Natura Impact Statement

Barnesmore Windfarm Repowering

Report produced by Woodrow Sustainable Solutions Ltd. on behalf of ScottishPower Renewables

Woodrow Sustainable Solutions Ltd.,
Main Street,
Ballisodare,
Co Sligo,
F91 R9VC,
Ireland.

Tel: 0719140542
Email: info@woodrow.ie

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Client	ScottishPower Renewables
Prepared by	Woodrow Sustainable Solutions Ltd., Main Street, Ballisodare, Co Sligo, F91 R9VC, Ireland. Tel: +353 719140542
Lead Author	Will Woodrow
Checked internally	Hazel Doyle and Róisín NigFhloinn
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1 INTRODUCTION

1.1 Background

Woodrow Sustainable Solutions Ltd. (Woodrow) was engaged by ScottishPower Renewables (SPR) (the Applicant) to undertake a Screening for Appropriate Assessment and Appropriate Assessment for a proposed repowering project on land comprising an existing, operating windfarm (Operational Barnesmore Windfarm). The Operational Barnesmore Windfarm comprises 25 x 600 kilowatt (kW) wind turbines, situated approximately 10 km north-east of Donegal town at Keadew Upper, County Donegal. This Natura Impact Statement (NIS) details the assessment of the proposed repowering and the operational replacement of the existing 25 no. 600 kW turbines with up to 13 no. 4-6 megawatt (MW) turbines ("the Development").
This NIS constitutes a report of a scientific examination of evidence and data carried out by competent persons to identify and classify any implications for one or more European Sites (also called Natura 2000 sites) in view of the Sites' conservation objectives. It aims to provide the Board with the best scientific knowledge and objective information on which to carry out a Screening for Appropriate Assessment and Appropriate Assessment, as required, pursuant to the requirements of the EU Habitats Directive 1992/43/EEC and the Birds Directive 2009/147/EC.

In carrying out the Screening for Appropriate Assessment, the Board is required to determine whether the Development, on its own or in combination with other plans or projects, is likely to have significant effects on any European Sites. Where it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European Site or Sites, such Sites have been 'screened in' to ensure that they are the subject of an Appropriate Assessment. For the avoidance of doubt, no measures are proposed or relied upon to avoid or reduce a likely significant effect on any European Site at the Screening for Appropriate Assessment Stage.

Where significant effects on a European Site(s) cannot be excluded with a high degree of scientific certainty, this NIS aims to assist the Board to comply with its requirement to carry out an Appropriate Assessment of the proposed development on such Site(s) and to reach a definitive conclusion that the proposed development, on its own or in combination with other projects or plans, will not adversely affect the integrity of any such Site(s). At this Appropriate Assessment stage, measures to prevent, avoid or reduce adverse effects may be proposed and taken into account by the Board.

Where the Board is satisfied on the basis of objective / best scientific information that the proposed development would not adversely affect a European Site if it is carried out in accordance with the permission, the Board may grant permission. Where the Board is not so satisfied, the Board may do the following: -

- refuse permission, or

- if the Board is satisfied on the basis of objective information that the proposed development is not likely to have an adverse effect on a European Site if certain proposed modifications or conditions are complied with, grant permission subject to such modifications or conditions.

European Sites in Irish law include Special Areas of Conservation (SACs) and candidate SACs for the protection of habitats and species under the Habitats Directive, and Special

Protection Areas (SPAs) and proposed SPAs for the protection of birds and supporting wetland habitat under the Birds Directive. European Sites do not include Natural Heritage Areas (NHAs) or proposed NHAs designated under the Wildlife Act 1976, as amended, although effects on NHAs may have effects on European Sites.

Woodrow undertook ecological surveys at the Site and of the wider area. An Environmental Impact Assessment Report (EIAR) has also been prepared, including **Chapter 6: Biodiversity** (Woodrow, 2019). This NIS and Chapter 6: Biodiversity of the EIAR, provide the Board with a complete scientific and objective data set for the proposed development Site, relevant European Sites and NHAs and any other sites or features of ecological and conservation value in the potential zone of influence of the Development.

This report is also supported by figures in Volume III and the following Technical Appendix documents provided in Volume IV:

- Outline Construction Environmental Management Plan (CEMP) in **Technical Appendix 2.1**;
- TLI Technical Note 1 on Grid Connection is contained in **Technical Appendix 2.2**; and
- Draft Habitat Management Plan (Draft HMP) in **Technical Appendix 6.7.**

Common acronyms used throughout this NIS can be found in **Technical Appendix 1.4** in Volume IV.

The Outline CEMP will be developed into a site-specific Barnesmore CEMP post consent/pre-construction once a contractor has been appointed and will cover both the decommissioning of the Operational Barnesmore Windfarm and the construction of the Development. It will include all of the mitigation measures recommended within the EIAR and any measures included in conditions to the consent. For the purpose of this application, a summary of the mitigation measures is included in **Technical Appendix 15.1.**

Note – all figures are provided in Appendix 1 of this NIS.

1.2 Site Location and Environs

The Operational Barnesmore Windfarm is located approximately 10 km northwest of Donegal Town. The site commenced operations in 1997 and currently there are 25 no., 600 kW Vestas V42 Wind Turbine Generators (WTG) with a 61 m tip height operating on the site. General access to the Site will be via the N15 and the L2595 and onto the L2015 to the site entrance.

The existing turbines are sited on elevated moorland above Barnesmore Gap between the N15 and the Irish national border, the Site Boundary is wholly within the Republic of Ireland. The site elevation is between 300 m and 398 m AOD.

Planning permission ('the Existing Permission') was granted by Donegal County Council (DCC) on the 10th August 1996 under planning reference 95/914 (An Bord Pleanála Ref: PL 05.098236) for the erection of up to 26 no., 40 m hub height wind turbine masts, transformer compound with associated single storey switch room building and service roads at Keadew Upper, Cullionboy and Clogher, Co. Donegal. The Existing Permission is for a windfarm in 'perpetuity', which means there is no expiry of the Existing Permission and it can therefore continue to operate with the existing turbines indefinitely.

Planning Permission is being sought by the Applicant to repower the Operational Barnesmore Windfarm at Keadew Upper, Cullionboy and Clogher, Co. Donegal.

1.2.1 Legislative Requirement

The requirement to carry out Screening for Appropriate Assessment, Appropriate Assessment, and to prepare an NIS for this purpose, is found in Article 6(3) of the Habitats Directive incorporating the Birds Directive. For the purposes of an application to the Board for permission, the relevant provisions to transpose Article 6(3) are found in Part XAB of the Planning and Development Act 2000, as amended. The EC (Birds and Natural Habitats) Regulations 2011, as amended ("the Habitats Regulations") also have from the perspective of species effects.

A Screening for Appropriate Assessment was undertaken for the project. A screening matrix is provided at Table 1. The potential for significant effects on five European Sites could not be excluded on the basis of objective scientific data. These five European Sites include

1. Lough Eske and Ardnamona Wood SAC,
2. River Foyle and Tributaries SAC,
3. River Finn SAC,
4. Lough Derg (Donegal) SPA and
5. Pettigo Plateau Nature Reserve SPA.

These five Sites were 'Screened in' on the following basis:

- The Development is hydrologically connected to the Lough Eske and Ardnamona Wood SAC, the River Foyle and Tributaries SAC and the River Finn SAC, and, without mitigation, has the potential to result in surface water impacts to include sediment release and chemical / hydrocarbon pollution, which could impact on the Qualifying Interests[1] (QIs) of these sites. These include freshwater pearl mussel *Margaritifera margaritifera*, Atlantic salmon (*Salmo salar*), otter (*Lutra lutra*), oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) and water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. These QIs are described and assessed more fully below.
- The Development lies within 5.2 km of the Pettigo Plateau Nature Reserve SPA, designated for Greenland white-fronted goose (*Anser albifrons flavirostris*). As a windfarm proposal, there is potential for collision risk on QI bird species flying in the wider area. The level of risk is unknown without detailed Appropriate Assessment. The Development lies within 6.5 km of the Lough Derg (Donegal) SPA, designated for lesser black-backed gull (*Larus fuscus*) and herring gull (*Larus argentatus*). As a windfarm proposal, there is potential for collision risk on QI bird species flying in the wider area. The level of risk is unknown without detailed Appropriate Assessment.

Consequently, this NIS has been prepared to provide objective scientific information to the Board to inform the Appropriate Assessment of the proposed development on these Sites, including, but not limited to, best scientific evidence that is required for the purposes of the Appropriate Assessment, in the form of winter bird surveys conducted throughout the 2017-18 winter bird season by Marc Ruddock (Bird Surveyors Ltd. (BSL)).

In addition, this NIS has been produced in light of recent European and Irish case law which is relevant to the Appropriate Assessment process. This is summarised in Appendix 2.

[1] Qualifying Interests are the European protected Annex I habitats or Annex II species for which the SACs and/or SPAs have been designated.

1.2.2 Overview of Screening Process

According to the NPWS (2009, as amended in 2010), the Appropriate Assessment Screening Exercise can result in the following possible conclusions or outcomes[2]:

- Appropriate Assessment is not required: The Development is directly connected with or necessary to the nature conservation objectives of the site.
- Appropriate Assessment is not required: Screening establishes that there is no potential for significant effects on a European Site (subject to any further changes to the proposed development)
- Significant effects are likely, or it is uncertain as to whether or not they are likely. Permission must be refused unless the proposed development is subject to Appropriate Assessment.

Alternatively, the Screening process may recommence on the basis of modified plans.

European Sites within the Zone of Influence of the Development

In many cases a standard 15 km distance from a proposal is used as a potential Zone of Influence (ZoI) within which European Sites should be screened for potential impact. However, in reality, potential impacts on sites is dependent on the nature of the impacts arising, sensitivity of receptors and causal links and conduits rather than distance. In many cases the potential ZoI is considerably less than 15 km (for example noise and airborne pollution) while the potential ZoI could be greater than 15 km, for example if there is a direct water connection.

Information acquired during both the desk-study and field surveys has identified any European Sites which have a potential ecological and/or hydrological connection with the Development and as such occur within the ZoI of the Development. The ZoI depends on the type of Development taking place, its likely impacts and the presence of ecological connections which provide a pathway for such impacts to an ecological feature of interest, which in the case of European Sites are listed as QI that are sensitive to such impacts. As such the ZoI may extend beyond the boundaries of the Development due to the presence of ecological connections of a QI with a distant European Site. Similarly, the QI of a European Site which is geographically close to the Development but which has no ecological connection with the Development, and as such no pathway for impacts, are not within the ZoI regardless of their proximity to the Development. Any such ecological / hydrological connections which provide pathways for impacts will be identified and described.

Following the Screening for Appropriate Assessment, the likelihood of significant effects on five European Sites could not be excluded on the basis of objective scientific information. These are sites with potential ecological / hydrological connections with the Development and as such are considered to be within the potential Zone of Influence (ZoI) of the Development. These European Sites are:

- Lough Eske and Ardnamona Wood SAC;
- River Foyle and Tributaries SAC;
- River Finn SAC;
- Lough Derg (Donegal) SPA; and,
- Pettigo Plateau Nature Reserve SPA.

[2] Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities 2009 page 34

Screening Matrix

Table 1 identifies European Sites within the Zone of Influence of the Development with the potential for significant effects. Table 2 identifies European Sites within the Zone of Influence of the proposed Haul Route / upgrade works. The potential for impacts and significant effects on these Sites is identified in Tables 1 and 2. No reliance is placed on any measure to avoid or reduce or exclude the likelihood of significant effects. Sites which have been screened out, and the justification for this, are also presented.

Tables 1 and 2 use a number of specific terms to conclude on the potential for significant effects. The term 'likely significant effect' (LSE) is used where a plan or project is likely to undermine any of the Site's conservation objectives. The term 'potential significant effect' (PSE) is used where a plan or project has an indicated potential to undermine any of the Site's conservation objectives, but where doubt exists about the risk of a significant effect in the current context. Nevertheless, where doubt exists about the risk of a significant effect, use of the precautionary principle requires this effect to be considered appropriately within the screening process. The term 'No Potential Significant Effect' is used where it can be concluded with confidence that there is no potential causal link (or source-pathway-receptor linkage).

Table 1 Significance of potential effects matrix for European Sites.

European Site	Distance	Qualifying Interest (in bold if within the Zone of Influence)	Conservation Objectives	Potential Direct, Indirect and In-Combination Effects	Potential for Significant Effect?
Lough Eske and Ardnamona Wood SAC [000163]	0.3 km	• **[3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)** • [7220] Petrifying springs with tufa formation (*Cratoneurion*) • [91A0] Old sessile oak woods with Ilex and *Blechnum* in the British Isles • **[1029] *Margaritifera margaritifera* (Freshwater Pearl Mussel)** • **[1106] *Salmo salar* (Atlantic salmon)** • [1421] *Trichomanes speciosum* (Killarney fern)	See NPWS[3] (2019) Detailed in Section 4.1	Sediment and/or hydrocarbons pollution within the Development during the construction and operational stages of the Development. Potential impacts include those arising from Haul Route upgrade. Watercourses exist connecting the Development and the European Site	**Potential for significant effect – see Section 1.3**
River Foyle and Tributaries SAC [UK0030320]	2.6 km	• **[3260] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation** • **[1355] *Lutra lutra* (Otter)** • **[1106] *Salmo salar* (Atlantic salmon)**	See NIEA[4] (2017) Detailed in Section 4.1	Sediment and/or hydrocarbons pollution within the Development during the construction and operational stage of the Development. Watercourses exist connecting the Development and the European Site	**Potential for significant effect – see Section 1.3**
River Finn SAC [002301]	7.2 km	• **[3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)** • [4010] Northern Atlantic wet heaths with Erica tetralix • [7130] Blanket bogs (* if Active) • [7140] Transition mires and quaking bogs	See NPWS (2017)[5] Detailed in Section 4.1	Sediment and/or hydrocarbons pollution within the Development during the construction and operational stage of the Development.	**Potential for significant effect – see Section 1.3**

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000163.pdf
[4] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Conservation%20Objectives%20%282017%29.%20%20River%20Foyle%20%26%20Tributaries%20SAC.%20%20Version....pdf
[5] https://www.npws.ie/protected-sites/sac/002301

European Site	Distance	Qualifying Interest (in bold if within the Zone of Influence)	Conservation Objectives	Potential Direct, Indirect and In-Combination Effects	Potential for Significant Effect?
		• **[1106] *Salmo salar* (Atlantic salmon)** • **[1355] *Lutra lutra* (Otter)**		Watercourses exist connecting the Development and the European Site	
Pettigo Plateau and Nature Reserve SPA [004099]	5.3 km	• **Greenland white-fronted Goose (*Anser albifrons flavirostris)* [A395]**	See NPWS (2018a) Detailed in Section 4.1	Collision risk during operational stage of the Development. The Development is within the potential foraging range of QI species.	**Potential for significant effect – see Section 1.3**
Lough Derg (Donegal) SPA [004057]	6.5 km	• **Lesser black-backed gull (*Larus fuscus*) [A183]** • **Herring gull (*Larus argentatus*) [A184]**	See NPWS (2018b) Detailed in Section 4.1	Collision risk during operational stage of the Development. The Development is within the potential foraging range of QI species.	**Potential for significant effect – see Section 1.3**
Meenaguse / Ardbane Bog SAC [000172]	11.2 km	• [7130] Blanket bogs (* if Active)	See NPWS (2017b) Detailed in Section 4.1	No potential connectivity (no hydrological connection).	No potential for significant effect
Meenaguse Scragh SAC [001880]	12.2 km	• Northern Atlantic wet heaths with *Erica tetralix* [4010]	See NPWS (2019b) Detailed in Section 4.1	No potential connectivity (no hydrological connection).	No potential for significant effect
Lough Nillan Bog (Carrickatlieve) SAC [000165]	14.1 km	• Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] • Blanket bogs (* if active bog) [7130]	See NPWS (2016) Detailed in Section 4.1	No potential connectivity (no hydrological connection).	No potential for significant effect

European Site	Distance	Qualifying Interest (in bold if within the Zone of Influence)	Conservation Objectives	Potential Direct, Indirect and In-Combination Effects	Potential for Significant Effect?
Lough Nillan Bog SPA [004110]	14.1 km	• Merlin (*Falco columbarius*) [A098] • Golden Plover (*Pluvialis apricaria*) [A140] • Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] • Dunlin (*Calidris alpina schinzii*) [A466]	See NPWS (2018c) Detailed in Section 4.1	No potential connectivity - beyond potential foraging range of QI species[6].	No potential for significant effect
Croaghonagh Bog SAC [000129]	3.4 km	• [7130] Blanket bogs (* if Active)	See NPWS (2017c) Detailed in Section 4.1	No potential connectivity (no hydrological connection).	No potential for significant effect
Dunragh Loughs / Pettigo Plateau SAC [001125]	3.1 km	• Northern Atlantic wet heaths with *Erica tetralix* [4010] • Blanket bogs (* if active bog) [7130]	See NPWS (2017d) Detailed in Section 4.1	No potential connectivity (no hydrological connection).	No potential for significant effect
Donegal Bay (Murvagh) SAC [000133]	7.7 km	• Mudflats and sandflats not covered by seawater at low tide [1140] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae) [2170] • Humid dune slacks [2190] • *Phoca vitulina* (Harbour Seal) [1365]	See NPWS (2012) Detailed in Section 4.1	No realistic potential. QIs are largely terrestrial except 1140 and 1365. Taking account of works, area within catchment and dispersal within tidal / marine environment there is considered no potential for significant effect arising from water quality changes.	No potential for significant effect
Donegal Bay SPA [004151]	7.7 km	• Great Northern Diver (*Gavia immer*) [A003] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Common Scoter (*Melanitta nigra*) [A065] • Sanderling (*Calidris alba*) [A144] • Wetland and Waterbirds [A999]	See NPWS (2012b) Detailed in Section 4.1	No potential connectivity – designated for wintering species not generally connected with upland sites.	No potential for significant effect

[6] SNH (2016) Assessing Connectivity with Special Protection Areas (SPAs). Version 3. States foraging ranges as merlin 5km, golden plover 3-11 k m, Greenland white-fronted goose core range 5 – 8km, dunlin core range 500m – 3 km.

Table 2 - Significance of potential effects matrix on European Sites from the proposed Haul Route upgrades.

Item / description	Location and proximity to European Site	Potential impact	Potential for Significant Effect?
Verge strengthening. Bruckless Bridge, Co Donegal. (Map 5823-AT155-101) Point A in **Figure 2**	Bruckless. N 56 Circa 7 km from marine element of St John's Point SAC. Separated by 6.7 km of sea.	Bridge is already re-aligned. Works are minimal. Site is separated from nearest European Site by 6.7 km of sea; there is no source-pathway-receptor linkage to any European Site.	**No potential for significant effect**
Vegetation removal and verge strengthening, Darney, Bruckless, Co Donegal. (Map 5823-AT155-102) Point B in **Figure 2**	As above	Works are minimal and there is no source-pathway-receptor linkage to any European Site. Site is separated from nearest European Site by 6.7 km of sea	**No potential for significant effect**
Vegetation removal and verge strengthening, Keadew Lower, Barnesmore, Co Donegal. (Map 5823-AT155-103) Point C in **Figure 2**	Keadew Lower, N15. Proposed works are adjacent to (within 20 m) of the Lough Eske and Ardnamona Wood SAC.	Although works are minimal, there is a potential source-pathway-receptor linkage to a European Site.	**Potential for significant effect**
Verge strengthening. Cullionboy, Barnesmore, Co Donegal. (Map 5823-AT155-104) Point D in **Figure 2**	Cullionboy, L2595. Proposed works are circa 242 m from the Lough Eske and Ardnamona Wood SAC.	Works are minimal and there is no source-pathway-receptor linkage to any European Site (no hydrological link).	**No potential for significant effect**
Verge strengthening. Clogher, Barnesmore. (Map 5823-AT155-105) Point E in **Figure 2**	Cullionboy, L2595. Proposed works are circa 150 m from the Lough Eske and Ardnamona Wood SAC. There is a potential hydrological link between the location of the works and the Lough Eske and Ardnamona Wood SAC in the form of a small watercourse that connects to the Lough Eske and Ardnamona Wood SAC circa 700 m downstream	Although works are minimal, there is a potential source-pathway-receptor linkage to a European Site	**Potential for significant effect**
Road realignment / widening and relocation of EIR poles.	Clogher L2095 / L2015 Site Access Road Junction.	Although works are 1.2 km from the SAC via a connecting watercourse, the nature of the works, which potentially require significant localised	**Potential for significant effect**

Clogher, Barnesmore. (Map 5823-AT155-106) Point F in **Figure 2**	Proposed works are circa 800 m from the Lough Eske and Ardnamona Wood SAC. There is a potential hydrological link between the location of the works and the Lough Eske and Ardnamona Wood SAC in the form of a drain that connects (via a pond) to the Lough Eske and Ardnamona Wood SAC circa 1.2 km downstream.	disruption (and, for example, mobilization of sediments), there is a potential source-pathway-receptor linkage to a European Site	
Road realignment / widening and strengthening. Clogher, Barnesmore. (Map 5823-AT155-107) Point G in **Figure 2**	Clogher L2015 Site Access Road. Proposed works are essentially connected to those above. The above works have a potential hydrological link between the location of the works and the Lough Eske and Ardnamona Wood SAC in the form of a drain that connects (via a pond) to the Lough Eske and Ardnamona Wood SAC circa 1.2 km downstream.	The connection of these works to the ones above, and the conclusions detailed above, mean that there is a potential source-pathway-receptor linkage to a European Site	**Potential for significant effect**
Road realignment / widening and strengthening. Clogher, Barnesmore. (Map 5823-AT155-108) Point H in **Figure 2**	Clogher L2015 Site Access Road. The proposed works will cross a drain that runs along the road to the section of road where the works above will be undertaken. The works have a potential hydrological link between the location of the works and the Lough Eske and Ardnamona Wood SAC in the form of a drain that connects (via a pond) to the Lough Eske and Ardnamona Wood SAC circa 1.7 km downstream.	The connection of these works to the ones above (and the same watercourses), and the conclusions detailed above, mean that there is a potential source-pathway-receptor linkage to a European Site.	**Potential for significant effect**

1.3 Conclusions of Screening for Appropriate Assessment

As stated in **Table 1,** the Screening for Appropriate Assessment process identified five European Sites which are considered to be within the ZoI of the Development and the proposed Haul Route upgrades. These include:

- Lough Eske and Ardnamona Wood SAC,
- River Foyle and Tributaries SAC,
- River Finn SAC,
- Lough Derg (Donegal) SPA, and,
- Pettigo Plateau Nature Reserve SPA.

It is considered that there is some potential for water quality impacts caused during the initial decommissioning and construction stage and / or the operational stage of the Development within the Development Site to negatively affect those QIs within the Lough Eske and Ardnamona Wood SAC, River Finn SAC and the River Foyle and Tributaries SAC which are, to varying degrees, sensitive to water quality issues. Potential impacts may result from unmitigated mobilisation of sediments during the construction stage, with potential impact sources including excavation and construction of new areas of infrastructure as well as upgrading of Access Site Tracks and removal of old infrastructure / site restoration. In addition, there is potential for pollution from hydrocarbons or other chemical pollutants, with potential impact sources comprising uncontained spillages or pollution events during the construction stage in particular. The hydrological connection distance to the Lough Eske and Ardnamona Wood SAC is under 500 m from the internal Access Site Tracks to be upgraded to the west of the Development, and within 20 m of some of the Haul Route works that are required (such as verge strengthening), whereas the hydrological connection distance to the River Foyle and Tributaries SAC is in > 10 km.

In the case of the Lough Eske and Ardnamona Wood SAC, it is concluded that there is potential for Significant Effects on QIs resulting from water quality changes.

In the case of the River Foyle and Tributaries SAC and River Finn SAC, it is concluded that, although potential for Significant Effects is likely to be low, Significant Effects on QIs resulting from water quality changes cannot be ruled out at this stage.

With respect to Pettigo Plateau and Nature Reserve SPA, the site is designated for Greenland white-fronted goose *Anser albifrons flavirostris* and the site lies within 5.3 km of the Development. SNH Guidance *Assessing Connectivity with Special Protection Areas (SPAs)* Version 2 (SNH, 2016) gives the core foraging range of Greenland white-fronted goose as 5-8 km. Therefore, there is a potential for significant effect on the SPA and it is 'screened in' for Appropriate Assessment..

With respect to Lough Derg (Donegal) SPA, the site is designated for lesser black-backed gull *Larus fuscus* and herring gull *Larus argentatus*. The SPA is 6.4 km from the Development. There is no clear guidance on the core foraging distance of the above two species, but they were known to occur within the site during surveys (Ruddock, pers. comm. 2019) and so the site is considered to 'screen in' with respect to the potential for significant effects.

1.4 Structure / Layout of the Natura Impact Statement

Following the structure of the requirements for Article 6(3) of the Habitats Directive, sections 2 to 10 of the NIS provide a description of the project and an assessment of potential effects

of aspects of the Development on European Sites and their conservation interests. Section 3 describes the details of the proposal; Section 4 describes those European Sites which are within the ZoI of the proposal and Section 6 assesses the potential effects on those European Sites. Section 7 assesses the potential for in-combination effects on those European Sites. Mitigation for such effects are identified in Section 8. Section 10 provides a conclusion which will determine whether the proposal is likely to have, either alone or in-combination with other plans or projects, an adverse effect on the integrity of any European Site.

2 METHODOLOGY

2.1 Desk Study Methodology

The following information sources were consulted:

- Department of Environment, Heritage and Local Government – NPWS (2009 – as amended in 2010). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities;
- Draft Wind Energy Development Guidelines (DHPLG, 2019)
- Planning and Development Act 2000, as amended
- EC (Birds and Natural Habitats Regulations 2011, as amended
- European Commission Environment DG (2001). Assessment of plans and projects significantly affecting European Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission Environment DG (2018) Managing European Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC;
- National Parks and Wildlife Services (NPWS) online MapViewer[7];
- National Parks and Wildlife Services data (downloaded GIS data files); and,
- Donegal County Council (DCC) Planning Application Search[8].

2.2 Survey Methodology

Table 3 details the surveys and investigation and ongoing monitoring undertaken at the Development which are considered relevant to this NIS (for full details of surveys undertaken, see **Chapter 6: Biodiversity, Chapter 7: Ornithology and Chapter 9: Hydrology and Hydrogeology** of the EIAR).

Table 3 Details of the surveys undertaken for the Development which are relevant to the NIS.

Description	Coverage	Dates and Personnel
Site scoping	Initial walkover of the Development. Description and identification of issues.	April 2019. Woodrow Sustainable Solutions Ltd. Woodrow personnel: • Róisín NigFhloinn • Will Woodrow
Freshwater Pearl Mussel Survey	Targeted survey of watercourses between the Site and the nearest known population in the River Eske and the upper Lough Foyle catchment.	September 2019. Malachy Walsh and Partners: • Ger Hayes
Hydrology and Hydrogeology survey	Hydrological and Hydrogeological Survey of site and surrounding area.	Between April and September 2019. Minerex Environmental Ltd. (MEL)
Bird surveys	Two years of bird surveys (March 2017-April 2019) to comply with Scottish Natural Heritage (SNH) methodology (SNH, 2017).	Bird Surveyors Ltd. (BSL) • Marc Ruddock

[7] NPWS Map Viewer http://webgis.npws.ie/npwsviewer/
[8] DCC Planning Application Website
http://donegal.maps.arcgis.com/apps/Viewer/index.html?appid=8c8572a2556b4a86a3ea8eef25fef6fe

All surveys undertaken followed industry-standard methodologies, as detailed in the following sections.

2.2.1 Bird Survey Methodology

Mark Ruddock from Bird Surveyors Ltd. was the lead ornithologist conducting bird surveys of the Development. Various bird surveys were conducted (see **Chapter 7: Ornithology** for a detailed list of surveys undertaken) to include Breeding Bird Surveys (BBS), Vantage Point (VP) surveys, walkover surveys and priority species surveys across appropriate seasons (details of which can be found in **Chapter 7: Ornithology** (Ruddock, 2019). The methodologies are summaries below and sourced from **Technical Appendix 7.1.**

The survey details can be found in **Table 7.2** of the **Technical Appendix TA7.1.**

2.2.2 Freshwater Pearl Mussel Survey Methodology

Malachy Walsh and Partners applied for and were issued a licence (No. C196/2019) to carry out Freshwater Pearl Mussel (FPM) survey work in selected watercourse reaches in the Eske River catchment. Surveying was carried out following the NPWS guidance '*Margaritifera margaritifera* Stage 1 and Stage 2 survey guidelines, Irish Wildlife Manuals, No. 12' (Anon 2004). Surveying was carried out on the 1st, 2nd and 3rd October 2019 during bright weather.

3 DESCRIPTION AND FEATURES OF THE PROJECT

3.1 General Project Description

General Description of the Development Site

The Operational Barnesmore Windfarm is located approximately 10 km north-west of Donegal town. The existing turbines are sited on elevated peatland above Barnesmore Gap between the N15 and the Irish national border, the site boundary is wholly within the Republic of Ireland. However, the eastern boundary of the site approaches the Northern Ireland boundary line.

The Operational Barnesmore Windfarm site, which became operational in 1997, includes a substation, 25 no. Turbines and associated tracks and met masts (MM) is situated on exposed peatland habitats. There are no woodland or hedgerows within the Site Boundary (red line planning boundary as illustrated in **Figure 1**). Conifer plantations exist outside of the Site Boundary within the environs of the site. Habitat types on the Application Site include Montane Heath, Blanket Bog (including hollows and pools etc.), wet heath, cutover bog, degraded peat, modified wet heath, acid grassland, wet grassland, fen and flush, oligotrophic lakes, rivers, streams and ditches. There are no substantial bridges, buildings or mature trees on this site which could provide habitat for roosting bats.

The Development proposes to reduce the number of turbines from 25 no. to a maximum of 13 no., albeit using new turbine specifications which have a rotor diameter of not exceeding 158 m, and a blade tip height of not exceeding 180 m while maintaining the footprint within the existing infrastructure (as far as possible owing to use of larger, modern equipment).

General Description of the Haul Route

It is currently proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Killybegs Harbour in County Donegal. From there, they will be transported to the Development via the R263 and N56 to Donegal Town and then the N15 to the L2595 and onto the L2015 to the site entrance. There will be a requirement for localised road verge strengthening and, in some cases, temporary road widening / realignment. The proposed Haul Route is shown on **Figure 2**.

General Description of Grid connection amendments

The Development will require some upgrade to the grid connection. This includes the undergrounding of existing 110kV overhead lines (OHL) within the Site (between the substation and the existing Access Site Track immediately south of Lough Slug), as well as replacement of an OHL mast and laying a new cable between that and the Clogher substation. Undergrounded sections will be laid primarily within existing roads/tracks.

3.2 Description of the Development

The permanent windfarm infrastructure will include the following infrastructure (see **Figure 2**):

- Construction and erection of up to 13 no. wind turbines each with maximum overall ground to blade tip heights of up to 180 metres and associated crane hardstandings and wind turbine foundations;
- Upgrade of the existing site access roads and provision of 188m of new site access road;
- Upgrade of the existing Golagh 110 kV electrical substation and compound to include for an expansion of the footprint to accommodate an EirGrid control building, a new IPP control building, car parking, grid transformer, 110kV cable chair, outdoor electrical plant and equipment, security boundary and perimeters fencing,

wastewater holding tanks, groundwater well and the removal of the existing overhead line connection and demolition of the existing IPP control building;
- Upgrade works associated with the existing 110kV grid connection including the undergrounding of a 1.15 km section of the existing 110 kV overhead power line, the construction of a new cable interface tower on the existing Golagh Tee 110kV overhead line, underground cable connection in the existing site access track from the new cable interface tower to the upgraded Golagh Substation and removal of the existing angle mast and end mast towers;
- 1 no. permanent meteorological mast up to 30 m in height, including a foundation, underground power and communication cabling and security fencing;
- Temporary Contractors Construction Compound;
- Site drainage network;
- Internal wind farm underground power and communications cabling;
- A 15 Megawatt Energy Storage Facility and associated electrical plant, equipment and security fencing; and
- All associated site development and ancillary works.

The temporary works to facilitate development construction works, which are assessed in the EIAR as part of the Development, will include the following:

- Works on the public highway to allow delivery of turbine components, some of which may be left as permanent works if DCC are in agreement;
- A temporary Construction Compound, that will then be site for the Energy Storage Facility; and,
- Temporary site drainage features.

The layout design was based on the following constraints and buffers where possible:

- New infrastructure within or adjacent to existing infrastructure;
- Distance to watercourses of 50 m;
- Distance to land drains of 20 m;
- Distance from turbines to inhabited houses of at least 2 km; and,
- Avoidance of ground slopes of greater than approximately 10 - 14%.

The maximum installed capacity of the Development will be up to 76 MW with an additional Energy Storage Unit of 15 MW. It is noted, however, that the potential environmental impacts arise predominately from the number, size and location of the wind turbines and associated infrastructure, rather than their installed capacity. The wind turbine maximum output is a marginal factor for the environmental impacts but does have a greater corollary in the consideration of the benefits of The Development. EirGrid have been consulted and have confirmed that for the grid connection route, reusing the existing infrastructure is viable and that an increase in export capacity is available for a windfarm of the size proposed. However, some works will be required off-site which will involve removal of an overhead line lattice tower and erection of a new tower to divert lines from the Development into the 110 kV Clogher substation.

Figure 3 illustrates the layout of the Development in relation to European Sites.

3.3 Description of the Haul Route Works

Works to facilitate the delivery of turbine infrastructure are proposed at a number of locations as detailed in **Chapter 14 of the EIAR** and as shown on **Figure 4**, these are described below (with proximity to European Sites shown in **Table 2**):

- Point A – Verge strengthening, within the highways boundary, on the southern side of the N56 at Bruckless Bridge and on the western side before the bridge to allow for the wheel loading of abnormal load vehicles.
- Point B - Relocation of electricity pole at Darney on the N56, verge strengthening for wheel loading and blade oversail on the western side of the road north of the bend and removal of existing vegetation on the verge to the east of the road on the northern side of the road.
- Point C - On the N15, a part of the road verge will need to be strengthened for wheel loading and some existing vegetation will need to be removed to allow oversail of the turbine vehicle. On the L2595, the verge will need to be strengthened on the western side of the road, the Stop signs will need to be temporarily relocated, existing vegetation will need to be removed on the western side and there will be strengthening of the verge on the eastern side to allow the necessary wheel loading.
- Point D – Verge to be strengthened to allow for the necessary wheel loadings on the northern side of the L2595 and on the southern side of the L2095.
- Point E - Existing verge will need to be strengthened on the L2095 between Clogher Bridge and the L6565 to allow for the necessary wheel loadings for turbine transport vehicles.
- Point F - The road will need to be widened at the junction to allow abnormal loads vehicles to turn onto the L2015 from the L2095. An ESB pole will also need to be removed.
- Point G - Widening of the L2015 local road to the Site.
- Point H - Widening on the L2015 to the Site to allow abnormal load vehicles to negotiate the bend. There will also be a requirement to pipe an existing open drain and strengthening of the verge to allow for the required wheel loading.

The scope of the upgrade works has been informed following a process of digital vehicle swept path analysis and can be made available to the authorities on a confidential basis. These works are not part of the Development application (aside from the works at Point F & G) however, and consent for them will be sought under a separate application, as required. Any potential impacts resulting from Haul Route upgrades must be assessed with respect to European Sites in this NIS. The location of proposed Haul Route upgrades in relation to European Sites is shown in **Figure 4**.

3.4 Description of the Grid Connection

EirGrid have been consulted on the Development and confirmed that a connection to the national grid via the existing 110 kV lines which currently run from the Site to Clogher Substation for the Operational Barnesmore Windfarm is the most viable option.

The Operational Barnesmore Windfarm is currently connected to the Cathaleen's Fall-Golagh Tee 110 kV Overhead Line (OHL). The current 110 kV grid connection does not have sufficient capacity to facilitate the increased Maximum Export Capacity (MEC) of up to approximately 76 MW. It is therefore proposed to reconfigure the OHL to connect directly into the 110 kV Clogher Substation, removing the tee-connection with the Cathaleen's Fall – Letterkenny line. Grid reconfiguration works will involve the following:

- Construction of a new Cable Interface Tower between Structure 130T and Structure 310;
    - New cable interface tower to be built on the east side of the Cathaleen's Fall-Letterkenny 110kV OHL, under the existing Golagh Tee 110kV OHL
- Underground Cable connection from new interface tower to Clogher 110kV GIS Substation (Spare Bay);

- Removal of hard tee-connection between Cathaleen's Fall-Letterkenny 110kV OHL and Cathaleen's Fall-Golagh Tee 110kV OHL;
- Retirement of existing structure 130T; and
- Termination of existing conductor to new proposed cable interface tower.

The location of these structures is outlined on **Figure 3.5 of the EIAR**.

Approximately 1.15 km of the existing 110 kV overhead lines which currently run through the Site will be undergrounded to allow the construction of T10 and T12. EirGrid require that turbines are a minimum of 3 rotor diameters from existing 110 kV lines. Therefore, the replacement section of Windfarm Internal Cabling will be run within the existing Site Access Track for a distance for c. 1.2 km and then return to continue on the existing overhead route. The environmental effect of the grid connection is assessed within the EIAR.

4 EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE OF THE PROPOSAL

The potential for likely significant effects on European Sites has been assessed based on the likely impacts of the Development, the QI of each European Site and the identification of ecological / hydrological pathways. The sites considered in the screening for Appropriate Assessment that are considered to be within the ZoI are shown in **Table 4** below.

Table 4 - European Sites with potential Ecological / Hydrological Connections with the Development Site

European Site	Qualifying Interest. The QI potentially affected is highlighted in amber (QIs with potential source – receptor pathway)	Distance from Development	Potential Ecological / Hydrological Connection
Lough Eske and Ardnamona Wood SAC (Site Code: 000163)	[3110] Oligotrophic waters containing very few minerals	0.3 km by distance 0.5 km by watercourse connection	Hydrological Connection
	[7220] Petrifying springs with tufa formation (*Cratoneurion*)		
	[91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles		
	[1029] Freshwater pearl mussel (*Margaritifera margaritifera*)		
	[1106] Atlantic Salmon (*Salmo salar*)		
	[1421] *Trichomanes speciosum* (Killarney Fern)		
River Foyle and tributaries SAC (Site Code: UK0030320)	[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	2.6 km by distance 12 km by watercourse connection	Hydrological Connection
	[1106] Atlantic salmon (*Salmo salar*)		
	[1355] *Lutra lutra* (Otter)		
River Finn SAC (Site Code: 002301)	[3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	7.2 km by distance 12 km by watercourse connection	Hydrological Connection
	[4010] Northern Atlantic wet heaths with *Erica tetralix*		
	[7130] Blanket bogs (* if Active)		
	[7140] Transition mires and quaking bogs		
	[1106] *Salmo salar* (Atlantic salmon)		
	[1355] *Lutra lutra* (Otter)		
Pettigo Plateau Nature Reserve SPA (Site Code: 004099)	Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395]	5.3 km by distance	Potential Ecological Connection (impact on QI species through displacement or collision risk)
Lough Derg (Donegal) SPA (Site Code: 004057)	Lesser black-backed gull (*Larus fuscus)* [A183]	6.5 km by distance	Potential Ecological Connection (impact on QI species through displacement or collision risk)
	Herring gull (*Larus argentatus*) [A184]		

4.1 Description of European Sites within the Zone of Influence

4.1.1 Lough Eske and Ardnamona Wood SAC

Qualifying Interests within the Zone of Influence

The QIs for this European Site are listed in Table 4. The potential source – receptor pathway between the Development and this European Site is by surface watercourse, with potential

impacts considered to be limited to those associated with water quality changes. The following QIs of the Lough Eske and Ardnamona Wood SAC are considered to be sensitive to downstream surface water quality impacts:

- [3110] Oligotrophic waters containing very few minerals
- [1029] Freshwater pearl mussel (*Margaritifera margaritifera*)
- [1106] Atlantic salmon (*Salmo salar*)

Conservation Objectives of the Qualifying Interests within the Zone of Influence

The Conservation Objectives of those QIs in the Lough Eske and Ardnamona SAC are outlined in the document *Conservation Objectives: Lough Eske and Ardnamona Wood SAC 000163. Version 1* (NPWS, 2019). These are summarised below, with the relevant Attributes / Targets that the Development has the potential to affect, highlighted in amber.

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll *a*	Maintain appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/absent attached algal biomass
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l	Maintain appropriate turbidity to support the habitat

Attribute	Measure	Target
	SS/ other appropriate units	
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110

7220 Petrifying springs with tufa formation (Cratoneurion)

To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Square metres	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for point location at White Goat's Island
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes
Water quality - nitrate level	mg/l	No increase from baseline nitrate level and less than 10mg/l
Water quality - phosphate level	µg/l	No increase from baseline phosphate level and less than 15µg/l
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; potentially negative woody species should be absent in unwooded springs; invasive species should be absent
Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground <10cm)
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant

91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles

To maintain the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 11m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91A0 woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter
Woodland structure: veteran trees	Number per hectare	No decline

Attribute	Measure	Target
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Woodland structure: indicators of overgrazing	Occurrence	All four indicators of overgrazing absent
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy
Vegetation composition: typical species	Occurrence	At least 1 target species for 91A0 woodlands present; at least 6 positive indicator species for 91A0 woodlands present
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent

1029 Freshwater Pearl Mussel Margaritifera margaritifera

To restore the favourable conservation condition of Freshwater Pearl Mussel (Margaritifera margaritifera) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution	Kilometres	Maintain/restore distribution at 6.08km.
Population size	Number of adult mussels	Restore population to at least 200,000 adult mussels
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution
Suitable habitat: extent	Kilometres	Restore suitable habitat in more than 6.08km in the Eske system (see map 5) and any additional stretches necessary for salmonid spawning
Suitable habitat: condition	Kilometres	Restore condition of suitable habitat
Water quality: macroinvertebrate and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93
Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%)
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regime
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population

1106 Salmon Salmo salar

To restore the favourable conservation condition of Atlantic Salmon (Salmo salar) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded

Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA

6985 Killarney Fern Vandenboschia speciosa

To maintain the favourable conservation condition of Killarney Fern (Vandenboschia speciosa) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Distribution	Occurrence	No loss in geographical spread of populations, subject to natural processes
Number of populations	Number	No decline, subject to natural processes
Number of colonies	Number	No decline, subject to natural processes
Population: lifecycle stage	Type (sporophyte or gametophyte)	Maintain life-cycle stage composition of populations, subject to natural processes
Population size: area of occupancy	Square metres	No decline, subject to natural processes
Population size: living sporophyte fronds	Number	No decline, subject to natural processes
Population structure: young and unfurling fronds	Occurrence	Young (not fully expanded) and/or unfurling (crozier) fronds present in populations previously observed to have these, subject to natural processes
Population structure: fertile fronds	Occurrence	Fertile fronds present in populations previously observed to have these, subject to natural processes
Population structure: juvenile sporophyte fronds emerging from gametophytes	Number	No decline, subject to natural processes
Habitat extent	Hectares	No loss of suitable habitat, subject to natural processes
Hydrological conditions: wet/damp microhabitats	Occurrence	Maintain hydrological conditions at the locations of known populations - visible water source, with dripping or seeping water present and/or substrate wet/damp to touch, subject to natural processes
Hydrological conditions: relative humidity	Percentage	Maintain relative humidity levels at known colonies at not less than 80%, subject to natural processes
Hydrological conditions: desiccated fronds	Number	No increase, subject to natural processes
Light levels: shading	Shade index score	At least 4 for woodland sporophyte-only and mixed colonies; at least 5 for open upland sporophyte-only and mixed colonies; at least 6 for gametophyte-only colonies, subject to natural processes
Woodland canopy cover	Percentage	No loss of woodland canopy at, or in the vicinity of, the locations of known populations and canopy cover here maintained at more than 33%, subject to natural processes
Invasive species	Occurrence	Maintain absence of invasive non-native and vigorous native plant species at the locations of known populations or, if present, maintain vegetation cover of these at less than 10%, taking into account the habitat requirements of V. *speciosa*

4.1.2 River Foyle and tributaries SAC

Qualifying Interests within the Zone of Influence

The QIs for this European Site are listed in Table 4. The potential source – receptor pathway between the Development and this European Site is by surface watercourse, with potential impacts considered to be limited to those associated with water quality changes. The following QI of the River Foyle and tributaries SAC are considered to be sensitive to downstream water quality impacts:

- [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation
- [1106] Atlantic salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)

Conservation Objectives of the Qualifying Interests within the Zone of Influence

The Conservation Objectives of those QI in the River Foyle and tributaries SAC are outlined in the document *R Foyle and tributaries SAC (UK0030320) Conservation Objectives (McKeown 2017).* These are summarised below, with the relevant Attributes / Targets that the Development has the potential to affect, highlighted in amber.

Feature	Grade[9]	Objective
Atlantic Salmon ***Salmo salar***	**B**	Maintain and, if possible, expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population.
		Maintain and, if possible, enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the ***Ranunculus fluitans*** **and** ***Callitricho-Batrachion*** **vegetation**	**B**	Maintain and, if possible, enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Otter ***Lutra lutra***	**C**	Maintain and, if possible, increase population numbers and distribution.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

4.1.3 River Finn SAC

Qualifying Interests within the Zone of Influence

The QIs for this European Site are listed in Table 4. The potential source – receptor pathway between the Development and this European Site is by surface watercourse, with potential impacts considered to be limited to those associated with water quality changes. The following QIs of the River Finn SAC are considered to be sensitive to downstream water quality impacts:

- [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

[9] Grades (Source: McKeown 2017) *A – Sites holding outstanding examples of the habitat in a European Context. B – Sites holding excellent stands of the habitat, significantly above the threshold for SSSI/ASSI notifications but of somewhat lower value than grade A sites. C – Examples of the habitat which are of at least national interest (i.e. usually above the threshold for SSSI / ASSI notifications on terrestrial sites) but not significantly above this. These habitats are not the primary reason for SACs being selected. D - Habitat present but not of sufficient extent or quality to merit listing as SAC feature. There is therefore a distinction between the principal features for which sites have been selected (those graded A or B) and those which are only of secondary interest (those graded C). This is a useful distinction but it is important to note that all three grades are qualifying SAC interest features.*

- [1106] Atlantic salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)

Conservation Objectives of the Qualifying Interests within the Zone of Influence

The Conservation Objectives of those QI in the River Finn SAC are outlined in the document *Conservation Objectives: River Finn SAC 002301. Version 1* (NPWS 2017). These are summarised below, with the relevant Attributes / Targets that the Development has the potential to affect, highlighted in amber.

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency
Water quality: nutrients	µg/l P; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species
Water quality: phytoplankton biomass	µg/l Chlorophyll *a*	Maintain appropriate water quality to support the habitat, including high chlorophyll a status
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric Maintain trace/absent attached algal biomass (	
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat

Attribute	Measure	Target
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110

4010 Northern Atlantic wet heaths with Erica tetralix

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (Erica tetralix) present within a 20m radius of each monitoring stop
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of Cladonia and Sphagnum species, Racomitrium lanuginosum and pleurocarpous mosses at least 10%
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (Empetrum nigrum) at least 15%
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (Pteridium aquilinum) less than 10%
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (Juncus effusus) less than 10%
Vegetation structure: Sphagnum condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%

Attribute	Measure	Target
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

7130 Blanket bogs (if active bog)*

To restore the favourable conservation condition of Blanket bogs (*if active bog) in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding Sphagnum fallax, at least 10%
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%
Vegetation structure: Sphagnum condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%

Attribute	Measure	Target
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

7140 Transition mires and quaking bogs

To restore the favourable conservation condition of Transition mires and quaking bogs in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: number of positive indicator species	Vegetation composition: number of positive indicator species	Number of positive indicator species at each monitoring stop is at least three for infilling pools and flushes and at least six for fens
Vegetation composition: number of core positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	At least one core positive indicator species present
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of positive indicator species is at least 25%
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation structure: height	Percentage of leaves/shoots at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

1106 Salmon Salmo salar

To maintain the favourable conservation condition of Atlantic Salmon in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary

Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA

1355 Otter Lutra lutra

To maintain the favourable conservation condition of Otter in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Distribution	Percentage positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 390ha along river banks/lake shoreline/ around ponds
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 182.2km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 354ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase.

4.1.4 Pettigo Plateau Nature Reserve SPA

Qualifying Interests within the Zone of Influence

The QIs for this European Site are listed in Table 4. The potential source – receptor pathway between the Development and this European Site is by direct impact on QI bird species if flying through or within the area, with potential impacts considered to be limited to those associated with collision risk or displacement from foraging areas. The following QI of the Pettigo Plateau Nature Reserve SPA are considered to be potentially sensitive to these impacts:

- Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395]

The results of the bird surveys undertaken for the Development (See **Chapter 7: Ornithology** of the EIAR for the proposal) state that Greenland White-fronted Goose were not recorded within 500 m of the proposed turbines during any surveys, with the nearest birds to the proposal being recorded at Lough Derg, approximately 6.3 km from the Development.

Conservation Objectives of the Qualifying Interests within the Zone of Influence

The Conservation Objectives of those QI in the Pettigo Plateau Nature Reserve SPA that are within the Zone of Influence of the Development are outlined in the document *Pettigo Plateau Nature Reserve SPA (004099) Conservation objectives for Pettigo Plateau Nature Reserve SPA [004099]. Generic Version 6.0* (NPWS, 2018a). These are given below, with the relevant Attributes / Targets that the Development has the potential to affect, highlighted in amber.

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Bird Code	*Common Name*	*Scientific Name*
A395	*Greenland White-fronted Goose*	*Anser albifrons flavirostris*

Favourable conservation status of a habitat is achieved when:

- *its natural range, and area it covers within that range, are stable or increasing, and*
- *the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and*
- *the conservation status of its typical species is favourable.*

The favourable conservation status of a species is achieved when:

- *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.*

Lough Derg (Donegal) SPA
Qualifying Interests within the Zone of Influence

The QIs for this European Site are listed in Table 4. The potential source – receptor pathway between the Development and this European Site is by direct impact on QI bird species if flying through or within the area, with potential impacts considered to be limited to those associated with collision risk or displacement from foraging areas. The following QIs of the Lough Derg (Donegal) SPA are considered to be sensitive to ecological impacts:

- Lesser black-backed gull (*Larus fuscus)* [A183]
- Herring gull (*Larus argentatus*) [A184]

The results of the bird surveys undertaken for the Development (See **Chapter 7: Ornithology** of the EIAR for the proposal) state that neither species was recorded within 500 m of the proposed turbines, with both being recorded only 5 km or more from the site (See **Table 7.7** of **Chapter 7: Ornithology** of the EIAR).

Conservation Objectives of the Qualifying Interests within the Zone of Influence
The Conservation Objectives of those QIs in the Lough Derg (Donegal) SPA that are within the ZoI of the Development are outlined in the document *Lough Derg (Donegal) SPA (004057) Conservation objectives for Lough Derg (Donegal) SPA [004057]. Generic Version 6.0* (NPWS, 2018b). These are given below, with the relevant Attributes / Targets that the Development has the potential to affect, highlighted in amber.

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Bird Code	Common Name	Scientific Name

A183	Lesser Black-backed Gull	Larus fuscus
A184	Herring Gull	Larus argentatus

Favourable conservation status of a habitat is achieved when:

- *its natural range, and area it covers within that range, are stable or increasing, and*
- *the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and*
- *the conservation status of its typical species is favourable.*

The favourable conservation status of a species is achieved when:

- *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.*

5 SURVEY RESULTS

5.1 Freshwater pearl mussel (FPM) Survey Results

The FPM Survey report as provided in **Volume IV Technical Appendix 6.5** of the EIAR concluded that the watercourses which lie in close proximity to the Operational Barnesmore Windfarm (i.e. the 4th order Leaghany River in the Foyle catchment and the watercourses flowing into Lough Eske) do not support FPM. The conclusions of the FPM report (MWP, 2019) are provided in Section 6.1 below.

5.2 Bird Survey Results

5.2.1 Qualifying Interests of the Pettigo Plateau Nature Reserve SPA and the Lough Derg (Donegal) SPA Recorded During the Surveys

As detailed above, the QIs for these sites are:

- Greenland white-fronted goose (*Anser albifrons flavirostris*) (wintering)
- Lesser black-backed gull (*Larus fuscus*) (breeding)
- Herring gull (*Larus argentatus*) (breeding)

Table 5 below shows the closest recorded distance of those species listed as QIs of the above sites, to the proposed turbines during field surveys from 2017 to 2018.

Table 5 Minimum distance of recorded Qualifying Interest species to nearest proposed turbines during 2017-2018 surveys. Adapted from Chapter 7: Ornithology (Ruddock 2019).

Species / season	Distance (m) – 2017 surveys	Distance (m) – 2018 surveys
Herring gull (breeding)	8300.0	5499.4
Lesser black-backed gull (breeding)	5917.1	6128.1
Greenland white-fronted goose (wintering)	6317.4	7830.5

6 ASSESSMENT OF IMPACTS AND EFFECTS ON EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE

This Section outlines the impacts (both direct and indirect) which are likely to have an effect on those European with QIs within the ZoI. An assessment of the likely effects which these impacts could have on these QIs is then undertaken.

The potential for effects on each European Site is assessed in terms of those impacts have the potential to affect the QIs of each European Site. In this report, direct impacts constitute direct or primary impacts to European Sites, for example habitat loss or mortality of QI species. Indirect or secondary impacts constitute pollution of water courses which may flow into a European Site or sedimentation of a watercourse also upstream of a site which is designated for pollution/sedimentation sensitive QIs.

6.1 Assessment of Likely Impacts affecting the Lough Eske and Ardnamona Wood SAC

6.1.1 Assessment of Water Quality Impact

As outlined in **Chapter 6: Biodiversity** of the EIAR (Woodrow, 2019) and **Chapter 9: Hydrology and Hydrogeology** of the EIAR (Minerex, 2019), there is potential for water quality impacts to occur during the construction, operational and decommissioning stage of the Development.

Construction Stage Water Quality Impacts

The proposal includes upgrading of internal Access Site Tracks that cross a total of 5 small watercourses within the catchment feeding the Lough Eske and Ardnamona Wood SAC (as shown in **Figure 4**). In addition, the works come within circa 75 m of a lake (Lough Slug) which has an outlet that feeds into the Eske catchment, with grid connection cabling works also in this location. Two proposed turbines (T6 and T5) fall within the Eske catchment. Works to remove the infrastructure and restore habitats in the north west of the site (covering a linear distance of 435 m) fall within the Eske catchment. The five Haul Route upgrade locations that have potential to impact on European Sites (see **Table 2** and **Figure 4**) are all within the Eske catchment. The location where the OHL mast to be relocated and new underground cabling is required, for the grid connection outside the Development boundary, also falls within the Eske catchment.

The potential connectivity of the proposal to the Lough Eske And Ardnamona Wood SAC therefore, includes direct connection via watercourses crossed by the internal Access Site Track to be upgraded (five crossing locations) and Haul Route upgrade works (five locations) , potential connectivity by overland flow to a waterbody within 75 m of the infrastructure, overland flow from two turbines within the catchment and overland flow / potential connectivity to small / ephemeral watercourses within the site associated with the removal of existing infrastructure and restoration of the area.

The most immediate connectivity in these cases relates to works along the existing internal Access Site Track, and the turbine component Haul Route to be upgraded as part of the works. However, the potential level of impact associated with these aspects is likely to be limited by the existence of existing culverts. The greatest potential sources of impact are likely to be excavation for turbine bases and / or hardstand areas, and the excavation of old infrastructure and restoration of the area. Impacts include

During the construction stage, there is potential for the following impacts to occur:

- Contamination of surface water from hydrocarbons and/or other chemicals stored onsite; and,
- Contamination of surface waters from sediment as a result of excavation and disturbance works onsite.

Operational Stage Water Quality Impacts

During the operational stage, there is potential for the following impacts to occur:

- An increase of impermeable surfaces at the Development may result an increased rate of surface water run-off and erosion resulting in sediment pollution of drainage ditches.

Chapter 9: Hydrology and Hydrogeology in the EIAR (Minerex, 2019) assessed these potential impacts and proposed a number of mitigation measures, which are set out in Section 8 and integrated into the CEMP in **Technical Appendix 2.1**.

The QIs within the Lough Eske and Ardnamona Wood SAC considered to be potentially impacted by the proposal (as shown in **Table 4)** are [3110] oligotrophic waters containing very few minerals, [1029] freshwater pearl mussel (*Margaritifera margaritifera*) and [1106] Atlantic salmon (*Salmo salar*). Potential impacts on these features is discussed below.

Potential impacts on Oligotrophic Waters containing very few minerals

Oligotrophic waters usually have low primary productivity (they have a high water quality and few algae) and are nutrient poor. The primary potential impact on these habitats comes from the potential for sediments coming into such habitats to hold, and subsequently deposit, sediments holding nutrients. Increases in sediment can lead to excess nutrients available which increases primary production and decreases water quality and can ultimately lead to eutrophication of these waters.

Potential impacts on Freshwater Pearl Mussel

As detailed in *Practical Implementation of Freshwater Pearl Mussel Measures – Windfarm development Guidance* (Anon, 2014), and Skinner, *et al.* (2003) freshwater pearl mussels are highly sensitive to changes to water quality, and particularly increases in suspended solids. Direct impacts can include smothering of mussel beds, resulting, in extreme cases, in direct mortality as mussels are forced to close their shells. Indirectly, sedimentation of their gravels can prevent sufficient water flow through the gravels, resulting in starving the juveniles of oxygen. Siltier conditions in gravel beds also facilitates the rooting of macrophytes which once established trap additional silt leading to more macrophyte colonisation thereby gradually degrading the habitat for mussels which become excluded.

The freshwater pearl mussel survey report for the proposal (MWP, 2019) states the following in respect of potential impacts on freshwater pearl mussel:

> *It is concluded that the watercourses in close proximity to the Operational Barnesmore Windfarm do not support FPM: the 4th order Leaghany River in the Foyle catchment and the watercourses flowing into Lough Eske.*
>
> *The Leaghany River appeared to be affected by peat silt and was highly turbid compared to the watercourses examined in the Eske catchment. This could be attributed to the presence of commercial forestry and associated operations in the upper leaghany catchment (e.g. land drainage, clear-felling). Habitat for FPM in the Leaghany River is regarded as suboptimal for FPM. Based on the current survey,*

FPM are not considered present in the upper 5 km of the Leaghany River, the lower extent of this reach, and one of the subject watercourses of the current survey.

The Lowerymore River and its tributaries (Clogher, Mullanalamphry Streams, un-named stream at Keadew Upper) are not considered suitable habitats for FPM due to their high gradient and highly erosive nature. According to Skinner et al. (2003), the characteristics of riverbed substrata are of critical importance for FPM populations. The typical substrate preference is small sand patches, stabilised amongst large stones or boulders in fast-flowing streams and rivers. The scarcity of sand patches in these watercourses indicates turbulent conditions during spates/floods. Habitat for FPM in the watercourses upstream of Lough Eske is therefore assessed as marginal/unsuitable based on physical characteristics. Habitat suitability generally decreases with increasing elevation and proximity to the development. The lack of sheltered refugia and/or paucity of salmonids in these reaches are considered factors affecting FPM distribution in the study area upstream of Lough Eske. For example, the upper reaches of the un-named tributary of the Lowerymore River do not support Salmon, a host for the early life stage of FPM, as there is an impassable waterfall less than 100 m upstream of the Lowerymore confluence.

With the exception of the Leaghany River, the current observed water quality did not appear to be a factor that would affect FPM distribution. The degree of algal growth and siltation of surveyed reaches were favourable with respect to FPM habitat requirements. Evidence of anthropogenic activities affecting FPM habitats were minimal, with generally good riparian cover, low/moderate live-stocking densities and adequate bank protection. An old artificial embankment along a stretch of ca. 50 m of the lower reach Mullanalamphry Stream was noted however, this is likely to have been created by excavating the river. There are serious pressures on the FPM population in the Eske catchment. Significant mussel kills were recorded in the abundant stretch downstream of the N56 in 2014 and 2016 (Moorkens 2017 in NPWS 2019).

The watercourses in the Eske catchment are part of a Margaritifera sensitive area. Mussels are distributed throughout the River Eske from Lough Eske to the estuary NPWS (2019). The Eske FPM population is in a catchment listed in S.I. 296 of 2009 [European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009], an internationally important population and listed as a conservation interest in the Lough Eske and Ardnamona Wood cSAC (000163).

Based on the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I. No. 296/2009) for FPM habitat, the surveyed watercourses in the Eske catchment 'pass' for filamentous algae and siltation. With maintenance of buffer zones between the Operational Barnesmore Windfarm and headwaters of the streams in the Eske catchment, it is considered that the FPM which occur downstream of Lough Eske are unlikely to be at risk, with implementation of the measures in Section 5. Any development in the Eske catchment will need to carefully consider and conform to the conservation objectives for the Lough Eske and Ardnamona Wood cSAC.

The "measures in Section 5" include the implementation of an outline CEMP to include a surface water management plan as well as specific measures to protect water courses during the construction and operation stages of the project. These, together with further mitigation proposals, are incorporated into Section 8 of this report, as well as **Chapter 6:**

Biodiversity of the EIAR (Woodrow, 2019) to provide an overall package of effective mitigation.

Potential impacts on Atlantic salmon

High suspended solid concentrations in rivers can affect the feeding and health of individual species through increased turbidity (inhibiting respiration through gills) and increased siltation affecting composition of riverbed substrate (reducing fry survival) and affecting spawning beds (Hendry *et al.* 2003). Suspended solids often hold nutrients such as phosphorus or hydrocarbons that can result in eutrophication and reduced oxygen levels (with high oxygen levels being important for all life stages of Atlantic salmon for example).

Densities of different life stages of salmon, particularly fry and parr, vary within a river catchment, limited often by the availability of suitable substrates. Young parr are territorial and defend small sections of the river channel used for intercepting edible particles in the current (Kalleberg, 1958). Habitat availability and quality is intrinsically linked with survival rates and recruitment to smolt stages. Therefore, small amounts of debris entering a section of river important for vulnerable life stages of salmon can have deleterious impacts, even in the short-term, on juvenile survival and habitat utility.

In summary, it is considered that, although unlikely, there is potential for water quality impacts resulting from the construction and operational stages of the Development on Oligotrophic Waters containing very few minerals, freshwater pearl mussel and Atlantic salmon. The potential impacts are those largely related to sediment release and pollution vents. Such issues can be controlled by standard mitigation practices well-established as effective in these circumstances. Effective mitigation is proposed in Section 8.

6.2 Assessment of Likely Impacts affecting the Lough Foyle and Tributaries SAC and the River Finn SAC

The above two SACs occur, at the nearest point of potential hydrological connection, at the same location.

6.2.1 Assessment of Water Quality Impact

As with the Lough Eske and Ardamona Bog SAC, water quality changes are considered to be the only potential impact on the Lough Foyle and Tributaries SAC. Although the Lough Foyle and Tributaries SAC, at the closest point, lies 2.6 km to the east of the proposal, it lies *c.* 12 km from the proposal by connecting watercourse, as does the River Finn SAC. The two SACs lie on the River Derg, a border river, with the Lough Foyle and Tributaries SAC on the Northern Ireland side of the border, and the River Finn SAC on the Republic of Ireland side of the border.

Construction Stage Water Quality Impacts

A single new water crossing, of an unmapped watercourse, is required for the Development, which comprises a new crossing to facilitate access to the new proposed T13. This falls within the catchment feeding the Lough Foyle and Tributaries SAC and the River Finn SAC. The proposal includes upgrading of internal Access Site Tracks that cross a total of three small watercourses within the catchment feeding the Lough Foyle and Tributaries SAC (as shown in **Figure 4**). A total of 11 of the 13 proposed turbines fall within Lough Foyle and Tributaries SAC catchment.

The potential connectivity of the proposal to the Lough Foyle and Tributaries SAC therefore includes direct connection via watercourses crossed by the internal Access Site Track to be

upgraded, overland flow from 11 turbines within the catchment and overland flow / potential connectivity to small / ephemeral watercourses within the site associated with the removal of existing infrastructure and restoration of the area.

Although the designated sites are somewhat distant from the proposal, during the construction stage, there is potential for the following impacts to occur:

- Contamination of surface water from hydrocarbons and/or other chemicals stored onsite; and,
- Contamination of surface waters from sediment as a result of excavation and disturbance works onsite.

Operational Stage Water Quality Impacts

During the operational stage, there is potential for the following impacts to occur:

- An increase of impermeable surfaces at the Development may result an increased rate of surface water run-off and erosion resulting in sediment pollution of drainage ditches.

Chapter 9: Hydrology and Hydrogeology in the EIAR (Minerex, 2019) assessed these potential impacts and concluded the following with respect to hydrologically connected designated sites:

> *Contaminants arising as a product of the development have the potential to be intercepted by the drainage and surface water network associated with the Development. The Development is situated within the Barnesmore Bog NHA, and therefore any contaminants arising will automatically impact on a designated site, but contaminants which are intercepted by the surface water network will also be carried by same towards other designated sites downstream of the Development.*
>
> *As discussed in the baseline section of this report, and presented in **Technical Appendix TA9.2**, both of the two surface water catchments possess designated sites downstream of the proposed development site.*
>
> *In relation to the nearest designated area in the western catchment, Donegal Bay North Catchment, the proposed site surface water will flow into the Lowerymore and the associated Lough Eske and Ardnamona Wood SAC approximately 1.5 km west of the proposed site boundary.*
>
> *In relation to the nearest designated area in the eastern catchment, Foyle Catchment, the proposed site surface water will flow into the Leaghany River and associated River Finn SAC approximately 8 km south east of the proposed site boundary.*
>
> *In both SACs listed above, the site synopsis lists the habitat 'Oligotrophic Waters containing very few minerals', that is; waters with very low levels of nutrients or contaminants / pollutants and which are considered very pure or very clean. Results of baseline surface water sampling coincide with this, that is; baseline sampling results indicate very low levels of metals, organics, or physiochemical properties such as BOD.*
>
> *The potential of the proposed development to introduce contaminants to these surface water catchments and in turn impact on the designated areas downstream is considered a negative, significant to profound, Significant / Profound weighted significance, transboundary, potentially temporary to long-term impact of the*

proposed development, which is in contrast to baseline. However, with appropriate environmental engineering controls and measures, these potential risks can be significantly reduced and considered unlikely.

It should be noted that, considering the geographical scale of both catchments, or portions of the catchments associated with the proposed site, the assimilative capacity of the surface water systems will buffer against any potential contaminants introduced. This does not reduce the need for mitigation measures to be implemented, but is considered a last line of defence for the protection of designated areas downstream of the proposed development.

A number of mitigation measures were proposed. These, together with further mitigation proposals, are incorporated into Section 8 of this report and integrated into the outline CEMP in **Technical Appendix 2.1.**, to provide an overall package of effective mitigation.

Potential impacts on Atlantic salmon

The potential effects on Atlantic salmon are the same as those detailed under Lough Eske and Ardnamona Wood SAC above. Although there is not considered to be potential for salmon within the streams in this catchment in close proximity to the Development (as detailed in **Chapter 6: Biodiversity** (Woodrow, 2019)), there is potential for them to occur closer than the 12 km hydrological connection distance to the SACs, and any such populations will be connected to the SAC populations at some stage of the life cycle.

As with the Lough Eske and Ardnamona Wood SAC, therefore, it is considered that, although unlikely, there is potential for water quality impacts resulting from the construction and operational phases of the proposal on Atlantic salmon, with potential impacts largely related to sediment release and pollution events.

Potential impacts on otter

Although otters can be impacted by habitat degradation, accidental death / persecution and water pollution, the only realistic potential impact from the proposal is as a result of water pollution. Pollution can impact otters either indirectly or directly. Indirect effects include damage to food supply or habitat thus lowering the carrying capacity of an affected area. Direct effects impact of the animal itself, resulting in either rapid death (acute toxicity) or in lowered fitness (sub-lethal toxicity), reducing the animal's ability to reproduce successfully or to survive in inclement conditions (Macdonald & Mason, 1990).

Being large mammalian predators, otters are tolerant of a wide range of habitat conditions, but where deterioration in water quality leads to deterioration in food supply, there will clearly be an indirect effect.

Potential impacts on Floating River Vegetation

In general terms, floating river vegetation habitat occurs on rivers in areas with clean substrate and swift to moderate flow. Substrate generally needs to be largely free of silt (except for channel margins and localised deposits associated with macrophytes (Hatton-Ellis TW *et al.* 2003). Increases in sediment loading can reduce the available light and, if nutrient rich, can provide ideal conditions for the growth of benthic algae, which can hinder the spring growth of channel plants (Mainstone *et al.* 2000). Mainstone (1999) states that plants growing in nutrient-rich sediments tend to have shorter shoots and weaker roots, and are therefore, prone to washout during spates and that the seeds of *Ranunculus* spp. (the main floating river vegetation species of this QI habitat), do not survive in the anoxic conditions that develop within organic sediments, or are lost when the silt is flushed out by high flows.

In summary, it is considered that, although unlikely, there is potential for water quality impacts resulting from the construction and operational stages of the proposal on floating river vegetation, freshwater pearl mussel and Atlantic salmon. The potential impacts are those largely related to sediment release and pollution events. Such issues can be controlled effectively and with a high degree of certainty by appropriate standard mitigation. Appropriate mitigation is proposed in Section 8.

6.3 Assessment of Likely Impacts affecting the Pettigo Plateau Nature Reserve and Lough Derg (Donegal) SPAs

Chapter 7: Ornithology in the EIAR (Ruddock 2019) assessed potential impacts on Pettigo Plateau Nature Reserve SPA and Lough Derg (Donegal) SPA. It also addresses Donegal Bay SPA, Lough Nillan SPA and Pettigoe Plateau SPA (NI). However, these other sites have been excluded from further assessment in this NIS due to their distance from the proposal (AS DETAILED IN Table 1). Relevant text from the chapter (with references to tables and sub-sections within **Chapter 7: Ornithology** excluded) is as follows:

> *Within 15 km (as required by NPWS 2019; scoping response; Table 7.1) the key ornithological sites to be considered are Pettigoe Plateau SPA (5-6 km white-fronted goose; 1996), Lough Derg SPA (6-7 km; lesser black-backed gull; herring gull; 1995), Donegal Bay SPA (10-11 km; great northern diver, light-bellied brent goose, common scoter, sanderling and wintering waterbird assemblage; 2004), Lough Nillan Bog SPA (14-15 km; merlin, golden plover, white-fronted goose, dunlin; 1996) and Pettigoe Plateau SPA (NI) (14-15 km; golden plover, white-fronted goose; 1996). Four of these five SPA sites were designated just prior to the construction of the Operational Barnesmore Windfarm (1995 – 1996) whilst one was after the construction of the windfarm (2004).*
>
> *The two SPA designated species which were identified to potentially be affected at Barnesmore are merlin and golden plover neither of which have significant potential direct and/or secondary effects. These are the only two species from these SPA citation list which were detected within the site and none of these detections were of individuals which were part of the specific designated site complexes for which the species is designated i.e. local birds rather than constituent parts of the respective SPAs. Since a range of other species were detected in the wider hinterland the detections, potential flight path connectivity and proximity were reviewed to / from Barnesmore, namely red-throated diver, great northern diver, light-bellied brent goose, sanderling, herring gull, lesser black-backed gull and white-fronted goose and significant effects were excluded at the outset for these species. Common scoter and dunlin were not detected during surveys.*
>
> *White-fronted goose were recorded from a range of sites more than 6.3 – 8.5 km away although nearest birds were closer to proposed turbines. Nearest birds were recorded at Lough Derg. SNH (2016) cites core range of 5 – 8 km between foraging and roost sites and thus Barnesmore is at the outer limit of this potential range. None were recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.*

Red-throated diver were recorded from sites more than 5.9 – 7.6 km away although nearest birds were closer to proposed turbines. Nearest birds were recorded at Lough Eske and Pettigoe. SNH (2016) cites core range of 8 – 13.5 km between foraging and nest sites and thus Barnesmore is within but at the outer limit of this potential range. None were recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.

Great northern diver were recorded from sites more than 6.5 km away although nearest birds were closer to proposed turbines. Nearest birds were recorded at Lough Eske (6.5 km), Lough Derg and off-shore at Donegal Bay (>20 km). SNH (2016) cites core range of (black-throated diver as 10 km and 8 – 13.5 km for red-throated diver) between foraging and nest sites and thus Barnesmore is within but at the outer limit of this potential range. None were recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.

Light-bellied Brent goose, were recorded from sites more than 13.8 – 18.8 km away although nearest birds were marginally closer to proposed turbines. Nearest birds were recorded at Donegal Bay. SNH (2016) cites core range of a range of goose species between foraging and roost sites between 5 km and 25 km and thus Barnesmore is within but at the outer limit of this potential range. Brent geese are coastal specialist with a much smaller foraging / roosting range and no suitable habitat occurs within Barnesmore for this species. None were recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.

Similar to the Brent geese, sanderling were recorded from sites more than 15.7 – 20.5 km away although nearest birds were marginally closer to proposed turbines. Nearest birds were recorded at Donegal Bay. SNH (2016) cites core range of a range of wader species between foraging and / nest roost sites between 500 m and 11 km and thus Barnesmore is outside the limit of this potential range. Sanderling are coastal specialist with a much smaller foraging / roosting range and no suitable habitat occurs within Barnesmore for this species. None were recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.

Herring gull and lesser black-backed gull, were recorded from sites more than 5.4 km away although nearest birds were marginally closer to proposed turbines. Nearest birds were recorded at Lough Eske and Lough Derg where breeding behaviours were observed in both years of survey and the birds were also recorded wintering more widely including at Lough Mourne and Donegal Bay. SNH (2016) do not cite core range of a range of gull species but the species is known to forage widely with a median maximum foraging distance of circa 22 km (Isaksson et al., 2016) or 20 – 30 km (Spelt et al., 2019) although both these studies show range is dependent on foraging habitat types. Thus Barnesmore is within the limit of this potential range. Despite this potential range neither of these species were recorded on site during walkover or vantage point surveys and no movement corridors were detected to /

from the site. Therefore there is no significant identified pathway for significant effects on this species nor to / from designated sites.

The five SPAs within 15 km cite additional secondary or assemblage species including merlin and hen harrier and Pettigoe Plateau both of which have been assessed here and no connectivity was found with individuals from these sites for either species. At Lough Derg SPA additional citation species includes common gull, Greenland white-fronted goose, tufted duck, mallard, goldeneye and greylag goose only mallard which were recorded within the site although all these species were recorded within wider hinterland surveys. Potentially significant effects on these have been scoped out from this assessment as no significant effects are likely. At Donegal Bay SPA a range of secondary / assemblage species are included in the citation such as great northern diver, light-bellied brent goose, common scoter, sanderling, black-throated diver, red-throated diver, cormorant, shelduck, wigeon, mallard, long tailed duck, red-breasted merganser, oystercatcher, ringed plover, golden plover, lapwing, dunlin, bar-tailed godwit, curlew, redshank, greenshank, turnstone, black-headed gull, common gull. Curlew and golden plover were assessed for potential effects since they occurred in close proximity and whilst some of the other species were detected during wider hinterland surveys and were not recorded on site during walkover or vantage point surveys and no movement corridors were detected to / from the site. Therefore there is no significant identified pathway for significant effects on these assemblage species nor to / from designated sites.

At Lough Nillan Bog SPA additional assemblage species were red-throated diver which were excluded from potential effects since none of these were shown to have any connection to the SPA or via regular or significant flyways. At Pettigoe Plateau SPA (NI) additional assemblage species included hen harrier, merlin, dunlin, common tern, lapwing, curlew and snipe some of these species were recorded in the wider hinterland and some species were recorded on site during walkover or vantage point surveys but no movement corridors were detected to / from the site to these SPAs. Therefore there is no significant identified pathway for significant effects on these assemblage species nor to / from designated sites.

At all of the nearest SPAs there are other consented and/or operational wind turbines in closer proximity than Barnesmore. At Lough Nillan Bog both Anarget I / II and Corkermore are operational whilst at Pettigoe Plateau the Operational Meenadreen Windfarm complex is located between Operational Barnesmore Windfarm and the Dunragh / Pettigoe Plateau SPA and is spatially closer to Donegal Bay SPA. Closer to the east of Donegal Bay SPA there is also an operational windfarm known as Acres Windfarm.

Other Natura sites (SAC) within 5 km list secondary ornithology features at Croaghonagh Bog SAC (Greenland white-fronted goose, merlin, red grouse, curlew, kestrel) none of which were potentially affected or connected to the Barnesmore Windfarm although hen harrier were recorded wintering on this site which is the nearest identified roost site to the northern hen harrier pair which were also recorded over Barnesmore. Dunragh Loughs/Pettigo Plateau SAC cites additional secondary species merlin, golden plover, Greenland white-fronted goose, red-throated diver, red grouse for which some of these species were assessed but there is no significant identified pathway for significant effects on these assemblage species nor to / from designated sites.

It can be concluded, on the basis of objective scientific information, that the proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European designated site and there are no significant pathways for any of the primary species cited at these sites and therefore no significant effects are predicted. Detailed Natura Impact Statement and Appropriate Assessment (AA) Screening have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the proposed Development in compliance with EU Directives.

It is clear from this analysis, that the absence of records for Greenland white-fronted goose, herring gull and lesser black-backed gull, within the site, and the distance of nearest records from the site (over 5 km in all cases), means that there is no potential pathway between the proposal and the Lough Derg or Pettigo Plateau Nature Reserve SPAs.

7 CONSIDERATION OF 'IN-COMBINATION' EFFECTS

In-combination effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as;

- Additive/incremental – in which multiple activities/projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM, 2018).
- Associated/connected – a Development activity 'enables' another Development activity e.g. phased Development as part of separate planning applications. Associated Developments may include different aspects of the project which may be authorised under different consent processes. It is important to assess impacts of the 'project' as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2018).

In-combination effects are required to be considered at Screening for Appropriate Assessment Stage, and the Appropriate Assessment itself.

7.1 Associated Developments

Associated/Connected developments are those developments which may result as a consequence of the current planning application process (CIEEM, 2018). There are not considered to be any Associated/Connected developments related to this proposal.

7.1.1 Associated Development Impacts relating to water quality within European Sites

As detailed in Section 3.3, there are a number of locations where works are likely to be required to upgrade the Haul Route to facilitate delivery of the turbine components. These works will be authorised under a separate application, as required. As such (and as facilitating works) they are considered to be associated developments in relation to the proposal. These works include those within the Lough Eske and Ardnamona Wood SAC catchment. They have been fully considered within this NIS as an integral part of the proposed works, and assessed accordingly. They are therefore, not considered further within the 'in-combination' impacts.

7.2 Additive / Incremental Impacts

Additive incremental impacts consider multiple activities/projects (each with potentially insignificant effects) but which added together can give rise to a significant effect due to their proximity in time and space (CIEEM, 2018).

7.2.1 Additive / Incremental Impacts relating to water quality and hydraulic loading (flood risk) within European Sites

Additive incremental impacts relating to water quality on the above SACs relates to other projects within the catchments that have the potential to impact, during construction or operational stages, on the water-influenced QIs within the designated sites. This notably, and primarily, includes other windfarms, which are also likely to occur in the higher parts of the catchments feeding into the headwaters of these SACs.

Chapter 9: Hydrology and Hydrogeology of the EIAR (Minerex, 2019) concludes, with respect to cumulative impacts

> *Considering hydrology, and the fact that potential effects of the Development on same are transboundary, the effects of the Development are considered to contribute and add to the cumulative nature of adverse impact imposed on the surface water network in the catchments associated with the proposed development. However, considering the presence of the Operational Barnesmore Windfarm (>20 years), the generally good WFD status particularly in relation to headwaters within the proposed development (and NHA), and high quality of baseline samples of the associated surface water network draining the site, the potential for the Development to have adverse cumulative impacts on hydrology is limited to the construction phase predominantly, and furthermore, considering the catchments areas, volumes of water associated (assimilative capacity), and the baseline impact on surface waters in the region/s, the proposed development is not considered to significantly contribute to cumulative effects in terms of water quality, or indeed hydraulic loading (flood risk).*
>
> *Considering hydrogeology, and the fact that potential effects of the Development on same are likely to be localized when considering the classification of the overlying subsoil (peat / blanket bog) and underlying groundwater aquifer (poor except for local zones), the Development is not considered to significantly contribute to cumulative effects.*

It can be seen from **Table 6** and **Table 7** below, that two operational windfarms fall within the catchment discharging to the Lough Eske and Ardnamona Wood SAC, and a total of nineconsented windfarms within the catchment discharging to the River Foyle and Tributaries SAC, four of which are operational (the River Finn SAC lies upstream of these sites and so will be unaffected).

With the site lying closest to the Lough Eske and Ardnamona Wood SAC, the potential for significant effect is greatest with respect to this European Site (with the SAC also holding freshwater pearl mussel, a highly sensitive aquatic species). However, it is one of only three windfarms falling within the Eske catchment. Both of the other windfarms are already operational, so there is no potential for cumulative impacts at the construction stage.

Conversely, although the site lies some 12 km (by hydrological connection) to the River Foyle and tributaries SAC, it is one of nine windfarms that have the potential connectivity to the SAC, including five which are yet to be built.

It is considered that, although the likelihood for cumulative impacts is low, there is a need to ensure that the site has no realistic potential to contribute to cumulative impacts either at the construction or operational stages. A suite of targeted mitigation measures, based on a highly precautionary stance, are therefore required to ensure this. These mitigation measures are set out in Section 8 and incorporated into the outline CEMP in **Technical Appendix 2.1** of the EIAR.

Table 6 Windfarms within 30 km of the Operational Barnesmore Windfarm (Republic of Ireland).

Windfarms within Lough Eske catchment are shown in green, windfarms within River Finn / River Foyle catchment are shown in orange.

No.	Planning Reference	Name	No. WTG	Easting	Northing	Distance to the Development	Planning Status	Working Status
1	P.A 0950116 & 1240091	Lenalea	9	209725	405785	24	Conditional	Consented
2	P.A 028010	Ballystrang	6	211115	404852	23	Conditional	Operational
3	P.A 0760294	Cark Extension	9	207189	404403	22	Unconditional	Operational
4	P.A 96780	Cark	13	207953	404231	22	Conditional	Operational
5	P. A 971740	Culliagh	18	207164	402777	18	Conditional	Operational
6	P.A 1260076	Meenbog (Culliagh Extension)	3	206067	401444	19	Conditional	Operational
7	P.A 018038	Meentycat	15	209956	402939	21	Conditional	Operational
8	P.A 028373	Meenahorna	9	208991	401383	19	Conditional	Operational
9	P.A 028008	Meenalaban	9	210242	401686	20	Conditional	Operational
10	P.A 018143	Meenanilta	3	211703	400209	19	Conditional	Operational
11	P.A 018305	Meenanilta 2	3	211703	400209	19	Conditional	Operational
12	P.A 049275	Meenanilta 3	4	211703	400209	19	Conditional	Operational
13	P.A 961342	Anarget I	3	189338	389769	16	Conditional	Operational
14	P.A 00551 & 03103	Anarget II	3	189338	389769	16	Conditional	Operational
15	P.A 01846	Corkermore	5	177090	385097	27	Conditional	Operational
16	P.A 1250188	Corkermore Extension	4	177090	385097	27	Conditional	Consented
17	13/51404	Crilly	4	218861	375384	16	Approved	Consented
18	NO.99/1257 (PL05.116924)	Meenadreen 1	4	202032	379195	2	Conditional	Operational
19	P.A 041461, 041462, 041526 & 1250866	Meenadreen Extension Windfarm (Comprising Meenadreen Windfarm Extension, Lough Cuill, Straness & Croaghnameal)	38	202455	379184	1	Conditional	Operational
20	ABP.05.PA0040	Meenbog	19	207800	385900	2	Conditional	Consented
21	1851741	Behy Windfarm	7	189911	363653	24	Due to be decided on the 17/12/2019	N/A
22	PL05E.305260	Cark Windfarm	12	205311	406162	23	Due to be decided on the 07/01/2019	N/A
23	05127, 0620377 & 1350420	Acres Wind Farm	6	188086	364179	22	Conditional	Operational
24	14/51400 & 05E.245108	Derrykillew Wind Farm	5	195766	361326	21	Conditional	Consented
25	19/51750	Derrykillew Wind Farm	5	195766	361326	21	Due to be decided on the 07/01/2019	N/A
26	06/21459	Killin Hill Wind Farm	3	181169	383756	22	Conditional	Operational
27	14/5	Clogheravaddy Wind Farm	7	182738	384378	21	Conditional	Operational
28	09/30155	Garvegort Wind Farm	4	175338	391827	28	Conditional	Consented
29	09/30520	Mully Graffy Wind Farm	35	191158	399679	21	Conditional	Consented

Table 7 Windfarms within 30 km of the Operational Barnesmore Windfarm (Northern Ireland).

Windfarms within River Finn / River Foyle catchment are shown in orange.

No.	Name	District	No. WTG	Easting	Northing	Distance to the Development	Planning Status	Working Status
1	Callagheen	Fermanagh	13	199109	354913	28	Extant	Operational
2	Meenakeeran	Strabane	4	210720	382514	6	Approved	Consented
3	Crighshane	Strabane	14	213120	377157	10	Approved	Operational
4	Tievenameenta	Strabane	15	216344	377371	13	Approved	Operational
5	Churchill	Strabane	8	218230	378549	15	Approved	Operational
6	Seegronan Extension	Strabane	3	218680	378860	16	Approved	Consented
7	Gronan	Strabane	4	217713	376552	15	Approved	Consented
8	Seegronan	Strabane	6	219289	377913	16	Approved	Operational
9	Altgolan	Strabane	5	221627	375717	18	Approved	Consented
10	Thornog Ext	Omagh	4	223980	370682	23	Approved	Operational
11	Thornog	Omagh	4	224153	371150	23	Approved	Operational
12	Bin Mountain	Strabane	6	223817	374313	21	Extant	Operational
13	Castlecraig	Omagh	10	226103	375100	23	Approved	Operational
14	Lough Hill	Omagh	6	225276	375585	22	Extant	Operational
15	Slieveglass	Strabane	3	227714	377644	24	Approved	Operational
16	Tappaghan	Fermanagh	13	229093	368191	29	Extant	Operational
17	Tappaghan Ext	Fermanagh	6	228892	368350	29	Approved	Operational
18	Clunahill	Omagh	7	229401	371736	28	Approved	Consented
19	Meenamullan	Tyrone	5	218338	376745	15	Refused	On Appeal

7.2.2 Additive / Incremental Impacts relating to bird species within European Sites

As detailed in Section 6.3, Greenland white-fronted goose, herring gull and lesser black-backed gull were not recorded within 5 km of the proposal during all surveys from 2017 to 2018. With respect to potential cumulative impacts on Pettigo Plateau Nature Reserve SPA and Lough Derg SPA (for which they are the QI species) therefore, there is not considered to be any potential for the proposal to contribute to cumulative impacts on these sites.

For other SPA sites, **Chapter 7: Ornithology** of the EIAR (Ruddock, 2019) details the potential impacts on QI species for five SPAs within the wider area, comprising Pettigo Plateau Nature Reserve SPA, Lough Derg (Donegal) SPA, Donegal Bay SPA, Lough Nillan SPA and Pettigoe Plateau SPA (NI) (with the text repeated under Section 6.3 of this report). It concludes that there is no potential for significant direct or potential effects on the QIs for these sites or that the QI species for the sites did not occur at the proposal during surveys. It states, with respect to merlin and golden plover that "*These are the only two species from these SPA citation lists which were detected within the site and none of these detections were of individuals which were part of the specific designated site complexes for which the species is designated i.e. local birds rather than constituent parts of the respective SPAs*". It is therefore, concluded that the proposal does not have the potential to result in additive or incremental impacts on SPAs in the wider area.

8 MITIGATION OF POTENTIAL EFFECTS ON EUROPEAN SITES

8.1 Mitigation of Water Quality Impacts at the Development

It has been highlighted above that, although likelihood of impact is low, there is potential for impact on downstream SACs through changes in water quality, notably as a result of the introduction of contaminants (including sediment and chemical pollutants) during primarily the construction stage, with the potential for ongoing sediment input during the operational phase in the absence of appropriate mitigation.

The mitigation measures detailed below are intended to remove any risk either of events that have the potential to result in an impact alone, but also remove the risk of ongoing low-level inputs that may result in an ongoing impact on the European Sites in combination with other projects or potential land use inputs. These mitigation measures include those detailed in **Chapter 9: Hydrology and Hydrogeology** of the EIAR (Minerex, 2019).

8.1.1 Design Stage (Embedded) Mitigation

A process of "mitigation by avoidance" was undertaken by the EIA team during the design of the turbine and associated infrastructure layout. Arising from the results of this study, a constraints map was produced that identifies areas where geotechnical constraints could make parts of the site less suitable for development. The constraints map is presented in **Technical Appendix TA9.9 of Chapter 9: Hydrology and Hydrogeology** of the EIAR.

As part of mitigation by avoidance during the design phase of the Development, a 50 m buffer zone around significant drainage and surface water features was established during the desk study undertaken as part of the Hydrology and Hydrogeology studies. The buffer zone is intended to drive the design process by minimising or avoiding the risk to surface water features by restricting construction disturbance to outside these zones, in turn protecting riparian vegetation and providing potential for filtering of runoff from the proposed site (it is noted that some of the existing infrastructure associated with the Operational Barnesmore Windfarm is situated in close proximity surface water features, less than 10 m in some instances).

Some of the Development infrastructure footprint will fall within the 50 m buffer zone due to the unique and limiting circumstances associated with the proposed site and development, that is:

- The Development is restricted to existing infrastructure which is on close proximity to surface water features;
- The layout of the Development is restricted due to constraints related to other environmental disciplines including; ecology, ornithology, etc. and,
- The layout of the Development is restricted due to the proposed infrastructure itself, that is; the proposed turbines require a minimum distance from each other to ensure the potential for wind turbulence impacting on downwind locations is minimised.

The proposed turbines which fall within the surface water buffer zone include:

- T3 (within 50 m buffer zone associated with unnamed lake (Unnamed (A) (01_8))
- T13 (within 50 m buffer zone associated with unmapped drain / stream associated with Derg River).

The above embedded measures have a significant role to play in reducing potential for downstream impacts (including on European Sites).

8.1.2 Construction Stage Water Quality Mitigation at the Development

Site Management and Buffer Zones

Site management and layout measures will be taken to minimise the risk to watercourses, including:

- Avoid physical damage to watercourses, and associated release of sediment;
- Avoid excavations or material storage within 20 m of surface watercourses, with the exception of watercourse crossings and locations where existing infrastructure is within 20 m of a watercourse, in which case works will be minimised;
- Avoid dewatering to watercourses or drainage systems hydrologically connected to downstream water features;
- Avoid ground rutting by machinery that could produce mobilised solids by using low ground pressure wide tracked machinery;
- Reduce working zones by the setting up of working corridors, to prevent any unwanted access to sensitive areas and areas where solids may become mobile due to machinery movements;
- No refuelling within 50 m of a watercourse;
- An Ecological Clerk of Works ("ECoW") will be employed from the commencement to completion of construction works, including tracks, substation, temporary compound, hardstand areas and turbine bases and cabling works at a minimum. Primary roles for the ECoW will include the setting out and monitoring of the working corridor and review of pollution control measures and working practices during the active construction period;
- Any additional drainage infrastructure required for the management of surface water runoff or draining peat ahead of excavation works will be established before excavation works commence. Similarly, mitigation measures related to surface water quality will be implemented before excavation works commence; and,
- Clean water drains will be created to divert water away from dirty water and construction areas to reduce the amount of silt laden water to be treated onsite.

Earthworks, Excavations and Spoil Management

- Excavations will be kept to the absolute minimum for the work required both in terms of full extent and in terms of the extent of open excavation at any one time (open excavations increase the requirement for dewatering of silt laden water following precipitation). Linear excavations (such as cable routes) will be limited to only the extent that can be back-filled the same day top avoid acting as pathways for the mobilisation of suspended solids.
- Engineered drainage and attenuation features required for the management of surface water runoff or draining peat ahead of excavation works will be established before excavation works commence. Similarly, mitigation measures related to surface water quality will be implemented before excavation works commence.
- Dewatering flow rate or pumping rate will be controlled by an inline gate valve or similar infrastructure. This will facilitate reduction of loading on the receiving drainage and attenuation network, thus enhancing the attenuation and settlement of suspended solids.
- In some areas of the Development, constraints related to incline and/or stability will likely limit the potential for installation of engineered attenuation features. In such

instances it is recommended that water arising from dewatering activities is pumped to a settlement tank before being discharge to the receiving drainage network, or pumped to an area of the site where the installation of attenuation features is suitable. Areas with such constraints are highlighted in **Technical Appendix TA9.8** of **Chapter 9: Hydrology and Hydrogeology** of the EIAR.

- Management of excavated material will adhere to the measures related to the management of temporary stockpiles outlined in **Chapter 8: Soil and Geology** of the EIAR, that is: a materials management plan will be established and form part of the CEMP with a view to establishing material balance during the proposed construction phase, thus minimising the potential for, or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff. No permanent, or semi-permanent stockpile will remain on the site during the construction or operational phase of the Development.
- Suitable locations for temporary stockpiles will be identified on a case by case basis. The suitability of any particular location will consider characteristics of the Development including; slope incline and topography, drainage networks in the vicinity and proximity to same, other relevant characteristics which are likely to facilitate, increase, or compound the potential for entrainment by surface water runoff.
- Earthworks will be limited to seasonally dry periods, and will not occur during sustained or intense rainfall events. An emergency response system will be developed for the construction phase of the project, particularly during the early excavation phase. This, at a minimum, will involve 24 hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (at the minimum, a Met Éireann orange rainfall warning or worse), planned responses will be undertaken. These responses will include, inter alia; cessation of construction until the storm event including storm runoff has passed over. Following heavy rainfall events, and before construction works recommence, the site will be inspected and corrective measures implemented to ensure safe working conditions, for example; dewatering of standing water in open excavations, etc. Weather warnings are explained below in **Table 8**.

Table 8: Irish Meteorological Service weather warnings

Amounts can be up to double on windward upper slopes and impacts vary depending on for example soil moisture deficits[10]		
Yellow	*Not unusual weather. Localised danger*	*20 mm – 30 mm in 6 hrs or less* *30 mm – 40 mm in 12 hrs or less* *30 mm – 50 mm in 24 hrs*
Orange	*Infrequent. Dangerous/disruptive*	*30 mm – 50 mm in 6 hrs or less* *40 mm – 60 mm in 12 hrs or less* *50 mm – 80 mm in 24 hrs*
Red	*Rare. Extremely dangerous/destructive*	*Greater than 50 mm in 6 hrs or less* *Greater than 60 mm in 12 hrs or less* *Greater than 80 mm in 24 hrs or less*

Management of Suspended Solids

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

- Collector drains will be established to direct/divert surface water runoff from development areas and direct same into established stilling ponds, buffered discharge points or other surface water runoff control infrastructure as appropriate.

[10] The Irish Meteorological Service Weather warnings explained https://www.met.ie/weather-warnings

This is particularly important in relation to plan effectively for surface water management associated with proposed infrastructure within 50 m surface water buffer zones.

- Buffered drainage outfalls will contain hard core material of similar or identical geology to the bedrock at the site to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, reducing sediment loading to any adjacent watercourses and avoiding direct discharge to the watercourse.
- Numerous drainage outfalls, discharging either indirectly to surface watercourses or into appropriate wetland habitats via stilling ponds and buffered drains. Discharging at regular intervals mimics the natural hydrology by encouraging percolation and by decreasing individual hydraulic loadings from discharge points.
- Stilling ponds will buffer the larger volumes of run-off discharging from the drainage system during periods of high precipitation, by retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds are designed to reduce flow velocity to 0.3 m/s at which velocity silt settlement generally occurs. This reduces the suspended sediment and associated nutrient loading to surface water courses and mitigates potential impacts on plant and animal ecologies.
- Silt fences will be established in existing natural drains and degraded peat areas. This will reduce the potential for surface water runoff loaded with suspended solids to rapidly infiltrate towards and be intercepted by significant surface water features.
- Waters arising from dewatering practices during excavation works are highly likely to be significantly loaded with suspended solids. As such, constructed stilling ponds or buffered outfalls may be insufficient in controlling the release of suspended solids to the surface water network, or have the potential to clog due to significant volumes of settled or attenuated solids. Therefore, any water pumped from excavations, or any waters clearly heavily laden with suspended solids will be pumped through silt dewatering bags, or through a settlement tank before the treated water is discharged to the established drainage network.
- The drainage, attenuation and other surface water runoff management systems will be installed prior to the main construction activities to control increased runoff and associated suspended solids loads in discharging waters from the development areas. This involves the construction of drainage ditches, the installation of silt traps, stilling ponds and the implementation of prescribed buffer zones. Where possible drainage control will be installed during seasonally dry ground conditions.
- Monitoring of drainage discharge during the construction stage, particularly at all upstream and downstream stream / drain sections relative to stilling ponds is recommended. Monitoring should be undertaken during and immediately following high rainfall events. As part of the CEMP, regular checking and maintenance of pollution control measures are required, with an immediate plan for repair or backup if any breaches of design occur.

Ensuring the precautionary and mitigation measures listed here are implemented, the risk of significant loading of suspended solids in the receiving surface water bodies is low. Therefore, the risk to sensitive receptors is low. However, in the unlikely event of a significant discharge of suspended solids to surface waters it should also be noted that the numerous lakes associated with the Site and their assimilative capacity will also act as a natural hydrological buffer in terms of suspended solids loading, where by the reduction in flow and retention time through the water body will increase attenuation and enable solids to settle out, therefore reducing the potential impact on sensitive receptors further downgradient. This however, is not considered a prescribed mitigation measure, but is a last line of defence. Any loading of suspended solids in lakes is considered an adverse effect of the Development, regardless of the positive mitigation potential for other more sensitive receptors downstream.

A detailed design of required drainage, collector drainage, stilling ponds and other listed mitigation infrastructure has not been developed as part of the EIAR, however suitable and particularly sensitive areas are identified and presented in **Technical Appendix TA9.8** of the EIAR. A detailed design of surface water mitigation infrastructure will accompany the CEMP.

Watercourse crossings

The construction of one new watercourse crossing / culvert is required at the site. A detailed assessment in terms of bridge design and the proposed location including characteristics of water flow at that location, has not been carried out as part of the EIAR. There remains the potential for the actual construction of such bridges to have significant adverse impacts on the receiving watercourse/s. Relevant guidance documents will be consulted and applicable mitigation measures i.e. applicable to the consented detailed design of proposed bridges and construction methodology of same, will be adhered to with a view to mitigating and reducing any potential impact on the receiving watercourse. The following is a non-exhaustive list of relevant guidance documents:

- National Roads Authority (NRA) (2008) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes
- Inland Fisheries Ireland (IFI) (2016) Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters
- Office of Public Works (OPW) (2013) Construction, Replacement or Alteration of Bridges and Culverts
- Scottish Environment Protection Agency (SEPA) (2010) Engineering in the water environment: good practice guide – River Crossings

Given the absence of a detailed design and assessment of the proposed bridge and its location at present, the following general mitigation measures are required as a non-exhaustive list, or minimum requirements to ensure any potential impacts of the proposed watercourse crossing are minimised:

- Proposed bridges will be designed in such a way as to minimise, in so far as practical but to the extent deemed acceptable by the Competent Authority, the disturbance or alteration of water flow, erosion and sedimentation patterns and rates. This will be done following and adhering to relevant available guidance and will be reviewed and consented (or otherwise) by the OPW, thus mitigating against any significant impact in terms of surface water flow and in turn the risk of flooding locally or indeed elsewhere.
- A detailed site-specific CEMP and detailed Risk Assessment Method Statement (RAMS) will be drafted and will include details of the bridge design and construction methodology, including the environmental risk(s) involved (as identified in this report) and how each can be minimised using best practice techniques.
- Construction methodology will be designed and planned with a view to minimising the potential for contaminating the receiving watercourse, in particular the potential for the release of suspended solids into the receiving watercourse.
- Plant machinery used in the construction of proposed bridges, or any part of the Development, will only be refuelled at an established refuelling station.
- During use of heavy plant machinery there is an inherent risk of accidental leaks or spillages of fuel/hydrocarbons. This will be incorporated in the RAMS, including an emergency response plan for such incidents. An emergency spill kit will be kept on site at all times and within 50 m of ongoing construction works. The spill kit will contain oil absorbent pads and booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter) at a minimum. An oil absorbent

boom will be installed downstream (within 25 m) of construction works, before works commence.

- Construction management plans and methodology, including RAMS, will be included with the application submitted to the OPW requesting consent to construct said watercourse crossing / bridge.
- All construction works related to watercourse crossing, i.e. any construction works within 50 m surface water buffer zones (e.g. trackways leading to crossings), will be incorporated in watercourse crossing construction plans and considerations, and the above mitigation measures will be applied in these instances also.

Mitigation of Hydrocarbon / Chemical Pollution

To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, it is recommended where possible to refuel plant equipment off the Development, thus mitigating this potential impact by avoidance. However, given the remote nature of the Development, this is not likely to be a practical measure.

If fuelling must occur on site, then a discrete "fuel station" will be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station should be bunded to 110% volume capacity of fuels stored at the site. As stated in a consultation response by IFI, "Vehicle maintenance should not occur within 100 m of any watercourse and all machinery must be in good working order, free from any leakage of fuel, oil or hydraulic fluid". The bunded area will be drained by an oil interceptor and this drainage will be controlled by a pent stock valve that will be opened to discharge storm water from the bund. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning.

In the consultation response by the Loughs Agency, they recommend inclusion of the following condition to prevent pollution of surface waters: "All storm water from the development site should not be discharged to nearby watercourses unless first passed through pollution interception and flow attenuation measures. Storm water can carry pollutants into watercourses and high-volume discharges can alter the prevailing hydrological regime, both of which can impact on fisheries interests".

The Loughs Agency also recommend that "Existing drainage channels should remain untouched".

As also stated by IFI in their consultation response, "Roadside drains should not intercept large volumes of water from ground above. Any watercourse, however small that is intercepted by the access routes should preferably be bridged or culverted at that point. The use of fords must be avoided. Culverts should be of a size sufficient to avoid overloading, blocking or washout. The profile of any stream that is crossed must remain the same and any fish movement remain unhindered. Shooting velocities must be avoided. Floating roads must be considered where any peat encountered is one metre or more in depth. Piling may be considered for turbine bases at deep peat locations and these bases should be a minimum 50 metres from watercourses. This separation distance must be increased where fisheries sensitive waters occur".

Despite the management of refuelling and fuel storage, there remains the risk of leakage from vehicles and plant equipment during construction activity. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction). This will be specified in the site CEMP.

If the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk,

and therefore both precautionary measures and emergency response protocols will be established.

Oil (hydrocarbon) absorbent booms will be installed in all surface water features associated with the Development, downstream of the proposed construction areas. A total of 2 no. oil booms will be installed at each required location, this will facilitate changing out of booms if needed, without facilitating direct flow of floating product during such activities if present. Oil booms deployed will have sufficient absorbency relative to the hazard, that is; the volume of fuel in a particular construction vehicle.

All site machinery will have a spill-kit on board and staff will be familiar with the use of these kits.

Fuels stored on site will be minimised. Any storage areas will be bunded appropriately.

The plant used should be regularly inspected for leaks and fitness for purpose; and,

An emergency plan for the construction phase to deal with accidental spillages will be contained within the CEMP. Spill kits will be available to deal with accidental spillages.

The Development Applications Unit (DAU) in their consultation response outlined the importance of a final CEMP in order to allow an adequate appropriate assessment to be undertaken. DAU state that "Applicants need to be able to demonstrate that construction management plans and other such plans are adequate and effective mitigation supported by scientific information and analysis and that they are feasible within the physical constraints of the site. The positions, locations and sizes of construction infrastructure and mitigation such as settlement ponds, disposal sites and construction compounds may significantly affect European and other designated sites, habitats and species in their own right and could have an effect for example on drainage, water quality, habitat loss, and disturbance. If these are undetermined at time of the assessment all potential effects of the development on the site are not being considered".

Mitigation of Construction / Cementitious Materials

In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water in the receiving environment, the following precautions and mitigation measures are required:

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place.
- The acquisition, transport and use of any cement or concrete on site will be planned fully in advance and supervised at all times.
- Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on the vehicle which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order.
- Where possible pre-cast elements for culverts and concrete works will be used.
- Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures could be taken to

ensure this, for example the use of plastic sheeting or other sealing products at joints.

- Concrete will be poured during periods of minimal precipitation. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete.
- Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately.
- 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.
- No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site. Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location;
- Where concrete has cured but water from rain or another source has come in contact with the cement, this water will not be allowed to be discharged to the environment. This water will be required to be removed off-site for appropriate disposal.
- Personnel involved with the testing of the delivered concrete onsite need to employ good housekeeping when working with the test boxes. Cement can run off from these areas during testing. Cubes of cement must be placed within a boxed area to prevent spillages.

Monitoring

The following requirements will ensure that any risk of hydrological impacts are identified and avoided/mitigated throughout the construction and operational phases.

- The baseline monitoring undertaken at the proposed site as part of this study should be repeated periodically before during and after the construction phase of the Development to monitor any deviations from baseline hydrochemistry that occur at the site. This monitoring along with the detailed monitoring outlined below will help to ensure that the mitigation measures that are in place to protect water quality are working. Specifically, a construction period and post construction monitoring programme for the Development site should include the following.
- During the construction phase; daily inspection of silt traps, buffered outfalls and drainage channels and daily measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations on the site. Monitoring of same during times when excavations are being dewatered (likely high in solids) should be done in real time.
- During the construction phase of the project, the development areas should be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process.
- During both the construction and operational phases of the project, watercourse crossings should be monitored frequently (daily during construction and intermittently during operational phase). The water course crossings should be monitored in terms of structural integrity and in terms of their impact on respective watercourses.

- A detailed inspection and monitoring regime, including frequency will be specified in the Construction Management Plan.
- Post construction; regular inspection of silt traps, buffered outfalls and drainage channels, measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations at the site. During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the site.
- An ECoW will be employed to oversee the prescribed mitigation measures for the project. The ECoW will have a 'STOP WORKS' authority in the event of a pollution event or a potential pollution event occurring.
- As required by IFI's consultation response, the ECoW will ensure:
    - All mitigation measures identified are implemented prior to and during the construction phase, as appropriate.
    - Continual assessment to ensure the mitigation measures are effective including assessment of adjacent peats for cracking/instability.
    - Cessation of works should slippage indicators develop and/or settlement arrangements are inadequate for suspended solid removal in surface waters.
    - Peat reinstatement is completed according to a detailed restoration plan.
    - Arrangements are established in relation to a contact protocol for the relevant statutory bodies on progress of works.

Emergency Response

Mitigation measures as outlined in the previous sections will reduce the potential for surface water contamination during the construction phase of the Development, however there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

Emergency responses to potential contamination incidents will be established and form part of the Construction Management Plan before construction works initiate. The following is a non-exhaustive list of potential emergencies and respective emergency responses:

- Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the Development. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.
- Significant hydrocarbon spill or leak – In the event of a significant or catastrophic hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as; installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons; excavation and disposal of contaminated material. Any such measures will be reviewed by appropriate consultants, considering that collector drainage will be established prior to construction activities, the need for drainage as an emergency response will be limited, however 'dig and dump' remediation processes will likely be required.
- If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer must have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up.
- Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine

erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.
- Other construction and general waste – Wastes which are dispersed by construction activities or by natural causes such as wind will be collected and dealt with immediately.

Emergency responses, including methodologies, will be specified in the Construction Management Plan.

In the event of a significant contamination or polluting incident the relevant authorities will be informed.

8.1.3 Operational Stage Water Quality Mitigation Measures at the Development

Mitigation for Protection of watercourses

- No crossing of rivers or stream by machinery during the operational phase for maintenance programmes and all machinery must stay within designated routes within the site boundary.
- Re-seeding of all areas of bare ground or the placement of jute matting should take place as practically possible at the start of the operational phase to prevent run-off
- Silt traps erected during the construction phase within trackside and artificial drainage should be replaced with stone check dams for the lifetime of the project. These stone check dams should only be placed within artificial drainage systems such as trackside drains and not natural streams or ditches.
- Site compound should house all chemicals within a secure bunded Control of Substances Hazardous to Health (COSSH) store for the operational phase of the project.
- All onsite wastewater treatment facilities should be as per regulations to prevent nutrient overloading of aquatic environments.

The operational phase drainage system will be designed in accordance with Sustainable Drainage Systems (SUDS) principles and will be installed and constructed in conjunction with the Access Site Track and hardstanding construction work as described below:

- Interceptor drains will be installed up-gradient of all proposed infrastructure during the construction phase to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;
- Swales/track side drains will be used to collect runoff from Access Site Tracks and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling
- Check dams will be used along sections of Access Site Track drains to intercept silts at source. Check dams will be constructed from a 4/40 mm non-friable crushed rock;
- Settlement and attenuation ponds, emplaced downstream of track swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, A Drainage Maintenance Plan will be put in place at commencement of the operational phase. All drains, silt ponds and attenuation ponds will be inspected quarterly bi-annually

and, in addition, following a significant rainfall event (25 mm or greater in any 24-hour period). The results of all inspections will be documented and the findings of any inspections will be incorporated into ongoing maintenance works programmes such that any remedial works are completed within a three-month period.

Mitigation of Sediment Pollution

- Machinery used as part of maintenance works are to avoid working in wet areas that may cause solids to become mobile.
- Geotextile silt fences will be replaced with stone check dams within trackside drainage systems for sediment control during the operational stage of the project
- The operational phase drainage system will be designed in accordance with SUDS principles and will be installed and constructed in conjunction with the Access Site Track and hardstanding construction work

Mitigation of Hydrocarbon / Chemical Pollution

- All chemicals to be housed within a dedicated lifetime COSSH store that is locked and secure during the operational phase of the project. Mitigation for operational phase to follow construction stage measures for hydrocarbon and chemical pollution.

Mitigation of Cement Pollution

- Any cement works to be undertaken as part of maintenance will follow construction stage mitigation measures for cement works.

8.2 Mitigation of Water Quality Impacts along the Haul Route Options

The potential impacts relating works along the Haul Route generally relate to the potential for mobilisation of suspended solids into watercourses connecting to European Sites or pollution spillage into these watercourses.

In order to avoid any such impacts, Method Statements will need to be agreed for all the proposed works in advance of the commencement of construction. These should be based on the requirements detailed above and must include at a minimum:

- No re-fuelling within 50 m of a watercourse;
- No excavation or material storage within 20 m of an active watercourse;
- Adherence to 'Inland Fisheries Ireland (IFI) (2016) Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters' in all works;
- Measures to minimise excavations and time that excavations are left open;
- No direct de-watering of excavations to watercourses;
- Use of silt-buster or silt bags as required;
- A pollution response plan and deployment of spill kits; and
- An Invasive Alien Species survey of each site in advance of works and the implementation of an Invasive Alien Species Management / Biosecurity Plan as required.

9 ASSESSMENT OF RESIDUAL IMPACTS AND EFFECTS

Table 9 provides a summary of those European Sites and their QIs within the ZoI of both the Development (including the Haul Route options), the potential impacts, the assessment of their potential effects on the QIs listed, mitigation measures proposed and an assessment of any residual effects.

Table 9 Summary of Impacts and their effects on European Sites within the Zone of Influence of the Development and the Haul Route Options.

European Site	QIs within the Zone of Influence	Potential Impacts	Significance of Effects on QI within the Zone of Influence	Mitigation Measures	Significance of Residual Effects on QI within the Zone of Influence
Lough Eske and Ardnamona Wood SAC (Site Code: 000163)	[3110] Oligotrophic waters containing very few minerals [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1106] Atlantic salmon (*Salmo salar*)	Water Quality Impacts Hydraulic loading	Potentially Significant at international Scale	Sediment Control Measures Hydrocarbon Control Measures. Cement Control Measures. Pollution control at Haul Route works locations. Ecological Clerk of Works. Surface water Management Plan within CEMP	No potential for adverse effects on integrity
River Foyle and tributaries SAC (Site Code: UK0030320)	[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [1106] Atlantic Salmon (*Salmo salar*) [1355] *Lutra lutra*	Water Quality Impacts Hydraulic loading	Potentially Significant at international Scale	Sediment Control Measures Hydrocarbon Control Measures. Cement Control Measures. Pollution control at Haul Route works locations. Ecological Clerk of Works. Surface water Management Plan within CEMP	No potential for adverse effects on integrity
River Finn SAC (Site Code: 002301)	[3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [1106] *Salmo salar* (Atlantic salmon) [1355] *Lutra lutra* (Otter)	Water Quality Impacts Hydraulic loading	Potentially Significant at international Scale	Sediment Control Measures Hydrocarbon Control Measures. Cement Control Measures. Pollution control at Haul Route works locations. Ecological Clerk of Works.	No potential for adverse effects on integrity

European Site	QIs within the Zone of Influence	Potential Impacts	Significance of Effects on QI within the Zone of Influence	Mitigation Measures	Significance of Residual Effects on QI within the Zone of Influence
				Surface water Management Plan within CEMP	
Pettigo Plateau Nature Reserve SPA (Site Code: 004099	Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395]	Collision Risk Displacement / Disturbance	Not Significant	NA	No potential for adverse effects on integrity
Lough Derg (Donegal) SPA (Site Code: 004057)	Lesser Black-backed gull (*Larus fuscus)* [A183] Herring gull (*Larus argentatus*) [A184]	Collision Risk Displacement / Disturbance	Not Significant	NA	No potential for adverse effects on integrity

10 CONCLUSIONS OF NATURA IMPACT STATEMENT

The Development does not occur within any European Site. Consequently, there is no potential for the Development to result in direct impacts on any European Site. However, the Development is hydrologically connected to the Lough Eske and Ardnamona Wood SAC, River Finn SAC and the River Foyle and Tributaries SAC. These sites have QIs which are, to varying degrees, sensitive to water quality issues (comprising [3110] oligotrophic waters containing very few minerals, [3260] water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, [1029] freshwater pearl mussel (*Margaritifera margaritifera*), [1106] Atlantic salmon (*Salmo salar*) and [1355] otter (*Lutra lutra*)).

In addition, Pettigo Plateau Nature Reserve SPA and the Lough Derg (Donegal) SPA fall within the potential ZoI of the proposal, due to likely foraging distances of QI bird species ([A395] Greenland white-fronted goose (*Anser albifrons flavirostris*), [A183] lesser black-backed gull (*Larus fuscus)* and [A184] herring gull (*Larus argentatus*)) as detailed within SNH (2016)[11]

The proposal includes upgrading of internal Access Site Tracks that cross a total of five small watercourses within the catchment feeding the **Lough Eske and Ardnamona Wood SAC**. In addition, the works come within circa 75 m of a lake (Lough Slug) which has an outlet that feeds into the Eske catchment, with grid connection cabling works also in this location. Two proposed turbines (T6 and T5) fall within the Eske catchment. Works to remove the infrastructure and restore habitats in the north west of the site (covering a linear distance of 435 m) fall within the Eske catchment. The five Haul Route upgrade locations that have potential to impact on European Sites are all within the Eske catchment. The location where the OHL mast to be relocated and new underground cabling is required, for the grid connection outside the Development, also falls within the Eske catchment. The NIS and the EIAR has identified that, in the absence of mitigation, there is potential for significant effect of the Lough Eske and Ardnamona Wood SAC. However, it has also identified appropriate mitigation measures that will avoid an impact on the integrity of the site. The mitigation includes measures required during both the construction and operational stages of the windfarm. During construction, these include buffer zones (for works and storage of potential pollutants), temporary cut-off drains, minimization of ground disturbance, avoidance of working in high rainfall conditions, appropriate specification of sediment ponds, protocols for refuelling, working with pollutants and spill response, and active re-vegetation. During operation, mitigation measures include blocking of temporary construction-phase drains, active revegetation and embedded drainage design to avoid potential erosion. Where appropriate, these have been incorporated into the CEMP.

The **Lough Foyle and Tributaries SAC** and the **River Finn SAC** are connected to the proposed development site by a connecting watercourse, both lying circa 12 km downstream of the proposal. Much of the windfarm falls within this catchment, including 11 wind turbines. Significantly more distant than the Lough Eske and Ardnamona Wood SAC, impacts on these sites are less likely, with potential impact more likely to result from hydrocarbon or chemical spillage during construction. Mitigation measures are proposed, as detailed above in respect of Lough Eske and Ardnamona Wood SAC, for the full windfarm site in order to avoid any potential for downstream impacts.

[11] SNH (2016) Assessing Connectivity with Special Protection Areas (SPAs) Guidance. Version 3 – June 2016

The proposal lies within 5.3 km of the **Pettigo Plateau Nature Reserve SPA** (designated for Greenland white-fronted goose) and within 6.5 km of **Lough Derg (Donegal) SPA** (designated for lesser black-backed gull and herring gull) and falls within the likely foraging range of the species for which these sites are designated.

Bird surveys undertaken at / in the vicinity of the Development for the purpose of informing the assessment (from 2017 to 2019, following SNH (2017) methodology), confirmed that Greenland white-fronted goose, lesser black-backed gull and herring gull were not recorded within the site or 500 m buffer zone (indeed with the closest site records for these species being beyond 5 km) and are therefore, not considered to be at risk of collision from the proposal. While there is some potential for the operational turbines to provide disturbance related impacts to bird species in its immediate vicinity, it is considered that there is no potential for such disturbance to result on the QI species occurring beyond 5 km from the proposal.

Consequently, it is considered that there is no potential for the proposal to adversely affect the **Pettigo Plateau Nature Reserve SPA** or **Lough Derg (Donegal) SPA,** taking account of their QI species.

In conclusion, this Natura Impact Statement details the precautionary mitigation measures needed to prevent any potential direct or indirect impacts on QIs of the Lough Eske and Ardnamona Wood SAC (Site Code: 000163), River Finn SAC (Site Code: 002301) and the River Foyle and Tributaries SAC (Site Code: UK0030320) as summarised above. This report concludes that if the mitigation measures specified for this specific development are implemented, as detailed in Section 8, the proposal will not, in the light of best scientific knowledge, adversely affect the integrity of **any European Site either alone or in combination with any other plans or projects.**

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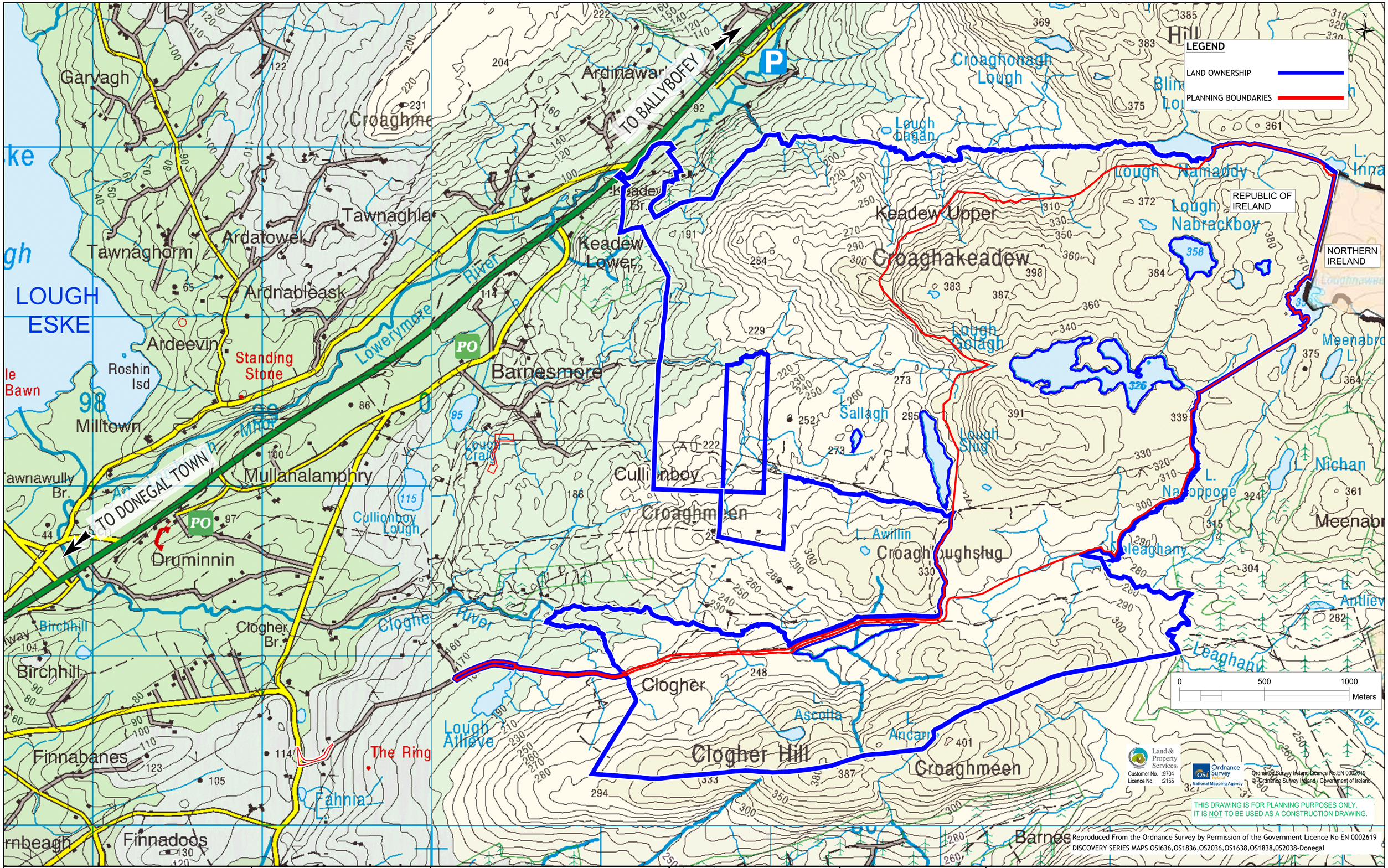
APPENDIX 1 FIGURES

Figure 1 - Geographical Location of the Development



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SCOTTISHPOWER RENEWABLES

ScottishPower Renewables
320 St Vincent Street
Glasgow
G2 5AD

Email: info@scottishpowerrenewables.com
Web: www.scottishpowerrenewables.com

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Project: BARNESMORE WINDFARM REPOWERING

Title: SITE LOCATION MAP

Issue Details				Office Use Only	
Designed:	JOD	Information		Drawing Number:	5952-000-000
Drawn:	AMcC	Approval	X		
Checked:	S.M.	Tender		Date: 30/10/2019	Rev.
Approved:	D.K.	Construction			
Scale: AS NOTED		Record			

Figure 2 - Geographical Location of the Haul Route for the Development

Legend

Haul Route Potential Constraint Points Denoted Thus.....

- A
- " B
- " C
- " D
- " E
- " F
- " G
- " H

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SCOTTISHPOWER RENEWABLES

ScottishPower Renewables
320 St Vincent Street
Glasgow
G2 5AD

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Rev.	Date	By	Amendments

Project: **BARNESMORE WINDFARM REPOWERING**

Title: **HAUL ROUTE POTENTIAL CONSTRIANT POINTS LOCATION PLAN**

Issue Details

Designed:	JOD	Information	
Drawn:	A.McC	Approval	X
Checked:	S.M	Tender	
Approved:	DK	Construction	
Scale: AS NOTED		Record	

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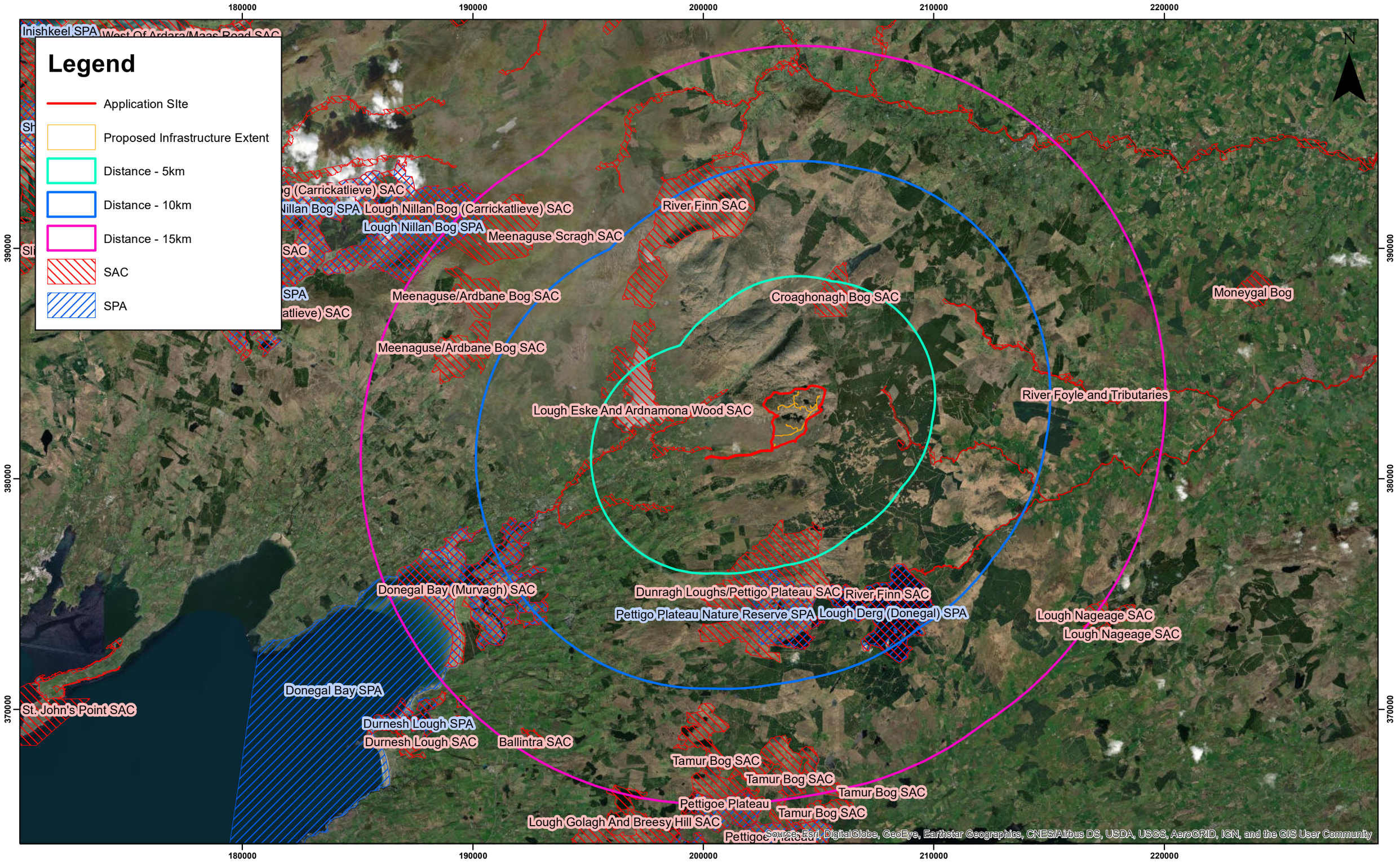
Drawing Number: **5952-1100-1100**

Date: **11/11/19**

Rev.

Figure 3 - The Development in relation to European SItes



SCOTTISHPOWER RENEWABLES

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A	17/12/19	WW	First Issue.

1:150,000 Scale @ A3

0 3.75 7.5 Km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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NIS Figure 3 - Development in relation to European SItes

Drg No	NIS-3	
Rev	A	Datum: TM65 Projection: TM
Date	17/12/19	
Figure	NIS 3	

Shapefile

Figure 4 - Potential hydrological connections from the Development to European Sites

200000

210000

380000

Legend

- Application SIte
- Proposed Infrastructure Extent
- Haul Route Work locations
- SAC
- SPA
- Watercourse connection to European Site

N

River Foyle and Tributaries

Lough Eske And Ardnamona Wood SAC

Dunragh Loughs/Pettigo Plateau SAC

Pettigo Plateau Nature Reserve SPA

River Foyle and Tributaries

Lough Derg (Donegal) SPA

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

200000

210000

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Rev	Date	By	Comment
A	17/12/19	WW	First Issue.

1:40,000 Scale @ A3

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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NIS Figure 4 - Potential hydrological connections to European Sites

Drg No	NIS-4	
Rev	A	Datum: TM65
Date	17/12/19	Projection: TM
Figure	NIS 4	

Shapefile

APPENDIX 2 RELEVANT CASE LAW

Information to inform the Appropriate Assessment Process

Case C-258/11, Peter Sweetman and Others v An Bord Pleanála - The Court of Justice of the European Union (CJEU) judgement 11 April 2013

Case C-164/17, Edel Grace and Peter Sweetmen v An Bord Pleanála – CJEU judgement 25 July 2018

Case C-323/17, People Over Wind and Peter Sweetman v Coillte Teoranta Judgement 12 April 2018[12]

And Case Law Updates:

Kelly v An Bord Pleanála & Anor (Aldi Stores) [2019] IEHC 84; and,

Heather Hill Management Company Clg v An Bord Pleanála [2019] IEHC 450.

Sweetman v An Bord Pleanála [2016] IEHC 277 (Killaloe By-Pass Case)

Case C-461/17 Brian Holohan and Others v An Bord Pleanála

[12] Judgement is available at: http://curia.europa.eu/juris/document/document.jsf?text=&docid=200970&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=5618971