

Environmental Impact Assessment Report (EIAR)

Crumhach Wind Farm, Co.
Sligo

Chapter 16 – Major Accidents and
Natural Disasters



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GLOSSARY OF TERMS

Term	Definition
Catchment Flood Risk Assessment Management	The Catchment Flood Risk Assessment and Management Programme is Ireland's largest-ever national flood study, commissioned by the Office of Public Works to assess 80% of the country's primary flood risk, develop detailed flood management Plans with tailored strategies for 300 communities to meet EU Directive requirements
Factor of Safety	The ratio of a structure's absolute capacity (strength) to its actual applied load (demand), indicating how much stronger a system is than it needs to be.
Hydrocarbons	Organic compounds composed entirely of hydrogen and carbon atoms, serving as the primary components of fossil fuels like petroleum and natural gas.
SEVESO Site	Industrial facilities storing potentially dangerous substances in high quantities under the EU SEVESO Directives
Major Emergency Plan	Outlines potential site/event specific emergency plans which have been considered or ruled out as part of the baseline, prepared by Sligo County Council (2020).

GLOSSARY OF ACRONYMS

Acronym	Definition
A	Alluvium
BkPt	Blanket Peat
BMEP	Biodiversity Management and Enhancement Plan
CAP	Climate Action Plan
CEMP	Construction and Environmental Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
FoS	Factor of Safety
FRA	Flood Risk Assessment
GSI	Geological Survey Ireland
HGV	Heavy Goods Vehicles
INSN	Irish National Seismic Network
LACAP	Local Area Climate Action Plan
LGV	Light Goods Vehicles
RSES	Regional Spatial Economic Strategy
RWCS	Reasonable Worst Case Scenario
SCC	Sligo County Council
T	Turbine



TMp	Metamorphic Till
TMP	Traffic Management Plan

16. MAJOR ACCIDENTS AND NATURAL DISASTERS

16.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the likely significant adverse effects on the environment arising from the vulnerability of the Proposed Project, as detailed in Chapter 4: Description of the Proposed Project, to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Project itself to cause potential major accidents and/or natural disasters. It has been completed in accordance with the guidance set out by the Environmental Protection Agency (EPA) in ‘Guidelines on Information to be contained in Environmental Impact Assessment Reports’ (EPA, 2022)¹ and the European Commission in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU, as amended by 2014/52/EU), namely ‘Guidance on the preparation of the Environmental Impact Assessment Report’².

The assessment of the vulnerability of the Proposed Project to major accidents and/or natural disasters, as well as the risk of the Proposed Project itself causing major accidents and/or natural disasters has been carried out in compliance with the EIA Directive (2014/52/EU) which states the need to assess:

“the expected significant effects deriving from the vulnerability of the project to risks of major accidents and/or natural disasters which are relevant to the project concerned.”

The objective of this assessment is to ensure that appropriate precautionary actions are taken for the Proposed Project:

“because of their vulnerability to major accidents and/or natural disasters, (such as flooding, sea level rise, or earthquakes), are likely to have significant adverse effects on the environment”.

Based on the requirements of the EIA Directive, this chapter seeks to determine:

- › The relevant major accidents and/or natural disasters, if any, that the Proposed Project could be vulnerable to or could cause;
- › The potential for these major accidents and/or natural disasters to result in likely significant adverse environmental effect(s); and
- › The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

For the purposes of this EIAR, the various project components are described and assessed using the following references: ‘Proposed Project’, ‘the Site’, ‘Proposed Wind Farm’, ‘Proposed Turbines’, ‘Proposed Grid Connection Route’, ‘Existing Wind Farm’ and ‘Existing Grid Connection’. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4: Description of the Proposed Project of this EIAR.

¹ EPA, 2022. Guidelines on Information to be contained in Environmental Impact Statements. Available at: https://www.epa.ie/publications/monitoring-assessment/assessment/EIAR_Guidelines_2022_Web.pdf

² European Commission, 2017. Guidance on the preparation of Environmental Impact Assessment Reports. Available at: <https://op.europa.eu/en/publication-detail/-/publication/2b399830-cb4b-11e7-a5d5-01aa75ed71a1>

16.1.1 Statement of Authority

This section of the EIAR has been prepared by Brandon Taylor with input from Edel Mulholland and reviewed by Ellen Costello and Sean Creedon all of MKO.

Brandon Taylor is a Project Environmental Scientist with over three years of private consultancy experience. Brandon holds a BSc (Hons) in Geography from McGill University, and a MSc (Hons) in Coastal & Marine Environments from the University of Galway. Brandon's key skills include scientific research and report writing, particularly in the context of local communities and their interactions with environmental stressors, and geospatial analysis and the application of GIS and remote sensing tools across fields of renewable energy development, coastal zone management and education and scientific communication. Since joining MKO, Brandon has been involved in the design and environmental impact assessment of multiple large-scale onshore wind energy developments across Ireland, contributing to and managing the production of EIA reports.

Edel Mulholland is an Environmental Scientist with MKO with over 1 year experience. Edel holds BA (Hons) in Environmental Science from the University of Galway. Prior to taking up her position with MKO in September 2024, Edel worked as an Environmental Chemistry Analyst with Complete Laboratory Solutions, Co. Galway, where she assisted with water quality analysis. Since joining MKO, Edel has assisted in the submission of several renewable energy developments. Edel's key strengths and areas of expertise are in environmental policy, drafting EIAR chapters, field work and QGIS mapping.

Ellen Costello is a Senior Environmental Scientist with MKO with over 6 years' experience in private consultancy. Ellen holds a BSc (Hons) in Earth Science, and a MSc (Hons) in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on renewable energy development in Europe and its implications on environment and society. Ellen's key strengths and expertise are Environmental Protection and Management, Environmental Impact Statements, Project Management, and GIS Mapping and Modelling. Since joining MKO, Ellen has been involved in a range of renewable energy infrastructure projects. In her role as a senior project manager, Ellen works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs.

Sean is an Associate Director in the Environment Team at MKO. He oversees a team of highly skilled environmental professionals working on EIAR for large and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He is a member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Sean has over 23 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

16.2 Assessment Methodology

16.2.1 General

The following sources of information and literature pertinent to the area were used in the preparation of this section:

- › Census of Ireland³
- › Regional Planning Guidelines for the Border Region (2010 – 2022)⁴
- › Regional Spatial and Economic Strategy (RSES) Northern and Western Regional Assembly 2020 – 2032⁵
- › Sligo County Development Plan (2024– 2030)⁶
- › County Sligo Council Local Authority Climate Action Plan (CAP) 2024-2029⁷
- › Sligo County Council Major Emergency Plan (2020)⁸
- › Sligo County Council Website⁹, and
- › Fáilte Ireland¹⁰
- › HSE West and Northwest Interim Regional Major Emergency Plan for HSE Services in counties Donegal, Sligo, Leitrim, West Cavan, Galway, Mayo and Roscommon (February 2026)¹¹

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Project and lead to environmental effects directly and indirectly. These include accidents during construction, operation and decommissioning of the Proposed Project caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster is considered in relation to the information required to be provided in the EIAR, i.e., Chapter 5: Population and Human Health, Chapter 6: Biodiversity, Chapter 8: Land, Soil and Geology, Chapter 9: Hydrology and Hydrogeology, Chapter 10: Air Quality, Chapter 11: Climate, Chapter 13: Landscape and Visual, Chapter 14: Cultural Heritage, and Chapter 15: Material Assets.

16.2.2 Legislative Context

An assessment of the following key elements was undertaken in accordance with the EIA Directive (2014/52/EU):

- › The vulnerability of the Proposed Project to potential major accidents and/ or natural disasters.
- › The potential for the Proposed Project to cause major accidents and/or natural disasters which pose a risk to human health, cultural heritage and/or the environment.

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the

³ Central Statistics Office <https://www.cso.ie/en/census/>

⁴ Regional Planning Guidelines for the Border Region (2010-2022) < <https://www.nwra.ie/wp-content/uploads/Planning-Guidelines-for-the-Border-Region.pdf> >

⁵ Regional Spatial and Economic Strategy (RSES) Northern and Western Regional Assembly 2020 – 2032
< <https://www.nwra.ie/rse/#:~:text=Regional%20Spatial%20and%20Economic%20Strategy,policies%20and%20objectives%20of%20Government.>> >

⁶ Sligo County Development Plan (2024-2030) < <https://consult.sligococo.ie/en/consultation/draft-sligo-county-development-plan-2024-2030> >

⁷ Sligo County Council Local Authority Climate Action Plan (LACAP) 2024-2029
< <https://www.sligococo.ie/Environment/ClimateAction/SCCClimateActionPlan2024-2029/SCC%20Final%20LACAP.pdf> >

⁸ Galway County Council (2021) Galway Major Emergency Plan
< <https://www.sligococo.ie/Services/FireService/MajorEmergency/MajorEmergencyPlan/SligoCoCo.MEPV6April20PE.pdf> >

⁹ Sligo County Council Website < <https://www.sligococo.ie/Housing/> >

¹⁰ Fáilte Ireland <https://www.failteireland.ie/>

¹¹ https://assets.hse.ie/media/documents/HSE_West_and_North_West_Interim_Regional_Major_Emergency_Plan_V2_2026-02-25.pdf

requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies”.

16.2.2.1 Guidance Documents

In addition to the guidance documents described in Chapter 1 Section 1.2.1, the following guidance documents have been consulted in the preparation of this section:

- › Department of Environment, Heritage and Local Government (2010) A Guide to Risk Assessment in Major Emergency Management
- › Department of Housing, Local Government and Heritage (2024). *A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*¹²
- › Environmental Protection Agency (2014) Guidance on Assessing and Costing Environmental Liabilities
- › Health Service Authority Advice for Health and Safety in the Renewable Sector;
- › Department of Defence (2024) National Risk Assessment 2024: Overview of Strategic Risks
- › Sligo County Council Major Emergency Plan (2020)¹³
- › Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022)
- › Department of the Taoiseach (2024) A National Risk Assessment 2024 – Overview of strategic Risks ¹⁴

On a regional scale, Sligo falls under the scope of the HSE Northwest (Area 1) Major Emergency Plan.

16.2.3 Categorisation of the Baseline Environment

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster. Local and regional context has been established prior to undertaking the risk assessment to develop an understanding of the vulnerability and resilience of the area to emergency situations.

Further detail on the baseline environment is provided in Section 16.3.

16.2.4 Impact Assessment Methodology

16.2.4.1 Introduction

This assessment is based on an understanding that the Proposed Project will be designed, built and operated in line with the methodologies and measures prescribed in this EIAR.

A wind farm is not a recognised source of pollution. It is not subject to Industrial Emissions Directive regulation or any other Environmental Protection Agency (EPA) environmental regulatory consent. Should a major accident or natural disaster occur the potential sources of pollution onsite during the construction, operational and decommissioning phases of this type of development are limited and of low environmental risk. Sources of pollution with the potential to cause significant environmental

¹² DoHLGH (2024) *A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*. Available at: https://assets.gov.ie/static/documents/Guide_to_Regional_Risk_Assessment_September_2024.pdf

¹³ Galway County Council (2021) *Galway Major Emergency Plan* <<https://www.sligococo.ie/Services/FireService/MajorEmergency/MajorEmergencyPlan/SligoCoCoMEPV6April20PE.pdf>>

¹⁴ Department of the Taoiseach (2024). *National Risk Assessment 2024 – Overview of Strategic Risks*. Available at: <https://assets.gov.ie/static/documents/national-risk-assessment-2024-overview-of-strategic-risks.pdf>

pollution and associated negative effects such as bulk storage of hydrocarbons or chemicals, storage of wastes, management of flammable materials etc. are limited and so there is an inherent low level of environmental risk associated with major accident or natural disaster impacting the Proposed Project and causing environmental damage.

There is low potential for significant natural disasters to occur at the Proposed Project. Ireland is a geologically stable country with a mild temperate climate. According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are “normal” in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, buildings or structures in Ireland are extremely unlikely to be damaged or collapse due to seismic activity. Irelands geographic position means that tsunamis, which may pose a risk to developments similar to the Proposed Project in other geographic locations, are of a low likelihood of occurrence, and are less likely to be of a significant magnitude in order to cause an accident or disaster. The potential natural disasters and/or major accidents that may occur are therefore limited to issues such as flooding, impacts on infrastructure, fire, etc., which are addressed in the Sections below.

The supporting Construction and Environment Management Plan (CEMP) (Appendix 4-5) details the environmental management, mitigation and monitoring measures to prevent and minimise impacts of the construction phase of the Proposed Project on environmental receptors such as air and water quality, noise emissions and ecological and archaeological receptors.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of an accident. The European Communities Control of Major Accident Hazards Involving Dangerous Substance Regulations, 2000, applies to sites known as ‘SEVESO sites’, where certain quantities of specified dangerous substances are present. The Proposed Project site is not regulated or connected to or close to any SEVESO sites, and so there are no potential effects from this source. Mitigation and monitoring measures to avoid the release of fuels and hazardous materials at the Site are detailed below in Section 16.4.2, in Section 9.5.2.5 of Chapter 9: Hydrology and Hydrogeology, Chapter 18: Schedule of Mitigation, and in the CEMP (Appendix 4-5).

The Proposed Project has low potential to cause natural disasters or major accidents. As detailed in Appendix 8-1 (Peat Stability Risk Assessment) of Chapter 8: Land, Soils and Geology of this EIAR, the published soil map (www.epa.ie) for the area shows that Proposed Wind Farm is predominantly covered by blanket peat (BkPt) with localised areas of till (TMp) derived from Metamorphic rock, Alluvium (A) associated with the stream/ river valleys and localised areas of bedrock outcrop or subcrop.

The blanket peat found within the Proposed Wind Farm has been significantly degraded due to peat cutting, agricultural land improvement and commercial forestry. The Proposed Project is located in an upland site, therefore there is potential for peat slides. The Geological Survey of Ireland (GSI) have classified the areas of the Site where the majority of the Proposed Wind Farm infrastructure is located as having a low to high potential for landslides.

Any risks associated with flooding, impacts on infrastructure, accidents etc are addressed in the sections below.

Current Environmental Impact Assessment (EIA) Guidelines, as outlined in Section 16.1 above, already includes an assessment of some potential accidents and disaster scenarios such as pollution incidents to ground and watercourses as well as assessment of flooding events and peat instability. These are described in detail in the relevant EIAR assessment chapters (Refer to Chapters 5 to 16 for further detail).

16.2.4.2 Site Specific Risk Assessment Methodology

A site-specific risk assessment identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the construction, operation and decommissioning of the Proposed Project. The approach to identifying and quantifying risks associated with the Proposed Project by means of a site-specific risk assessment is derived from the DoEHLG 'A Framework for Major Emergency Management – A Guide to Regional Risk Assessment' 2024 document¹⁵ and the EPA 'Guidance on Assessing and Costing Environmental Liabilities' 2014 document¹⁶. The following steps were taken as part of the site-specific risk assessment:

- › Risk Identification
- › Risk Classification, likelihood and consequence, and
- › Risk Evaluation

16.2.4.2.1 Risk Identification

Risks have been reviewed through the identification of reasonably foreseeable risks in consultation with relevant contributors to this EIAR and relevant major emergency response plans. The identification of risks has focussed on non-standard but plausible incidents that could occur at the Proposed Project during construction, operation and decommissioning.

In accordance with the European Commission EIAR Guidance¹⁷, risks are identified in respect of the Proposed Project's:

1. *Potential to cause accidents and/or disasters,*
2. *Vulnerability to potential disaster/accident*

16.2.4.2.2 Risk Analysis

Identify the Reasonable Worst Case Scenario (RWCS)

The RWCS is defined in BS EN 31010:2010 p85/3 as *"The most serious credible outcomes consequences"* for each risk

After identifying the potential risks and RWCS, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was completed when estimating likelihood of identified potential risks occurring. Table 16-1 defines the likelihood criteria that have been applied.

The approach adopted has assumed a 'risk likelihood' where one or more aspects of the likelihood description are met.

¹⁵ DoHGLH (2024). A Framework for Major Emergency Management – A Guide to Regional Risk Assessment' Available at: https://assets.gov.ie/static/documents/Guide_to_Regional_Risk_Assessment_September_2024.pdf

¹⁶ EPA (2014) Guidance on assessing and costing environmental liabilities. Available at https://www.epa.ie/publications/compliance-enforcement/licensees/reporting/financial-provisions/EPA_OEE-Guidance-and-Assessing-WEB.pdf

¹⁷ European Commission, 2017. Guidance on the preparation of Environmental Impact Assessment Reports. Available at: <https://op.europa.eu/en/publication-detail/-/publication/2b399830-cb4b-11e7-a5d5-01aa75ed71a1>

Table 16-1 Classification of Likelihood (Source DoHLGH, 2024)

Rating	Classification	Average Recurrence Interval
1	Extremely Unlikely	100 or more years between occurrences.
2	Very Unlikely	51-100 years between occurrences.
3	Unlikely	11-50 years between occurrences.
4	Likely	1-10 years between occurrences.
5	Very Likely	Ongoing/ Less than one year between occurrences.

Note: statistical ¹⁸estimate of the average period of time between occurrences of an event of given scale

Classification of Impact

The impact rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures have failed to prevent the major accident and/or disaster. Furthermore, the Sligo County Major Emergency Plan (2020) will work to reduce the impact of any major accident or disaster. The consequence of the impact if the event occurs has been assigned as described in Table 16-2.

The impact of a risk to/from the Proposed Project has been determined where one or more aspects of the consequence of the impact description are met, i.e., risks that have no consequence have been excluded from the assessment. In determination of the consequence rating, the highest score under any of the impact categories (People, Environment, Essential Services or Social) is allocated, not the mean or aggregate.

¹⁸ Australian National Emergency Risk Assessment Guidelines (2020) Available at:
<https://knowledge.aidr.org.au/resources/handbook-nationalemergency-risk-assessment-guidelines/>

Table 16-2 Classification of Impact (Source: DoHLGH, 2024)

Impact Category	People	Environment	Essential Services	Social
1 Very Low Impact	Deaths less than 1 in 250,000 people for population of interest OR Critical injuries/illness less than 1 in 250,000 OR Serious injuries less than 1 in 100,000 OR Minor injuries only	Simple localised contamination	Very low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Limited disruption to community
2 Low Impact	Deaths greater than 1 in 250,000 people for population of interest OR Critical injuries/illness greater than 1 in 250,000 OR Serious injuries greater than 1 in 100,000	Simple, regional contamination, effects of short duration	Low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Community functioning with considerable inconvenience
3 Moderate Impact	Deaths greater than 1 in 100,000 people for population of interest OR Critical injuries/illness greater than 1 in 100,000 OR Serious injuries greater than 1 in 40,000	Heavy contamination localised effects of extended duration	Medium disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Community functioning poorly
4 High Impact	Deaths greater than 1 in 100,000 people for population of interest OR Critical injuries/illness greater than 1 in 100,000 OR Serious injuries greater than 1 in 40,000	Heavy contamination, widespread effects or extended duration	High disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities	Community only partially functioning

Impact Category	People	Environment	Essential Services	Social
5 Very High Impact	Deaths greater than 1 in 40,000 people for population of interest OR Critical injuries/illness greater than 1 in 40,000 OR Serious injuries greater than 1 in 20,000	Very heavy contamination, widespread effects of extended duration	Loss of delivery of services essential for the maintenance of vital societal functions or economic activities	Community unable to function without support

Risk Evaluation

Once classified, the likelihood and consequence ratings have been multiplied to establish a 'risk score' to support the evaluation of risks by means of a risk matrix.

The risk matrix sourced from the DoHLGH (2024) '*A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*' has been amended to align with the EPA (2014) '*Guidance on assessing and costing environmental liabilities*' risk matrix. as outlined in Table 16-3 below to indicate the critical nature of each risk. This risk matrix has then been applied to evaluate each of the risks associated with the Proposed Project. The risk matrix is colour coded to provide a broad indication of the critical nature of each risk:

- › The red zone represents 'high risk scenarios':
- › The amber zone represents 'medium risk scenarios', and
- › The green zone represents 'low risk scenarios'.

Table 16-3 Risk Matrix (Source: EPA, 2014)

		Consequence Rating				
		1.very Low	2.Low	3. Moderate	4.High	5.Very High
Likelihood Rating	5. Very Likely					
	4. Likely					
	3. Unlikely					
	2. Very Unlikely					
	1. Extremely Unlikely					

16.3 Baseline Environment

16.3.1 Sligo Major Emergency Plan

The Major Emergency Plan prepared by Sligo County Council (2020) outlines a series of potential major emergency scenarios in County Sligo. The risks that are most relevant to this assessment, and the areas to which they are relevant, are outlined below:

- › Natural Hazards:
 - Flooding
 - Tsunami
 - Landslide
 - Forest Fire
- › Civil Hazards:
 - Influenza Pandemic
 - Crowd Safety
- › Technological Hazards:

- Industrial Chemical
- Explosions
- Sligo Hospitals
- Large Residential
- Water Pollution
- Oil Pollution
- › Transportation Hazards:
 - Aviation
 - Sligo Airport
 - Railway
 - Major RTC
 - HAZMAT
 - Marine Emergency

As part of the Local Area Climate Action Plan for County Sligo (Sligo LACAP) a climate change risk assessment was carried out by Sligo County Council (SCC). The assessment included a review of the extreme weather events in County Sligo over the time period of 1973-2022, and the identification of the main climate hazards such as rainfall, flooding, windstorms, drought, snowfall etc and their impacts on the delivery of SCC services. The Sligo LACAP risk assessment identified the following as the most significant future risks to the delivery of SCC services (based on predicted frequency and impact): Severe Windstorm, River and Pluvial Flooding, Coastal Erosion and Flooding, Heatwave and Drought.

16.3.2 Baseline Risks to the Proposed Project

16.3.2.1 Natural Hazards

Flooding

Chapter 8: Land Soils and Geology and Chapter 9: Hydrology and Hydrogeology of this EIAR provides detailed assessment regarding the susceptibility of the Proposed Project to flooding and landslide events. A flood risk identification study was undertaken within Chapter 9 and in Appendix 9-1 to identify existing potential flood risks associated with the Proposed Project. From this study, it was identified that there were no instances of historical flooding recorded within the Proposed Wind Farm.

The OPW National Flood Hazard Maps have no records of any recurring or historic flood incidences within the Proposed Wind Farm (www.floodinfo.ie). The GSI's Winter 2015/2016 surface water flood map shows areas of fluvial and pluvial flooding during the Winter 2015/2016 flood event, which was the largest recorded flood event in many areas. This flood map does not record any mapped flood areas within the Proposed Wind Farm, the nearest are of fluvial and pluvial flooding occurred at Lough Nafullow approximal 1.2km east of the nearest Proposed Turbine (T04). An area of surface water flooding is recorded in the western portion of the Proposed Wind Farm approximately 200m east by the Proposed Turbine (T04) and also in the centre portion of the Proposed Wind Farm approximately 190m northeast of the Proposed Turbine (T07). NIFM fluvial flood maps record low (1,000-year flood event) and medium (100-year flood event) probability fluvial flood zones along the Dunneill River, Buncrowey River and Easky River in the northwestern and southern portion of the Proposed Wind Farm respectively. The Proposed Wind Farm infrastructure is not proposed within these flood zones. NIFM fluvial flood zones are also mapped within the Lugdoon River, Dooflin River, Dunmorán River and Ushin River, along the Proposed Grid Connection Route. These fluvial flood zones do not encroach upon the Proposed Wind Farm. Mitigation by design measures are outlined in Section 9.5.2.2 of the EIAR.

The Proposed Grid Connection Route crosses a total of 31 no. EPA mapped watercourses and an additional 3 no. non-EPA mapped watercourse crossings in which mitigation measures are provided in Section 9.5.2.8 of the EIAR and Appendix 9-1 Flood Risk Assessment. The Proposed Grid Connection Route is at low risk of flooding. However, there are areas which may be prone to flooding, principally

at existing watercourse crossings. Due to the depth of the Proposed Grid Connection Route underground cabling, this will have no impact during the operational phase of the Proposed Project. During the construction phase, works along the Proposed Grid Connection Route may have to be postponed following heavy rainfall events which could cause flooding in these areas.

The Proposed Project is considered to be low risk in terms of flooding potential and will not have an effect on the potential for increased downstream flood risk.

Peat Stability/ Landslide

A comprehensive and robust Geotechnical and Peat Stability Risk Assessment was undertaken by Fehily Timoney (refer to Appendix 8-1) for the Proposed Project and was used to inform the design process including the siting of all proposed main infrastructure location and drainage control measures. The Peat Stability Risk Assessment was informed by the Scottish Government's 2017 guidance document '*Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments*'. Intrusive ground investigation works were carried out as part of the peat stability assessment included peat depth probing, shear strength testing, rotary coring and trial pitting. The extensive suite of ground investigations, the robust peat stability assessment and the lessons learned from previous peat slide events on similar sites will ensure that the risk of such an event, occurring during the construction of the Proposed Project site is minimised. Peat stability impacts arising from the Proposed Project during the operational and decommissioning phases are not significant as there is no significant handling or movement of peat during these phases.

The findings of the peat assessment showed that the Site has a low risk of peat failure and is suitable for the development of the Proposed Wind Farm. The findings include recommendations and control measures for construction work in peatlands, all of which will be implemented in full to ensure that all works adhere to an acceptable standard of safety.

The Proposed Wind Farm which comprises undulating hilly terrain consists predominantly of blanket peat and commercial forestry. Peat thicknesses recorded during the site walkovers from 850 no. probes ranged from 0m to 7.2m with an average depth of 1.18m. 75% of the probes recorded depths less than 2.0m, and 90% of peat depth probes recorded peat depths of less than 3.0m. The deeper peat areas were avoided, where possible, when optimising the layout of the Proposed Wind Farm. The Proposed Grid Connection Route was not assessed for peat stability risk due to the lack of peat along the public road

An analysis of peat sliding was carried out at the main infrastructure location across the Proposed Project site for both the undrained and drained conditions. The purpose of the analysis was to determine the Factor of Safety (FoS) of the peat slopes.

An undrained analysis was carried out, which applies in the short-term during construction. For the undrained condition, the calculated FoS for load conditions 1 and 2 for the locations analysed, showed that all locations have an acceptable FoS of greater than 1.3, indicating a low risk of peat failure. The undrained analysis is considered the most critical condition for the peat slopes.

The peat stability risk assessment at each infrastructure location, along access roads, in peat placement areas and at settlement pond locations identified a number of mitigation/control measures to reduce the potential risk of peat failure. See Appendix 8-1 for details of the required mitigation/control measures for each infrastructure element.

In summary, the findings of the peat assessment showed that the Proposed Wind Farm has an acceptable margin of safety, is suitable for the proposed wind farm development and is considered to be at **low** risk of peat failure provided appropriate mitigation measures, such as using founded roads, and implementing and maintaining an appropriate drainage system are implemented. The findings include recommendations and mitigation/control measures for construction work in peat lands, all of which will be implemented in full to ensure that all works adhere to an acceptable standard of safety.

Please see Chapter 8: Land, Soils and Geology and Soils and Appendix 8-1: Geotechnical and Peat Stability Assessment for further details.

Forest Fire

As discussed in 11.3.2.1.1 of Chapter 11: Climate, the risk of wildfires and forest fires are increasing in Ireland and across Europe due to rising temperatures and periods of drought. However, the location of the Proposed Project is not considered high risk, as forest fires represent a very small percentage of wildfires in Ireland¹⁹.

The likelihood of a forest fire occurring at the Proposed Project is anticipated to be low due to best practice measures of storing fuel in banded containers during the construction phase. The likelihood of fire occurring will be further lowered by the implementation of good site management practices during the construction, operational and decommissioning phases.

In summary, the Proposed Wind Farm is considered to be at **low** risk of fire.

16.3.2.2 Civil Hazards

The likelihood of a civil emergency, as described in Section 16.3.1 above, occurring at the Site is anticipated to be low. Influenza Pandemic and Crowd Safety are not relevant to the Site. Access will be to authorised personnel only during the construction, operational, and decommissioning phases.

16.3.2.3 Technological Hazards

There are no large industrial sites within, or adjacent to the Site. The nearest SEVESO site is European Refreshments, located in Ballina, Co. Mayo, approximately 20km west from the Site at its closest point. The Site is also not located within an or adjacent to an urban centre.

The Proposed Project has the potential to cause contamination and pollution of soil and ground and surface water from potential release of hydrocarbons, earthworks and excavations during the construction phase and decommissioning of the existing wind farm. These impacts are addressed in detail in Chapter 8 Land Soil and Geology and Chapter 9: Hydrology and Hydrogeology of this EIAR and are not related to either the vulnerability of the Proposed Project to natural disasters or major accidents nor the potential for the Proposed Project to cause natural disasters or accidents. Accidental spillage during refuelling of construction plant with petroleum hydrocarbons is a pollution risk. The accumulation of small spills of fuels and lubricants during routine plant use can also be a significant pollution risk. Large spills or leaks have the potential to result in significant effects (i.e., contamination of subsoils and pollution of the underlying aquifer) on the geological and water environment. Best practice measures pertaining to hydrocarbon use and storage as detailed in Chapter 8 and the CEMP (Appendix 4-5) will minimise the potential for these impacts to occur. The release of wastewater at the Site could pose a risk to down gradient groundwater wells, groundwater quality and surface water quality. Proven and effective methods to mitigate against these potential impacts are detailed in Chapter 9: Hydrology and Hydrogeology and best practice measures during all phases of the Proposed Project (CEMP Appendix 4-5), which minimise the potential for leaks and will break the potential pathways between any source and receptor therefore resulting in no residual effects. Indirect impacts associated with major accidents and / or natural disasters on contamination are considered further in Section 16.4.1.

There is potential for hazardous materials in the form of hydrocarbons to be transported to and used on site. Mitigation measures as best practice as detailed in Chapter 9: Hydrology and Hydrogeology and the CEMP (Appendix 4-5), respectively, will minimise the potential for leaks and will break the

¹⁹ https://www.epa.ie/publications/research/climate-change/Research_Report_476.pdf

potential pathways between any source and receptor therefore resulting in no residual effects. The removal of hazardous materials will be done so by licenced operators for disposal at licensed waste facilities. There is limited potential for hazardous material release during the operational phase of the Proposed Project. On occasion, operational maintenance crew may need to dispose of hydrocarbon waste such as oil that may be required during turbine maintenance procedures. Any waste that does arise will be minimal and waste management will be carried out in accordance with 'Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) produced by the EPA.

The CEMP includes a Waste Management Plan which outlines the best practice procedures during the decommissioning phases of the project. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of decommission of the Proposed Project. Disposal of waste will be seen as a last resort. Please see the CEMP (Appendix 4-5) for best practice measures to prevent the creation of waste which During the decommissioning phase. Please see Appendix 4-6 for the Decommissioning Plan.

The likelihood of fire/explosion occurring at the Proposed Project is low. The likelihood of fire/explosion occurring will be further lowered by the implementation of good site management practices during the construction, operational and decommissioning phases.

During construction of the Proposed Project, all staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan. An Emergency Response Plan (ERP) which will be prepared prior to the construction phase and implemented and adhered to on site. The ERP provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection. Please see Chapter 4 Description of the Proposed Project and Appendix 4-5 CEMP for details.

16.3.2.4 Transportation Hazards

As detailed in Chapter 15: Material Assets, the Proposed Project will utilise the N15 and N59 national roads, the local road network and the Port of Killybegs in order to facilitate construction and turbine delivery to the Proposed Wind Farm. A Traffic Management Plan (TMP) (Appendix 15-2) will be included as part of detailed traffic and transport assessment provided in Chapter 15: Material Assets.

The Proposed Grid Connection Route will not interact with any railway line, as the Proposed Grid Connection Route passes underneath a bridge along the railway line entirely within the public road corridor. The nearest railway station is located in Collooney, approximately 0.25km east of the Proposed Grid Connection Route at its closest point. In relation to telecommunication impacts, scoping was carried out with Irish Rail where it was identified that the Proposed Project lies within the GSM-R (Mobile Network for Railways) coordination zone. Railway sections included within the 30km coordination zone was provided by Irish Rail, however, there was no overlap with Proposed Turbine locations which are over 20km away from the nearest coordination zone located in Collooney, and therefore no interference with their links is anticipated. See Section 15.2.4.1 of Chapter 15: Material Assets for further details on Irish Rail.

Killybegs Port in Donegal is the proposed point of arrival for the large turbine components for the Proposed Wind Farm. The port is a well-established point of arrival for wind turbine components of similar scale into the State on a regular basis, as is the road network between the port and the national road network. For the purposes of this EIAR only the Port of Killybegs has been considered.

For further discussion on aviation, please see Section 15.2.4.2 of Chapter 15: Material Assets.

16.4

Risk Assessment

This section outlines the possible risks associated with the Proposed Project for the construction, operational and decommissioning phases.

These risks have been assessed in accordance with the relevant classifications as outlined in Table 16-1 and 16-2.

As outlined in Section 16.2.4.2.2, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster i.e. pre-mitigation.

16.4.1

Likely Significant Effects

16.4.1.1

'Do-Nothing' Scenario

An alternative land use option to repowering the Existing Wind Farm as part of the Proposed Project would be to leave the Existing Wind Farm site as it is, with no changes made to the existing operating 23 no. wind turbines within the Existing Wind Farm. In doing so, environmental effects in terms of emissions are likely to be neutral for the short term, however 13 no. of the existing turbines (existing Dunneil Wind Farm) are due to be decommissioned in accordance with their planning permissions in 2039. Once the 13 no. turbines are decommissioned, there will be a negative effect on greenhouse gas emissions. The 10 no. turbines which were commissioned in 2003 will be left in situ (existing Kingsmountain Wind Farm). However, these machines are aging and are not as efficient as the newer machines. Although these turbines do not have a decommissioning date, they will eventually break down and have to be decommissioned. The opportunity to continue capturing the available renewable energy resource with the Existing Wind Farms would be lost.

An alternative land use option to developing a renewable energy project in the greenfield sections of the Proposed Wind Farm site (i.e areas of the Proposed Wind Farm site located outside the footprint of the Existing Wind Farm) would be to leave the area as it is with no changes made to the current land use practices of commercial forestry, turf cutting, and public road corridor.

In implementing the 'Do-Nothing' alternative, however, the opportunity to capture a significant part of Co. Sligo's renewable energy resource would be missed, as would the opportunity to contribute to meeting Government and EU 2030 targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. In addition, the opportunity to meet the obligations as laid out in the Climate Action and Low Carbon Development Act 2021 will be lost. The opportunity to generate local employment, development contributions, and rates would also be forgone. Furthermore, the opportunity to implement the measures outlined in the Biodiversity Management and Enhancement Plan (BMEP) as outlined in Appendix 6-4 would also be lost.

16.4.1.2

Assessment of Effects During Construction

A risk register has been developed which contains all potentially relevant risks identified during the construction phase of the Proposed Project, with consideration of the risks identified in the SCC Major Emergency Plan (2020). A total of nine risks specific to the construction of the Proposed Project have been identified and are presented in Table 16-4.

Table 16-4 Risk Register - Construction Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to accidents and / or natural disasters		

Risk ID	Potential Risk	Possible Cause
A	Critical Infrastructure Emergencies Risk of delivery of turbines and associated infrastructure to the Site.	Traffic accident during turbine delivery or extreme weather periods of heavy rainfall, taking into account climate change and strong winds
B	Severe Weather Risk to construction activity on site	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds
C	Flooding High levels of surface water on site	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds
D	Landslide/Peat Stability	Earthquake, land slide, extreme weather events Periods of heavy rainfall, taking into account climate change
Potential to cause accidents and / or natural disasters.		
E	Utility emergencies Risk of construction activity along the Proposed Grid Connection Route.	Construction activity along the Proposed Grid Connection Route and road network impacting on local services and utilities.
F	Traffic Incident Collisions onsite and offsite with vehicles involved in construction of Proposed Project.	Driver negligence or failure of vehicular operations on Proposed Project roads (Proposed Wind Farm access tracks) and public road network. Traffic Management not implemented.
G	Contamination Discharge or spillage of fuel, chemical solvents onto subsoils and into watercourse or percolated to groundwater. Groundwater and surface water emissions from construction activities. Risk of sediment-laden run off reaching the groundwater system.	Accidental fuel spillage during delivery to site. Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions. Drainage and seepage water resulting from accident during infrastructure excavation. Stockpiled excavated material becoming unstable and providing a point source of exposed sediment.

Risk ID	Potential Risk	Possible Cause
		Excavation works during the construction of the Proposed Project which may result in entrainment of sediment from the excavations during construction.
H	Fire / Explosion	Equipment or Proposed Wind Farm infrastructure failure; Electrical problems; and Employee negligence.
I	Landslide/Peat Stability Movement of peat within the Proposed Wind Farm during construction.	Mismanagement of excavated material on site. Severe weather conditions- storm, flooding.

16.4.1.3 Assessment of Effect During Operation

Eight risks specific to the operation of the Proposed Project have been identified and are presented in Table 16-5.

Table 16-5 Risk Register – Operational Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to accidents and / or natural disasters		
J	Severe Weather Risk to operational activity on site, blade or turbine damage	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
K	Loss of Critical Infrastructure Risk to infrastructure on site.	Equipment or infrastructure failure. Electrical problems. Employee negligence. Landslide/Earthquake Extreme weather conditions such as periods of heavy rainfall, taking into account climate change and strong winds.
L	Flooding Risk of high levels of surface water on site impacting the operational phase.	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds

Risk ID	Potential Risk	Possible Cause
Potential to cause accidents and / or natural disasters.		
M	Fire / Explosion	Equipment or infrastructure failure; Electrical problems; and Employee negligence
N	Collapse / damage to structures	Earthquake, extreme weather events; and Vehicular collisions due to driver negligence on public roads.
O	Traffic Incident Collisions onsite and offsite with vehicles involved in operation of Proposed Project	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented
P	Loss of Critical Infrastructure	Electrical fault at substation bay
Q	Contamination Discharge or spillage of fuel, chemical solvents, sewage or wastewater into watercourse or percolated to groundwater	A vehicular incident on the public road involving fuel, wastewater or sewage transportation in the operational phase. Spill or leak of oil during operational maintenance

These risks have been assessed in accordance with the relevant classification (Refer to Table 16-1 and Table 16-2), and the resulting risk analysis is detailed in Table 16-7: Assessment of Likely Significant Effects.

The risk register is based upon possible risks associated with the Proposed Project. As outlined in Section 16.2.4.2.2 the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and or/disaster.

16.4.1.4 Identification of Effect During Decommissioning

Five risks specific to the decommissioning of the Proposed Project have been identified and are presented in Table 16-6.

Table 16-6 Risk Register – Decommissioning Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to accidents and / or natural disasters		
R	Severe Weather Risk to decommissioning activity on site leading to environmental emissions	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.

Risk ID	Potential Risk	Possible Cause
S	Flooding Risk of flooding in areas surrounding the Site impacting the decommissioning phase and leading to environmental emissions.	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
T	Landslide/ Peat Stability Movement of peat within the Proposed Wind Farm during decommissioning	Disturbance of peat on removal of the Proposed Turbines Severe weather conditions- storm, flooding.
Potential to cause accidents and / or natural disasters.		
U	Traffic Incident Collisions onsite and offsite with vehicles involved in construction of Proposed Project	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented.
V	Contamination Discharge or spillage of fuel, chemical solvents into watercourse or percolated to groundwater	Accidental fuel spillage during delivery to the Site. Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions.

16.4.1.5 Risk Assessment Summary

These risks have been assessed in accordance with the relevant classification (Refer to Table 16-1 and Table 16-2), and the resulting risk analysis is detailed in Table 16-7: Assessment of Likely Significant Effects.

The risk register is based upon possible risks associated with the Proposed Project. As outlined in Section 16.2.4.2.2, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. A summary of the findings can be found in Table 16-7. Table 16-7: Assessment of Likely Significant Effects contains a risk assessment which has been developed and contains all potentially relevant risks identified during the construction, operation and decommissioning phases of the Proposed Project. 9 no. risks specific to the construction, operation and maintenance, and decommissioning of the Proposed Project have been identified.

16.4.1.6 Assessment of Effect - Summary

Table 16-7 Assessment of likely significant effects

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
Construction Phase								
A	Critical Infrastructure Emergencies	Traffic accident during turbine delivery or extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.	Illness or loss of life;	1	The risk of traffic accident during turbine delivery severe weather conditions impacting the identified road network is unlikely when considering the assessment in Chapter 11: Climate (weather conditions recorded over the last 30 years within the area) and Chapter 15: Material Assets, Section 15.1 – Traffic Assessment (turbine delivery occurring during the night, Garda patrolled, etc)	1	The risk of a traffic accident due to severe weather conditions during the construction phase will result in a Very Low Impact in that a ‘ <i>Very Low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities</i> ’ should a severe weather event occur with ‘ <i>minor injuries only</i> ’	1
B	Severe Weather	Extreme weather- periods of heavy rainfall, taking into account climate	Illness or loss of life;	3	The risk of severe weather is unlikely when considering the assessment in Chapter 11: Climate and weather conditions	1	The risk of severe weather conditions during the construction phase will result in a Very Low Impact in that a ‘ <i>very low</i>	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		change and strong winds.	Sedimentation of nearby watercourse; Damage to, or depletion of aquatic habitats and species.		recorded over the last 30 years within the area. The works programme for the groundworks part of the construction phase of the Proposed Project, which is laid out in detail in the Construction and Environmental Management Plan (CEMP), (Appendix 4-5) will take account of weather forecasts and predicted rainfall in particular and construction will be paused if required. All construction works will be paused during a Red Weather Warning as issued by Met Éireann and will not recommence until the weather warning has been lifted and it has been deemed safe to do so.		<i>disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities</i> should a severe weather event occur, with ' <i>minor injuries only</i> ' Severe weather may cause increased mobilisation of sediment or ' <i>simple localised contamination</i> ' which will be controlled via the Proposed project design and mitigation measures.	
C	Flooding	Extreme weather- periods	Illness or loss of life;	2	The risk of flooding is considered very unlikely	1	The risk of flooding during the construction phase will	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		of heavy rainfall, taking into account climate change and strong winds	Groundwater Flooding; Sedimentation of nearby watercourse; Flooding to surrounding properties; Damage to, or depletion of aquatic habitats and species.		when taking into account the assessment in Chapter 9: Hydrology and Hydrogeology of the EIAR, the raising of infrastructure in flood zones to above flood zone level and the implementation of a bespoke drainage design plan for the project.		result in a Very Low Impact . There will be a ' <i>limited disruption to community</i> ' should a severe weather event occur with ' <i>minor injuries only</i> ' Flooding has the potential to cause increased sediment mobilisation however flooding is not anticipated and should any flooding occur, it would be localised.	
D & I	Landside/ Peat Stability	Earthquake, land slide, extreme weather events Periods of heavy rainfall, taking into account climate change Mismanagement of excavated material on site.	Movement of peat within the Site; Sedimentation of nearby watercourse; and Damage to, or depletion of aquatic habitats and species.	2	The Proposed Project has been designed to minimise the potential for peat instability and failure. Refer to Appendix 8-1: Geotechnical and Peat Stability Report.	2	The risk of peat instability during the construction phase will result in a Low Impact in that there would be ' <i>Simple, regional constamination, effects of short duration</i> ' Simple contamination of environment (e.g. watercourses, aquatic habitats and associated species), localised effects of short duration.	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Severe weather conditions-storm, flooding.						
E	Utility emergencies	Construction activity along road network during the Proposed Grid Connection Route installation impacting on local services and utilities. Connecting the Proposed Project to the national grid at the Srananagh 220kV substation in the townland of Ballysumaghan, Co. Sligo	Illness or loss of life; Disruption to services	2	Confirmatory surveys will be carried out by the Contractor to ensure that the Proposed Grid Connection Route is designed to take into consideration any services and utilities with the road network.	1	The risk of impact on utilities and services during the construction phase will result in a Very Low Impact in that there would be 'Limited disruption to community'	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
F	Traffic Incident	Driver negligence or failure of vehicular operations on site roads (Proposed Wind Farm access roads and public road network in which the Proposed Grid Connection Route is proposed). Driver negligence or failure of vehicular operations on public road network (turbine component deliveries/ other infrastructure	Injury or loss of life.	3	Chapter 15: Material Assets of this EIAR, Section 15.1 details traffic movements which relate to the Construction Phase of the Proposed Project. The Traffic Management Plan included as Appendix 15-2 details proposals for traffic movements entering and leaving the Site, and within the internal access roads. The internal access track network within the Proposed Wind Farm has been designed to allow for 2 vehicles to pass on the road, and/or in passing bays, which will reduce the likelihood of a traffic incident or collision occurring within the Proposed Wind Farm. There will also be a speed limit imposed on the internal Proposed Wind Farm road network, which	1	A Very Low Impact is predicted for traffic incidents. Having regard to on-site speed limits and vehicular movements, there would be ' <i>Serious injuries less than 1 in 100,000</i> ' should a vehicular collision occur,	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		deliveries/ staff vehicles). Traffic Management not implemented.			will also reduce the likelihood of any traffic incident or collision. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on site or public roads, 'at some time.' An unlikely risk is therefore predicted. Staff will be trained/toolbox talks highlighting construction entrances and proper access and egress procedures.			
G	Contamination – Fuel storage and handling - General Construction	Accidental Fuel spillage during delivery to Site. Failure of fuel storage tank or tanks in plant and machinery and vehicles.	Release of suspended solids to groundwater. Contamination of local drinking water supplies and	2	As outlined in Chapter 4: Description of the Proposed Project, fuel storage and re-fuelling plant and machinery will be managed on-site to ensure containment and prevent spillages of fuel. No fuels, chemicals or	2	The risk of a fuel spillage at the Site causing a significant environmental effect is Low Impact taking all and best practice measures proposed into account. There would be ' <i>Simple, regional contamination, effects of short duration</i> '	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Drainage and seepage water resulting from infrastructure excavation. Stockpiled excavated material providing a point source of exposed sediment. Works during the construction of the Proposed Project which may result in entrainment of sediment from the excavations or HDD.	groundwater aquifers. Groundwater and surface water emissions from construction activities. Accidental spillage during refuelling.		solvents will be stored outside of the confines of the Proposed Wind Farm. Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures as detailed in Chapter 9: Hydrology and Hydrogeology. Detailed mitigation measures and methodologies for the control of sediment Proposed Grid Connection Route works as described in the EIAR. Standard and specific mitigation to prevent accidents and indirect effects of accidents are included in the Proposed Project design and will be implemented.		The majority of the infrastructure associated with the Proposed Grid Connection Route is located in the existing road network which is a low value environmental receptor. HDD is proposed at 15 no. locations along the Proposed Grid Connection Route and 3 no. locations within the Proposed Wind Farm and will be controlled to prevent significant environmental effects should frack out occur. Should impacts to drinking water occur as a result of construction activities at the Site, they would be considered Low Impact in that there would be <i>‘Simple, regional, effects of short duration’</i> on people and environmental	

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
							receptors due to the nature of the Proposed Project, The potential residual environmental effects are described in detail in Chapter 8 which concludes that there will be no significant environmental effects.	
H	Fire / Explosion	Equipment or infrastructure failure; Fuel spillage/storage; Electrical problems; Employee negligence;	Illness or loss of life; Damage to, or depletion of habitats and species; Impacts on ambient air quality; Fire and explosion.	2	As outlined in Chapter 4: Description of the Proposed Project, fuel stored onsite during the construction phase of the Proposed Project will be stored in bunded areas. Therefore, fuel leakage/spillage is not considered to be a significant fire risk. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the Proposed Project shall be subject to a fire	2	Should a fire/explosion occur at the Site, a Low Impact would apply in that there would be <i>'Community functioning with considerable inconvenience'</i> due to the nature of the Proposed Project and the lack of infrastructure or fuel storage during operation that would result in any such incident. The co-ordination systems as well as the response elements detailed in the SCC Major Emergency	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
					safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		Plan will work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	
Operational Phase								
J	Severe Weather	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life;	3	The risk of severe weather is unlikely when considering the assessment in Chapter 11: Climate and weather conditions recorded over the last 30 years within the area.	1	The risk of severe weather conditions during the operational phase will result in a Very Low Impact in that ‘ <i>Serious injuries less than 1 in 100,000</i> ’ would occur should a severe weather event occur.	3
K & P	Loss of Critical Infrastructure	Equipment or infrastructure failure. Electrical problems. Employee negligence.	Injury or loss of life.	1	EirGrid operates the grid from National Control Centres matching electricity production to customer demand, switching from synchronous to non-synchronous where required to ensure no power outages.	2	Should a power failure occur at the proposed 110kV substation, it will result in a Very Low Impact in that there would be a ‘Limited disruption to community’. The risk of infrastructure collapse and damage during the operational	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Extreme weather conditions such as flooding and storms. Electrical fault at substation bay.			The Proposed Wind Farm will be connected to the proposed onsite 110kV substation and utilise the Existing Grid Connection to Cunghill 110kV substation, and any shortages or failures will not impact other connections to the 220kV Srananagh substation. According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are “normal” in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, structures and infrastructure (e.g. turbines, met mast) in Ireland are extremely		phase will result in a Very Low Impact in that a ‘very low disruption to the delivery of services essential for the maintenance of vital societal functions or economic activities’ should a power failure occur at the proposed 110kv substation or Existing Wind Farm control buildings.	

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
					unlikely to be damaged or collapse due to seismic activity. As outlined in Chapter 11 of this EIAR, due to Ireland's latitudinal position, the probability of extreme weather events posing a threat to human life are low. However, in the circumstance of such a weather event occurring at the site of the Proposed Project during the operational phase, the Severe Weather Plan as set out in the Sligo County Major Emergency Plan will be followed.			
L	Flooding	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life; Groundwater Flooding;	2	As detailed in Appendix 9-1, Flood Risk Assessment (FRA), a flood risk identification study was undertaken to identify existing potential flood risks associated with the Proposed Project.	1	The risk of flooding during the operational phase will result in a Very Low Impact in that there would be a ' <i>Limited disruption to community</i> ' should a severe weather event occur. With ' <i>Minor injuries only</i> '.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
			Sedimentation of nearby watercourse; Flooding to surrounding properties; Damage to, or depletion of aquatic habitats and species.		The overall risk of flooding posed by the Proposed Project and associated works within the Proposed Wind Farm is low. The closest mapped downstream recurring flood event is located approximately 4.1km to the northwest of the Proposed Wind Farm. There are several recurring flood events mapped along the Proposed Grid Connection Route, but due to the temporary nature of the construction works and the fact that the electrical cable will be placed underground, flood events will not pose a risk to the Proposed Project.		‘No contamination’ of environment (e.g., watercourses), ‘localised effects’.	
M	Fire / Explosion	Equipment or infrastructure failure;	Illness or loss of life;	2	There is a possibility of equipment failure during the operational phase of the Proposed Project. The	2	Should a fire/explosion occur at the Site, a Low Impact would apply in that there would be	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Fuel spillage/storage; Electrical problems; and Employee negligence.	Damage to, or depletion of habitats and species; and Impacts on ambient air quality.		Proposed Turbines have an operation life of approximately 35 years, but components may need to be replaced before this period has passed. The onsite 110kV substation will need maintenance. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the Proposed Project shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		‘Community functioning with considerable inconvenience’ due to the nature of the Proposed Project and the lack of infrastructure or fuel storage during operation that would result in any such incident. The ‘generic command, control & co-ordination systems’ as well as the ‘common elements of response’ detailed in the SCC Major Emergency Plan will work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	
N	Collapse/ damage to structures	Vehicular collisions due to driver negligence on	Injury or loss of life.	1	According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are “normal”	1	The risk of infrastructure collapse during the operational phase will result in a Very Low Impact in that there would be	1

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		public roads; and Earthquakes, extreme weather events.			in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, buildings in Ireland are extremely unlikely to be damaged or collapse due to seismic activity. As outlined in Chapter 11: Climate of this EIAR, due to Ireland's latitudinal position, the probability of extreme weather events posing a threat to human life are low. However, in the circumstance of such a weather event occurring at the site of the Proposed Project during the operational phase, the Severe Weather Plan as set out in Section 11 of the Sligo County Major Emergency Plan will be followed.		<i>'Serious injuries less than 1 in 100,000'</i> and no real likelihood of any impact on any environmental receptors. In the event of a severe weather event, all stipulations outlined in the Severe Weather Plan will be followed explicitly.	

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
					Having regard to speed limits within the Proposed Wind Farm, it is not predicted that any collision of vehicles and any infrastructure would result in significant damage/collapse.			
O	Traffic Incident	Driver negligence or failure of vehicular operations on Proposed Wind Farm roads. Traffic Management not implemented.	Injury or loss of life.	3	A very low number of vehicles will access the Proposed Wind Farm as part of the operational phase. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur within the Site, 'at some time.' An unlikely risk is therefore predicted.	1	A Very Low Impact is predicted for traffic incidents. Having regard to on-site speed limits and vehicular movements, there would be ' <i>Serious injuries less than 1 in 100,000</i> ' should a vehicular collision occur.	3
Q	Contamination	A vehicular incident on the public road or Proposed Wind	Damage to, or depletion of aquatic habitats and species.	2	As outlined in Chapter 9: Hydrology and Hydrogeology, Section 9.5.2.5 fuels stored on site	1	The risk of a fuel spillage or impact on surrounding drainage during the operational stage will result	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Farm road network involving fuel, wastewater or sewage transportation in the operational phase.	Contamination of local drinking water supplies, Group Water Schemes, and groundwater aquifers.		will be minimised and any hydrocarbons stored on-site will be banded to 110% of the storage tanks maximum capacity		in a Very Low Impact in that there would be ‘ <i>Simple localised contamination</i> ’ with ‘ <i>Limited disruption to community</i> ’ through the use of banded containment areas during operation. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.	
Decommissioning Phase								
R	Severe Weather	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.	Illness or loss of life; Damage to, or depletion of aquatic habitats and species.	3	The risk of severe weather is unlikely when considering the assessment in Chapter 11: Climate and weather conditions recorded over the last 30 years within the area. Decommissioning works will be paused should a Status Red weather warning alert be issued by	1	The risk of severe weather conditions during the decommissioning phase will result in a Very Low Impact in that there would be a ‘ <i>Limited disruption to community</i> ’ should a severe weather event occur, with ‘ <i>Minor injuries only</i> ’ Decommissioning will not require significant	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
					Met Eireann as is standard practice		excavations works. There is no likelihood of any impact on any environmental receptors.	
S	Flooding	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.	Illness or loss of life; Groundwater Flooding; Flooding to surrounding properties; Damage to, or depletion of aquatic habitats and species.	2	The risk of flooding is considered to be low when taking into account the assessment in Chapter 9: Hydrology and Hydrogeology of the EIAR.	1	The risk of flooding during the decommissioning phase will result in a Very Low Impact in that a ' <i>Limited disruption to community</i> ' should a severe weather event occur, with ' <i>minor injuries only</i> '.	2
T	Landslide/ Peat Stability	Mismanagement of excavated material on site, Extreme weather conditions.	Movement of peat within the Site. Sedimentation of nearby watercourse.	2	The Proposed Project has been designed to minimise the potential for peat instability and failure, with peat instability considered extremely unlikely. Refer to Appendix 8-1: Geotechnical and Peat	2	The risk of peat instability during the decommissioning phase will result in a Low Impact in that there would be 'Simple, regional contamination, effects of short duration'	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
			Damage to, or depletion of aquatic habitats and species.		Stability Assessment Report for further detail.		‘Simple contamination’ of environment (e.g. watercourses), ‘localised effects of short duration’.	
U	Traffic Incident	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented.	Injury or loss of life.	3	Traffic movements associated with the decommissioning phase of the Proposed Project will be limited to Heavy Goods Vehicles (HGVs) needed for the decommissioning works, and Light Goods Vehicles (LGVs) needed to transport construction staff to the Site. As such, it can be determined that there is some ‘opportunity, reason or means’ for a vehicle collision to occur on site, ‘at some time.’ An unlikely risk is therefore predicted.	1	A Very Low Impact is predicted. Having regard to on-site speed limits and vehicular movements, there would be ‘serious injuries less than 1 in 100,000’ should a vehicular collision occur.	3
V	Contamination	Fuel spillage during delivery to the Site.	Damage to, or depletion of	2	As outlined in Chapter 4: Description of the Proposed Project, fuel will	2	The risk of a fuel spillage or impact on surrounding drainage during the	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Impact Rating	Basis of Impact	Risk Score (Impact x Likelihood)
		Failure of fuel storage tank or tanks in plant and machinery and vehicles.	aquatic habitats and species; Discharge to groundwater.		be stored on-the Proposed Wind Farm but in a bunded area to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside of the confines of the Proposed Wind Farm. All main infrastructure (turbines, hardstands, temporary construction compounds etc.) besides roads for site access will be kept outside the water abstraction zone. Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage measures as detailed in Chapter 9: Hydrology and Hydrogeology		decommissioning stage will result in a Low Impact in that there would be '<i>Simple, regional contamination, effects of short duration</i>' through the use of bunded containment areas during decommissioning. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects Should impacts to drinking water occur as a result of decommissioning activities at the Site, there would be a Low Impact in that there would be '<i>Limited disruption to community</i>' with <i>Simple localised contamination</i>' due to the nature of the Proposed Project and the proposed mitigation.	

The risk assessment for each of the potential risks identified are consolidated in Table 16-8 which provides their 'risk-score'. A corresponding risk matrix is provided in Table 16-9, which is colour coded to provide an indication of the critical nature of each risk. As outlined in Section 16.2.4.2, the red zone represents 'high risk' scenarios, the amber zone represents 'medium risk' scenarios, and the green zone represents 'low risk' scenarios.

Table 16-8 Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Impact Rating	Risk Score
Construction Phase				
A	Critical Infrastructure Emergencies	1	1	1
B	Severe Weather	3	1	3
C	Flooding	2	1	2
D & I	Landslide/ Peat Stability	2	2	4
E	Utility Emergencies	2	1	2
F	Traffic Incident	3	1	3
G	Contamination	2	2	4
H	Fire / Explosion	2	2	4
Operational Phase				
J	Severe Weather	3	1	3
K & P	Loss of Critical Infrastructure	1	2	2
L	Flooding	2	1	2
M	Fire / Explosion	2	2	4
N	Collapse/ damage to structures	1	1	1
O	Traffic Incident	3	1	3
Q	Contamination	2	1	2
Decommissioning Phase				
R	Severe Weather	3	1	3
S	Flooding	2	1	2
T	Landslide/ Peat Stability	2	2	4
U	Traffic Incident	3	1	3
V	Contamination	2	2	4

Table 16-9 Risk Matrix

		Consequence Rating				
		1.Very Low	2.Low	3. Moderate	4.High	5.Very High
Likelihood Rating	5.Very Likely					
	4. Likely					
	3. Unlikely	B, F, J, O, R, U				
	2. Very Unlikely	C, E, K, L, P, Q, S, V	D, G, H, I, M, T			
	1. Extremely Unlikely	A, N				

Table 16-9 presents the potential risks identified during the construction, operation and decommissioning of the Proposed Project all of which can be classified as ‘low’ risk scenarios. On this basis, none of the assessed risks have the potential to have a significant effect on the environment. Therefore, the overall effect is **Not Significant**.

The scenarios with the highest risk score (risk scores of 4 or higher) in terms of a major accident and/or natural disaster during the construction, operation and decommissioning phase of the Proposed Project are identified below. It should be noted; specific mitigation measures are proposed for the lower risk score scenarios (risk score of 3 or below) and are described in detail in their relevant chapters.

Contamination During Construction, Operation and Decommissioning (G, L, T)

There is a potential risk of contamination from site activities during the construction, operation and decommissioning phases from potential release of hydrocarbons. The risk of contamination was given a risk score of 4 on a precautionary basis. However, as outlined in Chapter 8: Land, Soils and Geology Section 8.7, and Chapter 9: Hydrology and Hydrogeology, Section 9.5, measures will be put in place to reduce the risk of accidental spillage and contamination of pollution risk to soils, groundwater, surface water and associated ecosystems, and to terrestrial ecology.

The risk of contamination is ‘very unlikely’ to occur and will have Low Impact when considering the RWCS, representing a ‘low-risk scenario’ during the construction, operation, and decommissioning phases.

It is therefore considered that there will be unlikely, temporary, moderate, negative effects, which are Not Significant associated with contamination events during the construction, operation and decommissioning of the Proposed Project.

Landslide / Peat Stability During Construction and Decommissioning (D, I)

There is a potential risk of landslide/peat instability during the construction and decommissioning of the Proposed Project. The risk of peat instability was given a risk score of 4. The risk of peat instability has been minimised through the careful design of the Proposed Project and will be further limited through the implementation of the best practice construction control measures outlined in the Geotechnical and Peat Stability Report; Appendix 8-1 of the EIAR.

The risk of landslide/peat instability is ‘very unlikely’ to occur and will have Low Impact when considering the RWCS representing a ‘low-risk scenario’ during the construction and decommissioning phase.

It is therefore considered that there will be unlikely, permanent, moderate, negative effects, which are Not Significant associated with landslide/peat instability during the construction, operation and decommissioning of the Proposed Project.

Fire/ Explosion During Construction and Operation (H, M)

There is a potential risk of fire/explosion at the Site. However, as outlined in Section 16.2.1, the scope of this assessment has been based on the understanding that the Proposed Project will be designed, built and operated in line with current best practice. Further, in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, the Proposed Project shall be subject to a fire safety risk assessment which will assist in the identification of any major risks of fire on the Site.

Therefore, the risk of fire occurring at the Proposed Project resulting in a major accident and/or disaster was given a risk score of 4 on a precautionary basis. This indicates a scenario that is ‘very unlikely’ to occur and having ‘limited’ consequences should it do so, representing a ‘low-risk scenario’ during the construction, operational and decommissioning phases.

It is therefore considered that there will be unlikely, temporary, moderate, negative effects, which are Not Significant associated with major fire during the construction, operation and decommissioning of the Proposed Project.

16.4.2 Mitigation Measures

As outlined in Section 16.4.1 and Section 16.4.2, the scenarios with the highest risk score in terms of the occurrence of major accident and/or disaster during construction, were identified as identified as ‘Contamination’ ‘Fire/Explosion’ and ‘Peat Stability’ and, risk of ‘Fire/ Explosion’ during operation; ‘Contamination’ for the decommissioning stage; In addition the next highest scores was for ‘Severe Weather’ during construction, operation, and decommissioning.

The Proposed Project will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission ‘*Guidance on the preparation of Environmental Impact Assessment Reports*’, a Risk Management Plan (RMP) will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The RMP will include sufficient preparedness and emergency planning measures.

16.4.2.1 Mitigation – Contamination During Construction, Operation and Decommissioning (G, L, T)

Potential effects associated with contamination during construction, operation and decommissioning are addressed fully in Chapter 8: Land, Soils and Geology and Chapter 9: Hydrology and Hydrogeology. The mitigation measures outlined in Chapter 8: Land, Soils and Geology and Chapter 9: Hydrology and Hydrogeology to protect environmental receptors as well as the procedures and measures described in the CEMP will ensure that the risk from these sources is low.

A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. Upon a grant of planning permission for the Proposed Project, the CEMP will be updated to reflect the conditions stipulated in the consent prior to the commencement of the development. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major

accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-5 for the CEMP that sets out the minimum standards to be employed by the contractor.

All mitigation measures proposed as part of this project are also listed in Chapter 18: Schedule of Mitigation and Monitoring Measures.

16.4.2.2 **Mitigation – Landslide/Peat Stability During Construction and Decommissioning (D, I)**

The findings of the Geotechnical & Peat Stability Report (Appendix 8-1) showed that the Site has an acceptable margin of safety, is suitable for the Proposed Project and is considered to be at low risk of peat failure. The findings include recommendations and control measures for construction work in peatlands to ensure that all works adhere to an acceptable standard of safety. These measures are summarised below and further detailed in Chapter 8 of the EIAR:

- › Appointment of experienced and competent contractors;
- › The site should be supervised by experienced and qualified personnel;
- › Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement);
- › Prevent undercutting of slopes and unsupported excavations;
- › Maintain a managed robust drainage system;
- › Prevent placement of loads/overburden on marginal ground;
- › Set up, maintain and report findings from monitoring systems (as outlined in Appendix 8-1 Geotechnical and Peat Stability Report);
- › Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and,
- › Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.

16.4.2.3 **Mitigation – Fire/Explosion During Construction and Operation (H, M)**

The Proposed Project will be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.

As outlined in Section 4.7.3 of Chapter 4: Description of the Proposed Project of the EIAR, the CEMP will be reviewed and updated prior to the commencement of any works. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-5 for the CEMP that sets out the minimum standards to be employed by the contractor.

All mitigation measures proposed as part of this project are also listed in Chapter 18: Schedule of Mitigation and Monitoring Measures.

16.4.2.4 **Mitigation – Severe Weather During Construction, Operation and Decommissioning (B, J, P)**

The works programme for the construction stage of the development will take account of weather forecasts and work will be suspended in the case of extreme weather events. The following forecasting and weather warning systems are available and will be used on a daily basis at the Site to direct proposed construction activities:

- › General Forecasts: Available on a national, regional and county level from the Met Éireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- › Weather Warning or Advisories: Met Éireann's main suite of warnings are issued by the duty forecaster between 10am and midday and are updated as necessary as new information becomes available. In general, warnings will not be issued more than 60-hours ahead of the expected adverse weather but advisories on potential hazards are issued up to a week in advance. The three warning categories are:
 - Yellow: Not unusual weather. Localised danger.
 - Orange: Infrequent. Dangerous/disruptive.
 - Red: Rare. Extremely dangerous/destructive.
- › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- › Rainfall Radar Images: Images covering the entire country are freely available from the Met Éireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and
- › Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

16.4.3 Residual Effects

In accordance with the Risk Evaluation process outlined in Section 16.2.4.2.2, and considering the Risk Matrix in Table 16-9, the risk of a major accident and/or disaster during the construction, operation and decommissioning of the Proposed Project is considered 'low' in accordance with the '*A Framework for Major Emergency Management – A Guide to Regional Risk Assessment*' (DoEHLG 2024)

It is considered that when the mitigation and monitoring measures outlined in the CEMP are implemented and adhered to there the residual effects associated with the construction, operation and decommissioning of the Proposed Project will be unlikely, temporary to permanent, slight, negative effects, which are Not Significant.

16.4.4 Monitoring

16.4.4.1 Monitoring During Construction

As outlined in Section 4.7.3 of Chapter 4: Description of the Proposed Project of the EIAR, the CEMP will be reviewed and updated prior to the commencement of any works. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-5 for the CEMP that sets out the minimum standards to be employed by the contractor.

All monitoring measures proposed as part of this project are also listed in Chapter 18: Schedule of Mitigation and Monitoring Measures.

16.4.4.2 Monitoring During Operation

The operator of the Proposed Project will continue to assess the risk of major accidents and/or disasters on Site on an on-going basis during operation.

The maintenance programme, record of reported incidents, as well as general site activities will be monitored on an on-going basis to ensure risk of major accidents does not increase over time.

16.4.4.3 Monitoring During Decommissioning

As outlined in Section 4.10 of Chapter 4: Description of the Proposed Project of the EIAR, a Decommissioning Plan has been prepared (Appendix 4-6) the final detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be finalised with the competent authority at that time. The Decommissioning Plan includes mitigation and monitoring measures that will be in place during the decommissioning phase. These can also be found in a Chapter 18 which sets out all proposed Mitigation and Monitoring Measures for all three phases of the Proposed Project.

16.4.5 Assessment of Cumulative and In Combination Impacts

A search in relation to plans and projects that may have the potential to result in a cumulative impact with the Proposed Project on the environment was carried out as part of the EIAR. The Proposed Project has been considered, in combination with existing, permitted and proposed projects and plans (wind energy or otherwise), as set out in Section 2.9 in Chapter 2: Background to the Proposed Project of this EIAR.

All elements of the Proposed Project were assessed to identify any cumulative effects. A wind farm including all its various components including the grid connection works, substation, roads, turbines etc is not a recognised source of pollution. It is not subject to Industrial Emissions Directive regulation or any other Environmental Protection Agency environmental regulatory consent. Should a major accident or natural disaster occur the potential sources of pollution onsite during the construction, operational and decommissioning phases are limited and of low environmental risk. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects such as bulk storage of hydrocarbons or chemicals, storage of wastes, management of flammable materials etc. are limited and so there is an inherent low level of environmental risk associated with major accident or natural disaster.

There is low potential for significant natural disasters to occur at the Site. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited and these have been assessed in the context of the Proposed Project, cumulatively in this chapter and in the wider EIAR.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Proposed Project is not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites and so there are no potential effects from this source. There is no real likelihood of significant environmental effects cumulatively associated with major accidents.

The Proposed Project has low potential to cause natural disasters or major accidents. The majority of the Proposed Wind Farm is on blanket peat, with appropriate control/ mitigation measures implemented, there is low potential for peat slides or landslides. Any risks associated with flooding, impacts on infrastructure, accidents etc are addressed in the sections above. There is no real likelihood of significant environmental effects cumulatively associated with the Proposed Project's potential to cause accidents or natural disasters.

Following a detailed assessment of the potential for any further impact when considered in combination with any or all of the plans and projects set out in set out in Chapter 2: Background to the Proposed Project, Section 2.9 of this EIAR, the Proposed Project, with mitigation measures in place, was found to have no potential for significant in-combination or cumulative effects associated with the potential for the project to be impacted by major accidents and/ or natural disasters or the Proposed Projects potential to cause major accidents and/ or natural disasters. This is based on the low risk associated with the Proposed Project described in this Chapter of the EIAR and a review of the nature of the surrounding land uses and projects existing or intended in the surrounding area. Therefore, the cumulative residual effect of the Proposed Project to cause or be impacted by major accidents and natural disasters is not significant.

16.1

EIA Classification Summary

Please see Table 16-10 below for a summary of all identified impacts for the Proposed Project relating to major accidents and natural disasters.

Table 16-10 Assessment Classification Summary

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.2.1	Temporary, Slight, Negative	Not Significant
Fire/Explosion	Temporary, Moderate, Negative	Section 16.4.2.3	Temporary, Slight, Negative	Not Significant
Landslide/ Peat Stability	Permanent, Slight, Negative	Section 16.4.2.2	Permanent, Imperceptible, Negative	Not Significant
Operational Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.2.1	Temporary, Slight, Negative	Not Significant
Fire/Explosion	Temporary, Moderate, Negative	Section 16.4.2.3	Temporary, Slight, Negative	Not Significant
Decommissioning Phase				
Contamination	Temporary, Moderate, Negative	Section 16.4.2.1	Temporary, Slight, Negative	Not Significant
Landslide/ Peat Stability	Temporary, Moderate, Negative	Section 16.4.2.3	Temporary, Slight, Negative	Not Significant