

## 16 INTERACTION OF THE FOREGOING

### 16.1 Introduction

Article 3 of EIA Directive 2014/52/EU stipulates that ‘The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d).

This EIAR was prepared with respect to an application for 12 turbine wind energy development in Co. Donegal along with its associated infrastructure, grid connection, turbine delivery route and replacement planting lands. In accordance with the requirements of the EIA directive, this EIAR has presented environmental assessments of the likely significant environmental effects and impacts of the entire project under each required factor. Where relevant, the interaction between the factors, which is the interactions between specific environmental aspects and effects, are already addressed within each of the individual assessment topic areas or chapters of this EIAR. The purpose of this chapter is to draw attention to significant interaction and interdependencies between one topic and another.

### 16.2 Interaction of Environmental Factors

There is potential for interactions between one aspect of the environment and another which can result in direct or indirect impacts, and which may be positive or negative. This chapter is completed based on a desktop review of the assessments and results presented in the preceding chapters of this EIAR and by provision of a matrix to present the main interactions and interdependencies between specific environmental factors.

The matrix contains each of the environmental topics, which were considered as part of this environmental impact assessment, on both axes. These interactions have been identified for both the construction [C] and operation [O] phases, of the proposed development. Potential interactions during decommissioning would be similar to those of the construction phase. The matrix is presented in **Figure 16.1**. The assessments and results have previously been presented in the preceding chapters of this EIAR.

The most dynamic interaction and interdependencies relate to the connection between ecology, soils, and hydrology. Changes in site run-off from changes and removal of soil cover can result in effects or changes on hydrology, both in terms of water quality and hydraulic regime, which may result in secondary ecological effects on vegetation patterns and habitats and species. The relationship and effects of these aspects have been fully considered in Chapter 6 Biodiversity of the EIAR. The following is a summary of other key interactions.

### 16.2.1 Population and Human Health

#### **Population and Human Health and Noise & Vibration and Air Quality & Climate**

Plant and machinery used during the construction phase has the potential to cause nuisance through noise and dust emissions. Once operational there will be noise from the wind turbines, substation, and battery storage compound. This has been fully assessed in Chapter 11 (Noise and Vibration) and found to be acceptable. There will be no significant inter-related effects.

Once operational, this additional step towards eventual national decarbonisation will have beneficial effects on air quality and climate, and a resulting beneficial inter-related effect on the population.

#### **Population and Human Health and Water**

There is potential for water pollution during the construction phase which could impact on different types of receptors including the human population. Chapter 10 assess the potential impacts and describes mitigation measures to ensure there are no significant inter-related effects from water pollution on the population.

#### **Population and Human Health and Landscape**

The most visually dominant project infrastructure will be the wind turbines. The erection of the wind turbines will change the landscape to observers. How this will impact the landscape is described in Chapter 12. At an individual level, the potential impact is highly subjective, often depending on individual attitudes to wind turbines and/ or renewable electricity generation.

#### **Population and Human Health and Material Assets**

HGVs will be required to deliver materials to the site during the construction phase and there will be abnormal load delivery of turbine components. These additional vehicles on the local road network may cause inconvenience to other road users. A Traffic Management Plan (TMP) will be put in place to minimise disturbance to other road users. The implementation of the traffic management plan will ensure no significant inter-related effects.

### 16.2.2 Biodiversity

#### **Biodiversity and Land**

There will be some habitat loss during excavation of certain works areas. There will be disturbance to fauna caused by the construction activity. Forestry will be felled to facilitate the construction of infrastructure.

The forestry will be replanted elsewhere resulting in no net loss. A site specific Biodiversity Enhancement Plan will minimise the effects of any habitat loss. The likely significant impact and mitigation measures are described in full in Chapter 6. Subject to the implementation of the mitigation measures there will be no significant inter-related effects.

**Biodiversity and Water**

There is the potential for water pollution from different sources during the construction works. This could cause a deterioration in the quality of aquatic habitats and thereby adversely impact the fauna that depend on the habitat. These impacts and any others including drainage are fully assessed in Chapter 6. The mitigation measures to reduce potential impacts are also described therein. Subject to the implementation of the mitigation measures there will be no significant inter-related effects.

**Biodiversity and Noise & Vibration**

Noise from construction works will likely result in some avoidance behaviour by fauna. This is addressed in Chapter 6. There may be disturbance and avoidance behaviour during the construction works, however this will be temporary and short term. Overall, the inter-related effects will not be significant.

**Biodiversity and Landscape**

The development of the project infrastructure including roads and hardstandings, borrow pits and peat and spoil storage areas will alter the local landscape. The borrow pits will be re-instated and the material storage areas managed to incorporate them back into the natural landscape as much as possible through measures detailed in the CEMP.

**16.2.3 Biodiversity (Ornithology)****Ornithology and Land and Noise & Vibration**

The civil engineering works require the excavation of land resulting in some habitat loss which may have been utilised by birds. The plant and machinery required to do the works will generate noise emissions. The habitat loss and disturbance/ avoidance impacts are described in Chapter 7 and mitigation measures proposed where needed. There may be disturbance and avoidance behaviour during the construction works, however this will be temporary and short term. Overall, the inter-related effects will not be significant.

**16.2.4 Land****Land and Water and Biodiversity and Cultural Heritage**

The civil engineering works will require the excavation and movement of overburden and rock. This will lead to habitat loss and potential sources of pollution for surface and groundwater. There is also the potential for previously unrecorded sites of archaeological interest to be disturbed during excavation works. The potential for all these interactions and the resultant effects are assessed in detail in the relevant chapters. The likely impacts will be avoided or minimised through the topic specific mitigation measures.

**16.2.5 Landscape and Visual****Landscape and Visual and Cultural Heritage**

The development site infrastructure has the potential to alter the landscape setting of recorded site and monuments in the area. The potential impacts and mitigations are described in detail in Chapter 13. The wind farm is not situated within a designated landscape, therefore the inter-related effects will not be significant

### 16.2.6 Shadow Flicker

#### Shadow Flicker *and* Population and Human Health

The spinning turbines have the potential to cause shadow flicker within dwellings. This can be a nuisance to room occupants. The wind turbines will be programmed to shut down during times when shadow flicker is predicted to occur. The full shadow flicker assessment is described in Chapter 14. The inter-related effects will not be significant.

### 16.3 Risks of Major Accidents and Disasters

Overall it is not expected that the Project will result in significant effects resulting in the risk of major accidents and disasters, nor is the project considered vulnerable to risks of major accidents and disasters. Threats to the environment are inherently assessed within environmental impact assessment. Landslide susceptibility is covered within the Peat Stability Risk Assessment (Volume III, Appendix E-1) and the Project has been designed using Mitigation by Avoidance to ensure no infrastructure is situated in deep peat and the outcome of the risk assessment was that landslide presented a Negligible to Low Level of risk to the Wind Farm Infrastructure.

There is potential for the Proposed Development to be impacted by severe weather including increased wind storms. However, wind turbines are designed to withstand extreme weather conditions with brake mechanisms installed within the turbines so that they only operate under specific wind speeds and will shut-down during high wind speed events. Therefore, there is very low risk to the Proposed Development from high wind speeds.

Flood risk is considered in EIAR Chapter 10 to determine whether the site is at risk from extreme fluvial flooding events. This assessment concluded that the site is not at risk from extreme flooding. The assessment also considered the increase risk of downstream flooding as a result of the proposed development. The assessment considers that forest felling, new site access tracks, turbine hard-standing areas and other new, hard surfaces have the potential to contribute to a low level of increase in surface water run-off. The assessment however determined that the risk of an increase in downstream flooding is low due to the small percentage increase in run-off contributing to the catchments as a result of the wind farm development. The proposed development is at a distance of approximately 7.5km from the nearest recorded location by the Office of Public Works (OPW) where flooding has occurred in the Swilly sub catchment.

Major Interaction
Minor Interaction
C Construction Phase
O Operation Phase

	Population & Human Health	Biodiversity	Ornithology	Water	Lands and Soils	Air Quality & Climate	Noise and Vibration	Landscape and Visual	Shadow Flicker	Archaeology & Cultural Heritage	Material Assets
Population & Human Health				C	C	C/O	C/O	C/O	O		O
Biodiversity			C	C	C		C/O				
Ornithology		C			C		C/O				
Water	C	C			C						
Lands and Soils		C	C	C						C	
Air Quality and Climate	C/O										C
Noise and Vibration	C/O										
Landscape and Visual	O									O	
Shadow Flicker	O										
Archaeology and Cultural Heritage				C				O			
Material Assets	C/O				C/O						

Figure 16.1 Matrix of impacts