proposed development to this SPA.</p> <p><b>Mobile Species Pathway</b></p> <p>Common gull is the only special conservation interest bird species of this SPA for which a mobile species pathway occurs between the wind farm site, the proposed peat storage and restoration (habitat enhancement) area and the grid connection route.</p> <p>The grid connection route and haul route is located within the zone of sensitivity of all special conservation interest bird species of this SPA and as such a potential mobile species pathway occurs between the haul route and these species.</p> <p><b>Human Disturbance Pathway</b></p>	<p>connection route and haul route.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		The proposed development will not result in changes in land use or human activity within or adjoining this SPA.	
<p><b>Lough Corrib SPA (Site Code: 4042)</b></p> <p><i>Special conservation interests (key ornithological receptors highlighted in bold)</i></p> <p>Gadwall (Anas strepera) [A051]            Shoveler (Anas clypeata) [A056]            Pochard (Aythya ferina) [A059]            Tufted Duck (Aythya fuligula) [A061]            Common Scoter (Melanitta nigra) [A065]  <b>Hen Harrier (Circus cyaneus) [A082]</b>            Coot (Fulica atra) [A125]  <b>Golden Plover (Pluvialis apricaria) [A140]</b>            Black-headed Gull (Chroicocephalus ridibundus) [A179]  <b>Common Gull (Larus canus) [A182]</b></p>	<p>1km from the wind farm site</p> <p>2.3km from the proposed peat storage and restoration (habitat enhancement) area</p> <p>2.5km from the grid</p>	<p><b>Hydrological pathway</b></p> <p>There is a hydrological pathway between the proposed wind farm site, the proposed peat storage and restoration (habitat enhancement) area, the grid connection route and the haul route and this SPA.</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>This SPA is located beyond the noise emission zone of sensitivity. No noise emission pathway connects the proposed development to this SPA.</p> <p><b>Air Emission Pathway</b></p> <p>This SPA is located beyond the air emission zone of sensitivity. No air emission pathway connects the proposed development to this SPA.</p>	<p>Yes.</p> <p>Hydrological pathway between haul route and SPA.</p> <p>Noise &amp; vibration pathway between haul route and SPA.</p> <p>Air emission pathway between haul route and SPA.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Common Tern (Sterna hirundo) [A193]                      Arctic Tern (Sterna paradisaea) [A194]                      Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]                      Wetland and Waterbirds [A999]</p>	<p>connection route &amp; the haul route</p>	<p><b>Light Emission Pathway</b></p> <p>The zone of sensitivity for golden plover, merlin, and cormorant and common gull population of this SPA overlaps with the proposed wind farm site and proposed peat storage and restoration (habitat enhancement) area. Lighting will be provided on turbines at the proposed wind farm site. As such there is a potential light emission pathway connecting the proposed wind farm site to the populations of these species of this SPA.</p> <p><b>Visual Emission Pathway</b></p> <p>Visual emissions that will arise as a result of the project are restricted to the presence of the turbines at the proposed wind farm site. Common gull is the only special conservation interest bird species of this SPA whose zone of sensitivity overlaps with the proposed wind farm site. This species is not sensitive to disturbance as a result of changes in the visual setting of the wider surrounding landscape. No visual pathway connects the proposed development to this SPA.</p> <p><b>Mobile Species Pathway</b></p>	<p>Light emission pathway from turbines</p> <p>Mobile species pathway between all special conservation interest bird species and the wind farm site.</p> <p>Mobile species pathway between common gull and the proposed peat storage and restoration (habitat enhancement) area, grid connection route and haul route.</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p>The proposed wind farm site overlaps within the zone of sensitivity for the three relevant special conservation interest bird species that have been identified as key ornithological receptors. As such a potential mobile species pathway connects the proposed wind farm site to the populations of these species supported by this SPA.</p> <p>The golden plover and common gull zone of sensitivity overlaps within the proposed peat storage and restoration (habitat enhancement) area, grid connection route and haul route.</p> <p><b>Human Disturbance Pathway</b></p> <p>The proposed development will not result in changes in land use or human activity within or adjoining this SPA.</p>	
<p><b>Lough Mask SPA (Site Code: 4062)</b>  <i>Special conservation interests (key ornithological receptors highlighted in bold)</i></p>	<p>9.5km from the wind farm site</p>	<p><b>Hydrological pathway</b></p> <p>There is no hydrological pathway connecting the proposed development to this SPA.</p>	<p>Yes.  Mobile species pathway</p>

European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p>Tufted Duck (Aythya fuligula) [A061]                      Black-headed Gull (Chroicocephalus ridibundus) [A179]  <b>Common Gull (Larus canus) [A182]</b>  <b>Lesser Black-backed Gull (Larus fuscus) [A183]</b>                      Common Tern (Sterna hirundo) [A193]                      Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]                      Wetland and Waterbirds [A999]</p>	<p>9.7km from the proposed peat storage and restoration (habitat enhancement ) area                      10.5km from the grid connection route and the haul route</p>	<p><b>Noise &amp; vibration Pathway</b>                      This SPA is located beyond the noise emission zone of sensitivity. No noise emission pathway connects the proposed development to this SPA.</p> <p><b>Air Emission Pathway</b>                      This SPA is located beyond the air emission zone of sensitivity. No air emission pathway connects the proposed development to this SPA.</p> <p><b>Light Emission Pathway</b>                      The zone of sensitivity for the common gull and lesser-black backed gull populations of this SPA overlaps with the proposed development. Lighting will be provided on turbines at the proposed wind farm site. As such there is a potential light emission pathway connecting the proposed wind farm site to the common gull and the lesser-black backed gull populations of this SPA.</p>	<p>RECEIVED: 26/01/2023</p>

European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		<p><b>Visual Emission Pathway</b></p> <p>Visual emissions that will arise as a result of the project are restricted to the presence of the turbines at the proposed wind farm site. Common gull and lesser-black backed gull are not sensitive to disturbance as a result of changes in the visual setting of the wider surrounding landscape. No visual pathway connects the proposed development to this SPA.</p> <p><b>Mobile Species Pathway</b></p> <p>The zone of sensitivity for common gull and lesser-black backed gull overlap with the proposed development and as such there is potential for a mobile species pathway between the proposed development and these special conservation interest bird species.</p> <p><b>Human Disturbance Pathway</b></p> <p>The proposed development will not result in changes in land use or human activity within or adjoining this SPA.</p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
<p><b>Lough Carra SPA</b></p> <p><i>Special conservation interests (key ornithological receptors highlighted in bold)</i></p> <p><b>Common Gull (Larus canus) [A182]</b></p>	<p>24km from the wind farm site</p> <p>27km from the proposed peat storage and restoration (habitat enhancement ) area</p> <p>27km from the grid connection</p>	<p><b>Hydrological pathway</b></p> <p>There is no hydrological pathway connecting the proposed development to this SPA.</p> <p><b>Noise &amp; vibration Pathway</b></p> <p>This SPA is located beyond the noise emission zone of sensitivity. No noise emission pathway connects the proposed development to this SPA.</p> <p><b>Air Emission Pathway</b></p> <p>This SPA is located beyond the air emission zone of sensitivity. No air emission pathway connects the proposed development to this SPA.</p> <p><b>Light Emission Pathway</b></p> <p>The zone of sensitivity for the common gull and lesser-black backed gull populations of this SPA overlaps with the proposed development. Lighting will be provided on turbines at the proposed wind farm site. As such there is a potential light emission pathway</p>	<p>Yes</p> <p>Light emission pathway</p> <p>Mobile species pathway</p>

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
	route and the haul route	<p>connecting the proposed wind farm site to the common gull and the lesser-black backed gull populations of this SPA.</p> <p><b>Visual Emission Pathway</b></p> <p>Visual emissions that will arise as a result of the project are restricted to the presence of the turbines at the proposed wind farm site. Common gull and lesser-black backed gull are not sensitive to disturbance as a result of changes in the visual setting of the wider surrounding landscape. No visual pathway connects the proposed development to this SPA.</p> <p><b>Mobile Species Pathway</b></p> <p>The zone of sensitivity for common gull and lesser-black backed gull overlap with the proposed development and as such there is potential for a mobile species pathway between the proposed development and these special conservation interest bird species.</p> <p><b>Human Disturbance Pathway</b></p>	

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European Sites & Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Pathway Connection	Does European Site occur within the Projects Zone of Influence?
		The proposed development will not result in changes in land use or human activity within or adjoining this SPA.	

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In summary the following European Sites listed in Table 5.2 above have been identified as occurring within the zone of influence of the proposed development:

- Connemara Bog Complex SAC
- Maumturk Mountains SAC
- Lough Corrib SAC
- Kilkieran Bay and Islands SAC
- Connemara Bog Complex SPA
- Lough Corrib SPA
- Lough Mask SPA
- Lough Carra SPA

The special conservation interest bird species of the above four listed SPAs that occur within the zone of influence of the project have been identified while establishing the SPAs that required consideration under the source-pathway-receiver model (see Table 5.2 above). However, whilst the above four listed SACs have been identified as occurring within the zone of influence of the proposed development, the elements of the proposed development and the features of interest that are connected to these elements have not been identified in the preceding examination. As such the following sub-section examines which features of interest of these SACs are connected to the proposed development and to what element of the proposed development a pathway is established.

## **5.4 IDENTIFICATION OF SAC FEATURES OF INTEREST IN THE ZONE OF INFLUENCE OF THE PROPOSED DEVELOPMENT**

### **5.4.1 Connemara Bog Complex SAC**

The qualifying features of interest of the Connemara Bog Complex SAC are listed in Table 5.4 and an examination of potential pathways between the features of interest and the elements of the proposed development is also provided.

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**Table 5.4: Identification of qualifying features of interest of the Connemara Bog Complex SAC within the zone of influence of the proposed development**

Features of Interest	Pathway
Coastal lagoons [1150]	There are no pathways between the proposed development and the examples of coastal lagoon habitats supported by this SAC. A review of Map 3 of the site-specific conservation objectives for this SAC (NPWS, 2015) shows that the coastal lagoon habitats of this SAC are located at a remote distance from the nearest point of the proposed development (which is the grid connection route) and there is no hydrological pathway between this element of the proposed development and examples of this qualifying habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b>
Reefs [1170]	There are no pathways between the proposed development and the examples of reef habitats supported by this SAC. A review of Map 4 of the site-specific conservation objectives for this SAC shows that the reef habitats of this SAC are located at a remote distance from the nearest point of the proposed development (which is the grid connection route) and there is no hydrological pathway between this element of the proposed development and examples of this qualifying habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b>
Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110]	There are no pathways between the proposed development and the confirmed examples of this habitat supported by this SAC. A review of Map 6 of the site-specific conservation objectives for this SAC shows that the confirmed examples of Oligotrophic isoetid lake habitat of this SAC is located at a remote distance from the nearest point of the proposed development (which is the grid connection route) and there is no hydrological pathway between this element of the proposed development and examples of this qualifying habitat.  Map 6 of the site-specific conservation objectives also maps “potential” Oligotrophic isoetid lake habitat for this SAC. The proposed grid connection route will be installed along the existing public road that crosses or adjoins examples of this potential habitat. The proposed haul route widening location 3 is located within 60m of an example of potential Oligotrophic isoetid lake habitat. Given the proximity of these elements of the proposed development to potential examples of this habitat it is <b>identified as occurring within the zone of influence of the proposed development.</b>

<p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]</p>	<p>There are no pathways between the proposed development and the examples of this habitat supported by this SAC. A review of Map 6 of the site-specific conservation objectives for this SAC shows that the nearest example of a Mixed <i>Najas flexilis</i> lake habitat to this SAC is located at Lough Bofin, approximately 150m to the south of the proposed wind farm site. This lake is situated within a separate surface water sub-catchment to the proposed wind farm site and there is no hydrological pathway connecting the proposed wind farm site or any other element proposed development to this lake. No other example of this habitat occurs in close proximity to the proposed development, nor is it connected to the proposed development by pathways such as a hydrological pathway. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
<p>Natural dystrophic lakes and ponds [3160]</p>	<p>There are no pathways between the proposed development and the examples of this habitat supported by this SAC. A review of Map 6 of the site-specific conservation objectives for this SAC shows that the Acid oligotrophic lake habitat of this SAC is located at a remote distance from the nearest point of the proposed development (which is the grid connection route) and there is no hydrological pathway between this element of the proposed development and examples of this qualifying habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
<p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</p>	<p>Map 7 of the site-specific conservation objective for this SAC indicates the location of all rivers and streams occurring within the SAC. The exact location of this habitat within the SAC is unknown and so all watercourses within the SAC are considered to be representative of potential examples of this habitat. Watercourses occurring within this SAC are crossed by the proposed grid connection route and the haul route and widening area 3 and 4 along the haul route are located in the vicinity of a watercourses. Given the crossing of SAC watercourse by these elements of the proposed development and the proximity of haul route widening areas, a hydrological pathway is identified as having the potential to connect these elements of the proposed development to this habitat. <b>This habitat is identified as occurring within the zone of influence of the proposed development.</b></p>
<p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p>	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that wet heath habitat occurs along the section of the proposed grid connection route and haul route that pass through the SAC along the R336</p>

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	<p>and R340. These sections of the proposed development are located within 50m of mapped wet heath habitat. Given this proximity and the nature of this habitat, pathway identified as having the potential to connect the proposed development to this habitat is an air emission pathway. In light of this, the wet heath habitat of the SAC <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
European dry heaths [4030]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that dry heath habitat occurs to the west of the proposed grid connection route and haul route that pass along a section of the R336. The extent of the dry heath habitat at this location is buffered from the R336 by approximately 80m. Given this buffer, along with the fact that this habitat is not influenced by lotic processes and hydrological pathways, <b>this habitat does not occur within the zone of influence of the proposed development.</b></p>
Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> ) [6410]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples <b>this habitat, it does not occur within the zone of influence of the proposed development.</b></p>
Blanket bogs (* if active bog) [7130]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that blanket bog habitat occurs along the section of the proposed grid connection route and haul route that pass through the SAC along the R336. These sections of the proposed development are located within 50m of mapped wet heath habitat. Given this proximity and the nature of this habitat, pathway identified as having the potential to connect the proposed development to this habitat is an air emission pathway. In light of this, the blanket bog habitat of the SAC <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
Transition mires and quaking bogs [7140]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any</p>

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	examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Alkaline fens [7230]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	There are no pathways between the proposed development and the examples of old oak woodland habitats supported by this SAC. A review of Map 8 of the site-specific conservation objectives for this SAC shows that the old oak woodland of this SAC are located at a remote distance from the nearest point of the proposed development (which is the haul route) and there is no pathway between this element of the proposed development and examples of this qualifying habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b>
<i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]	The distribution of marsh fritillary and marsh fritillary colonies have been mapped as part of the Article 17 mapping. This mapping shows that the distribution of this species within this SAC is located to the south of the SAC, north of Inverin and Spiddal. There are no pathways connecting the proposed development to the habitats upon which this species rely. As such <b>the populations of this species supported by this SAC does not occur within the zone of influence of the proposed development.</b>
<i>Salmo salar</i> (Salmon) [1106]	Watercourses of the SAC are crossed by the proposed grid connection route and the haul route. These watercourses have the potential to support Atlantic salmon. A hydrological pathway connects the proposed development to lotic habitats that are relied upon by this species. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b>

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<p><i>Lutra lutra</i> (Otter) [1355]</p>	<p>Watercourses of the SAC are crossed by the proposed grid connection route and the haul route. These watercourses have the potential to support otters. A hydrological pathway connects the proposed development to lotic habitats that are relied upon by this species. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b></p>
<p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	<p>There are no pathways between the proposed development and the examples of this habitat supported by this SAC. A review of Map 9 of the site-specific conservation objectives for this SAC shows that the nearest example of a <i>Najas flexilis</i> lake habitat to this SAC is located at Lough Bofin, approximately 150m to the south of the proposed wind farm site. This lake is situated within a separate surface water sub-catchment to the proposed wind farm site and there is no hydrological pathway connecting the proposed wind farm site or any other element of the proposed development to this lake. No other example of <i>Najas flexilis</i> habitat occurs in close proximity to the proposed development or is connected to the proposed development by pathways such as hydrological pathway. <b>This species does not occur within the zone of influence of the proposed development.</b></p>

#### 5.4.2 Maumturk Mountains SAC

The qualifying features of interest of the Maumturk Mountains SAC are listed in Table 5.5 and an examination of potential pathways between the features of interest and the elements of the proposed development is also provided.

**Table 5.5: Identification of qualifying features of interest of the Maumturk Mountains SAC within the zone of influence of the proposed development**

Features of Interest	Pathway
<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p>	<p>There are no confirmed examples of this habitat mapped as part of the published site-specific conservation objectives for this SAC. Map 3 of the site-specific conservation objectives maps “potential” Oligotrophic isoetid lake habitat for this SAC (NPWS, 2017a). The northern proposed peat storage and restoration (habitat enhancement) area is located in close proximity to Loughanillaun, which is mapped as an example of</p>

	<p>“potential” Oligotrophic isoetid lake habitat, hydrological pathways in the form of an existing stream and open drains connect the northern proposed peat storage and restoration (habitat enhancement) area to this lake habitat. Given the proximity of this element of the proposed development to potential examples of this habitat it <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that wet heath habitat adjoins the boundary of the northern proposed peat storage and restoration (habitat enhancement) area. In light of this, the wet heath habitat of the SAC <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
Alpine and Boreal heaths [4060]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that examples of this heath habitat occur at elevated locations approximately 1.5km to the northwest of the nearest point of the proposed development (which is the northern area of the proposed peat storage and restoration (habitat enhancement) area). No pathways connect the proposed development to examples of this habitat within this SAC. In light of this, the alpine heath habitat of the SAC <b>is not identified as occurring within the zone of influence of the proposed development.</b></p>
Blanket bogs (* if active bog) [7130]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that blanket bog habitat adjoins the boundary of the northern proposed peat storage and restoration (habitat enhancement) area. In light of this, the blanket bog habitat of the SAC <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
Depressions on peat substrates of the Rhynchosporion [7150]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b></p>

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<p>Siliceous rocky slopes with chasmophytic vegetation [8220]</p>	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping shows that examples of siliceous rocky slopes within this SAC occur in conjunction with alpine heath habitat at elevated locations approximately 1.5km to the northwest of the nearest point of the proposed development (which is the northern area of the proposed peat storage and restoration (habitat enhancement) area). No impact pathways connect the proposed development to examples of this habitat within this SAC. In light of this, the siliceous rocky slopes <b>habitat does not occur within the zone of influence of the proposed development.</b></p>
<p><i>Salmo salar</i> (Salmon) [1106]</p>	<p>The northern section of the proposed peat storage and restoration (habitat enhancement) area is hydrologically connected to Loughanillaun, which is known to support Atlantic salmon. Given the presence of a hydrological pathway between the northern proposed peat storage and restoration (habitat enhancement) area and the Atlantic salmon habitat occurring at Loughanillaun, this species <b>is identified as occurring within the zone of influence of the proposed development.</b></p>
<p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	<p>There are no pathways between the proposed development and the examples of this habitat supported by this SAC. A review of Map 4 of the site-specific conservation objectives for this SAC shows that the nearest example of a <i>Najas flexilis</i> lake habitat to this SAC is located at Derryneen Lough, approximately 8.5km to the west of the proposed peat storage and restoration (habitat enhancement) area. There are no pathways connecting the proposed development to this lake. No other example of <i>Najas flexilis</i> habitat occurs in close proximity to the proposed development or is connected to the proposed development by pathways such as hydrological pathway. <b>This species does not occur within the zone of influence of the proposed development.</b></p>

### 5.4.3 Lough Corrib SAC

The qualifying features of interest of the Lough Corrib SAC are listed in Table 5.6 and an examination of potential pathways between the features of interest and the elements of the proposed development is also provided.

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**Table 5.6: Identification of qualifying features of interest of the Lough Corrib SAC within the zone of influence of the proposed development**

Features of Interest	Pathway
Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110]	The Owenwee River establishes a hydrological pathway between confirmed examples of this habitat, as per Map 3 of the published site-specific conservation objectives (NPWS, 2017b), and the proposed wind farm site. Given the presence of this hydrological pathway this habitat it <b>is identified as occurring within the zone of influence of the proposed development.</b>
Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	The nearest point of this habitat, as mapped on Map 3 of the site-specific conservation objectives, to the outfall of the Owenwee River to Lough Corrib is approximately 2.2km to the east. This habitat is separated from the outfall location by the example of Oligotrophic isoetid lake habitat, that has been identified as occurring within the zone of influence of the proposed development. In light of this separation distance and the identification of Oligotrophic isoetid lake habitat within the zone of influence of the proposed development, this 3130 habitat <b>does not occur within the zone of influence of the proposed development.</b>
Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	The nearest point of this habitat, as mapped on Map 3 of the site-specific conservation objectives, to the outfall of the Owenwee River to Lough Corrib is approximately 15km to the east. This habitat is separated from the outfall location by the example of Oligotrophic isoetid lake habitat, that has been identified as occurring within the zone of influence of the proposed development. In light of this separation distance and the identification of Oligotrophic isoetid lake habitat within the zone of influence of the proposed development, this 3140 habitat <b>does not occur within the zone of influence of the proposed development.</b>
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	There are no pathways connecting the proposed development to watercourses of this SAC and potential examples of this habitat. The hydrological pathways that connect the proposed development to this SAC is established by the Owenwee River, which drains the proposed wind farm site and eventually discharges to the lake habitat of the Lough Corrib SAC. As such <b>this habitat does not occur within the zone of influence of the proposed development.</b>

Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (* important orchid sites) [6210]	No examples of this habitat occur in the vicinity of the proposed development and there are no pathways connecting the proposed development to this habitat. As such <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> ) [6410]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Active raised bogs [7110]	Map 4 of the site-specific conservation objectives shows the location of the examples of active raised bog within this SAC. These examples are located at a remote distance (approximately 30km to the southeast of the proposed wind farm site). There are no pathways connecting proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b>
Degraded raised bogs still capable of natural regeneration [7120]	Map 4 of the site-specific conservation objectives shows the location of the examples of active raised bog within this SAC. These examples are located at a remote distance (approximately 30km to the southeast of the proposed wind farm site). There are no pathways connecting proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b>
Depressions on peat substrates of the Rhynchosporion [7150]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b>
Petrifying springs with tufa formation ( <i>Cratoneurion</i> ) [7220]	The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of

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	<p>the Article 17 mapping however no examples of this habitat are mapped as part of this dataset within the Lough Corrib SAC. This is a groundwater dependent habitat. the proposed wind farm site, which is the nearest element of the proposed development to this SAC, as well as the proposed peat storage and restoration (habitat enhancement) area are situated in an area that is composed of low transmissivity rocks with low permeability bedrock. Baseflow contributions to rivers and streams are likely to be relatively low and groundwater flow direction is considered to follow topography (GSI, 2004). Given the bedrock characteristics, the topography of the wind farm site which falls to the south and east away from the SAC and the distance of circa 1km between the wind farm site and this SAC, there are no pathways connecting the proposed development to this habitat. Given the absence of any pathways connecting the proposed development to this habitat, <b>it does not occur within the zone of influence of the proposed development.</b></p>
Alkaline fens [7230]	<p>The extent of this habitat within the SAC has not been mapped as part of the published site-specific conservation objectives. The national distribution of this habitat has been mapped as part of the Article 17 mapping. This mapping does not show the presence of any examples of this habitat within the wider vicinity of the proposed development. Given the absence of any examples of <b>this habitat does not occur within the zone of influence of the proposed development.</b></p>
Limestone pavements [8240]	<p>Map 7 of the site-specific conservation objectives shows the location of the examples of limestone pavement within this SAC. These examples are located at a remote distance (approximately 32km to the southeast of the proposed wind farm site). There are no pathways connecting proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	<p>Map 8 of the site-specific conservation objectives shows the location of the examples of limestone pavement within this SAC. These examples are located at a remote distance (approximately 7km to the east of the proposed wind farm site). There are no pathways connecting proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Bog woodland [91D0]	<p>Map 8 of the site-specific conservation objectives shows the location of the examples of limestone pavement within this SAC. These examples are located at a remote distance (approximately 7km to the east of the proposed wind farm site). There are no pathways connecting proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>

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<p><i>Margaritifera margaritifera</i>          (Freshwater Pearl Mussel) [1029]</p>	<p>The freshwater pearl mussel catchment of this SAC is restricted to the Owenriff sub-catchment occurring within the Ballycurke Lough Stream sub-catchment (SC_010). No element of the proposed development is located within this catchment and there is no hydrological pathway connecting the proposed development to this catchment. The stretch of the Owenriff catchment that is targeted under the site-specific conservation objectives of the SAC for the restoration/maintenance of suitable habitat for freshwater pearl mussel is located approximately 5km to the east of the proposed development. There is no pathway connecting an element of the proposed development to the stretch of the Owenriff catchment that is targeted under the site-specific conservation objectives for the restoration/maintenance of suitable habitat and freshwater pearl mussel distribution. Given the absence of pathways <b>this species does not occur within the zone of influence of the proposed development.</b></p>
<p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p>	<p>The site-specific conservation objectives for white-clawed crayfish notes that the distribution of this species within the SAC is uncertain. Map 10 of the site-specific conservation objectives shows the locations of known white-clawed crayfish populations. However it is likely that this species occurs widely throughout the SAC. The Owenwee River establishes a hydrological pathway between the proposed wind farm site and potentially suitable habitat for this species downstream at Lough Corrib. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b></p>
<p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p>	<p>The site-specific conservation objectives for this SAC does not map the distribution of this species within the SAC. While no suitable habitat for lamprey species has been identified within the Owenwee catchment draining the proposed wind farm site, Lough Corrib downstream is known to support populations of this species. The Owenwee River establishes a hydrological pathway between the proposed wind farm site and suitable habitat for this species downstream at Lough Corrib. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b></p>
<p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p>	<p>The site-specific conservation objectives for this SAC does not map the distribution of this species within the SAC. While no suitable habitat for lamprey species has been identified within the Owenwee catchment draining the proposed wind farm site, Lough Corrib downstream is known to support populations of this species. The Owenwee River establishes a hydrological pathway between the proposed wind farm site and suitable habitat for this species downstream at Lough Corrib. As such</p>

	<b>this species is identified as occurring within the zone of influence of the proposed development.</b>
<i>Salmo salar</i> (Salmon) [1106]	The site-specific conservation objectives for this SAC does not map the distribution of this species within the SAC. However, Lough Corrib is known to be of significant importance for this species and the Owenwee catchment draining the proposed wind farm site also supports Atlantic salmon associated with the Lough Corrib population (see EIAR Chapter 6). The Owenwee River establishes a hydrological pathway between the proposed wind farm site and suitable habitat for this species downstream at Lough Corrib. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b>
<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	Map 11 shows the known location of lesser horseshoe bat roosts and foraging grounds within the SAC. The nearest location of a lesser horseshoe bats foraging habitat to the proposed development is approximately 6km to the northeast of the proposed wind farm site. the nearest roost location from the proposed development is located approximately 8.5km to the northeast of the proposed wind farm site. The nearest point of the core sustenance zone for the known lesser horseshoe bat population of the SAC to the proposed development is approximately 6km to the northeast. No lesser horseshoe bat activity was recorded within the proposed wind farm site during baseline bat activity surveys, while only one call of a lesser horseshoe bats was recorded at one monitoring location within Derroura Forest conifer plantation, approximately 1km to the east of the proposed wind farm site (see EIAR, Chapter 6). In light of the above the proposed wind farm site is not relied upon by lesser horseshoe bats and <b>this species does not occur within the zone of influence of the proposed development.</b>
<i>Lutra lutra</i> (Otter) [1355]	Map 12 of the SAC shows the location of otter commuting habitat. Suitable otter habitat occurs downstream of the proposed wind farm site at Lough Corrib, at the outfall of the Owenwee River. Suitable habitat for the otter population of the SAC also occurring upstream of Lough Corrib along the Owenwee River. A hydrological pathway connects the proposed development to lotic habitats that are relied upon by this species. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b>
<i>Najas flexilis</i> (Slender Naiad) [1833]	Map 13 of the site-specific conservation objectives for this SAC shows the known habitat for this species within the SAC. The area of known habitat encompasses the section of Lough Corrib to the north of the proposed wind farm site (i.e. Upper Lough Corrib), into which the Owenwee River drains. Only one record for the presence of <i>Najas flexilis</i> has been recorded in this area of

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	<p>Lough Corrib (O'Connor, 2013). This record is from 1986 and was recorded from the very northwest of Upper Lough Corrib in the townland of Teernakill South, and approximately 4.5km to the northwest of the Owenwee River outfall to Lough Corrib. Rodin et al. (2021) seem to suggest that this record from 1986 is as yet unconfirmed. Notwithstanding this and given the mapping of this section of Lough Corrib as <i>Najas flexilis</i> habitat the Owenwee River establishes a hydrological pathway between the proposed wind farm site and the known habitat of this species. <b>This species is identified as occurring within the zone of influence of the proposed development.</b></p>
<p><i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [1393]</p>	<p>Map 10 of the site-specific conservation objectives for this SAC shows the location of the known distribution of this species within the SAC. It is noted that this species may occur elsewhere within the SAC. This species is restricted to peatland habitats within the SAC. There are no pathways connecting the proposed development to the peatland habitats of this SAC and potential suitable habitat <i>Ir Hamatocaulis vernicosus</i>. As such there are no pathways connecting the proposed development to this species. <b>This species does not occur within the zone of influence of the proposed development.</b></p>

#### 5.4.4 Kilkieran Bay and Islands SAC

The qualifying features of interest of the Kilkieran Bay and Islands SAC are listed in Table 5.7 and an examination of potential pathways between the features of interest and the elements of the proposed development is also provided.

**Table 5.7: Identification of qualifying features of interest of the Kilkieran Bay and Islands SAC within the zone of influence of the proposed development**

Features of Interest	Pathway
Mudflats and sandflats not covered by seawater at low tide [1140]	Map 3 of the site-specific conservation objectives published for this SAC (NPWS, 2014) map the location of tidal mudflats and sandflats habitat of this SAC. No examples of this habitat occur in the vicinity of the proposed development and there are no pathways connecting the proposed development to examples of

	<p>this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Coastal lagoons [1150]	<p>Map 4 of the published site-specific conservation objectives for this SAC shows the location of coastal lagoons occurring within this SAC. These are located in the vicinity of the proposed grid connection route and haul route along the R336. Streams flow under the R336 along the proposed haul route and drain into examples of this habitat. As such there is a hydrological pathway connecting the proposed grid connection route and haul route to this habitat. <b>This habitat is identified as occurring within the zone of influence of the proposed development.</b></p>
Large shallow inlets and bays [1160]	<p>Map 5 of the published site-specific conservation objectives for this SAC shows the location of this habitat within the SAC. No examples of this habitat occur in the vicinity of the proposed development and there are no pathways connecting the proposed development to examples of this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Reefs [1170]	<p>Map 6 of the published site-specific conservation objectives for this SAC shows the location of reefs occurring within this SAC. These are located in the vicinity of the proposed grid connection route along the R340. Streams flow under the R340 along the proposed grid connection route and drain into the coast in the vicinity of this habitat. As such there is a hydrological pathway connecting the proposed grid connection route to this habitat. <b>This habitat is identified as occurring within the zone of influence of the proposed development.</b></p>
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	<p>Map 8 of the published site-specific conservation objectives for this SAC shows the location of saltmarsh habitats occurring within this SAC. An example of “potential” Atlantic salt meadows and Mediterranean salt meadows occurs to the south of the proposed grid connection route along the R340 near Screebe. There is no stream occurring at this location that could connect the R340 to the coast and the examples of these potential saltmarsh habitats. As such no potential pathway is identified as connecting the proposed development to this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	<p>Map 8 of the published site-specific conservation objectives for this SAC shows the location of saltmarsh habitats occurring within this SAC. An example of “potential” Atlantic salt meadows and Mediterranean salt meadows occurs to the south of the proposed grid connection route along the R340 near Screebe. There is no stream occurring at this location that could connect the R340 to the coast and the examples of these potential</p>

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	<p>saltmarsh habitats. As such no potential pathway is identified as connecting the proposed development to this habitat. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Machairs (* in Ireland) [21A0]	<p>Map 9 of the published site-specific conservation objectives for this SAC shows the location of machair occurring within this SAC. The distribution of this habitat within the SAC is at remote locations from the proposed development, with the nearest point being approximately 16km to the southwest of the proposed grid connection route. <b>This habitat does not occur within the zone of influence of the proposed development.</b></p>
Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [6510]	<p>The extent and distribution of this habitat within the SAC is currently unknown. However, no elements of the proposed development are located within or adjacent to grassland habitat within this SAC. The section of the R340 that will accommodate the proposed grid connection route and the haul route are buffered from the boundary of this SAC. The habitats within the SAC boundary occurring to the south of this section of the R340 are comprised of predominantly coastal intertidal habitat. Terrestrial habitat in the form of <i>Juncus effusus</i> and <i>Molinia</i> dominated wet grassland occurs within the SAC at a location approximately 450m to the northeast of the proposed grid connection route terminus at Screebe substation. This area of terrestrial grassland habitat is not an example of lowland hay meadow habitat. The terrestrial habitats that bound the section of the proposed haul route adjacent to the SAC boundary between Lough Cara Finonnla and Lough Cara na gCaorach (north of Costelloe) are dominated by wet grassland in the form of <i>Juncus</i> and <i>Molinia</i> dominated wet grassland as well as dry heath and scrub. No examples of lowland hay meadow occurs along this stretch of the SAC in the vicinity of the proposed route. Given the absence of any examples of this habitat in the vicinity of the proposed haul route, <b>this habitat does not occur within the zone of influence of the proposed development.</b></p>
<i>Lutra lutra</i> (Otter) [1355]	<p>Map 10 of the site-specific conservation objectives for this SAC shows the location of otter commuting habitat. Suitable otter habitat occurs downstream of the proposed wind farm site at Lough Corrib, at the outfall of the Owenwee River. Suitable habitat for the otter population of the SAC also occurring upstream of Lough Corrib along the Owenwee River. A hydrological pathway connects the proposed development to lotic habitats that are relied upon by this species. As such <b>this species is identified as occurring within the zone of influence of the proposed development.</b></p>

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<p><i>Phoca vitulina</i> (Harbour Seal) [1365]</p>	<p>Map 11 of the site-specific conservation objectives for this SAC shows the harbour seal habitats for this SAC. The nearest seal habitat to the proposed development is approximately 1km to the west/southwest of the proposed grid connection route terminus at the Screebe substation. There are no pathways connecting the proposed development to seal habitat. <b>This species does not occur within the zone of influence of the proposed development.</b></p>
<p><i>Najas flexilis</i> (Slender Naiad) [1833]</p>	<p>Map 12 of the site-specific conservation objectives for this SAC shows the known habitat for this species within the SAC. The nearest example of this habitat to the proposed development is approximately 5km to the west of the proposed haul route. There are no pathways connecting the proposed haul route to the habitats that support this species. <b>This species does not occur within the zone of influence of the proposed development.</b></p>

## 5.5 SUMMARY OF FEATURES OF INTEREST OF EUROPEAN SITES OCCURRING WITHIN THE ZONE OF INFLUENCE OF THE PROJECT

Following on from the examination set out in Section 5.3 and Section 5.4 above, Table 5.8 below provides a summary of the European Sites and their relevant features of interest that occur within the zone of influence of the proposed development. Also listed in Table 5.8 are the specific elements of the proposed development and the related pathways that trigger the inclusion of these European Sites and relevant features of interest within the zone of influence of the proposed development.

**Table 5.8: Summary of European Sites & Features of interest within the zone of influence & the elements and pathways connecting the proposed development**

European Sites	Features of interest	Element of the proposed development	Pathway
<b>SACs</b>			
Connemara Bog Complex SAC	3110 Oligotrophic isoetid lake habitat	proposed grid connection route proposed haul route	hydrological pathway
	3260 Floating River Vegetation	proposed grid connection route proposed haul route	hydrological pathway
	4010 Wet heath	proposed grid connection route proposed haul route	air emission

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	7130 blanket bog	proposed grid connection route proposed haul route	air emission
	1106 Atlantic salmon	proposed grid connection route proposed haul route	hydrological pathway
	1355 Otter	proposed grid connection route proposed haul route	hydrological pathway noise pathway visual pathway
Maumturk Mountains SAC	3110 Oligotrophic isoetid lake habitat	proposed peat storage and restoration (habitat enhancement) area	Physical disturbance hydrological pathway
	4010 Wet heath	proposed peat storage and restoration (habitat enhancement) area	Physical disturbance air emission
	7130 blanket bog	proposed peat storage and restoration (habitat enhancement) area	Physical disturbance air emission
	1106 Atlantic salmon	proposed peat storage and restoration (habitat enhancement) area	hydrological pathway
Lough Corrib SAC	3110 Oligotrophic isoetid lake habitat	proposed wind farm site	hydrological pathway
	1092 White-clawed crayfish	proposed wind farm site	hydrological pathway
	1095 Sea lamprey	proposed wind farm site	hydrological pathway
	1096 Brook lamprey	proposed wind farm site	hydrological pathway
	1106 Atlantic salmon	proposed wind farm site	hydrological pathway
	1355 Otter	proposed wind farm site	hydrological pathway
	1833 Najas flexilis	proposed wind farm site	hydrological pathway
Kilkieran Bay and Islands SAC	1150 Coastal lagoons	proposed haul route	hydrological pathway
	1170 Reefs	proposed grid connection route proposed haul route	hydrological pathway
	1355 Otter	proposed grid connection route proposed haul route	hydrological pathway
<b>SPAs</b>			
Connemara Bog Complex SPA	Cormorant	Grid connection route haul route	hydrological pathway noise pathway air pathway mobile species pathway

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	Merlin	Grid connection route Haul Route	noise pathway air pathway mobile species pathway
	Golden Plover	Grid connection route Haul route	hydrological pathway noise pathway air pathway mobile species pathway
	Common Gull	proposed wind farm site	mobile species pathway light emission pathway
		proposed peat storage and restoration (habitat enhancement) area	mobile species pathway
		grid connection route	hydrological pathway noise pathway air pathway mobile species pathway
		haul route	hydrological pathway noise pathway air pathway mobile species pathway
Lough Corrib SPA	Hen Harrier	proposed wind farm site	mobile species pathway light emission pathway
	Greenland white-fronted geese	proposed wind farm site	mobile species pathway light emission pathway
		proposed peat storage and restoration (habitat enhancement) area	mobile species pathway
		grid connection route	mobile species pathway
		haul route	mobile species pathway
	Golden Plover	proposed wind farm site	mobile species pathway light emission pathway
		proposed peat storage and restoration (habitat enhancement) area	mobile species pathway

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		grid connection route	mobile species pathway
		haul route	mobile species pathway
	Common Gull	proposed wind farm site	mobile species pathway hydrological pathway light emission pathway
		proposed peat storage and restoration (habitat enhancement) area	mobile species pathway hydrological pathway
		grid connection route	mobile species pathway hydrological pathway
		haul route	mobile species pathway hydrological pathway
	Wetland and Waterbirds	proposed wind farm site	mobile species pathway hydrological pathway light emission pathway
		proposed peat storage and restoration (habitat enhancement) area	mobile species pathway hydrological pathway
		grid connection route	mobile species pathway hydrological pathway
		haul route	mobile species pathway hydrological pathway
Lough Mask SPA	Common Gull	proposed wind farm site	mobile species pathway light emission pathway
	Lesser-Black Backed Gull	proposed wind farm site	mobile species pathway light emission pathway
Lough Carra SPA	Common Gull	proposed wind farm site	mobile species pathway light emission pathway

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## **6.0 IDENTIFICATION OF LIKELY SIGNIFICANT EFFECTS**

An examination of the likely significant effects to European Sites and relevant features of interest that could arise as a result of the elements of the proposed development and the pathways summarised in Table 5.8 above is set out in the following subsections. This examination is provided with respect to each of the pathways identified in Table 5.8.

### **6.1 PHYSICAL DISTURBANCE**

The boundary of the northern section of the proposed peat storage and restoration (habitat enhancement) area has been identified as overlapping within the boundary of the Maumturk Mountains SAC. A review of Article 17 mapping, as well as primary field data collected during field surveys completed at the proposed peat storage and restoration (habitat enhancement) area (see Tullaghmore Wind Farm EIAR, Chapter 6) has identified the presence of blanket bog and wet heath habitat within these overlapping areas and also adjoining other sections of the proposed peat storage and restoration (habitat enhancement) area.

Spoil material from the proposed wind farm site will be deposited within the northern section of the proposed peat storage and restoration (habitat enhancement) area. This material will be used to restore the cutover and degraded blanket bog occurring within this area of the proposed peat storage and restoration (habitat enhancement) area. However, any inappropriate disposal of spoil material or movement of construction plant and machinery at the edge of the proposed peat storage and restoration (habitat enhancement) area and within the SAC boundary will have the potential to result in physical disturbance and damage to these qualifying habitats of the Maumturk Mountains SAC. In light of this risk the potential for adverse effects to the blanket bog and wet heath habitats of the Maumturk Mountains SAC have been identified and further examination of these effects are required as part of a Natura Impact Statement for the proposed development.



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## 6.2 HYDROLOGICAL PATHWAY

A number of elements of the proposed development will be connected to a variety of features of interest of surrounding SACs and SPA as a result of a hydrological pathway. The features of interest of surrounding European Sites that will be connected to the proposed development as a result of a hydrological pathway are:

- 1150 Coastal lagoons;
- 1170 Reefs;
- 3110 Oligotrophic isoetid lake habitat;
- 3260 Floating River Vegetation;
- Wetland habitats of the Lough Corrib SPA;
- Annex 2 freshwater species in the form of Atlantic salmon, sea lamprey and brook lamprey; otters, white-clawed crayfish and *Najas flexilis*; and
- Annex 1 bird species in the form of cormorant, golden plover, common gull and waterbirds.

All four main elements of the proposed development, comprising the proposed wind farm site, the proposed peat storage and restoration (habitat enhancement) area, the proposed grid connection route and the proposed haul route are connected to one or more of these features of interest. In the absence of appropriate safeguards works associated with these elements of the proposed development will have the potential to generate contaminated surface water runoff. The discharge of contaminants from the proposed development along hydrological pathways to these receptors has the potential to result in negative effects to their status and undermine their conservation objectives.

Given the potential for such a risk to arise further examination of the proposed development and the impacts that could arise as a result of the release of contaminated surface water runoff along hydrological pathways is required as part of a Natura Impact Statement for the proposed development.

Given the potential for such a risk to arise further examination of the proposed development and the impacts that could arise as a result of the release of contaminated surface water runoff along hydrological pathways is required as part of an Natura Impact Statement of the proposed development.

### **6.3 AIR EMISSION PATHWAY**

Works associated with the proposed grid connection route, haul route and at the northern section of the Maumturk Mountains SAC will be undertaken within 50m of examples of blanket bog and wet heath qualifying habitats of both the Connemara Bog Complex SAC and the Maumturk Mountains SAC. Blanket bog and wet heath habitats are known to be particularly sensitive to air emissions and given that these habitats are located within the risk zone of air emissions (see Holman et al., 2014) the potential for adverse effects to these habitats cannot be ruled out at the screening stage. As such the potential for these elements of the proposed development and associated air emissions to result in adverse effects to blanket bog and wet heath habitat requires further examination as part of a Natura Impact Statement for the proposed development.

### **6.4 MOBILE SPECIES PATHWAY**

A mobile species pathway has been identified between the Atlantic salmon and otter population of the Lough Corrib SAC owing to the hydrological pathway connecting the Owenwee River to the proposed wind farm site and the presence of suitable habitat along this river to support these two qualifying species of this SAC. In the event that the proposed wind farm site results in negative impacts to the water quality of the Owenwee River the potential will exist for perturbations to the habitat of Atlantic salmon and otter populations of the Lough Corrib SAC.

A mobile species pathway has been identified between the proposed wind farm site and the following special conservation interest bird species: cormorant; merlin; hen harrier; Greenland white-fronted

geese; golden plover; common gull; and lesser-black backed gull. This pathway has been identified as each of these species have been identified as key ornithological receptors of the proposed wind farm site following detailed bird surveys (see EIAR, Chapter 7). Given the potential for interactions between the proposed development and these species the potential for associated impacts such as disturbance, displacement and collision cannot be ruled out at the screening stage. Further examination of these potential impacts will be required as part of an Natura Impact Statement of the proposed development.

## **6.5 IN-COMBINATION EFFECTS**

In the event that the proposed development overlaps within other projects and land use activities that give rise to similar impacts to the features of interest occurring within the zone of influence of the project the potential will exist for cumulative negative impacts to these receptors. In light of this an examination of the proposed developments potential to combine with other projects and land use activities in the surrounding area will be required to determine whether or not these species are at risk of adverse effects. This examination will be required to form part of the Natura Impact Statement of the proposed development.

## 7.0 SCREENING CONCLUSION

The project has been screened for its potential to result in likely significant effects to surrounding European Sites. A Source-Pathway-Receiver model was used to identify potential impact pathways linking the project site to European Sites.

A total of 8 European Sites comprising 4 SACs and 4 SPAs have been identified as occurring within the zone of influence of the project. A total of 19 features of interest that are associated with these 8 European Sites have been identified as occurring within the zone of influence of the project. These features of interest have been identified as being at risk of adverse effects from a number of potential pathways that connect the proposed development to them. These pathways include: physical disturbance; hydrological; air; light and mobile species pathways.

The potential for the proposed development to result in adverse effects to these European Sites and associated features of interest cannot be ruled out at the screening stage.

The potential for the proposed development to result in adverse effects to these European Sites and associated features of interest cannot be ruled out at the screening stage.

For the reasons outlined above it is the considered view of the authors of this Screening Report for Appropriate Assessment that the potential for likely significant effects to the following eight European Sites cannot be ruled out at the Screening stage and that an Appropriate Assessment of the project is required:

- Connemara Bog Complex SAC
- Maumturk Mountains SAC
- Lough Corrib SAC
- Kilkieran Bay and Islands SAC
- Connemara Bog Complex SPA
- Lough Corrib SPA

- Lough Mask SPA
- Lough Carra SPA

The authors have also concluded that it can be excluded, on the basis of objective information and in view of best scientific knowledge, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on any other European Site. Based on this conclusion a NIS has been prepared to inform the competent authority, in this case Galway County Council, during its Appropriate Assessment of the project and its potential to result in adverse effects to the integrity of the above listed European Sites, alone or in-combination with other plans or projects.

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