PROPOSED BALLYKETT WIND FARM,

COUNTY CLARE

SCREENING REPORT FOR APPROPRIATE ASSESSMENT

AND

NATURA IMPACT STATEMENT

February 2024

Prepared for

Ballykett Green Energy Ltd

by

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1. INTRODUCTION

BioSphere Environmental Services has been appointed by Ballykett Green Energy Ltd to prepare a report to inform screening for Appropriate Assessment, and a Natura Impact Statement (NIS) for the proposed Ballykett Wind Farm in County Clare (the proposed Project).

The purpose of the report is to provide the information required to assist the competent planning authority to conduct an Article 6(3) Screening for Appropriate Assessment of the proposed Development and, if considered necessary, an Appropriate Assessment (AA).

Based on best available scientific knowledge, the potential effects on European sites, both as a result of the proposed Project and in-combination with other plans and projects, are appraised in this report.

The requirements for "Appropriate Assessment" are set out *under Article 6 of the EU Habitats Directive (92/34/EEC)*, transposed into Irish law through the *European Union (Birds and Natural Habitats) Regulations 2011-2015* and the *Planning and Development Act, 2000* (as amended).

The assessment in this report is based on a desk study and various field surveys undertaken from 2021 to 2023.

1.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (2009/147/EC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (see below).

> "*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public"*

This provision has been implemented in the context of the planning code under article 177V of the Planning and Development Act, 2000, as amended.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any adverse effects on European sites by identifying possible effects early in the planning stage, and designing the project in order to avoid such effects. Second, mitigation measures should be applied, if necessary, during the AA process to the point, where no adverse effects on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect(s).

1.2 Stages of the Appropriate Assessment (AA)

This Appropriate Assessment Report / Natura Impact Statement has been prepared in accordance with the following guidance:

- *Appropriate Assessment of Plans and Projects in Ireland.* Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, 2010 revision;
- *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. European Commission Environment DG, 2021;
- *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC.* Guidance issued by European Commission (21st November 2018).
- *Assessment of Plans and Projects in relation to Natura 2000 sites – (Revised) Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* Guidance issued by European Commission (28.9.2021 C(2021) 6913 final)
- *ANNEX to the Commission notice to the Assessment of Plans and Projects in relation to Natura 2000 sites – (Revised) Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC : Examples of Practices, Case Studies, Methods and National Guidance.* Issued by European Commission (28.9.2021 C(2021) 6913 final)
- OPR Practice Note PN01 Appropriate Assessment Screening for Development Management. March 2021.

There are up to four successive stages involved in the Appropriate Assessment process. The outcome at each stage determines whether the next stage in the process is required. The following describes each of the four stages:

Stage 1 – Screening

The purpose of the screening stage is to determine, in view of best scientific knowledge, whether a plan or project, individually or in-combination with other plans or projects, is likely to have a significant effect on a European site in view of the site's conservation objectives.

A Stage 2 AA is required if it cannot be excluded, on the basis of objective scientific information following screening, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.

Stage 2 – Appropriate Assessment

A Stage Two AA determines whether the plan or project, individually or in-combination with other plans and projects, will adversely affect the integrity of a European site.

Stage 3 – Assessment of Alternatives

This stage of the potential process arises where it is determined that a project would have an adverse effect on the integrity of a European site and examines alternative ways of achieving the objectives of the project or plan that avoid adverse effects on the integrity of the European site.

Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)

This is the derogation process of Article 6(4), which examines whether there are imperative reasons of overriding public interest [IROPI] for allowing a project to proceed where adverse effects on the integrity of a European site have been predicted. Compensatory measures must be proposed and assessed as part of this stage.

1.3 Statement of Authority and Project Team

This report was prepared by Dr Brian Madden and is informed by the ecological survey data and relevant technical reports which accompany the planning application and a comprehensive literature review.

The ecological personnel and their role in the Ballykett Wind Farm project are listed in Table 1 below.

Table 1: Personnel involved in Terrestrial Ecological Assessment.

Project Team Member	Qualifications & Experience	Role
Dr Brian Madden, BioSphere Environmental Services	BA. Mod. (Hons), PhD, MCIEEM Brian graduated in Natural Sciences from the University of Dublin in 1984 and earned a Ph.D. degree in 1990 from the National University of Ireland for his research on ecosystem processes in raised bogs. Since 1994, Brian has been the principal ecologist with BioSphere Environmental Services. Brian has carried out botanical surveys and habitat assessments for most terrestrial habitats which occur on the island of Ireland. He is also an experienced ornithologist, with particular interests in birds of prey and wetland birds. He has published a range of peer-reviewed research papers. Examples of energy projects that Brian has been involved in include: Grousemount Wind Farm, Cos. Cork/Kerry, Oweninny	Preparation of EIAR Chapter 6; habitat assessment; terrestrial mammal survey

Project Team Member	Qualifications & Experience	Role
	Wind Farm Phases 1 & 2, Co. Mayo, Castlepook Wind Farm, Co. Cork, Letteragh Wind Farm, Co. Clare, Kiltumper Wind Farm Co. Clare, Eglish Wind Farm, Co Tyrone, Connemara 110kV Overhead Line Reinforcement Project (40 km from Barna to Maam Cross and to Screeb Bay in Connemara.	
Dr John Conaghan, Enviroscope Environmental Consultancy	BSc, PhD, MCIEEM John has over 25 years experience of working on botanical projects throughout Ireland. He is a habitat specialist, with particular expertise in peatland and wetland habitats, as well as rare plants. John has worked with Coillte on their LIFE funded habitat restoration programme - he regularly contributes this expertise to Species and Habitat Management Plans. Examples of energy projects that John has been involved in include: Oweninny Wind Farm Phases 1 & 2, Co. Mayo, The Galway Wind Park, Grousemount Wind Farm, Cos. Cork/Kerry, Castlepook Wind Farm, Co. Cork, BGE Corrib Gas Pipeline from Bellanaboy, Co. Mayo to Craughwell, Co. Galway,	Habitat and botanical surveys; Report input
Tom O Donnell, principal ecologist with O'Donnell Environmental Ltd.	BSc, MSc, MCIEEM Tom is an experienced ecologist, with over 15 years professional experience in the environmental industry, including working on projects such as wind farms, overhead power lines, roads, cycleways and residential developments. Tom has particular experience in bat survey and is licensed by NPWS for roost disturbance (Ref: DER/BAT 2023-16) and to capture bats (C25/2023).	Implementation of Bat Survey for project, analysis of data and preparation of risk assessment and mitigation requirements
John Murphy, formerly Malachy Walsh and Partners Now leading the Irish Ornithological Survey Group	John Murphy is a senior ornithologist (formerly with Malachy Walsh and Partners) and now leads the Irish Ornithology Survey Group as the Principal Ornithologist. He is highly experienced having worked in the field of ornithology and ecology since 1982 and has extensive knowledge of the Irish landscape with regard to bird populations. Examples of energy projects that John has provided ornithological surveys for include: Booltiagh Wind Farm, Co. Clare, Galway Wind Park, Barranstook Wind Farm, Co. Clare, Meenadreen Wind Farm, Co Donegal, Cusailling Wind Farm, Co. Offlay, Sheskin South Wind Farm, Co. Mayo.	Project ornithologist; Field Survey Team Lead; Report Input
Dr Tom Gittings Ecological Consultant	BSc, PhD, MCIEEM Tom Gittings has a BSc in Ecology, a PhD in Zoology and is a member of the Chartered Institute of Ecology and Environmental Management. Tom is an independent ecological consultant and has 27 years' experience in professional ecological consultancy work and research. From 1995-2001 Tom worked for the RPS Group environmental consultancy, as an Ecological Consultant (1995-1998), Associate Ecologist/Office Manager (1998-2000) and Technical Director (2000-2001). From 2001- 2009, Tom carried out research into forest and wetland biodiversity in University College Cork. During this period, Tom also developed a portfolio of independent consultancy work, and, since 2010, he has worked as a full-time independent consultant. Tom has specific expertise in ornithological assessments for wind energy	Compilation of Collision Risk Modelling Report for project

Project Team Member	Qualifications & Experience	Role
	projects and has been involved in numerous wind energy projects including Ummeras Wind Farm, Co. Kildare, Castlebanny, Co. Kilkenny. Tom's input to these latter projects included collision risk modelling, writing the ornithological sections of EIS/EIAR and NIS reports, expert witness services at oral hearings, and provision of scoping advice and peer review services	

1.4 Data Sources used to carry out the assessment

The assessment is supported by the following sources of data and information, including chapters of the accompanying EIAR:

- Review of relevant environmental databases including National Biodiversity Ireland Database
- Review of NPWS Site Synopses & Conservation Objectives for relevant European sites
- Review of NPWS (2019) The Status of EU Protected Habitats and Species in Ireland report
- Review of online web-mappers: National Parks and Wildlife Service (NPWS) & EPA
- Review of OS map and aerial photographs of the site and surroundings of the proposed Project
- Review of Clare County Development Plan 2023-2029.
- Review of other relevant plans and projects within the area
- Review of Bird Survey reports carried out by Malachy Walsh and Partners between 2019 and 2022
- Review of Bat Survey report 2023 carried out by O'Donnell Environmental Consultants
- EIAR Chapter 2. Project Description prepared by Jennings O'Donovan
- EIAR Chapter 5. Terrestrial Ecology prepared by BioSphere Environmental Services
- EIAR Chapter 7. Aquatic Ecology prepared by AQUAFACT International Ltd. (APEM Group)
- EIAR Chapter 8. Soils and Geology prepared by RSK Consultants
- EIAR Chapter 9. Hydrology and Hydrogeology prepared by RSK Consultants
- EIAR Volume IV (Appendix 2.1): Construction Environmental Management Plan (CEMP) prepared by Jennings O'Donovan
- EIAR Volume IV (Appendix 2.2): A Grid Connection Route Assessment report and accompanying drawings prepared by BFA Consulting
- EIAR Volume IV (Appendix 2.3): Ballykett Grid Connection Technical Report prepared by Mullen Grid Consulting
- EIAR Volume IV (Appendix 8.1): Ballykett Windfarm (BWF): Site Investigation by Peat Probing and Peat Stability Risk Assessment Report. Prepared by RSK.
- S.I. No. 296 of 2009: European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009
- WFD Cycle 2: Catchment Mal Bay – Subcatchment Doonbeg_SC_010
- Doonbeg System Priority Area for Action – Desk Study
- EIARs and NISs for other wind farms in the region

2. SCREENING FOR APPROPRIATE ASSESSMENT

Screening determines whether appropriate assessment is necessary by examining:

1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a Natura 2000 site;
2. Whether, in view of best scientific knowledge, the project is likely to have a significant effect on a European site, either alone or in combination with other projects or plans, in view of the site's conservation objectives.

Screening involves the following:

i. Description of plan or project;
ii. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives;
iii. Assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of best scientific knowledge
iv. Assessment of any combination effects with other plans and projects.
v. Screening Statement with conclusions.

2.1 Description of the Project Site

The Site is located in south-west county Clare 3.5 km north-east of the town of Kilrush and 3 km south-west of Coorraclare village (see **Figure 1**). It is located within the townlands of Ballykett, Gowerhass and Tullabrack East and situated within a landscape dominated by agricultural land (mainly used for livestock grazing), with scattered commercial conifer plantation and areas of cutaway bog.

There are a number of established wind farms in the area, including Moanmore Wind Farm, located c. 1.3 km to the west and Tullabrack Wind Farm, located c. 1.5 km to the northwest of the Site; this Project in Ballykett has been assessed in combination with them.

From an ecological and conservation perspective, the River Shannon system is the dominant feature of the local area, with Poulnasherry Bay located approximately 5 km to the west-southwest of the Site and the Clonderalaw Bay inlet approximately 10 km to the southeast. Various small lakes and wetlands occur in the hinterland (approximate 5 km distance) of the Site, including Tullabrack Lough, Gower Lough, Knockerra Lough, Tarmon Lough and Moanmore Lough.

There are two mapped geological formations underlying the Site Development area. Both are a variation of sandstone and siltstone. The Site is a former raised bog, with soil type across the entire Site classified as peat. Results of Peat Depth Probing surveys confirm that peat depths on Site are generally shallow (0.5-2.0 m) to moderately deep (2.0-3.5 m), with isolated pockets of deeper peat. The majority of the bog basin within the Site Redline Boundary was planted with commercial conifer plantation in the early 1990s. An area immediately to the west of the Redline Boundary of the Site had

been planted earlier (probably early 1980s). The unplanted bog within the Redline Boundary measures 9.66 ha and had been cut for turbary in the past but is now well revegetated.

The topography of the Site is relatively flat and lies at an altitude of between 30-40 m above ordnance datum (AOD). The Site for the proposed Development is located within the Shannon Estuary North catchment. Drainage of the Site is to the Moyasta River, which rises to the north-east of the Site and flows for a section through the northern aspect of the Redline Boundary. The Moyasta flows in a general westward direction before draining to Poulnasherry Bay. The section of the river which skirts part of the Redline Boundary has been dredged over the years and appears as a canalised watercourse. In addition to the main Moyasta River, there are various natural and artificial drainage ditches located within the proposed Site and its surrounds. The Aquatic Ecology impact assessment (Chapter 7 of EIAR) and Hydrology and Hydrogeology impact assessment (Chapter 9 of EIAR) describes the streams in the Project Area, including the two streams within the Doonbeg River catchment (Tullagower river & Brisla East stream) which are crossed by the Turbine Delivery Route, as being characterised by slow flowing water, low discharge and muddy substrates, with moderate to poor water quality. The afforested sections of the Site have an artificial drainage network.

Ecologically, the Site for the proposed wind farm can be described as dominated by Conifer plantation (WD4 of Fossitt 2000), with relatively small areas of Cutover bog (PB4) and Improved grassland (GA1). The conifer plantation occurs on peat soil (former raised bog), which generally varies between 2.0 and 3.5 metres in depth. The main tree species is Sitka spruce *Picea sitchensis,* which was planted in the early 1990s. The ground layer is very species-poor being dominated by conifer needles along with occasional clumps of mosses. The area of cutover raised bog on Site (estimated at 9.66 ha), which is now surrounded by conifer plantation, has been subject to peat-cutting in the past, though it appears that no cutting has taken place in recent decades. As a result of this abandonment the bog flora has regenerated well in the previously cut areas. In the wetter areas of cutover bog the cover of bog mosses is well-developed. The Moyasta and the Doonbeg River systems are examples of Depositing/lowland rivers (FW2). A full description of the Habitats, Flora and Fauna associated with the Project is presented in Chapters 6 and 7 of the accompanying EIAR.

The red-lined Grid Connection Route (GCR) to the 110kV Tullabrack substation was assessed as part of the baseline surveys. The route is entirely within public roads and internal site tracks.

A baseline description of the proposed turbine delivery route (TDR) is included in Section 16.3, Chapter 16 of the EIAR (and see Figure 2 below). The TDR for delivery of major components (towers, blades, nacelles) will use national (N69, N18, N68) and regional (R510, R527, R445) road networks for the majority of the route until the N68 junction with the L6132 local road. Delivery vehicles will travel westbound on the L6132 to the wind farm site entrance. The L6132 is generally lined by grassy verges, low hedgerows, and drainage ditches; hedging is dominated by willow. The stream crossings (no. 3) along the L6132 are minor watercourses and, as already noted, are characterised by slow flowing water, low discharge, and muddy substrates, with moderate to poor water quality.

FIGURE 1: LOCATION OF SITE FOR PROPOSED BALLYKETT WIND FARM, INCLUDING ROUTE FOR GRID CONNECTION.

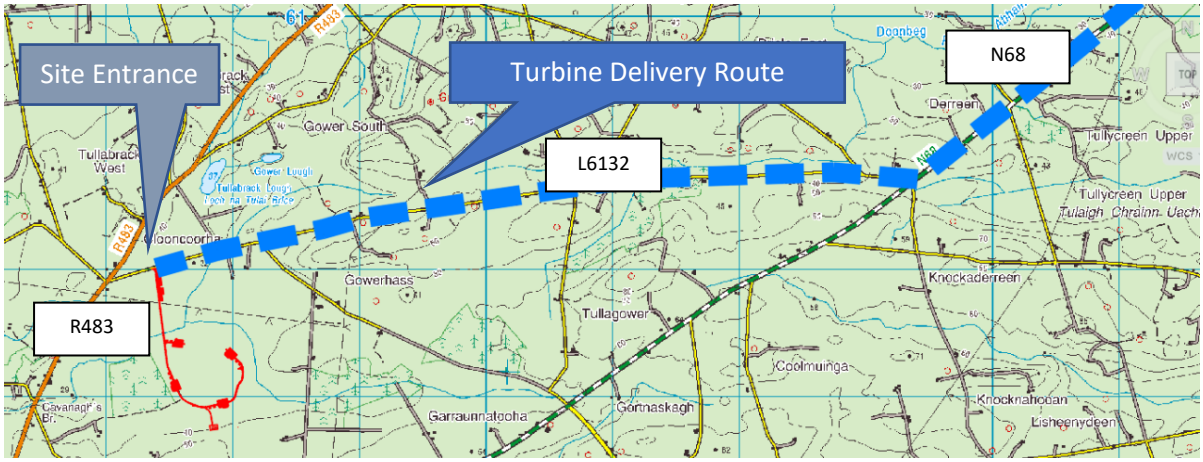

FIGURE 2: MAP SHOWING THE PROPOSED TURBINE DELIVERY ROUTE FROM FOYNES PORT TO THE SITE ENTRANCE ON THE L6132.

2.2 Overview of the Proposed Project

Planning permission is being sought by the Developer for the construction of 4 wind turbines, a permanent meteorological mast, an on-site electrical substation and all ancillary works.

The Development will consist of the following main components (a full and detailed description of the proposed project is presented in Chapter 2 of the accompanying EIAR):

- Erection of 4 no. 4-5MW wind turbines with an overall ground to blade tip height of 150 m. The candidate wind turbine will have a rotor diameter of 136 m and a hub height of 82 m.
- Construction of site access tracks, Turbine Hardstand areas and Turbine Foundations.
- Construction of new site entrance with access onto the adjoining local road network (L6132).
- Construction of one no. Temporary Construction Compound with associated temporary site offices, parking areas and security fencing
- Installation of 1 no. permanent Met Mast of 82 m overall height.
- Construction of new internal site access tracks and upgrade of existing site track, to include all associated drainage including new clear span bridge crossing of the Moyasta 27_010 watercourse.
- Development of a site drainage network.
- Construction of one no. Electrical Substation.
- 2. no permanent spoil storage areas
- All Wind Farm Internal Cabling connecting the wind turbines to the Electrical Substation.
- Ancillary forestry felling to facilitate construction of the Development.
- All works associated with the permanent connection of the wind farm to the national electricity grid comprising a 38kV underground cable in permanent cable ducts from the proposed, permanent, on-site substation and to the existing Tullabrack 110kV ESBN Substation.
- Vertical realignment of an existing crest curve on the L6132 local road in order to prevent grounding of abnormal load vehicles during delivery of turbine component.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought.

It is proposed that the turbine components including rotor blades, towers, nacelles, hubs, and drivetrains will be landed by ship and stored for transportation at Foynes Port, County Limerick. From there, they will be transported to the Site using specialised abnormal load vehicles. Turbine delivery vehicles will travel eastbound on the N69 towards Limerick City and join the N18, delivery vehicles which satisfy the 4.65 m height restriction in Limerick tunnel will continue on the N18 northbound through the tunnel. Delivery vehicles with high loads will join the R510 at junction 2 on the N18, cross the river Shannon on the R527, join the R445 at Coonagh roundabout and re-join the N18 at junction 4. On the N18 / M18 delivery vehicles will travel northbound towards Ennis and join the N85 at Junction 9. Vehicles will travel eastbound on the N85 to the N68 junction where they will join the N68 and continue southbound towards Kilrush to the L6132 junction. Delivery vehicles will travel westbound on the L6132 to the Site entrance.

The TDR analysis shows that enabling works such as verge strengthening and junction modifications will be required at limited locations on the route along the L6132 to accommodate abnormal load vehicles.

An evaluation was carried out of possible Grid Connection Route options, and it was found that the 1.84 km 38kV Grid connection to Tullabrack 110kV substation is the most expedient option. This can be summarised as follows:

- Underground Cable (UGC) single 38kV circuit from Ballykett wind farm utilising sections of UGC public roads, regional roads, and internal site tracks to Tullabrack substation. [approx. 1.84 km]

It is expected that joint bays will be in the non-wheel and weight bearing strip of public roadway. 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 will typically be 6 m long x 2.5 m wide x 2.3 m deep, pre-cast, reinforced, concrete structures installed below finished ground level.

There are no watercourse crossings along the Grid Connection Route to the Tullabrack 110kV substation, and no directional drilling work is planned.

The TDR identified as part of the Development requires verge strengthening along a limited stretch of the L6132 on approach to the proposed wind farm site entrance. Three existing watercourse crossing are located on the L6132 after leaving the main road (N68). The Tullagower River and Brisla East Stream are upstream from the Doonbeg River and within the Doonbeg catchment, while the Gowerhass Stream is within the Moyasta River catchment.

2.3 Method and Identification of Relevant European Sites

The approach to screening is likely to differ somewhat between plans and projects, depending on scale and on the likely effects, but the following should be included (following “Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities” (Department of Environment, Heritage and Local Government)):

1. Any Natura 2000 sites within or adjacent to the plan or project area.
2. Any Natura 2000 sites within the likely zone of impact of the plan or project. A distance of 15 km is used in the case of plans, and derives from UK guidance (Scott Wilson et al. 2006). For projects, the distance could be much less than 15 km, and in some cases less than 100 m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in-combination effects.
3. Natura 2000 sites that are more than 15 km from the plan or project area depending on the likely impacts, and the sensitivities of the ecological receptors, bearing in mind the

precautionary principle. In the case of sites with water dependent habitats or species, and a plan or project that could affect water quality or quantity, for example, it may be necessary to consider the full extent of the upstream and/or downstream catchment.

The Department Guidance (as referred to above) notes the following in section 3.2.3 "Natura 2000 Sites":

> *"The second stage (of the AA Screening process) is an examination of what Natura 2000 sites might be affected. These sites should be identified and listed, bearing in mind the potential for a plan or project, whether it is within or outside a Natura 2000 site, to have direct, indirect or cumulative effects, and taking a precautionary approach so that a site is included if doubt exists".*

For the proposed Ballykett Wind Farm project, all European sites that could potentially be affected were identified using a Source-Pathway-Receptor conceptual model for environmental management risk assessment. To provide context for the assessment, European sites within 15 km surrounding the Redline Boundary are shown on Figure 3. Information on these sites with regard to their conservation objectives and connectivity to the Site is provided in Table 2. Sites that were further away from the Development were also considered and no realistic likely Source-Pathway-Receptor chain for significant effect was identified for any European site that was further than 15 km from the Site.

A total of seven European designated sites occurs within a 15 km distance of the Site (see Figure 3). These are listed in Table 2, along with the reasons for designation, the distance from the Site and whether any linkages or connectivity exist between the two locations.

As identified in Table 2, hydrological connectivity exists between the Site and the following four designated sites:

- Lower River Shannon SAC
- River Shannon and River Fergus Estuaries SPA
- Carrowmore Dunes SAC
- Mid-Clare Coast SPA

The **Lower River Shannon SAC** and the **River Shannon and River Estuaries SPA** (which extend over a similar geographical area) essentially drain the Project area and it is considered that there is potential for significant effects on the qualifying interests/Special Conservation Interests of these sites as a result of the proposed development and that further assessment is required. It follows that there may be potential for the proposed development to result in an in-combination effect. The potential for effects on these sites is addressed in the NIS component of the present document.

The **Carrowmore Dunes SAC** and the **Mid-Clare Coast SPA** are connected to the Project by two watercourse crossings (the Tullagower River & the Brisla East Stream) along the L6132 section of the TDR, which are tributaries of the Doonbeg River. The Doonbeg River flows for approximately 13 km before entering Doonbeg Bay and the SAC and SPA (it is noted that the area of the Carrowmore Dunes SAC overlaps entirely with the Mid-Clare coast SPA).

The portion of route that requires strengthening works is limited to a section of the L6132 road, after the route exits off the N68. To provide further clarification to the information already included in **Chapter 16 Traffic and Transport** of the EIAR, the proposed road strengthening works are detailed in drawings contained in **Appendix 16.1** Turbine Delivery Route Works. A temporary strengthening approach will be implemented which does not require any excavation works. This involves the placement of steel plates directly on the existing carriageway and supported on the verge by sandbags. This approach will be in place for the duration of the turbine delivery period (period of 6-8 weeks) and the plates and sandbags will be removed immediately afterwards. As with all aspects of the Project involving watercourse crossings, an Ecological Clerk of Works ("ECoW") with an appropriate level of experience relevant to aquatic ecology will be present to supervise the water crossings during the strengthening works along the turbine delivery. The project's strategy for water crossings is referenced in-depth in **Appendix 2.1** Construction Environmental Management Plan CEMP, **Section 5.3.10.2**.

The strengthening works do not include any intrusive or groundbreaking / excavation activities at the mapped surface water crossings. Similarly, no intrusive works are planned along the TDR as it traverses the L6132. The verge strengthening is limited to shallow works in the existing grass verges along the public road. The proposed works are considered to be minor in scale and are detailed in drawings contained in **Appendix 16.1** Turbine Delivery Route Works.

PLATE 1 (A, B): TULLAGOWER STREAM WESTERN CROSSING (DOONBEG CATCHMENT). VIEW NORTH (A) AND SOUTH (B) (2023)

PLATE 2 A, B: TULLAGOWER STREAM EASTERN CROSSING (DOONBEG CATCHMENT VIEW NORTH (A) AND SOUTH (B) (2023)

The two crossing points over the Tullagower River and the Brisla East Stream are shown in Plates 1 (A, B) and Plate 2 (A, B). These are minor watercourses, little more than drainage channels, with heavy vegetation cover. As noted, these two watercourses are within the Doonbeg River catchment. Previous surveys undertaken in 2016, by consultants from EirEco and ASU, identified the presence of freshwater pearl mussel (*Margaritifera margaritifera)* downstream (>6 km) on the Doonbeg River. However, a recent survey in October 2023 carried out by APEM (see Chapter 7 Aquatic Ecology Section 7.2.1.2) did not record the presence of freshwater pearl mussel in any of the sections where potentially suitable habitat exists.

The proposed methodology (see **Appendix 2.1** CEMP) and **Chapter 2 Section 2.6.11** for crossing the Tullagower River and the Brisla East Stream for turbine component delivery will not make any contact with the watercourse(s), and the potential for effects on aquatic life in the lower Doonbeg catchment is considered to be negligible (see **Chapter 7: Aquatic Ecology**). Since the proposed crossings will have no physical impact on the local watercourses, there is no potential for effects on the qualifying interests of the Carrowmore Dunes SAC or the Mid-Clare Coast SPA (i.e., located approximately 13 km downstream of the crossing points). Hence, it is concluded that no further assessment is required for these two sites, and they can be 'screened-out'.

For the other three sites described in Table 2 and listed below, no ecological or hydrological pathway was identified between the site for the proposed wind farm (Source) and the relevant European site(s) (Receptor). Therefore, it is concluded there is no potential for effects on the conservation objectives of these sites. It follows that the proposed Project cannot contribute to any in-combination effects on these three sites when considered with other plans and projects. It is concluded that no further assessment is required for these three sites and that they can be 'screened-out'.

- Tullaher Lough and Bog SAC
- Carrowmore Point to Spanish Point and Islands SAC
- Kilkee Reefs SAC

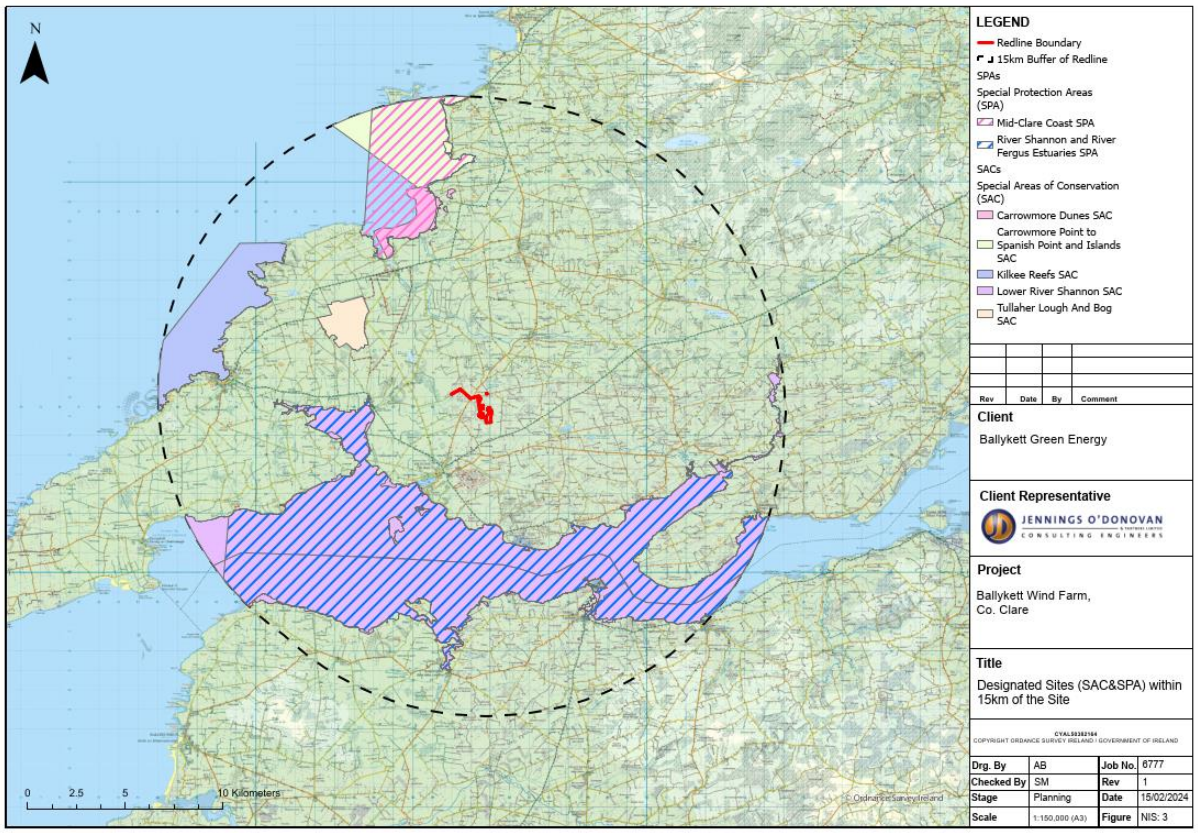

FIGURE 3. LOCATIONS OF EUROPEAN DESIGNATED SITES WITHIN A 15 KM RADIUS OF THE SITE

2.4 AA Screening Concluding Statement

On the basis of objective scientific information, it is concluded that a hydrological pathway exists between the proposed Project Site and two European sites (listed below) and that in the absence of mitigation, it cannot be excluded that the Project will have a significant effect on the two sites,

- Lower River Shannon SAC
- River Shannon and River Fergus Estuaries SPA

As a result, it is respectfully submitted that the competent authority should carry out an Appropriate Assessment (AA) in respect of the Project. A Natura Impact Statement has been prepared to assist with the AA.

It is also concluded that while hydrological connectivity exists (via the Tullagower river and Brisla East stream) between a section of the TDR on the L6132 and two further European sites (i.e., Carrowmore Dunes SAC; Mid-Clare Coast SPA), the proposed methodology to widen and strengthen the road to accommodate abnormal loads will not impact local watercourses. Hence the project does not have potential to have effects on these two designated sites when considered alone or in combination with other plans and projects.

For the other three sites within the identified zone of influence, namely Tullaher Lough and Bog SAC, Carrowmore Point to Spanish Point and Islands SAC, and Kilkee Reefs SAC, no pathway was identified between the site for the proposed wind farm (Source) and the relevant European site (Receptor). Therefore, it is concluded beyond reasonable scientific doubt, and in view of the best available scientific knowledge, that there is no potential for likely significant effects on these three sites (or their conservation objectives) as a result of the proposed Project when considered alone or in combination with other plans and projects.

Accordingly, it is concluded that no further assessment is required for five of the sites within the identified Zone Of Influence (ZOI), as listed below, and that they can be 'screened-out'. Measures intended to avoid or reduce the harmful effects of the Development on European sites, *i.e.* "mitigation measures", have not been taken into account in this screening stage appraisal.

- Tullaher Lough and Bog SAC.
- Carrowmore Dunes SAC.
- Carrowmore Point to Spanish Point and Islands SAC.
- Kilkee Reefs SAC.
- Mid-Clare Coast SPA.

Table 2. Relevant European sites, reasons for designation, distances from Site and summary of connectivity.

European Site	Reasons for designation (information correct as of 18th November 2023) (*denotes a priority habitat)	Distance from proposed Ballykett Wind Farm Site and summary of connectivity
	SPECIAL AREAS OF CONSERVATION	
Lower River Shannon SAC (site code 002165)	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonizing mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Lampetra fluviatilis (River Lamprey) [1099] Salmo salar (Salmon) [1106] Tursiops truncatus (Common Bottlenose Dolphin) [1349] Lutra lutra (Otter) [1355] According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage and the Gaeltacht, 07 August 2012), for each of the listed Qualifying Interests, the Conservation Objective is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.	The proposed wind farm Site at Ballykett is just over 5 km north of the SAC site. Hydrological connectivity exists between the Lower River Shannon SAC and the proposed site via the Moyasta river. This water course skirts part of the Site for the proposed wind farm and flows for approximately 7.8 km to enter the Shannon system and SAC at Moyasta. The section of the Turbine Delivery Route (TDR) along the L6132 crosses three watercourses, two upstream of the Doonbeg River and one on the Moyasta River. The Moyasta crossing (Gowerhass stream), is upstream of the Development Site. Hence, hydrological connectivity exists between the TDR component of the Project and the SAC. It is concluded that hydrological connectivity exists between the Project area and the SAC.

European Site	Reasons for designation (information correct as of 18th November 2023) (*denotes a priority habitat)	Distance from proposed Ballykett Wind Farm Site and summary of connectivity
Tullaher Lough and Bog SAC (site code: 002343)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage Regional, Rural & Gaeltacht Affairs, 6th December 2016) for each of the listed Qualifying Interests, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed wind farm Site is approximately 6 km east-southeast of the SAC. There are no ecological corridors or hydrological connectivity between the two areas.
Carrowmore Dunes SAC (site code:002250)	Reefs [1170] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage and the Gaeltacht, 4th March 2014) for each of the listed Qualifying Interests, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed wind farm Site is approximately 8 km (straight-line distance) southeast of the SAC. There are no ecological corridors or hydrological connectivity between the wind farm site or the grid connection routes and the SAC. The section of the TDR along the L6132 crosses three watercourses, two upstream of the Doonbeg River (Tullagower river & Brisla East stream) and one on the Moyasta River. The Doonbeg River flows in a west to northwest direction for approximately 13 km before entering Doonbeg Bay and the SAC. Hence, hydrological connectivity exists between the TDR component of the Project and the SAC.
Carrowmore Point to Spanish Point and Islands SAC (site code: 001021)	Coastal lagoons [1150] Reefs [1170] Perennial vegetation of stony banks [1220] Petrifying springs with tufa formation (Cratoneurion) [7220] According to this SAC's site Conservation Objectives document (Version 1.0. Department	The proposed wind farm Site is approximately 11 km south-southeast of the SAC. There are no ecological corridors, or hydrological connectivity between the two areas.

European Site	Reasons for designation (information correct as of 18th November 2023) (*denotes a priority habitat)	Distance from proposed Ballykett Wind Farm Site and summary of connectivity
	of Arts, Heritage and the Gaeltacht, NPWS 7th April 2014) for each of the listed Qualifying Interests, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	
Kilkee Reefs SAC (site code 002264)	Large shallow inlets and bays [1160] Reefs [1170] Submerged or partially submerged sea caves [8330] According to this SAC's site Conservation Objectives document (NPWS 6th August 2014, Conservation objectives for Kilkee Reefs SAC [002264]. Version 1.0. Department of Arts, Heritage and the Gaeltacht) for each of the listed Qualifying Interests, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.	The proposed wind farm Site is approximately 8 km southeast of the SAC. There are no ecological corridors or hydrological connectivity between the two areas.
	SPECIAL PROTECTION AREAS	
River Shannon and River Fergus Estuaries SPA (site code: 004077)	Cormorant (Phalacrocorax carbo) [A017] Whooper Swan (Cygnus cygnus) [A038] Light-bellied Brent Goose (Branta bernicla hrota) [A046] Shelduck (Tadorna tadorna) [A048] Wigeon (Anas penelope) [A050] Teal (Anas crecca) [A052] Pintail (Anas acuta) [A054] Shoveler (Anas clypeata) [A056] Scaup (Aythya marila) [A062] Ringed Plover (Charadrius hiaticula) [A137] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Lapwing (Vanellus vanellus) [A142] Knot (Calidris canutus) [A143] Dunlin (Calidris alpina) [A149] Black-tailed Godwit (Limosa limosa) [A156] Bar-tailed Godwit (Limosa lapponica) [A157] Curlew (Numenius arquata) [A160] Redshank (Tringa totanus) [A162] Greenshank (Tringa nebularia) [A164]	The proposed wind farm Site at Ballykett is just over 5 km north of the SPA site. Hydrological connectivity exists between the two areas via the Moyasta river. This water course skirts part of the Site for the proposed wind farm and flows for approximately 7.8 km to enter the Shannon system and SPA at Moyasta. The section of the TDR along the L6132 crosses three watercourses, two upstream of the Doonbeg River and one on the Moyasta. The Moyasta crossing (Gowerhass stream) is upstream of the Development Site. Hence, hydrological connectivity exists between the TDR component of the Project and the SPA.

European Site	Reasons for designation (information correct as of 18th November 2023) (*denotes a priority habitat)	Distance from proposed Ballykett Wind Farm Site and summary of connectivity
	Black-headed Gull (Chroicocephalus ridibundus) [A179] Wetland and Waterbirds [A999] According to this SPA's site Conservation Objectives document, Conservation Objectives Series: River Shannon and River Fergus Estuaries SPA 004077. Version 1.0, 17th September 2012, Department of Arts, Heritage and the Gaeltacht), for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The wind farm Site does not provide suitable ex-situ habitat to support any of the SCIs of the SPA. It is concluded that hydrological connectivity exists between the Project area and the SPA.
Mid-Clare Coast SPA (code 004182)	Cormorant (Phalacrocorax carbo) [A017] Barnacle Goose (Branta leucopsis) [A045] Ringed Plover (Charadrius hiaticula) [A137] Sanderling (Calidris alba) [A144] Purple Sandpiper (Calidris maritima) [A148] Dunlin (Calidris alpina) [A149] Turnstone (Arenaria interpres) [A169] Wetland and Waterbirds [A999] According to this SPA's site Conservation Objectives document, Conservation Objectives Series: Mid-Clare Coast SPA 004182. Version 1.0, 8th September 2014, Department of Arts, Heritage and the Gaeltacht), for each of the listed SCIs, the Conservation Objective is to maintain the favourable conservation condition of the species for which the SPA has been selected.	The proposed wind farm Site at Ballykett is just over 8 km (straight-line distance) southeast of the SPA site. There are no ecological corridors or hydrological connectivity between the Site of the wind farm or the grid connection routes and the SPA. The section of the TDR along the L6132 crosses three watercourses, two upstream of the Doonbeg River (Tullagower river & Brisla East stream) and one on the Moyasta. The Doonbeg river flows in a west to northwest direction for approximately 13 km before entering Doonbeg Bay and the SPA. Hence, hydrological connectivity exists between the TDR component of the Project and the SPA. The wind farm Site does not provide suitable ex-situ habitat to support any of the SCIs of the SPA.

3. NATURA IMPACT STATEMENT

The assessment for screening for Appropriate Assessment presented in Section 2 concludes that in the absence of mitigation, likely significant effects may arise as a result of the proposed Ballykett Wind Farm (the Project) on two European sites, as follows:

- Lower River Shannon SAC
- River Shannon and River Fergus Estuaries SPA

Such effects could arise during the Construction, Operational and Decommissioning phases of the project.

The following assessments consider, in absence of mitigation, whether the Project will adversely affect the integrity of the European sites either directly or indirectly alone or in combination with other plans and projects.

3.1 Potential for Direct Effects on European Sites

The two identified European sites occupy more or less the same geographical area and are located approximately 5 km (straight-line distance) from the Site.

On the basis of geographical separation, there is no potential for direct effects, such as disturbance of habitats and/or species, on European sites during any of the phases of the Project.

3.2 Potential for Indirect Effects on European Sites – Water Quality

The assessment for AA Screening (Section 2) identified hydrological connectivity between the Project and the Shannon Estuary system (and hence the associated designated European sites under consideration).

Chapter 9 of the EIAR, Hydrology & Hydrogeology, provides a detailed account of the drainage of the Project area and connectivity with the Shannon system. Briefly, the Development and Grid Connection Route (GCR) to the Tullabrack 110kV substation are situated within the Shannon Estuary North catchment (ID: 27, Area: c.1651.27 km^2).

The Site is located upstream of the Shannon Estuary. The Site has indirect hydraulic connectivity to the estuary via natural and artificial drainage that connects to the headwaters of the Moyasta River, which drain the Site. The mouth of the river Shannon (EU Code: IE_SH_060_0000), which comprises the designated SAC and SPA, has an area of 335.14 km^2. The Moyasta River flows in a general westward direction before draining to Poulnasherry Bay and into the Shannon Estuary. The channel distance from the Site to Poulnasherry Bay is approximately 5 km.

Construction and Decommissioning phase activities, and to a lesser extent operational phase activities, have the potential to cause adverse effects to receiving watercourses and associated aquatic life and ultimately the relevant qualifying interests QIs) and Special Conservation Interests (SCIs) of the above listed European sites.

The principal potential construction phase effects of the Project relate to the release of suspended solids/nutrients, concrete and hydrocarbons into the drainage network arising from all construction related site works including the Site access track network, turbine foundations and associated turbine hardstands, electrical sub-station building, met mast, borrow pit, spoil repository area, and the Grid Connection Route. There is also a risk of nutrient release as a result of the clear-fell of conifer plantation required for the Development.

In the unlikely event of a peat stability issue at the Site during the construction and/or operational phases of the Project, there is risk of substantial amounts of peat entering local watercourses which have connectivity to the Shannon estuarine system. The risk of landslides occurring as a result of the Project has been assessed by RSK, and a copy of the report ("Ballykett Windfarm (BWF), Site Investigation by Peat Probing and Peat Stability Risk Assessment Report", March 2023) is located in **Appendix 8.1 of the EIAR**. The report notes the following:

- There are no recorded landslide events in close proximity to the Site (GSI).
- There were no indications of stability issues or mass movement observed on the Site during Site surveys.
- The Site is mapped as having areas of Low Risk in terms of Landslide Stability, that is, full spectrum of slope stability risk categories (GSI, ND).

Under Geo-Hazards, the report concludes:

- There is no record of slope stability issues on Site.
- Peat stability Factor of Safety (FoS) is acceptable across the Site.
- Elevated risk of localised stability issues arising, with potentially significant consequences within surface water buffers.

Under Section 6. Caveats & Recommendations, the report notes that the risk of landslides occurring on the proposed Site under worst case scenario conditions (Conservative values and Scenario B (+1 m)) has been determined to be generally very low however, the following points should be noted;

• The very low risk classification is largely driven by consistent peat depths at the turbine locations correlated with the generally flat-lying topography at sampling points associated with proposed infrastructure locations, and by the undulating nature of the substrate topology. However, the potential for deeper areas of peat suggests that soil stability at a highly localized scale may give rise to some difficulty, *e.g.* collapse of side walls in excavations, and subsidence over time under newly installed Turbine Hardstands (on peat), *etc*. Such potential issues give rise to the need for vigilance during and after the construction phase of the Project and it is recommended that all works are supervised and monitored by a competent person (Geotechnical Engineer) throughout the construction phase, and that the Site is monitored at a reasonable frequency during the operational phase of the Project. The

frequency of monitoring during the operational phase will be conducted at a high frequency (*e.g*. weekly) during the initial months, and will reduce (*e.g.* monthly) gradually over the following year minimum, or longer until site conditions are observed to be stable.

- It is recommended that the Development layout avoids areas classified as having high stability risk per this [RSK] report or the GSI Landslide Susceptibility model. Furthermore, any potential impacts to hydrogeological conditions at high risk areas should be avoided. Through EIA, constraint identification and design process, the Development footprint avoids areas of unacceptable risk.

There is also potential for effects on watercourses, and potentially the relevant qualifying interests (QIs) / Special Conservation Interests (SCIs) of the above listed European sites, during the operational phase due to on-Site operational activities. The risk of pollutants entering local watercourses during the operational phase of the proposed wind farm Development could arise primarily through soil run-off from unvegetated surfaces, spillages of hydrocarbons and other chemicals, and potential peat slippage (as discussed above).

The significance of a subsequent effect on the qualifying interests/special conservation interests within these two designated sites would vary depending on the type of pollutant, as well as the magnitude and duration of the event. As the conservation objectives of identified Natura 2000 sites could potentially be affected adversely, measures are required to avoid or reduce harmful effects of the proposed Project (*i.e*. mitigation measures).

For the SAC and the SPA sites, a review of their conservation objectives indicates that the relevant qualifying interests and Special Conservation Interests (SCIs) which conceivably could be affected by the input of pollutants to the estuarine system are as listed below. This is based on the given attribute and target for each habitat or species, as well as the distribution of the habitats and species within the designated sites (all such information is contained within the Conservation Objectives for the sites).

Lower River Shannon SAC

Estuaries [1130]
Mudflats and sandflats not covered by seawater at low tide [1140]
Coastal lagoons [1150]
Large shallow inlets and bays [1160]
Reefs [1170]
Salmo salar (Salmon) [1106]
Tursiops truncates (Bottlenose Dolphin) [1349]
Lutra lutra (Otter) [1355]

Table 3: Lower River Shannon SAC: Attributes and Targets associated with identified Habitats and Species potentially affected by water pollution.

Habitat / Species	Relevant Attribute	Relevant Target	Distribution
Estuaries	Community distribution	Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal sand to mixed sediments with gammarids community complex; Subtidal sand to mixed sediment sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. Community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone dominated subtidal reef community.	Entire estuarine component of site
Mudflats and sandflats not covered by seawater at low tide	Community distribution	Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pnotocrates spp. community; and Intertidal sand to mixed sediments with polychaetes, molluscs and crustacean community complex.	Entire estuarine component of site including Poulnasherry Bay.
Coastal lagoons	Water quality: Molybdate Reactive Phosphorus (MRP)	Annual median MRP within natural ranges and less than 0.1 mg/L	Various estuarine locations, including Scattery Island
	Water quality: Dissolved Inorganic Nitrogen (DIN)	Annual median DIN within natural ranges and less than 0.15 mg/L	
Large shallow inlets and bays	Community distribution	Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pnotocrates spp. community; Intertidal sand to mixed sediments with polychaetes, molluscs and crustaceans community complex; Subtidal sand to mixed sediment sediment with Nephtys spp. Community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone dominated subtidal reef community; and Laminarian dominated community complex.	Outer estuarine and bay area
Reefs	Community distribution	Conserve the following community types in a natural condition: Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone dominated subtidal reef community; and	Estuarine and bay area

Habitat / Species	Relevant Attribute	Relevant Target	Distribution
		Laminarian dominated community complex.	
Salmon	Out-migrating smolt abundance	No significant decline. Note: Smolt abundance can be negatively affected by a number of impacts such as estuarine pollutants	Estuary
Bottlenose Dolphin	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be preserved in a natural condition.	Estuary and bay
Otter	Fish biomass available	No significant decline	Estuarine shoreline

River Shannon and River Fergus Estuaries SPA

Cormorant (*Phalacrocorax carbo*) [A017]

Whooper Swan (*Cygnus cygnus*) [A038]

Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]

Shelduck (*Tadorna tadorna*) [A048]

Wigeon (*Anas penelope*) [A050]

Teal (*Anas crecca*) [A052]

Pintail (*Anas acuta*) [A054]

Shoveler (*Anas clypeata*) [A056]

Scaup (*Aythya marila*) [A062]

Ringed Plover (*Charadrius hiaticula*) [A137]

Golden Plover (*Pluvialis apricaria*) [A140]

Grey Plover (*Pluvialis squatarola*) [A141]

Lapwing (*Vanellus vanellus*) [A142]

Knot (*Calidris canutus*) [A143]

Dunlin (*Calidris alpina*) [A149]

Black-tailed Godwit (*Limosa limosa*) [A156]

Bar-tailed Godwit (*Limosa lapponica*) [A157]

Curlew (*Numenius arquata*) [A160]

Redshank (*Tringa totanus*) [A162]

Greenshank (*Tringa nebularia*) [A164]

Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

Table 4: Lower River Shannon SPA: Attributes and Targets associated with identified Habitats and Species potentially affected by water pollution.

Habitat / Species	Relevant Attribute	Relevant Target	Distribution
Cormorant Whooper Swan Light-bellied Brent Goose Shelduck Wigeon Teal Pintail Shoveler Scaup Ringed Plover Golden Plover Grey Plover Lapwing Knot Dunlin Black-tailed Godwit Bar-tailed Godwit Curlew Redshank Greenshank Black-headed Gull	Distribution	There should be no significant decrease in the range, timing or intensity of use of areas by the listed species other than that occurring from natural patterns of variation.	Entire estuarine component of site

In the absence of mitigation, the significance of an effect on the above listed qualifying interests of the SAC and Special Conservation Interests of the SPA by contaminants derived from activities associated with the Project entering the estuarine system would depend on the type of pollutant, as well as the magnitude and duration of a pollution event.

Aquatic invertebrate communities and aquatic macrophytes can be affected by sediment loading which reduces both the biotic diversity and the food resource for fish populations through direct toxicity to fish and invertebrates, and also indirectly affecting top predators such as otter and carnivorous bird species through a reduction in prey availability. Suspended solids often hold nutrients such as phosphorus that can result in eutrophication and reduced oxygen levels, which can affect aquatic communities.

3.3 Mitigation Measures for Maintenance of Water Quality

The objective of the mitigation measures is to avoid, minimise and control contaminated run-off entering drains and local watercourses and potentially the two identified European sites which are hydrologically linked to the Site.

An in-depth discussion of water quality and the required mitigation to prevent or minimise the entry of contaminants to local watercourses is provided in the accompanying EIAR, in the Aquatic Ecology impact assessment (**EIAR Chapter 7**) and the Hydrology and Hydrogeology impact assessment (**EIAR Chapter 9**). Best practice mitigation measures will be implemented during the design, construction, operational and Decommissioning phases of the Development. The mitigation measures are Site-specific and are proven techniques. When in force, the mitigation measures will be monitored to ensure their efficacy.

3.3.1 Construction Phase Mitigation

All of the mitigation measures relating to maintenance of water quality are incorporated into a Construction and Environmental Management Plan (CEMP), which is contained in **Appendix 2.1 of the EIAR** for this application. The CEMP includes a Surface Water Management Plan, a Water Quality Management Plan and a Waste Management Plan. The CEMP will require mandatory adherence by all parties involved in the construction of the proposed Ballykett Wind Farm project. The CEMP which has been prepared will be further developed and expanded following the appointment of a Contractor for the main construction works. The development of the mitigation measures and all method statements for watercourse crossings adhere to all relevant guidance and current best practice.

There follows an overview of the approach to mitigation.

Mitigation by Avoidance

The fundamental mitigation measure to be implemented during each stage of the proposed Development will be avoidance of sensitive hydrological receptors wherever possible, this key principle is referred to as “mitigation by avoidance”. This principle has been adopted during the design of the site layout and associated infrastructure across multiple design iterations. The final Development layout plan has been identified as the optimal layout design available for protecting the existing hydrological regime of the Site, while at the same time incorporating and overlaying engineering and other environmental constraints.

The greatest risk of adverse impacts on the aquatic environment will occur during the construction phase of the Development. Key to minimising this risk has been the siting of all turbine locations and other key infrastructure at a minimum set-back from watercourses (50 m). No works will take place within the 50 m buffer zone of watercourses except for the construction of one clear span bridge and five proposed culverts on the watercourse crossings (the locations of the proposed crossings are mapped in Figure 9.2a EIAR Chapter 9 Hydrology and Hydrogeology).

Mitigation by Design

Drainage measures have been developed to protect all receiving waters from potential impacts during the construction of the Development in the catchment of the Site and along the proposed Grid Connection. These measures are aimed at preventing sediments or other pollutants from entering watercourses through the containment and treatment on-site of all surface water run-off from areas of works. The appointed contractor will have appropriately qualified environmental personnel to ensure compliance during the construction stage with all mitigation measures, planning conditions and legislative requirements related to the maintenance of water quality. An Ecological Clerk of Works (ECoW) will be appointed by the Contractor as part of the environmental team for the duration of the Project.

The use of Sustainable Drainage Systems (SuDS) on site will eliminate and/or minimise risk to watercourses from sedimentation during the construction and operational phases of the proposed Development.

Surface water management measures will be put in place concurrently during the Development of the Site access track network. The measures entail the following key elements which are described in detail within the Surface Water Management Plan (Appendix 2.1, CEMP):

- Open Constructed drains for development run-off collection and treatment;
- Collection Drains for upslope “clean” water collection and dispersion;
- Filtration Check Dams to reduce velocities along sections of Site access tracks which run perpendicular to contours;
- Settlement Ponds, Settlement Lagoons and Buffered Outfalls to control and store Development runoff to encourage settlement prior to discharge at greenfield run-off rates.

There will be no direct Site run-off to watercourses during the construction phase with all outflows from drainage via settlement ponds from which treated surface water is released by diffuse overland flow at appropriate locations. To reduce the amount of silt laden water to be treated, clean water drains will be created upstream of the works area to divert water away from construction areas, thereby lessening the volume of water to be treated on Site.

De-watering of excavations, where required, will be through filtered ‘silt socks’ / dewatering bags or a ‘*Siltbuster’* or similar system, prior to discharge. Excavations will be kept to the absolute minimum for the specific task and undertaken on a ‘just in time’ basis to minimise the extent of silty water generated and requiring treatment prior to discharge.

The proposed clear span bridge will not affect the banks or the stream bed of the watercourse as it will span the width of the channel with no associated instream support (see Chapter 9). For the laying of the proposed five culverts, mitigation will be implemented to ensure that pollutants are not released to downstream waters (see Section 9.5.2.10 in Chapter 9). There will be no tracking of machinery across any watercourse; all machinery will stay within designated routes (working corridor) within the Redline Boundary.

Mitigation by Reduction

Implementation of the following specific measures will ensure the protection of water quality in local watercourses and will ensure that contaminated water does not reach the identified European sites (Lower River Shannon SAC & River Shannon and River Fergus Estuaries SPA), which have hydrological connectivity with the Project.

This is a summary of the principle required mitigation measures, with full details being presented in the Hydrology and Hydrogeology impact assessment chapter of the EIAR (**EIAR Chapter 9)** and the Construction Environmental Management Plan (**Appendix 2.1 of the EIAR**).

- A 50 m buffer zone from all watercourses will be maintained during the construction phase. The only exception to this rule will be where upgrades to pre-existing access roads that are already located within the 50 m buffer zone are required or where unavoidable stream crossings are required.

- The Site compound and soil repository area will be located at a minimum distance of 50 m from any watercourse. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment.

- Sediment traps or settlement ponds will be provided at all outfalls during construction. Total suspended solid levels in all waters discharging to any watercourse shall not exceed 25 mg/l (Inland Fisheries Ireland, 2016)[1]. All construction Site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-containment facility prior to discharge.

- Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Contractor and supervised by the Environmental Manager to ensure satisfactory operation and/or the need, as required, for maintenance requirements.

- The storage of oils, hydraulic fluids, etc., will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005).

- The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment.

- All machinery operating at the Site will be fully maintained and routinely checked to ensure no leakage of oils or lubricants occurs. All fuelling of machinery will be undertaken at a discrete "fuel station" designated for the purpose of safe fuel storage and fuel transfer to vehicles.

[1] Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*.

- Culverting works will be undertaken in dry conditions and in low flow conditions on drains that do not run dry. These works will be undertaken during a period of dry stable weather via monitoring of medium range forecasts.
- During the culvert installation and associated construction work, double silt fences will be emplaced immediately downgradient and downstream of the construction area for the duration of the construction phase.
- In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water, precast concrete will be used wherever possible. Elements of the Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Where the use of precast concrete is not possible the following mitigation measures will apply.
    - Lean mix concrete, often used to provide protection to main foundations of infrastructure from soil biome, can alter the pH of water if introduced, which would then require the treatment of acid before being discharged to the surrounding environment. The use of lean mix concrete will be minimized, limited to the requirement of Turbine Foundations. The risk of runoff will be minimal, as concrete will be contained in an enclosed, excavated area.
    - Vehicles transporting cement or concrete to the Site will be visually inspected for signs of excess cementitious material prior to being granted access to the Site. This will prevent the likelihood of cementitious material being accidentally deposited on the Site access tracks or elsewhere at the Site.
    - Concrete will be poured during metrological dry periods/seasons in so far as practical and reasonably foreseeable. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions.
    - Pouring of concrete into standing water within excavations will be avoided.
    - Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.
    - Any required shuttering installed to contain the concrete during pouring will be fully secured around its perimeter to minimise any potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints.
    - No surplus concrete will be stored or deposited anywhere on Site.
    - Raw or uncured waste concrete will be disposed of by removal from the Site and returned to the source location or disposed of appropriately at a suitably licensed facility.
    - Designated washout of concrete trucks shall be strictly confined to the batching facility and will not be located within the vicinity of watercourses or drainage channels.

Only the chutes will be cleaned prior to departure from Site and this will take place at a designated area at the Temporary Site Compound. The contents will be allowed to settle and the supernatant will be removed off site by licenced operator to a licenced waste water treatment plant.

- Temporary storage of cement bound sand (if required for construction of the Electrical Substation building) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded, *e.g.* using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off.
- Spill kits will be readily available to Site personnel, and any spillages or deposits will be cleaned up as soon as possible and disposed of appropriately

- In the unlikely event of any incidents of pollution to watercourses, immediate steps will be undertaken to resolve the cause of the pollution and mitigate against the impact of pollution, following the advice set out in, the site-specific Emergency Response Plan (CEMP-Management Plan 1, Appendix 2.1).

3.3.2 Operational Phase Mitigation

The following measures will be implemented during the operational phase to ensure the ongoing protection of watercourses and water quality at the Site and in downstream reaches leading towards the identified European sites (Lower River Shannon SAC & River Shannon and River Fergus Estuaries SPA), which have hydrological connectivity with the Site:

The Site compound / office will house all potential pollutants within a secure bunded COSSH store for the operational phase of the Project.

3.3.3 Decommissioning Phase Mitigation

Decommissioning of the Project will be scheduled to take place after the proposed 35-year lifespan. Potential effects on European sites from the decommissioning phase of the Project are likely to be broadly similar to construction phase effects, in terms of potential surface water quality impacts from ground disturbance, refuelling and the storage of potentially hazardous materials on Site. The implementation of all mitigation measures, as relevant, detailed for the construction phase will be adopted in full during the decommissioning phase to ensure all such effects are avoided.

When the final Decommissioning Plan is prepared prior to Decommissioning and presented as a standalone document, all drainage management measures, which will include maintenance of the operational drainage measures, will be included in that document, as required. However, it should be noted that by the time Decommissioning is undertaken after the planned 35 year lifespan of the Development, the areas within the Site will have re-vegetated resulting in a resumption of the natural drainage management that will have existed prior to any construction. It is not anticipated that the decommissioning phase will interrupt this restored drainage regime in any way with the works proposed.

Restoration of the Site following decommissioning of infrastructure will require the prior establishment of the new baseline conditions at the Site which will have developed over the intervening 35 years life of the project. These studies will inform any modification or additional sensitivities that may need to be factored in restoration and Site-specific measures.

3.4 Analysis of "In-combination" Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in-combination with other plans and projects.

There are 16 operational, consented and proposed wind farms within 20 km of the Ballykett site (see Table 5, and Figure 4). The nearest operational wind farms are Moanmore Wind Farm (7 turbines), which is located approximately 1.3 km to the northwest of the Site and Tullabrack Wind Farm (6 turbines), which is located approximately 1.5 km west of the Site. The operational Moneypoint Wind Farm (5 turbines) is located approximately 5.5 km to the south of the Site. The remaining 13 projects are located at distances varying from 11.6 km to 18.1 km from the Site.

Table 5: Wind Farms within 20 km of the Proposed Ballykett Development (Chapter 2 Table 2.1).

Wind Farm	Status	No. of Turbines	Approximate Distance to the Site Boundary	Direction from the Development
Moanmore	Operational	7	c. 1.31 km	West
Tullabrack	Operational	6	c. 1.52 km	Northwest
Beal Hill	Operational	6	c. 16.06 km	Southwest
Booltiagh	Operational	18	c. 17.42 km	Northeast
Cahermurphy	Operational	4	c. 13.07 km	Northeast
Carrownaweelaun	Operational	2	c. 18.08 km	West
Crossmore	Consented	7	c. 11.42 km	East
Curraghgerrig	Operational	2	c. 15.11 km	Southwest
Glenmore	Operational	12	c. 15.18 km	Northeast
Kiltumper	Operational	2	c. 12.98 km	Northeast
Lahra	Operational	2	c. 16.47 km	South
Leanamore	Operational	9	c. 11.57 km	Southeast
Moneypoint	Operational	5	c. 5.47 km	South
Shronowen	Consented	12	c. 16.86 km	South
Tullahennel South	Operational	9	c. 15.58 km	South
Tullahennel North	Operational	2	c. 15.72 km	South
Moanmore South	Proposed but not yet consented	3	c. 3.27 km	West

Other developments or proposed developments (larger than one-off houses) within 10 km of the proposed Ballykett Wind Farm Site are listed in Table 2.2 of Chapter 2 in the EIAR. These include agricultural facilities, a solar energy development, refurbishment of the existing Moneypoint – Oldstreet

400kV overhead line, a waste water treatment works, amenity facilities (9-hole pitch and putt course) and an apartment development.

All of these projects ultimately drain to the Shannon Estuary catchment. Each of the projects has been rigorously assessed by the relevant statutory planning agency for environmental and ecological impacts and where such impacts are identified mitigation has been incorporated into the planning consent. It is noted, however, that the surveys undertaken for the Aquatic Ecology impact assessment (**Chapter 7 in EIAR**) have shown that the local watercourses have moderate to poor water quality and the impact assessment considers that current forestry and agricultural activities are having negative effects on water quality within the catchment.

With respect to hydrology, the effects of the proposed Project are considered to contribute to and add to the cumulative nature of adverse effects imposed on the surface water network in the catchments associated with the Development (details in **EIAR Chapter 9 Hydrology and Hydrogeology**). However, considering the pre-existing "*Moderate*" WFD status of the surface waters surrounding the Development, the potential for the Development to have adverse cumulative effects on hydrology is limited to the construction phase. Considering cumulative effects of pressures on the surface water network, if an accidental release of contaminants were to occur, there is potential to temporarily effect surface waterbodies in the catchment. However, the mitigation measures outlined in this NIS and detailed in **Chapter 9 of EIAR** are to reduce any potential effect to acceptable levels. Therefore, the Development is not considered likely to significantly contribute to cumulative effects in terms of water quality.

It is concluded that with mitigation in place the Project will not result in any significant effect on local water quality during any Project phase and hence will not contribute to any cumulative effect on the designated sites associated with the Shannon Estuary when considered with the various other projects within the hinterland. Consequently, the proposed development alone and in combination with other plans and projects will not have an adverse effect on the integrity of any European site in view of its conservation objectives.

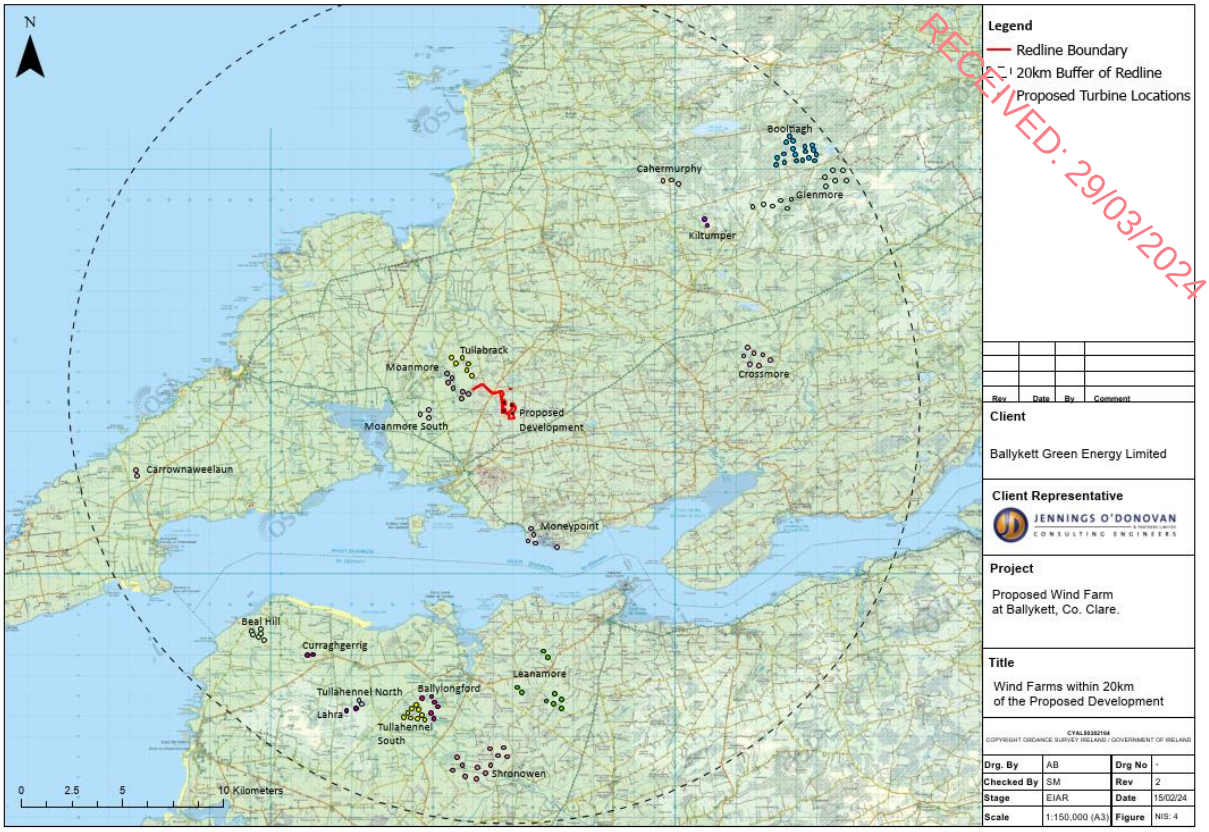

Figure 4. Locations of wind farm projects within a 20 km radius of the Site.

4. CONCLUSION

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the proposed Project which, by itself, or in combination with other plans or projects, which may affect the integrity of the relevant European Sites have been considered.

The NIS contains information that the competent authority (Clare County Council) may consider in making its own findings and conclusions and is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Project on the integrity of the relevant Natura 2000 sites.

In conclusion, it is considered that the Project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European site.

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