Planning and Environmental Consultants

Environmental Impact Assessment Report

Briskalagh Renewable Energy Development, Co. Kilkenny

Chapter 16 – Major Accidents and Natural Disasters

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16. MAJOR ACCIDENTS AND NATURAL DISASTERS

16.1 Introduction

This section 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, 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 Statements'* (EPA, 2022) 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'.*

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 is carried out in compliance with the EIA Directive (2014/52/EU) which states the need to assess:

> *"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 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, 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.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Wind Farm', 'Proposed Grid Connection' and the 'Site'. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

16.1.1 Statement of Authority

This section of the EIAR, has been prepared by Jack Smith, reviewed by Eoin McCarthy and Michael Watson, of MKO. Jack is a Project Environmental Scientist with MKO with over 3 years' experience in the consultancy sector. Jack holds a MSc. in Environmental Leadership from NUIG and is a Practitioner member of the Institute for Environmental Management and Assessment. Jack's key strengths and areas of expertise are in project management, environmental impact assessment, GIS mapping and modelling, and feasibility assessment. Since joining MKO, Jack has experience in report writing including feasibility studies and EIA screening reports and EIAR chapters including Major

Accident and Natural Disasters chapters for large-scale renewable energy developments. Eoin McCarthy holds a BSc. (Env.) in Environmental Science and is a Senior Environmental Scientist with over 12 years' experience in the consultancy sector. Eoin has completed numerous Material Assets (Other Material Assets) sections of EIARs for wind farm developments. Michael Watson is the Environmental Director at MKO with over 21 years' experience in the environmental sector.

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 Ireland
- Regional Planning Guidelines for the South-East Region 2010-2022
- Regional Spatial and Economic Strategy for the Southern Region (RSES) 2020
- HSE South East (Area 5) Emergency Plan: Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford, November 2019)
- Kilkenny County Development Plan 2021-2027
- Kilkenny County Council – Fire and Emergency Operations Plan 2022-2026 – Section 14 Major Emergency Management
- Fáilte Ireland

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., population and human health, biodiversity, land and soil, hydrology and hydrogeology, air quality, climate, material assets, cultural heritage and the landscape.

16.2.2 Legislative Context

16.2.2.1 Legislation

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 Proposed Project potential 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 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".

16.2.2.2 Guidance Documents

The following guidance documents have been consulted in the preparation of this section:

- European Commission. (2017). Environmental Impact Assessment of Projects – Guidance on the preparation of Environmental Impact Assessment Reports
- Environmental Protection Agency (2022), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Department of Environment, Heritage and Local Government (2010) *A Guide to Risk Assessment in Major Emergency Management*
- Environmental Protection Agency (2014) Guidance on Assessing and Costing Environmental Liabilities
- Department of Defence (2020) A National Risk Assessment for Ireland

On a regional scale, Kilkenny falls under the scope of the South East Major Emergency Plan (MEM)[1].

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

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 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 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. The potential natural disasters that may occur are therefore limited to issues such as flooding and fire and are described in the Sections below.

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

[1] *HSE South East (Area 5) Emergency Plan: Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford, November 2019)*

Dangerous Substances Regulations i.e., Seveso sites and so there are no potential effects from this source.

The Proposed Project has low potential to cause natural disasters or major accidents. As detailed in Sections 8.3 and 8.6 of this EIAR, there are no areas of peat within the Site (Proposed Wind Farm and Proposed Grid Connection), as per the published soils map (www.epa.ie) and published subsoils maps (www.gsi.ie), no peat has been logged or identified on the Site. The Site is not a peatland site and so there is low/no potential for peat slides or landslides.

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

Current EIA practice 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. These are described in detail in the relevant EIAR assessment chapters (Refer to Chapters 5 to 15 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 EPA '*Guidance on Assessing and Costing Environmental Liabilities'* document[2]. 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. 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 Guidance, 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 Classification*

Classification of Likelihood

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

[2] *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*

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

Table 16-1 Classification of Likelihood (Source: DoEHLG, 2010)

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years.
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities, or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years.
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Classification of Consequence

The consequence 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 Fire and Emergency Operations Plan 2022-2026 Kilkenny County Council Fire and Rescue Service and the HSE South East (Area 5) Emergency Plan: Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford, November 2019), will work to reduce the consequence 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 consequence of a risk to/from the Proposed Project has been determined where one or more aspects of the consequence description are met, i.e., risks that have no consequence have been excluded from the assessment.

Table 16-2 Classification of Impact (Source: DoEHLG, 2010)

Ranking	Likelihood	Impact	Description
1	Minor	Life, Health, Welfare Environment	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.

Ranking	Likelihood	Impact	Description
		Infrastructure Social	No contamination, localised effects <€0.5M Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration €0.5-3M Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration €3-10M Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated. Heavy contamination, localised effects or extended duration €10-25M Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.

Ranking	Likelihood	Impact	Description
		Infrastructure Social	Very heavy contamination, widespread effects of extended duration. >€25M Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant 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 DoEHLG *Guide to Risk Assessment in Major Emergency Management* and as outlined in Table 16-3 indicates the critical nature of each risk. This risk matrix has therefore 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 Classification of Impact (Source: DoEHLG, 2010)

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5. Very Likely					
	4. Likely					
	3. Unlikely					
	2. Very Unlikely					
	1. Extremely Unlikely					

16.3 Baseline Conditions

The functional areas of Kilkenny County Councils fall under the South-East Major Emergency Region (MEM). The HSE South East (Area 5) Emergency Plan: Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford, November 2019) outlines the following potential major emergency scenarios in the region:

1. **Transport**:

a. **Major Road Traffic Accident:** Applicable to all road networks.
b. **Major Rail Accident:** Applicable to all rail networks.
c. **Air Accident/Incident:** Applicable to Waterford Regional Airport, Kilkenny Airfield, and flight paths.
d. **Incident Involving Ship/Boat/Ferry Near Shore/Off Shore:** All coastal areas, ports, ferries, passenger craft and ships.

2. **Technological:**
   a. **Fire/Explosion:** Applicable to all areas.
   b. **Release of Harmful Substances During Transportation:** Applicable to all areas
   c. **Fire/Explosion of Hazardous Materials (on site):** Applicable to large industrial sites including Seveso sites.
   d. **Large Building Collapse:** Applicable to urban centres in particular, and all areas with large buildings.
   e. **Environmental Pollution of Water/Land/Contaminated Drinking Water:** Applicable to all areas.
3. **Civil:**
   a. **Emerging Viral Threats:** Applicable to all areas.
   b. **Terrorism:** Applicable to all areas.
   c. **Loss of Critical Infrastructure:** Applicable to all areas.
   d. **Public Events/Crowd Safety:** Applicable to public event/sporting events.
   e. **Animal Disease:** Applicable to all areas.
4. **Natural**
   a. **Meteorological Events – Storms, gales, Flooding, Freezing Temperatures, Tsunamis, Landslides**: Applicable to all areas.

The risks which are most relevant to this assessment are described below:

16.3.1 Transport

The Proposed Project will utilise the existing road network during the construction phase. Construction related traffic will comprise both turbine component and construction materials delivery and the subsequent return of empty vehicles, and daily construction staff movements to and from the Site.

It is proposed that large wind turbine components will be delivered to the Site, under Garda escort and mainly at night.

Potential impacts that may occur on the identified road networks could be caused by an accident during the delivery of the turbines, collisions onsite and offsite with vehicles involved in construction and operation of the Proposed Project, and damage to critical transport infrastructure caused by extreme weather i.e., periods of heavy rainfall, taking into account climate change and strong winds. As detailed in Chapter 15 of this EIAR: Material Assets, the localised traffic disruptions due to other proposed works will be mitigated using industry standard traffic management measures. These traffic management measures will be designed in accordance with the Department of Transport's *'Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)'.*

16.3.2 Technological

There are no large industrial sites within, or adjacent to the Site. The nearest Seveso site is Grassland Fertilizers (Kilkenny) Ltd., located in Palmerstown, Co. Kilkenny, approximately 8.3km 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. 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 practise measures pertaining to hydrocarbon use and storage as detailed in Chapter 8 and the CEMP (Appendix 4-2) 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 practise measures during all phases of the development (CEMP Appendix 4-2), 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 4-2), respectively, will minimise the potential for leaks and will break the 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 4-2) for best practice measures to prevent the creation of waste which During the decommissioning phase. Please see Appendix 4-5 for the Decommissioning Plan.

The likelihood of fire occurring at the Proposed Project is low. The likelihood of fire 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 and Appendix 4-2 CEMP for details.

16.3.3 Civil

The likelihood of a civil emergency, as described above, occurring at the Site is anticipated to be low. Major crowd safety and civil disorder are not relevant to the Site. Access will be to authorised personnel only during the construction, operational and decommissioning phases.

16.3.4 Natural

Chapter 9 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 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 site. The OPW Past Flood Events map record recurring flood events along the Proposed Grid Connection at Freshford and Ballyragget. At Freshford the recurring flooding is associated with flooding of the Nuenna River whilst the Nore is noted to flood at Ballyragget.

The GSI's Winter 2015/2016 Surface Water Flood Map records fluvial flooding along the River Nore to the west of Ballyragget.

CFRAM flood zones are mapped along the Proposed Grid Connection at Freshford and Ballyragget.

National Indicative Flood Mapping (NIFM) has been completed along the length of the Tullaroan Stream in the vicinity of the Proposed Wind Farm site. However, the modelled medium and low probability fluvial flood zones do not extend any significant distance from the river channel. The only proposed infrastructure located within the mapped flood zones comprises c.250m of existing access road (proposed for upgrade) to the west of the proposed substation location, and a c.160m stretch of proposed new road crossing the Tullaroan Stream to the south of T6. Note that the mapped flood zones do not encroach upon the proposed substation location. The closest turbine is c.150m from the mapped fluvial flood zones.

NIFM flood zones are also mapped along the Nuenna River and the Lisdowney Stream along the Proposed Grid Connection.

There are no historic or modelled groundwater flood zones along the Proposed Grid Connection.

In summary, the vast majority of the Proposed Grid Connection 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 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 may have to be postponed following heavy rainfall events which could cause flooding in these areas.

Furthermore, the Proposed Project will be constructed with its own drainage system which will provide additional surface water attenuation. The overall risk of flooding posed at the Site is assessed to be low. Please refer to the Chapter 9 Water of this EIAR for further details.

As detailed in Chapter 8 of this EIAR, there are no areas of peat within the Site (Proposed Wind Farm and Proposed Grid Connection), as per the published soils map (www.epa.ie) and published subsoils maps (www.gsi.ie), no peat has been logged or identified on the Site. The Site is not a peatland site and so there is low/no potential for peat slides or landslides.

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

If the Proposed Project were not to proceed, the existing uses for the Proposed Wind Farm site agricultural farming practices would continue, and public road corridor, agriculture and one-off rural housing along the Proposed Grid Connection would continue.

If the Proposed Project were not to proceed, the opportunity to capture a significant part of County Kilkenny's and Ireland's valuable renewable resource would be lost, as would the opportunity to contribute to meeting Government and EU Targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

16.4.1.2 Identification 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. 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		
A	**Critical Infrastructure Emergencies** Risk of delivery of turbines and infrastructure to 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** Risk of flooding in areas surrounding the Site impacting the construction phase and leading to environmental emissions	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds
Potential to cause accidents and / or natural disasters.		
D	**Utility emergencies** Risk of construction activity along the Proposed Grid Connection underground electrical cabling route and Proposed Wind Farm infrastructure	Construction activity along grid and road network impacting on local services and utilities.

Risk ID	Potential Risk	Possible Cause
E	**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
F	**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; Excavation works during the construction of the Proposed Project which may result in entrainment of sediment from the excavations during construction; and, Frack Out associated with HDD along the Proposed Grid Connection underground electrical cabling route which may result in sediment release to surface water.
G	**Fire / Gas Explosion** Presence of underground gas pipeline under the Proposed Wind Farm Site	Equipment or infrastructure failure; Electrical problems; and Employee negligence.

16.4.1.3 Identification of Effect During Operation

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		

Risk ID	Potential Risk	Possible Cause
H	**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.
I	**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.
Potential to cause accidents and / or natural disasters.		
J	**Fire / Gas Explosion**	Equipment or infrastructure failure; Electrical problems; and Employee negligence.
K	**Collapse / damage to structures**	Earthquake, extreme weather events; and Vehicular collisions due to driver negligence on public roads.
L	**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

16.4.1.4 Identification of Effect During Decommissioning

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		
M	**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
N	**Flooding of site** 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.
Potential to cause accidents and / or natural disasters.		
O	**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.
P	**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.

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 given in Table 16-7.

The risk register is based upon possible risks associated with the Proposed Project. As outlined in Section 16.2.4.2, the consequences 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 16-8.

16.4.1.5 Assessment of Effect - Summary

Table 16-7 Risk Assessment

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
Construction Phase								
A	**Critical Infrastructure Emergencies**	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 (weather conditions recorded over the last 30 years within the area) and Chapter 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 minor consequence in that a 'small number of people would be affected' should a severe weather event occur, with 'no fatalities and a small number of minor injuries with first aid treatment'.	1
B	**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.	2	The risk of severe weather is unlikely when considering the assessment in Chapter 11 and weather conditions recorded over the last 30 years within the area.	1	The risk of severe weather conditions during the construction phase will result in a minor consequence in that a 'small number of people would be affected' should a	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					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), 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.		severe weather event occur, with 'no fatalities and a small number of minor injuries with first aid treatment'. Severe weather may cause increased mobilisation of sediment which will be controlled via the Proposed Project design and mitigation measures.	
C	**Flooding**	Extreme weather- periods of heavy rainfall, taking into account climate	Illness or loss of life; Groundwater Flooding;	2	The risk of flooding is considered very unlikely when taking into account the assessment in Chapter 9 of the EIAR, the raising	1	The risk of flooding during the construction phase will result in a minor consequence in that a 'small number of people	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		change and strong winds	Flooding to surrounding properties; Damage to, or depletion of aquatic habitats and species.		of infrastructure in flood zones to above flood zone level and the implementation of a bespoke drainage design plan for the project.		would be affected' should a severe weather event occur with 'no fatalities and a small number of minor injuries with first aid treatment'. Flooding has the potential to cause increased sediment mobilisation however flooding is not anticipated and should any flooding occur, it would be localised.	
D	**Utility emergencies**	Construction activity along road network during the Proposed Grid Connection installation impacting on local services and utilities. Connecting the Proposed Project to the	Illness or loss of life; Disruption to services	2	Confirmatory surveys will be carried out by the Contractor to ensure that the Proposed Project 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 minor consequence in that a 'small number of people would be affected, with 'no fatalities and a small number of minor injuries with first aid treatment'.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		national grid at the 110kV Ballyragget Substation.						
E	**Traffic Incident**	Driver negligence or failure of vehicular operations on site roads (Proposed Wind Farm access roads and public road network in which Grid Connection is proposed). Driver negligence or failure of vehicular operations on public road network (turbine component deliveries/ other	Injury or loss of life.	3	The Traffic and Transport section of Chapter 15: Material Assets of this EIAR 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 road 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.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		infrastructure deliveries/ staff vehicles). Traffic Management not implemented.			There will also be a speed limit imposed on the internal Proposed Wind Farm road network, which 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.			
F	**Contamination – Fuel storage and handling**	Fuel spillage during delivery to Site.	Release of suspended solids to groundwater.	2	As outlined in Chapter 4, fuel storage and re-fuelling plant and machinery will be managed on-site to ensure containment and	2	The risk of a fuel spillage at the Site causing a significant environmental effect is extremely low taking all	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
	- General Construction	Failure of fuel storage tank or tanks in plant and machinery and vehicles. 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	Contamination of local drinking water supplies and groundwater aquifers. Groundwater and surface water emissions from construction activities. Accidental spillage during refuelling.		prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside of the confines of the Proposed Wind Farm site. Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures as detailed in Chapter 9. Detailed mitigation measures and methodologies for the control of emissions from the Proposed Grid Connection works as described in the EIAR. Standard and specific mitigation to prevent accidents and indirect effects of accidents are included in the Proposed		and best practice measures proposed into account. The majority of the infrastructure associated with the Proposed Grid Connection is located in the existing road network which is a low value environmental receptor. HDD is planned for 4 no. locations along the Proposed Grid Connection underground cabling route will be controlled to prevent significant environmental effects should frack out occur. The potential residual environmental effects are described in detail in Chapter 8 which concludes that there will be no significant environmental effects.	

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		the excavations or HDD.			Project design and will be implemented.			
G	**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, 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 development 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.	2	Should a fire/explosion occur at the Site, a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' on people and environmental receptors 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. There will be 'normal community functioning' in the area with 'some inconvenience' The co-ordination systems as well as the response elements detailed in the Kilkenny Fire and Emergency Operations Plan 2022-2026	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
							work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	
Operational Phase								
H	**Severe Weather**	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life;	2	The risk of severe weather is unlikely when considering the assessment in Chapter 11 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 minor consequence in that a 'small number of people would be affected' should a severe weather event occur with 'no fatalities and a small number of minor injuries with first aid treatment'.	2
I	**Contamination**	A vehicular incident on the public road or Proposed Wind Farm road network involving fuel, wastewater or sewage	Damage to, or depletion of aquatic habitats and species. Contamination of local drinking water supplies, Group Water	2	As outlined in Chapter 9, Section 9.5.3 fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded to 110% of the storage tanks maximum capacity	1	The risk of a fuel spillage or impact on surrounding drainage during the operational stage will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration',	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		transportation in the operational phase.	Schemes, and groundwater aquifers.				through the use of bunded 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.	
J	**Fire / Explosion**	Equipment or infrastructure failure; Fuel spillage/storage; Electrical problems; and Employee negligence.	Illness or loss of life; Damage to, or depletion of habitats and species; and Impacts on ambient air quality.	2	As outlined in Chapter 4, fuel will not be stored on-site post construction therefore fuel is not considered to be a significant fire risk. There is a possibility of equipment failure during the operational phase of the Proposed Project. The proposed turbines have an operation life of approximately 35 years, but components may need to be replaced before this period has passed. The onsite 38kV substation will need maintenance.	2	Should a fire/explosion occur at the Site, a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' on people and environmental receptors 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. There will be 'normal community functioning' in the area with 'some inconvenience' The co-ordination systems as well as the response	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					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.		elements detailed in the Kilkenny Fire and Emergency Operations Plan 2022-2026 work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site. As modern turbine blades are composite structures, the risk of injury arising from the malfunction of a turbine is low. Additionally, all turbines are located in excess of 500m from the nearest dwellings, again minimising the risk of injury and threat to human life.	
K	**Collapse/ damage to structures**	Vehicular collisions due to driver negligence on public roads; and	Injury or loss of life.	1	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	1	The risk of infrastructure collapse during the operational phase will result in a minor consequence in that a 'small number of people would be affected' and no real likelihood of	1

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		Earthquakes, extreme weather events.			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 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 Kilkenny County Major Emergency Plan will be followed (see also Section 11 of the HSE South East (Area 5) Emergency Plan).		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	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					Having regard to speed limits within the Site, it is not predicted that any collision of vehicles and any infrastructure would result in significant damage/collapse.			
L	**Traffic Incident**	Driver negligence or failure of vehicular operations on Proposed Wind Farm site roads. Traffic Management not implemented	Injury or loss of life.	3	A very low number of vehicles will access the Proposed Wind Farm site 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 on the Proposed Wind Farm site, 'at some time.' An unlikely risk is therefore predicted.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3
Decommissioning Phase								
M	**Severe Weather**	Extreme weather- periods of heavy rainfall,	Illness or loss of life;	2	The risk of severe weather is unlikely when considering the assessment	1	The risk of severe weather conditions during the decommissioning phase will	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		taking into account climate change and strong winds	Damage to, or depletion of aquatic habitats and species.		in Chapter 11 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 Met Eireann as is standard practice		result in a minor consequence in that a 'small number of people would be affected' should a severe weather event occur, with 'no fatalities and a small number of minor injuries with first aid treatment'. Decommissioning will not require significant excavations works. There is no likelihood of any impact on any environmental receptors.	
N	**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	2	The risk of flooding is considered very unlikely when taking into account the assessment in Chapter 9 of the EIAR.	1	The risk of flooding during the decommissioning phase will result in a minor consequence in that a 'small number of people would be affected' should a severe weather event occur, with 'no fatalities and a small number of minor injuries with first aid treatment'.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
			aquatic habitats and species.					
O	**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 minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3
P	**Contamination**	Fuel spillage during delivery to the Site. Failure of fuel storage tank or	Damage to, or depletion of aquatic habitats and species;	2	As outlined in Chapter 4, fuel will be stored on-the Wind Farm Site but in a bunded area to ensure containment and prevent spillages of fuel. No fuels,	2	The risk of a fuel spillage or impact on surrounding drainage during the decommissioning stage will result in a limited consequence in that there	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		tanks in plant and machinery and vehicles.	Discharge to groundwater.		chemicals or solvents will be stored outside of the confines of the Wind Farm Site Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage measures as detailed in Chapter 9.		would be 'a limited number of people affected' with 'localised effects of short duration' 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.	

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 in order 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	Consequence Rating	Risk Score
Construction Phase				
A	Critical Infrastructure Emergencies	1	1	1
B	Severe Weather	2	1	2
C	Flooding	2	1	2
D	Utility company emergencies	2	1	2
E	Traffic Incident	3	1	3
F	Contamination	2	2	4
G	Fire / Explosion	2	2	4
Operational Phase				
H	Severe Weather	2	1	2
I	Contamination	2	1	2
J	Fire / Explosion	2	2	4
K	Collapse/ damage to structures	1	1	1
L	Traffic Incident	3	1	3
Decommissioning Phase				
M	Severe Weather	2	1	2
N	Flooding	2	1	2
O	Traffic Incident	3	1	3
P	Contamination	2	2	4

Table 16-9 Risk Matrix

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5.Very Likely					
	4. Likely					
	3. Unlikely	E,L,O				
	2. Very Unlikely	B,C,D,H,I,M, N	F,G,J,P			
	1. Extremely Unlikely	A,K				

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.

The scenarios with the highest risk score in terms of a major accident and/or natural disaster during the construction, operation and decommissioning phase of the Proposed Project is identified below.

16.4.1.6 Contamination During Construction, Operation and Decommissioning

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 very precautionary basis. However, as outlined in Chapter 8 Section 8.6, and Chapter 9, 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 'limited' consequences should it do so, representing a 'low-risk scenario' during the construction and decommissioning phases.

The conclusions in the relevant chapters of the EIAR state that there will be no significant residual effects associated with this potential impact.

16.4.1.7 Fire/Explosion During Construction, Operation and Decommissioning

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, and mitigation of the same during operation.

16.4.2 Mitigation Measures

As outlined in Section 16.4.1, the scenario with the highest risk score in terms of the occurrence of major accident and/or disaster during construction was identified as 'Fire/Explosion' and 'Contamination', risk of 'Fire/Explosion' during operation, and 'Contamination' for the decommissioning stage.

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 will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.

16.4.2.1 Mitigation – Contamination During Construction, Operation and Decommissioning

Potential effects associated with contamination during construction, operation and decommissioning are addressed fully in Chapter 8 Land, Soils and Geology, and Chapter 9 Water. The mitigation measures outlined in Chapter 8 and Chapter 9 to protect environmental receptors as well as the procedures and measures described in the Construction and Environmental Management Plan (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 4-2 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 4-2 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.

16.4.2.2 Mitigation – Fire/Explosion During Construction and Operation

The Proposed Project will also 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 4.4 of the EIAR, the Construction Environmental Management Plan (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 4-2 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.

16.4.3 Residual Effects

The risk of a major accident and/or disaster during the construction of the Proposed Project is considered 'low' in accordance with the '*Guide to Risk Assessment in Major Emergency Management'* (DoEHLG, 2010).

It is considered that when the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, there will not be significant residual effect(s) associated with the construction, operation and decommissioning of the Proposed Project.

16.4.4 Monitoring

16.4.4.1 Monitoring During Construction

As outlined in Section 4.4 of the EIAR, the Construction Environmental Management Plan (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 4-2 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.

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 4.11 of the EIAR, a Decommissioning Plan has been prepared (Appendix 4-5) 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 Schedule of Mitigation and Monitoring Measures which sets out all proposed Mitigation and Monitoring Measures for all three phases of the Proposed Project.

16.4.5 Impacts 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 2.8 in Chapter 2 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 Proposed Project 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 Site is not a peatland site and so there is low/no 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, Section 2.7, 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.