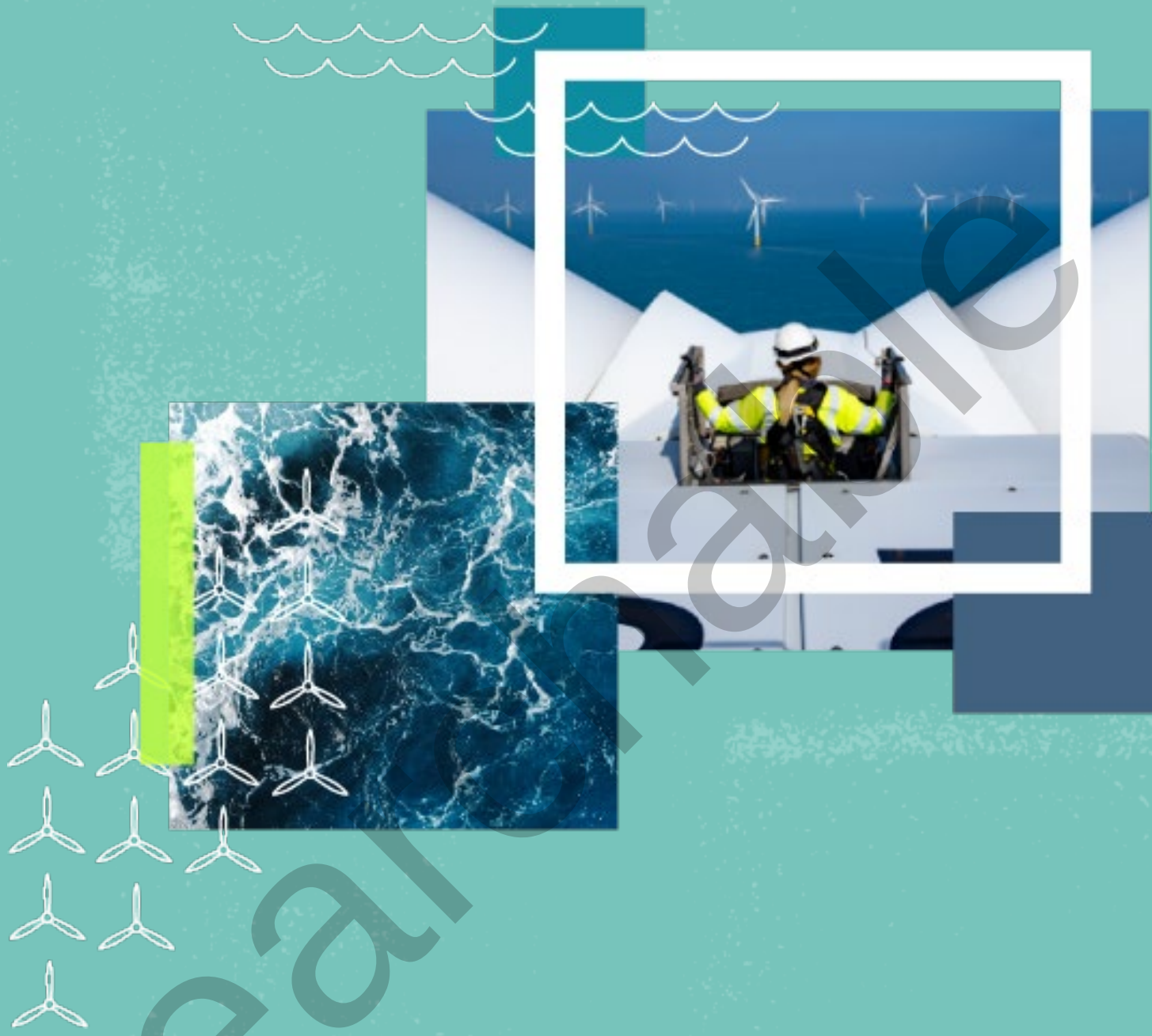

Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume II, Chapter 22: Major Accidents and Natural Disasters

sse Renewables

Revision	Date	Status	Author	Reviewed by	Approved by
1.0	15/05/2024	Final (External)	GoBe Consultants	GoBe Consultants	Sure Partners Limited

Statement of Authority

Experts	Qualifications	Experience
Thomas Overy	Masters of Marine Biology, NEBOSH	Tom joined GoBe in August 2023 as a Senior Consultant within the Project Delivery Team. He has over two years of experience in the Marine Management Organisation where; as a warranted Marine Enforcement Officer he managed inspections of commercial fisheries, marine protected areas and licensable offshore activities across the South East Coast (Poole to Gravesend). For over 5 years at the University of Warwick, Tom developed as a strong stakeholder liaison, managing relationships with internal and external groups to the university including the ability to chair contentious meetings, de-escalate protests and present data efficiently. As an Operations Manager for the Community Safety Team, Tom has experience in major and minor incident management including threats to life, property and reputation plus a keen interest in effective risk assessment.

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Glossary

Term	Meaning
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore wind farm in Ireland.
Arklow Bank Wind Park 2 – Offshore Infrastructure	"The Proposed Development", Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Arklow Bank Wind Park 2 (ABWP2) (the Project)	Arklow Bank Wind Park 2 (ABWP2) (The Project) is the onshore and offshore infrastructure. This EIAR is being prepared for the Offshore Infrastructure. Consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operations Maintenance Facility (Planning Reference 211316) has been granted on 26th May 2022 and 20th July 2022, respectively. • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the Maritime Area Consent. This is the subject of this EIAR and will be referred to as 'the Proposed Development' in the EIAR. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure: This relates to the onshore grid infrastructure for which planning permission has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter- array and interconnector cabling) and foundations will be installed.
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area within which export, inter-array and interconnector cabling will be installed. This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
Disaster	May be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident (IEMA, 2020).
Environmental Impact Assessment (EIA)	An Environmental Impact Assessment (EIA) is a statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Directive

Term	Meaning
	2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council (EIA Directive).
Landfall	The area in which the offshore export cables make landfall and is the transitional area between the offshore cabling and the onshore cabling.
Major accident	Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events (IEMA, 2020).
Mitigation Measure	Measure which would avoid, reduce, or remediate an impact.
Risk	The likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur (IEMA, 2020).
Source	The original cause of the hazard, which has the potential to cause harm (IEMA, 2020).
Supervisory Control and Data Acquisition	SCADA system is a collection of both software and hardware components that allow supervision and control of plant and systems, both locally and remotely.
The Developer	Sure Partners Ltd.
Vulnerable	Describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to the 'exposure and resilience' of the development to the risk of a major accident and/or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact (IEMA, 2020).

Acronyms

Term	Meaning
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
AIC	Aeronautical Information Circulars
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
Amsl	above mean sea level
ATC	Air Traffic Control
AtoN	Aid To Navigation
COLREGs	International Regulations for Preventing Collisions at Sea
COMAH	Control of Major Accident Hazards
DHLGH	Department of Housing, Local Government and Heritage
DPV	Dynamic Positioning Vessel
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ERCoP	Emergency Response and Cooperation Plan
EU	European Union
FL	Flight Level
FLO	Fisheries Liaison Officer
FMMS	Fisheries Management and Mitigation Strategy
HDD	Horizontal Directional Drilling

Term	Meaning
HNS	Hazardous and Noxious Substances
HWM	High Water Mark
IAA	Irish Aviation Authority
IAIP	Integrated Aeronautical Information Package
IALA	International Association of Lighthouse Authorities
IEMA	Institute of Environmental Management & Assessment
IMO	International Maritime Organisation
IRCG	Irish Coast Guard
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
MPCP	Marine Pollution Contingency Plan
MSO	Marine Survey Office
NCSC	National Cyber Security Centre
NMPF	National Marine Planning Framework
OFLO	Offshore Fisheries Liaison Officer
OREDP	Offshore Renewable Energy Development Plan
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PSR	Primary Surveillance Radar
ROV	Remotely Operated Vehicle
SAR	Search and Rescue
SCADA	Supervisory Control and Data Acquisition
SOLAS	International Convention for the Safety of Life at Sea

Term	Meaning
SOPEP	Shipboard Oil Pollution Emergency Plan
TSS	Traffic Separation Scheme
UXO	Unexploded Ordnance
VMP	Vessel Management Plan
WTG	Wind Turbine Generator

Units

Unit	Description
°C	Celsius
m	metre
Km^2	Square kilometres
ft	Feet
MW	Megawatt
nm	Nautical Mile

22 Major Accidents and Natural Disasters

22.1 Introduction

22.1.1 Overview

22.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the assessment of the expected effects deriving from the vulnerability of the Arklow Bank Wind Park 2 (ABWP2) Offshore Infrastructure, hereafter the 'Proposed Development' to risks of major accidents and/or natural disasters.

22.1.1.2 In particular, this EIAR chapter:

- Presents the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or natural disasters, based on the information gathered and the analysis and assessments undertaken;
  - This includes the following two assessments;
    - The vulnerability of the Proposed Development to accidents/disasters; and
    - The potential of the Proposed Development to cause accidents/disasters.
- Identifies any assumptions and limitations encountered in compiling the environmental information; and
- Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible environmental effects of the Proposed Development arising from major accidents and/or natural disasters.

22.1.1.3 The assessment presented is informed by the following chapters and reports:

- Volume II, Chapter 4: Description of Development;
- Volume II, Chapter 7: Marine Water and Sediment Quality;
- Volume II, Chapter 14: Commercial Fisheries;
- Volume II, Chapter 15: Shipping and Navigation;
- Volume II, Chapter 16: Civil and Military Aviation;
- Volume II, Chapter 19: Infrastructure and Other Users;
- Volume II, Chapter 20: Air Quality and Climate;
- Volume III, Appendix 25.1: Environmental Management Plan (EMP);
- Volume III, Appendix 25.5: Emergency Response and Cooperation Plan (ERCoP); and
- Volume III, Appendix 25.6: Lighting and Marking Plan (LMP).

22.2 Regulatory background

22.2.1.1 The legislation context for renewable energy infrastructure is presented in Chapter 2: Policy and Legislation. Legislation and policy in relation to major accidents and natural disasters is set out in Table 22.1.

Table 22.1: Summary of regulatory background

Publisher	Name of document incl. reference	Key provisions
Legislation		
European Commission, 2014 Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by 2014/52/EU)	Directive 2014/52/EU – The EIA Directive.	Article 3: 1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d). 2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.
		Annex IV point 5(d): A description of the likely significant effects of the project on the environment resulting from, inter alia: (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).
		Annex IV point 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. […] Where appropriate, this description should include […] details of the preparedness for and proposed response to such emergencies.

		Introduction: In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, 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. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment.
European Commission, 2012	Directive 2012/18/EU – The Seveso III Directive:	Article 1: This Directive lays down rules for the prevention of major accidents which involve dangerous substances, and the limitation of their consequences for human health and the environment, with a view to ensuring a high level of protection throughout the Union in a consistent and effective manner
Guidelines and technical standards		
Environmental Protection Agency (EPA), 2022	The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022): https://www.epa.ie/publications/monitoring—assessment/assessment/EIAR_Guidelines_2022_Web.pdf	To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk).
Department of Housing, Local Government and Heritage (DHLGH), 2018	The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment: https://www.gov.ie/pdf/?file=https://assets.gov.ie/44535/34aa9919f24243b79454994bc06476e1.pdf#page=null	Paragraphs 4.28 & 4.29: The EIA must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. Where appropriate, the description of expected significant effects should include details of the preparedness for and proposed response to such emergencies. There are two key considerations under this requirement, namely:

		• The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment; and • The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g. flooding) and man-made disasters (e.g. technological disasters).
Wicklow County Council (2017)	Major Emergency Plan. https://www.wicklow.ie/Living/Services/Environment/Fire-Services/Major-Emergency-Management	The Wicklow County Council Major Emergency Plan, recorded the following general and specific risks relevant to the Proposed Development that may be faced in County Wicklow: • Severe Weather; • Industrial Accident/Seveso/Hazmat; • Transport Incident; • Terrorist Incident; • Public Health; and • Loss of Utilities.

22.2.1.2 Planning policy on renewable energy infrastructure is presented in Chapter 2: Policy and Legislation. Planning policy, specifically in relation to accidents and natural disasters, is contained in the National Marine Planning Framework (NMPF) (Department of Housing, Planning and Local Government, 2021). A summary of the policy provisions relevant to accidents and natural disasters is provided in Table 22.2.

22.2.1.3 Additional policy requirements from the Offshore Renewable Energy Development Plan (OREDP) are provided in Table 22.3.

Table 22.2: Summary of NMPF policy framework provisions relevant to accidents/disasters

Summary of relevant policy framework	How and where considered in the EIAR
Defence and Security	
Defence and Security Policy 1: Any proposal that has the potential to interfere with the performance by the Defence Forces of their security and non-security related tasks must be subject to consultation with the Defence Organisation. This includes potential interference with: Safety of navigation and access to naval facilities; Firing, test or exercise areas; Communication, and surveillance systems; and Fishery protection functions.	Chapter 15: Shipping and Navigation and Chapter 16: Civil and Military Aviation examine the potential impact of the Proposed Development on Ireland's Defence Forces. Factored-in measures to allow for safe navigation form part of the Proposed Development.
Defence and Security Policy 2: Proposals should only be supported where, having consulted with the Defence Organisation, they are satisfied that it will not result in unacceptable interference with the performance by the Defence Forces of their security and non-security related tasks.	
Safety at Sea	
Safety at Sea Policy 1: Proposals for installation, operation, and decommissioning of offshore wind farms must demonstrate how they will: • Minimise navigational risk between commercial vessels arising from an increase in the density of vessels in maritime space as a result of wind farm layout; and • Allow for recreational vessels within the offshore wind farm (including consideration of turbine height) or redirect recreational vessels, minimising navigational risk arising between recreational and commercial vessels.	A number of factored-in measures have been committed to by the Developer and will be applied to the construction, operation and maintenance and decommissioning phase of the Proposed Development to ensure safety at sea is maintained and all navigational risk has been minimised (see Chapter 4: Description of Development and Chapter 15: Shipping and Navigation for the complete set of factored in measures). An LMP has been submitted as part of this Application (Volume III, Appendix 25.6) . The lighting and marking of wind turbines and OSP structures will be agreed with the Commissioners of Irish Lights, in consultation with the Irish Coast Guard, the Irish Aviation Authority (IAA) and the Department of Defence. The lighting and marking of the Proposed Development will take into account existing Aids

Summary of relevant policy framework	How and where considered in the EIAR
	to Navigation (AtoN) in the area, including those on the existing Arklow Bank Wind Park 1 (ABWP1) wind turbines.
Safety at Sea Policy 2: Proposals for offshore renewable energy infrastructure that have the potential to significantly reduce under-keel clearance must demonstrate how they will, in order of preference: (a) avoid, (b) minimise, (c) mitigate adverse impacts, or (d) if it is not possible to mitigate significant adverse impacts, proposals should state the case for proceeding	The offshore export cables and the inter-array and interconnector cabling connecting the wind turbines to each other and to the OSPs will be buried where possible, with cable protection installed where burial is not possible, to minimise interaction risk. Potential impacts on under keel clearance are outlined in Chapter 15: Shipping and Navigation.
Safety at Sea Policy 3: All proposals for temporary or permanent fixed infrastructure in the maritime area must ensure navigational marking in accordance with appropriate international standards and ensure inclusion in relevant charts where applicable.	Factored-in measures for the construction and operational and maintenance phase of the Proposed Development ensures that the required navigational marking is provided (see Chapter 4: Description of Development and Chapter 15: Shipping and Navigation).
Safety at Sea Policy 4: AtoN must be sanctioned in advance of construction/ deployment by the Commissioners of Irish Lights.	All navigational marking for the Proposed Development will be agreed with the Commissioner for Irish Lights and the Coastguard in advance of construction (see Chapter 4: Description of Development and Chapter 15: Shipping and Navigation).

Table 22.3: Summary of OREDP provisions relevant to accidents/disasters

Summary of OREDP provision	How and where considered in the EIAR
Accidental contamination: Design devices to minimise risk of leakage of pollutants; risk assessment and contingency planning; Implementation of Shipboard Oil Pollution Emergency Plan (SOPEP); benthic survey to characterise seabed.	Factored-in measures to address the risk of accidental contamination are discussed in Chapter 7: Marine Sediment and Water Quality, Chapter 9: Benthic Subtidal and Intertidal Ecology and Chapter 14: Commercial Fisheries. The factored-in measures will minimise the likelihood of accidental release of pollutants (e.g. spillage of chemicals and accidental release of biodegradable bentonite drilling fluid during trenchless activities) and in the unlikely event that such an incident occurs, they will limit the severity of any such release. The Array Area is relatively close to operational port facilities, therefore offshore refuelling is unlikely. Vessel refuelling will take place in port or, if it is necessary in the case of jack-up vessels supporting commissioning works for OSPs over an extended period of time, for example, this will be carried out in agreement with the relevant authority (the Irish Coast Guard [IRCG]) and in accordance with a permit issued, as per the Sea Pollution (Amendment) Act, 1999, Section 12.. All offshore operations will be subject to the measures set out in a Marine Pollution Contingency Plan (MPCP) (see Volume III, Appendix 25.1: Environmental Management Plan, Annex 2).

Summary of OREDP provision	How and where considered in the EIAR
Collision: Ensure structures are lit with aviation lights and provide notification of the erection of wind devices to the IAA.	Aviation marking and lighting requirements are discussed in section 16.3.1 in Chapter 16: Civil and Military Aviation.

22.3 Consultation

22.3.1.1 A summary of the key issues raised during consultation activities undertaken to date specific to major accidents and natural disasters is presented in Table 22.4, together with how these issues have been considered in the production of this EIAR Chapter. In addition, information was collected during consultation to assist in informing the baseline for the Proposed Development.

Table 22.4: Summary of consultation relating to Major Accidents and Natural Disasters

Date	Consultation Type	Consultation and key issue raised	Section where provision is addressed
2020	2020 Scoping Consultation feedback	Suggestion that a pollution plan to be in place if oil is being used in operations as per the Sea Pollution Acts (1994, 1999 and 2006) as well as an Emergency Plan. Both plans could be agreed with the Irish Coast Guard Search and Rescue (SAR) Operations Manager	MPCP (Volume III, Appendix 25.1, Annex 2) ERCoP (Volume III, Appendix 25.5).
2020	2020 Scoping Consultation feedback	No section regarding the impact of chemical use in the offshore construction of the Project. It was recommended that the chemicals to be used offshore are identified and quantified, and that potential impacts of discharge and spillage be considered in the EIAR.	Chapter 4: Description of Development MPCP (Volume III, Appendix 25.1, Annex 2) Waste Management Plan (Volume III; Appendix 25.1 Annex 6)

22.3.1.2 A summary of the key issues raised during consultation activities undertaken to date specific to shipping and navigation are included in Chapter 15: Shipping and Navigation. Issues relevant to this assessment included concerns relating to collision. Similarly, a summary of the key issues raised during consultation activities undertaken to date specific to civil and military aviation and radar are included in Chapter 16: Civil and Military Aviation. Issues relevant to this assessment included concerns relating to potential impacts on the IAA, Search and Rescue (SAR) and the Department of Defence aviation operations. Relevant key issues raised during consultation specific to commercial fisheries are included in Chapter 14: Commercial Fisheries and included concerns over navigational safety issues and on the application of safety zones.

22.3.2 Study area

22.3.2.1 The Study Area for the individual hazards has been determined in relation to the impact pathways, the distances to the receptors or from examination of the scale of impacts from examples of historic incidents where available. The geographic scope may reach beyond the Proposed Development boundaries where there is potential for interaction. Professional judgement has informed the scope relating to the hazards with the potential for interaction with the Proposed Development.

22.3.2.2 An existing wind farm is located within a sublease area of the ABWP2 Array Area. ABWP1 comprises seven 3.6 MW turbines with a capacity of 25.2 MW occupying approximately 1.35 km^2

within the ABWP2 Array Area. A single export cable route extends from the existing wind turbines to shore via landfall at Arklow Harbour. ABWP1 is not owned or operated by Sure Partners Limited (the Developer).

22.4 Methodology

22.4.1 Methodology to inform the baseline

Desktop studies

22.4.1.1 Information on Major Accidents and Natural Disasters was collected through a detailed desktop review of the EIAR chapters for the Proposed Development and their data resources, these included:

- Chapter 15: Shipping and Navigation
- Chapter 16: Civil and Military Aviation
- Chapter 19: Infrastructure and Other Users

Baseline environment

22.4.1.2 There are a number of baseline features that currently contribute a potential source of both anthropogenic (human-made) and biogenic (natural) sources of hazard in the vicinity of the Proposed Development and these are addressed within this section to set the framework for the assessment of the Proposed Development.

22.4.1.3 In terms of navigation and shipping, Chapter 15: Shipping and Navigation provides a description of existing navigational features within a 10 nautical mile (nm) buffer around the Array Area (excluding fishing vessels). Surveys of this area show that daily vessel numbers average between 36 to 37 vessels per day in the July/August 2023 survey period, (i.e. Automatic Identification System (AIS) vessels only) and the majority of traffic within the Shipping and Navigation Study Area was observed to be comprised of cargo vessels which account for approximately 40% of the total. Recreational vessels were the next most common vessel, accounting for approximately 31%, This was followed by fishing (10%), tanker (7%), passenger (5%) and the 'other' category (4%) which was observed to primarily consist of lifeboats and a workboat.

22.4.1.4 A total of 12 main commercial routes were identified within the Study Area, with the highest traffic volume route having an average of eight to nine transits per day between Dublin and Traffic Separation scheme (TSS) Off Smalls (between the Irish and Welsh Coasts); this route featured RoPax traffic, operated by Irish Ferries, undertaking regular routeing between Dublin and Cherbourg. Routes between Drogheda and TSS Off Smalls (three to four vessels per day) was the next busiest. The remaining 10 routes were each utilised by one vessel per day or less on average.

22.4.1.5 In relation to aviation, the Proposed Development is situated in an area of Class G uncontrolled airspace which is established from the surface up to 2,500 feet (ft) above mean sea level (amsl) in the northern portion of the Array Area; and up to 4,500ft amsl and Flight Level (FL) 75 (7,500 ft) in the remaining portion of the Array Area. Above these altitudes, Class C controlled airspace is established up to FL 245 (24,500ft). The baseline aviation risk in this area may be characterised as follows with further information provided in Chapter 16: Civil and Military Aviation:

- Military aviation: Ireland's primary airbase at Casement Aerodrome is located at Baldonnel, County Dublin; this is home to the Department of Defence's Air Corps. The Air Corps operate a fleet of fixed and rotary wing aircraft providing military support to the Army and Naval services, together with non-military tasks such as Garda air support, air ambulance, fisheries protection and the Ministerial Air Transport Service. The Air Corps also provide Air Traffic Control (ATC) services to military aircraft using a radar data feed from the Dublin Airport Primary Surveillance Radar (PSR);

- Civil aviation: the IAA operates a PSR at Dublin Airport. Although the Proposed Development is outside the airport's statutory safeguarding area, it is technically within the operating range of the PSR;
- Aerodromes: Newcastle Aerodrome is located near Greystones, 5 nm north of Wicklow, and is the nearest licensed aerodrome to the Proposed Development; the aerodrome is not radar equipped. Although technically outside the statutory consultation zone, the owner of the aerodrome was consulted and confirmed that the Proposed Development will not impact on Newcastle Aerodrome's operations. The Brittas Bay Aerodrome, 5 nm north of Arklow town, is disused and there are no plans for it to be re-established;
- Search and Rescue (SAR): the Irish Coast Guard operates five SAR helicopters deployed at bases in Dublin, Waterford, Shannon and Sligo, which respond to emergencies at sea, inland waterways, offshore islands and the mountains of Ireland (Department of Transport, 2019). The IAA is expected to respond officially on any potential impact on SAR operations. Consultation has also taken place with the IRCG, who have confirmed that they have no objection to the Proposed Development but that consultation will be required on the specific turbine layout to facilitate access for potential SAR missions within the wind farm;
- Helicopter routes: there is no surface infrastructure, such as oil and gas platforms, requiring helicopter access within 9 nm of the Array Area; and
- Military exercise and training areas: there are no military exercise and training areas in the vicinity of the Array Area.

22.4.1.6 There is no active oil and gas infrastructure located within the Array Area. There are five plugged and abandoned exploration wells offshore of Arklow Bank. Further details on the baseline infrastructure are included in Chapter 19: Infrastructure and Other Users.

22.4.1.7 Other than ABWP1 cables, there are no other active cables or pipelines within the Array Area. There is one operational subsea telecommunication cable located offshore of Arklow Bank beyond the 12 nm limit.

22.4.1.8 The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the Seveso III Directive (2012/18/EU). The Proposed Development is not classified as a COMAH establishment as the quantity of dangerous substances stored (as defined by Schedule 1 of the COMAH Regulations) is below the threshold of a lower tier establishment. The nearest COMAH site to the Proposed Development is the Sigma-Aldrich Ireland Limited – located on Vale Road adjacent to the M11 motorway and close to the Avoca River (Licence No: P0089-05) (14 km from the Array Area).

22.4.1.9 In relation to natural hazards, the current and evolving climate system poses a risk to infrastructure and development and Met Éireann (2021) predicts the following changes to the climate:

- Projections indicate an increase of 1 to 1.6°C in mean annual temperatures by mid-century (with the largest increases seen in the east of the country). Warming is enhanced for the extremes (i.e. hot or cold days), with highest daytime temperatures projected to rise by 0.7 to 2.6°C in summer and lowest night-time temperatures to rise by 1.1 to 3°C in winter. Averaged over the whole country, the number of frost days (days when the minimum temperature is less than 0°C) is projected to decrease by 50% for the medium-low emission scenario and 62% for the high-emission scenario;
- Significant projected decreases in mean annual, spring and summer precipitation amounts by 2050 with the projected decreases largest for summer, with reductions ranging from 0% to 13% and from 3% to 20% for the medium-to-low and high emission scenarios, respectively. The frequencies of heavy precipitation events show notable increases of approximately 20% during the winter and autumn months. The number of extended dry periods is projected to

increase substantially by mid-century during autumn and summer. The projected increases in dry periods are largest for summer, with values ranging from 12% to 40% for both emission scenarios;

- Globally sea levels have been rising at an average rate of approximately 3 mm per year between 1980 and 2010. Sea level is projected to continue to rise at this rate or greater. All major cities in Ireland are in coastal locations subject to tides, any significant rise in sea levels will have major economic, social and environmental impacts. Rising sea levels around Ireland would result in increased coastal erosion, flooding and damage to property and infrastructure (Met Éireann, 2021);
- Storms occur when mean wind speeds exceed 89 km/h and gust speeds are in excess of 110 km/h. Studies have projected decreases in the energy content of the wind for the spring, summer and autumn seasons, with the projected decreases largest for summer and no significant trend in winter. The overall number of North Atlantic cyclones is projected to decrease by approximately 10%. Results also indicate that the paths of extreme storms will extend further south, bringing an increase in extreme storm activity over Ireland, although the number of individual storms is projected to be quite small.

22.4.1.10 There is also potential for increased storm surge in the North Atlantic and the Irish Sea as a result of climate change. Research shows that storm surge heights in the range 50 to 100 cm are increasing in frequency around all Irish coastal areas.

22.4.1.11 There is also potential for targeted attacks from terrorists/protestors/cyberattacks, on the Proposed Development. Whilst this is unlikely, it should not be entirely discounted. Given the growing importance of wind power to some states' energy production strategies, and the major financial investment that large scale wind farms and linked hydrogen production represent, an attack could cause considerable damage and disruption, with significant political effects. An incident could entail a physical attack on a wind turbine or substation using explosives or a hijacked vessel, or a cyberattack aimed at destroying or disabling wind farm operations. Undersea cables could also be targeted maliciously. Large scale physical damage to offshore wind infrastructure could also cause floating debris, which could in turn pose a risk to navigation and so cascade the threat (Bueger & Edmunds, 2023). In Ireland, the current threat level is Moderate following 14 terror related arrests in 2021 (Europol, 2022), and the level of a direct cyberattack on Ireland is 'low' however the National Cyber Security Centre (NCSC) demonstrated that there is a "moderate to high risk" of knock-on effects from cyberattacks abroad (Irish Examiner, 2022). Examples of direct threats to other offshore wind farms include three cyber-attacks on turbines in Germany which caused loss of connection to satellites and caused shutdowns of systems which was linked to 11 Gigawatts (GW) of power (WSJ, 2022). This was caused by Russian supporting actors using ransomware to disrupt infrastructure.

22.4.1.12 Other potential extreme natural hazards such as earthquake, volcanoes, tsunami, etc. are not relevant to the baseline hazard conditions in the vicinity of the Proposed Development.

22.5 Impact assessment methodology

22.5.1.1 The major accidents and natural disasters impact assessment has followed the methodology set out in Volume II, Chapter 5: EIA Methodology. Specific to the major accidents and natural disasters impact assessment, the following guidance documents have also been considered:

- Major Accidents and Disasters in EIA: A Primer (Institute of Environmental Management & Assessment (IEMA), September 2020).

22.5.1.2 This approach directs the assessment to focus on low likelihood but potentially high consequence events such as a major spill (oil/Hazardous and Noxious Substances (HNS)), explosion, fire, transport accidents, etc. Smaller incidents (spills, sediment loss, etc.) are addressed elsewhere in this EIAR in the relevant topic chapters and this chapter focuses on major events only.

22.5.1.3 The approach includes three steps: screening, scoping and assessment. The screening stage identifies if a development has a vulnerability to major accidents and/or disasters and to consider whether a development could lead to a significant effect. The scoping stage is to determine in more detail whether there is potential for significant effects as a result of major accidents and/or disasters associated with a development. The assessment stage provides further understanding on the likelihood of a risk event occurring and identifies the requirement for further mitigation.

22.5.1.4 The two Project Design Options have been assessed simultaneously for Major Accidents and Disasters, as the potential impacts assessed are the same for both Project Design Options, and will affect the Proposed Development no differently.

22.5.1.5 This assessment has also considered the legislative framework and guidance as defined by:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Environmental impact assessment of projects: Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017);
- National Risk Assessment 2017 Overview of Strategic Risks (Department of the Taoiseach, 2017);
- Guidance on Assessing and Costing Environmental Liabilities (EPA, 2014);
- Sea Pollution (Amendment) Act, 1999
- A Guide to Risk Assessment in Major Emergency Management (Department of Environment, Heritage and Local Government, 2010); and
- National Risk Assessment 2021/2022 – Overview of Strategic Risk (Department of Defence, 2022.

22.6 Scope of the assessment for Project Design Option 1 and 2

22.6.1.1 The potential impacts assessed are the same for both Project Design Options.

22.6.2 Screening

22.6.2.1 In line with IEMA (2020), it has been determined that, given the location of the Proposed Development, the project has a vulnerability to major accidents and/or disasters and is therefore screened into assessment in this EIAR. The developer has ensured that the ERCoP covers the foreseeable major accident and disaster scenarios (Volume III, Appendix 25.5)..

22.6.3 Scoping

22.6.3.1 The aim of the scoping stage is to determine in more detail whether there is potential for significant effects as a result of major accidents and/or disasters associated with a development. This scoping analysis identifies the relevant accidents and/or disasters which may be scoped in for further assessment for the Proposed Development.

Impacts scoped out of the assessment

22.6.3.2 On the basis of the baseline environment and the description of development outlined in Chapter 4: Description of Development, a number of impacts are proposed to be scoped out of the assessment for Major Accidents and Natural Disasters. The impacts that do not have potential for significant adverse impact from the Proposed Development, and the baseline anthropogenic and biogenic sources of hazards that are scoped out of this assessment, together with a justification for scoping them out, are set out in Table 22.5.

Table 22.5: Impacts scoped out of the assessment for Major Accidents and Natural Disasters

Potential impact	Phase			Justification
	C	O	D	
Risk of accident – COMAH Establishments	×	×	×	The Proposed Development is not classified as a COMAH site. The nearest COMAH site to the Proposed Development is circa 14 km Northwest of the Array Area and hence due to the separation distance there is negligible potential for this site to impact on the Array Area or vice versa and this hazard is scoped out based on professional judgement.
Temperature Changes	×	×	×	The predicted rate of change in ambient and extreme temperatures within the Irish Sea over the 36.5 year lifetime of the Proposed Development is not significant for infrastructure such as the wind turbines, OSPs and cables. These structures are designed to operate within a wider temperature range in all European climates and, as such, the potential temperature changes do not pose a significant risk of hazard or accident to the Proposed Development and this hazard is scoped out.
Precipitation changes	×	×	×	The predicted changes in precipitation have no potential for a significant risk of hazard or accident to the Proposed Development given the marine location of the development and this hazard is scoped out.
Sea Level Rise and Storm Surge	×	×	×	At an average projected sea level rise of 3 mm per year over 36.5 years, this equates to a potential total increase in sea levels in the Array Area of 105 mm or 0.105 m. All wind turbine and OSP foundations will be comprised of steel monopiles. In both cases, a platform will be installed on top of the foundations with boat landings to provide access for maintenance. The platform heights for both the wind turbines and OSPs have been designed at heights which will consider sea level rise and will be well above the worst-case wave height and/or storm surge to protect personnel. In this regard, the projected sea level rise will have negligible impact on the operational performance of the Proposed Development and this pressure is scoped out.
Extreme Weather	×	×	×	Extreme weather events, such as strong winds and lightning strikes, will require a temporary shutdown of the turbines impacting on the generation capacity of the Proposed Development. However, the structural design of the foundations and wind turbines complies with the relevant standards for offshore installations in Northern Europe, including lightning protection with appropriate earthing systems, and therefore no significant risk of hazard or accident to the Proposed Development is predicted and this hazard is scoped out.

Potential impact	Phase			Justification
	C	O	D	
Terrorist Incident	×	×	×	Scoped out due to low threat level in Ireland and low impact target as the site will provide 800 MW of power equal to >2% of Irelands power infrastructure. The Proposed Development is no more vulnerable to this type of hazard than any other development.
Act of War	×	×	×	Scoped out due to low threat level in Ireland and low impact target as the site will provide 800 MW of power equal to >2% of Irelands targeted power infrastructure. The Proposed Development would have a low vulnerability to conflict and wars.
Cyber-attack	×	×	×	Successful or attempted cyber-attacks on WTGs, OSPs or remote-control systems have the capacity to force a shutdown of the Offshore Wind farm (OWF), reducing power output to zero for an undetermined period of time. Scoped out due to low impact target but must be aware of risks due to insecure connections. Any online connection in the OWF could potentially be a weak point (i.e. access point) into Irelands wider grid. The Proposed Development is no more vulnerable to this type of hazard than any other development.
Risk of accident – Oil and Gas Infrastructure	×	×	×	The closest active oil and gas infrastructure is 9 nm from the Array Area and this distance eliminates any existing risk of accident/disaster on the Proposed Development or any potential for the Proposed Development to impact on this infrastructure and this hazard is scoped out.
Risk of accident – Cables and Pipelines	×	×	×	Existing cables in the Array Area do not pose any significant risk of accident/disaster to the Proposed Development and this hazard is scoped out. It is noted that changes in coastal processes arising from the Proposed Development may result in scour and sediment mobilisation with the potential to impact upon third party cables. An assessment of this impact is included in Chapter 19: Infrastructure and Other Users and concluded that no such impact will occur for the Proposed Development.
Fire at OSP	×	×	×	In the unlikely event of a fire at the OSPs, this could lead to loss of life or a pollution event. However, the OSPs will include automatic fire alarm and fire suppression systems, be subject to routine maintenance and continuous Supervisory Control and Data Acquisition (SCADA) monitoring to ensure that any such malfunction (such as a fire) is detected and resolved immediately. As the probability of such an event resulting in a major accident is considered highly unlikely this has been scoped out of further assessment.

Potential impact	Phase			Justification
	C	O	D	
Fire at WTG	×	×	×	In the unlikely event of a fire at the WTGs this could lead to loss of life or a pollution event. Technical and procedural protective measures will ensure the risk to personnel and the environment is as low as reasonably practicable. These measures will include but are not limited to; prevention of a fire occurring (e.g. selection of materials, isolation of electrical equipment, continuous SCADA monitoring), fail-safe fire detection and alarm systems, robust emergency escape procedures, provision of fire extinguishing equipment. As the probability of such an event resulting in a major accident is considered highly unlikely this has been scoped out of further assessment.

22.6.3.3 The hazards identified in Table 22.5 have been considered but are not predicted to pose any significant impact (e.g. COMAH sites, temperature precipitation changes). In this regard, there is no further mitigation required given the low potential for these risks and these have also been scoped out of further assessment.

22.6.3.4 These risks are reduced to a level considered as low as reasonably practicable (ALARP) and have been scoped out of further assessment in this chapter.

Impacts scoped in for further assessment

22.6.3.5 The hazards that have potential for significant adverse impact on the Proposed Development to the baseline anthropogenic and biogenic sources of hazards that are scoped into this assessment are set out in Table 22.6.

Table 22.6: Scoping in of vulnerability of the Proposed Development (Options 1 and 2) to existing major accidents/disasters

Sources of Hazards	Phase			Justification
	C	O	D	
Operation of the ABWP1	✓	✓	✓	The ABWP1 is operational and is located within the Array Area. Maintenance vessels servicing the existing wind turbines poses a potential hazard to the Proposed Development. In addition, there is a single export cable route extending from the existing wind turbines to shore via landfall at Arklow Harbour.
Collision risk – Navigation and Shipping	✓	✓	✓	Potential for collision risk from existing navigation and shipping impacting on the construction, operation and decommissioning of the Proposed Development.
Collision risk – Aviation	✓	✓	✓	Potential for collision risk from existing aviation in the area impacting on the construction, operation and decommissioning of the Proposed Development.

22.6.3.6 In addition to the existing baseline pressures, the Proposed Development will introduce additional pressures that may give rise to the potential for accidents to impact on the receiving environment and these are listed in Table 22.7. Again, each pressure is assessed individually and scoped into further assessment and a justification for scoping is provided.

22.6.3.7 In general terms, it is also noted that the Proposed Development will incorporate the following factored-in measures which have been committed to by the Developer and will reduce the potential for any accidents during construction, operation and maintenance and decommissioning:

- An ERCoP has been prepared for the Proposed Development (Volume III, Appendix 25.5. The ERCoP details specific marking and lighting of the wind turbines and considers helicopters undertaking SAR operations when rendering assistance to vessels and persons in the vicinity of the Proposed Development.

Table 22.7: Scoping in of the potential for the Proposed Development (Options 1 and 2) to cause major accidents/disasters

Sources of Hazards	Phase			Justification
	C	O	D	
Construction, O&M and decommissioning phases – physical impacts (collision, allision)	✓	✓	✓	The Array Area covers an area of approximately 63.4 km^2 and is located approximately 6 to 15 km from the shore. During both construction and decommissioning there will be a series of vessels employed to both transport materials to each location and for the construction and decommissioning of each Wind Turbine Generator (WTG) and associated infrastructure. The construction phase may require up to 4,150 vessel round trips to the Array Area over the construction phase, including 20 vessel round trips for installation of the offshore export cables (including activities at the landfall) comprised of jack-up barge/Dynamic Positioning vessels (DPV), tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels, and scour/cable protection installation vessels; and up to 294 helicopter return trips to the Array Area over the 5-year construction phase and for the installation of the offshore export cables. During the decommissioning phase there may be up to 4,150 vessel round trips to the Array Area, comprised of jack-up barge/DP vessels, tug/anchor handlers, guard vessels, survey vessels, crew transfer vessels; and up to 294 helicopter return trips to the Array Area. These vessels as well as the fixed infrastructure (piles, etc.) represent additional collision/allision risk for other marine operations in the area.
Construction phase – Unexploded Ordnance	✓	×	×	Unexploded Ordnance (UXO) within the Array Area or cable routes has the potential, if detonated, to cause significant adverse impact to human health and existing assets in the area such as the Proposed Development infrastructure and/or third-party property.
Construction and O&M phase – Cable installation and maintenance	✓	✓	×	The Proposed Development will require the installation of an offshore export cable from the shore to the OSPs and a series of inter-array cables connecting the wind turbines to each other and to the OSPs and potentially interconnector cables between OSPs. The installation of these cables presents a potential risk to third party vessels in the area whereby the cables and any associated scour protection

Sources of Hazards	Phase			Justification
	C	O	D	
				may impact on the keel of the vessels if not suitably installed.
Construction and decommissioning phases – Pollution of the marine environment	✓	×	✓	The extent of the vessel movement during both construction and decommissioning are listed above. Each of these vessels has the potential to cause pollution of the marine environment in the event of a loss of containment from fuel or chemical storage.
Pollution of the marine environment (vessels)	×	✓	×	During the operational and maintenance phase of the Proposed Development, there may be up to 1,294 vessel round trips per year comprised of crew transfer vessels, jack-up vessels, cable repair vessels and other vessels; and up to 485 helicopter return trips per year. As with construction stage, these maintenance vessels will contain fuels/oils/lubricants that pose a risk to the marine environment in the event of a major spill. As with construction/decommissioning, each of these vessels has the potential to cause pollution of the marine environment.
Pollution of the marine environment (structures)	×	✓	×	Each of the wind turbines will contain quantities of oils and fluids (such as lubricating oils, hydraulic oils, coolants) with a maximum volume of 23.4 m^3 per turbine. Similarly, the two OSPs contain quantities of oils and fluids (such as lubricating oils, hydraulic oils, coolants) with a maximum volume of 123.5 m^3 per OSP. In the unlikely event of a simultaneous and combined loss of all oils/fluids from all wind turbines and OSPs, there would be a significant pollution event of the marine area. A single pollution event from a wind turbine would have a much reduced but potentially significant impact on the marine environment.
Damage or loss of fishing gear or potential health and safety concerns or loss of life as a result of gear snagging on Proposed Development infrastructure.	✓	✓	✓	During all phases there is potential for damage or loss of fishing gear or potential health and safety concerns or loss of life as a result of gear snagging with Proposed Development infrastructure (Chapter 14: Commercial fisheries, FMMS).

22.6.3.8 Table 22.6 and Table 22.7 have identified a number of hazards that have been scoped in for potential impact to and from the Proposed Development and these are further assessed in the Section 22.7.

22.7 Assessment of effects

22.7.1.1 The assessment of the hazards scoped into this assessment are presented in detail in Table 22.8. This data is presented in line with the IEMA hazard identification record template (IEMA, 2020) and shows the relevant factored in measures that have been committed to by the developer and have been applied for each of the risks and if further measures are required.

22.7.1.2 The risk of the impacts on the receptors is the same for both Project Design Options and therefore the summary of effects applies to Project Design Option 1 and 2.

22.7.1.3 The systematic consideration of all expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters indicates that the potential for significant adverse effects has been suitably minimised through the factored-in measures integrated into the Proposed Development. As such, there are no predicted significant adverse residual effects associated with major accidents and natural disasters from the Proposed Development and no further measures are required.

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Table 22.8: Assessment of vulnerability of, and the potential for, the Proposed Development to be impacted or cause accidents/disasters

Risk event	Source and/or pathways	Receptor(s)	Source document	Reasonable worst consequence if event did occur	Are cross disciplinary impacts likely	Factored in/control measures	Could this lead to a major accident and/or natural disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	If no, what secondary control measures are required to reach an acceptable level?
Vulnerability of the Proposed Development to existing accidents/ disasters									
ABWP1	Collision risk from maintenance vessels on ABWP1	Proposed Development	Chapter 7: Marine Sediment and Water Quality; Chapter 19: Infrastructure and Other Users	Minor physical impact to infrastructure (turbines, foundations, cables, etc.).	Potential impact on water quality through fuel/chemical loss and subsequent impact on biodiversity. Minor damage to energy assets impacting on transmission capacity.	Factored-in measures to manage any potential risk are summarised as follows: • Ongoing consultation with Arklow Energy Limited throughout the remaining lifetime of ABWP1; • One of the driving principles which guided the layout of the Proposed Development is that wind turbines and OSPs will be located such that there is no overfly or structural overhang within the ABWP1 sublease boundary; and • Cable crossings of the ABWP1 grid cable will be implemented in consultation with Arklow Energy Limited to minimise the potential for any impact on the ABWP1 export cable and maintenance activities, in accordance with recognised industry good practice.	No - with these measures in place, the Proposed Development is not considered vulnerable to risk of accident and/or disaster from maintenance vessels associated with the ABWP1.	Yes	N/A
Navigation and Shipping	Collision risk from other navigational vessels	Proposed Development	Chapter 7: Marine Sediment and Water Quality; Chapter 15: Shipping and Navigation	Physical impact to infrastructure (turbines, foundations, cables, etc.) cause by vessel collision.	Potential significant impact for water quality through fuel/chemical loss and subsequent impact on biodiversity. Significant damage to energy assets impacting on transmission capacity. Potential for loss of life or serious injury.	Factored-in measures to manage any potential risk to navigation and shipping in the area are summarised as follows: • Application and use of 'rolling' 500 m advisory safe passing distances surrounding all fixed structures where work is being undertaken by a construction or maintenance vessel, and around cable installation/maintenance vessels; • Application and use of 50 m advisory safety zones around all surface structures up until the point of commissioning; • Circulation of information via Notices to Mariners and other appropriate methods including Fisheries Liaison Officer (FLO); • Creation of a database of known users (including yacht clubs and local recreational activity centres) to act as a mailing list for direct issue of Notices to Mariners; • Navigational aids and marine charting; • Charting of all structures associated with the Proposed Development on relevant nautical and electronic charts; • Lighting and marking to be agreed with Commissioners of Irish Lights via a Lighting and Marking Plan, whose requirements generally align with International Association of Lighthouse Authorities (IALA) guidance G1162 (IALA, 2022); and • Lower blade tip height of 37 m above Lowest Astronomical Tide.	Yes, however this would be a very low frequency event- these measures comply with standard practice for the installation of offshore wind infrastructure to reduce the risk of impact from and to navigation and shipping. In this regard, the Proposed Development is not considered vulnerable to risk of accident and/or disaster from the existing navigation and shipping in the area.	Yes	N/A

Risk event	Source and/or pathways	Receptor(s)	Source document	Reasonable worst consequence if event did occur	Are cross disciplinary impacts likely	Factored in/control measures	Could this lead to a major accident and/or natural disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	If no, what secondary control measures are required to reach an acceptable level?
Aviation	Collision risk from aviation	Proposed Development	Chapter 16: Military and Civil Aviation	Physical impact to infrastructure (turbines, foundations, cables, etc.) caused by collision with planes or helicopters.	Potential significant impact for water quality through fuel/chemical loss. Significant damage to energy assets impacting on transmission capacity. Potential for loss of life or serious injury.	Factored-in measures to manage any potential risk are summarised as follows: • An LMP has been prepared, setting out specific requirements in terms of aviation lighting to be installed on the turbines (Volume III, Appendix 25.6). • The IAA will be informed of the locations, heights and lighting status of the wind turbines, including estimated and actual dates of construction and the maximum heights of any construction equipment to be used, prior to the start of construction, to allow inclusion on aviation charts and in the IAA Integrated Aeronautical Information Package (IAIP); • All structures >90 m in height will be charted on aeronautical charts and reported to the IAA at least three months prior to construction, for input into the IAA's database of tall structures; and • Limiting tip heights of blades to less than 1000ft. During the operational phase, the operator of the Proposed Development will issue, as necessary, requests to the IAA to submit Aeronautical Information Circulars (AIC) in the event of any failure of aviation lighting. Any light which fails shall be repaired or replaced as soon as is reasonably practicable. An alerting system for light failure will be put in place, such as remote monitoring or other suitable method agreeable to the IAA.	No - as with navigation, the factored in aviation safety measures designed into the Proposed Development comply with the relevant industry standards. The Proposed Development is therefore not considered vulnerable to risk of significant accident and/ or disaster both to and from aviation on the Proposed Development.	Yes	N/A
Potential for the Proposed Development to cause accidents/disasters									
Navigation and Shipping	Construction, O&M and decommissioning phases – physical impacts (collision, allision)	Existing third-party vessels and the marine environment	Chapter 15: Shipping and Navigation	Physical impact to third party vessels and property caused by collision/allision with turbine infrastructure or project construction vessels.	Potential impact on water quality through fuel/chemical loss and subsequent impact on biodiversity. Damage to material assets impacting on third party operations.	To prevent any potential physical impact from the construction or decommissioning phases, a buoyed construction/decommissioning area will be marked around the Array Area to warn other maritime users of the proposed works and to minimise the potential for any physical accident or incident from the works. Additionally, a Vessel Management Plan (VMP) is included within the ABWP2 EIAR.	No – with the implementation of this temporary buoyed construction/ decommissioning area, the risk is collision or allision is suitably mitigated.	Yes	N/A
Unexploded Ordnance (UXO)	Construction phase – Unexploded Ordinance	Human Health. Existing third-party vessels and the Proposed Development	Chapter 4: Description of Development	Physical impact to third party vessels and property as well as the Proposed Development through uncontrolled explosions.	Potential for impact on human health. Potential impact on water quality in the event of any fuel/chemical loss and subsequent impact on biodiversity.	In the event that UXO is identified through magnetometer survey activities, these will be further investigated by a Remotely Operated Vehicle (ROV) or specialist divers and avoided by Proposed Development infrastructure and associated installation activities.	No – as any UXO if identified will be avoided by the Proposed Development.	Yes	N/A

Risk event	Source and/or pathways	Receptor(s)	Source document	Reasonable worst consequence if event did occur	Are cross disciplinary impacts likely	Factored in/control measures	Could this lead to a major accident and/or natural disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	If no, what secondary control measures are required to reach an acceptable level?
					Damage to material assets.				
Cable Installation	Construction and O&M phase – cable installation and maintenance	Impacts to third party vessels	Chapter 15: Shipping and Navigation	Physical impact to the keel of third-party vessels caused by new cable installation for the Proposed Development.	Damage to third party vessels	All cables will be buried where possible and cable protection will be utilised where identified as necessary when cables cannot be buried.	No – with these measures in place, the proposed cable installation is not predicted to have potential for significant risk to lead to a major accident and/or disaster in the marine environment.	Yes	N/A
Oil/Fuel/HNS Pollution	Construction and decommissioning phases	Pollution of the marine environment	Chapters 6: Coastal Processes, Chapter 9: Benthic subtidal and intertidal Ecology	Potential for loss of fuels, chemicals or other substances from vessels during works polluting the marine environment.	Potential for significant adverse impact to marine waters. Potential to impact on marine biodiversity.	Each of the construction and decommissioning vessels will contain varying levels of fuels, oils, lubricants, HNS and specialist liquids which may have a deleterious impact on the marine environment. Any major loss from a vessel would constitute a significant spill with a potential for significant adverse impact on the environment. The following factored-in measures have been committed to by the Developer and will be applied: • Appropriate vessel health and safety including International Maritime Organisation (IMO) conventions and health and safety requirements, including Marine Survey Office (MSO) requirements for vessel certification; • Compliance from all project vessels with Irish Law (including the holding of correct certification as required by MSO and the Sea Pollution (Amendment) Act, 1999), and international maritime regulations as adopted by the relevant flag state including International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1972/77) and International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974); • Vessel traffic monitoring by AIS during the construction phase to facilitate project vessel management and to ensure third party movements are monitored against the anticipated behaviours and patterns; and • Implementation of Environmental Management Plan (EMP) including a Marine Pollution Contingency Plan (MPCP) (see Volume III, appendix 25.1: Environmental Management Plan).	No - with these measures in place and the scale of the vessels employed, any such spill is not considered to pose a significant risk to lead to a major accident and/or disaster and subsequent impact in the marine environment	Yes	N/A
Oil/Fuel/HNS Pollution	Operation and Maintenance of Proposed Infrastructure	Pollution of the marine environment	Chapters 6: Coastal Processes; Chapter 9: Benthic	Potential for loss of fuels, chemicals or other substances from structures	Potential for significant adverse impact to marine waters.	Both the wind turbines and OSPs are designed with suitably secure containment for all materials required for this infrastructure as these materials are essential to the operation and any loss will impact on generation capacity. In addition, each of the wind	No - these control measures will allow for early leak detection and subsequent repair and maintenance. As such,	Yes	N/A

Risk event	Source and/or pathways	Receptor(s)	Source document	Reasonable worst consequence if event did occur	Are cross disciplinary impacts likely	Factored in/control measures	Could this lead to a major accident and/or natural disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	If no, what secondary control measures are required to reach an acceptable level?
			Subtidal and Intertidal Ecology	polluting the marine environment.	Potential to impact on marine biodiversity	turbines and OSPs are subject to routine maintenance and continuous Supervisory Control and Data Acquisition (SCADA) monitoring to ensure that any such malfunction (such as a minor leak) is detected and resolved early.	any loss to the environment is minor and is not considered significant to lead to a major accident and /or disaster		
Impacts on Commercial Fishing	All phases - damage or loss of fishing gear or potential health and safety concerns or loss of life as a result of gear snagging with Proposed Development infrastructure	Impacts to commercial fisheries	Chapter 14: Commercial Fisheries	Potential for loss or damage to third party fishing nets, or potential health and safety concerns or loss of life caused by the installation of or operation of fixed infrastructure (WTGs, OSP and cables)	Potential for third party loss of income and asset value.	Factored-in measures committed to by the Developer to manage any potential risk are summarised as follows: Efficient and timely circulation of information to the fishing industry. Appointment of FLO and Offshore Fisheries Liaison Officer (OFLO) and use of guard vessels during sensitive lifting and cable installation operations. Development of a procedure for claim of loss or damage to fishing gear (Volume III, Appendix 25.3). Undertaking of post-installation cable surveys and periodic monitoring of cables every six months for first two years and annually thereafter. Implementation of Fisheries Management and Mitigation Strategy (FMMS) (Volume III, Appendix 25.3). Adherence to appropriate guidance with regard to fisheries liaison and mitigation.	No – With these measures in place, gear snagging is not considered to lead to a major accident and/or disaster.	Yes	N/A

22.8 Conclusions

22.8.1.1 The scoping stage of the assessment identified all possible major accidents and/or disasters that could be caused by the Proposed Development and examined the vulnerability of the Proposed Development to major accidents and/or disasters.

22.8.1.2 As factored-in measures which have been committed to by the Developer and will be implemented in full adequately control the potential major accidents and/or disasters, the assessment indicates that there is no potential for major accidents and/or disasters to be caused by the Proposed Development and that the Proposed Development is not vulnerable to major accidents and/or disasters that would result in significant adverse effects.

22.8.1.3 By extension, as no localised impacts are predicted there are no predicted significant transboundary effects associated with major accidents and hazards.

22.9 References

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