CERULEAN WINDS

Cerulean Winds Aspen Project Limited

Aspen Offshore Wind Farm

Offshore Environmental Impact Assessment Report

Volume 2, Chapter 20: Major Accidents and Disasters

August 2025

COMMERCIAL IN CONFIDENCE

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Defined Terms

Term	Definition
Applicant	Cerulean Winds Aspen Project Limited.
Aspen Array Area	The area in which the generation infrastructure for Aspen Offshore Wind Farm (OWF), including Wind Turbine Generators (WTGs) and Offshore Substation Platforms (OSPs) will be located.
Aspen Lease Area	The site for which Cerulean Winds Ltd was awarded an Exclusivity Agreement. The Aspen Lease Area totals 333 km^2 in which the Aspen Array Area will be sited.
Cumulative Effects	The combined effect of the Proposed Development in combination with the effects from a number of different projects, on the same single receptor/resource.
Cumulative Effects Assessment (CEA)	A CEA is a quantification and evaluation of likely significant effects by taking into consideration any other plans or projects proposed or existing, and where sufficient information is available, which, together with the Proposed Development have a likely significant effect on a receptor due to a common impact pathway and/or temporal or spatial overlap.
Cumulative Impacts	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Proposed Development.
EIA Directive	European Union Directive 85/337/EEC.
EIA Regulations	The collective term used to refer to the following: ▪ The Electricity Works (Environmental Impact Assessment)(Scotland) Regulations 2017; ▪ The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and ▪ The Marine Works (Environmental Impact Assessment) Regulations 2007.
Environmental Impact Assessment (EIA)	A statutory process whereby planned projects must be assessed before a formal decision to proceed can be made. It involves assessment requirements outlined in the EIA Regulations, including the collection and consideration of environmental information, which fulfils the publication of an Environmental Impact Assessment Report (EIAR).
Exclusivity Agreement	Exclusivity Agreements in the Innovation and Targeted Oil and Gas (INTOG) leasing round give successful applicants sole offshore wind development rights over the site while the planning processes for the INTOG Sectoral Marine Plan (SMP) are completed. If the project is in the final INTOG SMP, an Option Agreement can be awarded once its terms are agreed.
Floating Foundations	The foundations on which the Wind Turbine Generators (WTGs) are installed.
Foundation Anchors	The structure which anchors the moorings to the seabed.
Foundation Moorings	The chains/synthetics that connect the Floating Foundations to the Foundation Anchors to maintain floater station.
Greenhouse Gas (GHG)	A gas that absorbs and emits radiant energy at thermal infrared wavelengths causing the greenhouse effect.

Term	Definition
Habitats and Species Regulations 2017	A term commonly used to refer to the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), which transpose the EU Habitats and Birds Directives into Scots law. These Regulations provide the legal framework for the protection of European sites, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and underpin the Habitats Regulations Appraisal (HRA) process. The Regulations apply to both terrestrial and offshore areas under Scottish jurisdiction and are particularly relevant to assessing the impacts of developments such as offshore wind farms.
Habitats Regulation Appraisal (HRA)	A process required under the Conservation of Habitats and Species Regulations 2017 (commonly known as the Habitat Regulations), which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI).
High Voltage Alternating Current (HVAC)	Refers to where the flow of electric current reverses direction in a regular frequency. HVAC supports bulk power flow over short to medium transmission distances.
High Voltage Direct Current (HVDC)	Refers to high voltage electricity in direct current form where current flows in one direction only. HVDC supports longer transmission infrastructure due to not experiencing reactive losses.
Horizontal Directional Drilling	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array Cables (IACs)	Cables which link the Wind Turbine Generators (WTGs) to each other and to the Offshore Substation Platforms (OSPs) within the Aspen Array Area.
Landfall	The area between Mean Low Water Spring (MLWS) and Mean High Water Spring (MHWS) where the Offshore Transmission Cables (OTCs) will connect onshore to offshore.
Lease Areas	The three sites (Aspen, Beech and Cedar) for which Cerulean Winds (UKCS) have been awarded an Exclusivity Agreement. Together, the Lease Areas total approximately 999 km^2.
Likely Significant Effect (LSE)	In the context of Environmental Impact Assessment (EIA), a Likely Significant Effect (LSE) refers to a predicted environmental impact of a proposed development that, by its nature, magnitude, duration or likelihood, has the potential to be significant in the context of the EIA Regulations. This determination is made during the EIA screening and scoping stages and helps establish whether a full EIA is required and what topics should be assessed in detail.
Marine Directorate - Licensing Operations Team (MD-LOT)	The Marine Directorate responsible for Section 36 Consents, and marine licensing within the Scottish inshore region (between 0 and 12 nautical miles (nm)) and in the Scottish offshore region (between 12 and 200 nm). MD-LOT acts on behalf of the Scottish Ministers.
Marine Licence	Licence granted under the Marine (Scotland) Act 2010 and/or the Marine and Coastal Access Act 2009 where relevant.
Marine Scotland (MS)	The Directorate responsible for the integrated management of Scottish waters. Acts on behalf of the Scottish Ministers.

Term	Definition
Offshore Environmental Impact Assessment Report (Offshore EIAR)	The published report of the EIA that will be undertaken for the Proposed Development.
Offshore Scoping Opinion	The document issued by MD-LOT on 12 May 2025 to the Applicant under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2007 and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, setting out the Scottish Ministers' opinion on the content of the Offshore Environmental Impact Assessment Report (Offshore EIAR) including those issues that will or will not need to be addressed in the Offshore EIAR.
Offshore Scoping Report	The document submitted by the Applicant on 31 January 2025 setting out the proposed contents of the Offshore Environmental Impact Assessment Report (Offshore EIAR) and provided to MD-LOT to support the request for an Offshore Scoping Opinion.
Offshore Substation Platform (OSP)	Offshore platform consisting of High Voltage Alternating Current (HVAC) substations or High Voltage Direct Current (HVDC) substations.
Offshore Transmission Cable Corridor (OTC Corridor)	The area within which the Offshore Transmission Cables (OTCs) will be installed.
Offshore Transmission Cables (OTCs)	The subsea electricity cables running from Landfall in the region of Stonehaven to the Offshore Substation Platform(s) (OSP(s)) in the Aspen Array Area. The OTCs will act as both a demand and supply cable. The OTCs will provide both traditional supply of power to grid but also ensure robust secure power supply to oil and gas assets when the Aspen Array Area is not generating sufficient renewable power to support their demand.
Offshore Wind Farm (OWF)	The proposed generation infrastructure comprising of Wind Turbine Generators (WTGs) and associated Floating Foundations, Offshore Substation Platform(s) (OSP(s)) and associated foundations, substructures and Inter-array Cables (IACs).
Option Agreement	The property agreement that gives the tenant specific and exclusive development rights within the awarded area for a fixed period. An Option Agreement can be granted if the applicant's proposed project is in the final Innovation and Targeted Oil and Gas Sectoral Marine Plan (INTOG SMP). If any proportion (up to ten percent 10%) of the proposed project is outwith the final INTOG SMP, an Option Agreement may still be awarded but only for an area consistent with marine planning considerations and the final INTOG SMP.
Project	Aspen Offshore Wind Farm (OWF) - comprises the wind farm and all associated offshore and onshore components.
Proposed Development	The offshore development, infrastructure and components of the Project (Aspen Offshore Wind Farm) which include all offshore infrastructure to be located within the Aspen Array Area and the OTC Corridor

Abbreviations

Abbreviation	Definition
AARA	Air-to-Air Refueling Areas
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
AMSL	Above Mean Sea Level
ATS	Air Traffic Service
BP	British Petroleum
CAA	Civil Aviation Authority
CaP	Cable Plan
CBRA	Cable Burial Risk Assessment
CBRN	Chemical, Biological, Radiological and Nuclear
CCS	Carbon Capture Storage
CEMP	Construction Environmental Management Plan
CNS	Central North Sea
COLREGs	International Regulations for Preventing Collisions at Sea
COMAH	Control of Major Accident Hazards
CTA	Control Area
DA	Danger Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ERCoP	Emergency Response and Cooperation Plan
EU	European Union
FIR	Flight Information Region
FL	Flight Level
FMMCP	Fisheries Mitigation, Monitoring and Communication Plan
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GNSS	Greater North Sea
GP	General Practitioner
GPS	Global Positioning System
GVA	Gross Value Added

Abbreviation	Definition
HAT	Highest Astronomical Tide
HMRI	Helicopter Main Routing Indicators
HRA	Habitats Regulations Appraisal
HSE	Health and Safety Executive
HSEQ	Health, Safety, Environment and Quality
HSWA	Health and Safety at Work Act
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IALA	International Association of Lighthouse Authorities
ICES	International Council for the Exploration of the Sea
IEMA	Institute of Environmental Management and Assessment
IFR	Instrument Flight Rules
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
INTOG	Innovation and Targeted Oil and Gas
IOMU	Infrastructure and Other Marine Users
ISAC	Inverness Sub Aqua Club
IWRAP	IALA Waterway Risk Assessment Program
JV	Joint Venture
LSE	Likely Significant Effect
MCA	Marine and Coastguard Agency
MD-LOT	Marine Directorate Licensing Operations Team
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MoD	Ministry of Defence
NI	Northern Ireland
NLB	Northern Lighthouse Board
NMP	National Marine Plan
NRA	Navigation Risk Assessment
NRR	National Risk Register
O&M	Operation and Maintenance

Abbreviation	Definition
OSA	Offshore Safety Area
OSP	Offshore Substation Platform
OTC	Offshore Transmission Cable
OWF	Offshore Wind Farm
pUXO	Potential Unexploded Ordnance
RYA	Royal Yachting Association
SAR	Search and Rescue
SOLAS	Safety of Life at Sea
TCA	Trade and Cooperation Agreement
TMZ	Transponder Mandatory Zones
TPV	Third Party Verified
TRA	Temporary Reserved Area
UK	United Kingdom
UKCP	UK Climate Projects
UKHO	UK Hydrographic Office
UXO	Unexploded Ordnance
VFR	Visual Flight Rules
WTG	Wind Turbine Generator

Units

Unit	Definition
bn	Billion
dB	Decibel
GW	Gigawatt
ha	Hectares
kHz	Kilohertz
km	Kilometres
km^2	Kilometres squared
Kv	Kilovolt
kWh	Kilowatt-hour
m	Metre
mm	Millimetre

Unit	Definition
mn	Million
MW	Megawatt
nm	Nautical mile

20 Major Accidents and Disasters

20.1 Introduction

20.1.1 Cerulean Winds Aspen Project Limited (hereafter referred to as the 'Applicant') is proposing to develop the Aspen Offshore Wind Farm (hereafter referred to as 'the Project'). The Project is made up of both offshore and onshore components. The subject of the Offshore Environmental Impact Assessment Report (Offshore EIAR) is the offshore infrastructure of the Project seaward of Mean High Water Springs (MHWS) which is hereafter referred to as 'the Proposed Development'.

20.1.2 The Aspen Array Area covers an area of approximately 333 km2 and is located approximately 84 km east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Proposed Development includes Wind Turbine Generators (WTGs) and associated floating foundations, Offshore Substation Platform(s) (OSP(s)) and associated foundations, the Inter-array Cables (IACs), Inter-link Cables, Offshore Transmission Cables (OTCs) and Landfall.

20.1.3 This Chapter of the Offshore EIAR presents an assessment of the potential impacts and associated effects of major accidents and disasters on the Proposed Development; as well as the potential for the Proposed Development to cause major accidents and disasters, and discusses appropriate mitigation and monitoring as required to address any significant effects. As per the Environmental Impact Assessment (EIA) Regulations, this Chapter specifically refers to the assessment of Likely Significant Effects (LSE) on major accidents and disasters, seaward of MHWS, during pre-construction, construction, operation and maintenance, and decommissioning phases.

20.1.4 The term 'Likely Significant Effect' is used in both the EIA Regulations and the Habitat Regulations. The Offshore EIAR is accompanied by an Offshore Report to Inform Assessment (Offshore RIAA) (Cerulean Winds Aspen Project Limited, 2025) which uses the term as defined by the Habitat Regulations Appraisal (HRA) Regulations. The Offshore EIAR uses the term as defined in the 'EIA Regulations'.

20.1.5 This Chapter should be read alongside the following other EIAR Chapters and technical appendices:

- Volume 1, Chapter 3: Project Description;
- Volume 1, Chapter 5: Site Selection and Alternatives;
- Volume 2, Chapter 13: Commercial Fisheries;
- Volume 2, Chapter 14: Shipping and Navigation;
- Volume 2, Chapter 15: Military and Civil Aviation;
- Volume 2, Chapter 17: Socioeconomics, Tourism and Recreation;
- Volume 2, Chapter 18: Climate;
- Volume 2, Chapter 19: Infrastructure and Other Marine Users;
- Volume 3, Appendix 4.1: Offshore Cumulative Effects;

- Volume 3, Appendix 13.1: Commercial Fisheries Technical Report;
- Volume 3, Appendix 14.1: Navigational Risk Assessment; and
- Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report.

20.1.6 This Chapter refers to the design of the Proposed Development as described in Volume 1, Chapter 3: Project Description of the Offshore EIAR.

20.1.7 This Chapter has been prepared by GoBe Consultants Ltd. on behalf of the Applicant.

20.2 Purpose of the Chapter

20.2.1 The primary purpose of the Offshore EIAR is defined in **Volume 1, Chapter 1: Introduction**.

20.2.2 The key objective of this Chapter is to provide Scottish Ministers, statutory and non-statutory stakeholders the information required to assess for LSE in relation to major accidents and disasters caused by or happening to the Proposed Development.

20.2.3 The structure of this Chapter is guided by the Institute of Environmental Management and Assessment (IEMA) 'Major Accidents and Disasters in EIA: A Primer' guidance (IEMA, 2020). This provides direction on using a risk-based assessment that is split into three stages; Screening, Scoping and Assessment. Further detail on the difference in assessment methodology from a typical EIAR chapter can be found in section 20.6.

20.2.4 The IEMA guidance defines a major accident as an event that threatens immediate or delayed serious environmental effects to human health, welfare, and/or the environment. Additionally, major accidents can be caused by disasters resulting from both man-made and natural hazards. A disaster can therefore be an external hazard (e.g. an act of terrorism) or a natural hazard (e.g. an earthquake) with the potential to cause an event and/or situation that meets the definition of a major accident.

20.2.5 At present, there are no clear definitions for the terms 'major accident' or 'disaster' within the context of the EIA Regulations. For the purpose of this assessment, key terms used in this Chapter are set out below and are based on IEMA Major Accidents and Disasters in EIA – A Primer (IEMA, 2020):

- Accident – something that happens by chance or without expectation;
- Disaster – 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;
- 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 developer 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;
- Risk – the likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur;
- Risk event – an identified, unplanned event, which is considered relevant to the Proposed Development and has the potential to result in a major accident and / or disaster, subject to assessment of its potential to result in a significant adverse effect on an environmental receptor;
- Vulnerability – 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 Regulations, the term refers to 'exposure and resilience' of the Proposed Development to the risk of a major accident and / or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact; and

- Significant environmental effect (in relation to a major accident and / or disaster assessment) – includes the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.

20.2.6 This Chapter presents the following:

- A description of current environmental baseline conditions relevant to major accidents and disasters. These have been established from literature review, desk studies, site specific surveys and stakeholder consultation;
- Discussion of assumptions and any limitations with respect to the information used to define the baseline;
- Identification of potential impacts and any resulting LSE of major accidents and disasters related to Proposed Development activities. This process is informed by the application of embedded commitments;
- Consideration of the need for any 'secondary' mitigation measures (in addition to embedded commitments) to avoid, minimise, reduce, or offset LSE on major accidents and disasters from the Proposed Development;
- Consideration of any residual effects following application of secondary mitigation; and
- Identification of monitoring measures to support proposed mitigation.

20.3 Legislation and Policy Context

20.3.1 Overarching legislation, policy, and guidance in relation to the Offshore EIAR for the Proposed Development is provided in **Volume 1, Chapter 2: Policy and Legislative Context** of the Offshore EIAR. A summary of policy (Table 20.1), legislation (Table 20.2Table 20.2), and guidance directly relevant to major accidents and disasters is provided in the following sections.

Legislation and Policy

20.3.2 A summary of relevant legislation is provided below within Table 20.1. All policy directly applicable to major accidents and disasters is presented in Table 20.2.

Table 20.1 Table of Relevant Legislation for Major Accidents and Disasters

Legislation	Summary	How/Where This Chapter has Considered This
The EIA Regulations	Consisting of: ▪ Electricity Works (EIA)(S) Regulations 2017; ▪ Marine Works (EIA)(S) Regulations 2017; and ▪ Marine Works (EIA) Regulations 2007.	Any Likely Significant Effects on or caused by the Proposed Development in relation to major accidents and disasters are assessed in section 20.7 of this document.
The Marine Works (EIA) (Scotland) Regulations 2017	The EIA Regulations require that the expected significant effects arising from the vulnerability of the project to major accidents or disasters are considered in the decision-making process for that project. Regulation 5 (2) outlines receptors that "the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development" and this includes major accidents and disasters. Regulation 5 (4) outlines the requirement to "include the relevant, the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to the development." The EIA Regulations also detail that a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development 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 European Union (EU) legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments 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	This chapter contains descriptions of the types of potential major accidents and disasters which could occur and the processes which ensure these are reduced to As Low as Reasonably Practicable (ALARP) in section 20.7. The ALARP principle involves weighing a risk against the time, effort and cost needed to control it. A key part of the ALARP process is to justify that identified risks are controlled to be ALARP and to do more to reduce risk would incur disproportionate time, effort and cost factors (Hurst *et al.*, 2018).

Legislation	Summary	How/Where This Chapter has Considered This
European Commission 2014 Environmental Impact Assessment (EIA) Directive (2001/92/EU as amended by 2014/52/EU) and implementing EIA Regulations	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.	This Chapter meets the requirement to consider whether the Proposed Development will be vulnerable to major accidents and/or disasters.
Health and Safety at Work etc. Act 1974 (HSWA) and Regulations Made Thereunder	The HSWA is the primary legislative instrument covering workplace health and safety in Great Britain. The HSWA establishes various obligations to ensure, so far as is reasonably practicable, that persons are not exposed to risks to their health and safety. The Health and Safety Executive (HSE), along with local authorities, are responsible for enforcing the Act.	This Chapter demonstrates that the Proposed Development has suitable processes in place to reduce risks to persons to ALARP and complies with good risk management practice. Both the Control of Major Accident Hazard Regulations 2015 and The Major Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009 are made under the HSWA.
The Control of Major Accident Hazards (COMAH) Regulations 2015	The COMAH Regulations lay down rules for the prevention of major accidents which might result from certain industrial activities sites involving the production, use or storage of dangerous substances at or above certain thresholds, and the limitations of their consequences.	Major accidents that involve dangerous substances are considered in section 20.7.
Construction (Design and Management) Regulations 2015 (CDM Regulations)	The CDM Regulations place specific duties on developers, designers and contractors, so that health and safety is considered throughout the life of a project from its inception to its subsequent final decommissioning. They include the requirement to appoint a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction. Under the CDM Regulations, designers must avoid foreseeable risks so far as reasonably practicable by: eliminating hazards from the construction,	The CDM Regulations expand upon the requirements of the HSWA to apply specific requirements for construction projects. The measures explained in this Chapter demonstrate how the Proposed Development will achieve the requirements and intention of the

Legislation	Summary	How/Where This Chapter has Considered This
	cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures.	CDM Regulations, which include management of construction risk to ALARP.
Marine Strategy Framework Directive (Directive 2008/56/EC)	The Directive includes the following wide-ranging descriptors which Member States must use as the basis for their more detailed characterisation of good environmental status: ▪ Biological diversity is maintained; ▪ The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions; ▪ Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems; ▪ Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock; ▪ All elements of the marine food web, to the extent that they are known, occur at normal abundance and diversity levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity; ▪ Human-induced eutrophication is minimised, especially the adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters; ▪ Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems; ▪ Sea floor integrity is at a level that ensures that the structure and functions of the ecosystem are safeguarded and benthic ecosystems, in particular, are not adversely affected; ▪ Concentrations of contaminants are at levels not giving rise to pollution effects;	This Chapter assesses the likelihood of a major accident or disaster that could affect the points outlined within the Directive.

Legislation	Summary	How/Where This Chapter has Considered This
	▪ Properties and quantities of marine litter do not cause harm to the coastal and marine environment; and ▪ Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.	

Table 20.2 Table of Relevant Policy for Major Accidents and Disasters

Legislation	Summary	How/Where This Chapter has Considered This
Scottish National Marine Plan (NMP) Scottish Government, 2015	Marine planners and decision makers must ensure that renewable energy projects demonstrate compliance with Environmental Impact Assessment and Habitats Regulations Appraisal legislative requirements.	Section 20.70 assesses the likelihood of the Proposed Development interacting with other marine users via potential major accidents and/or disasters.
Scottish National Marine Plan (NMP) Scottish Government, 2015 GENERAL 4 Co-existence 4.16	Where it becomes apparent that different activities are incompatible or mutually exclusive, some areas may be identified within regional marine plans for preferential use by specific sectors. Any selection of such areas should follow: ▪ A scoping exercise to determine where potential interactions may occur and the likely effect of interaction; ▪ Sustainability appraisal considering the potential range of impacts on the environment and the range of other potential users, and others who could be less directly impacted; and ▪ Consideration of any cumulative impact.	Section 20.70 of this document identifies, describes and assesses the direct and indirect effects of the Proposed Development in relation to the stated factors.
Scottish National Marine Plan (NMP) Scottish Government, 2015 GENERAL 5 Climate Change	Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.	Paragraph 20.5.150 *et seq*. details the relationship of the Proposed Development with potential climate change effects.
Draft Sectoral Marine Plan (2025)	General: This draft updated SMP-OWE will optimise the sustainable deployment of offshore wind in Scottish Waters balanced with the needs of other marine users and the marine environment. The purpose of the draft updated Plan is to enable the sustainable development of offshore wind energy in Scottish waters, by balancing economic, social and environmental objectives through a systems-led	Section 20.70 assesses the likelihood of the Proposed Development interacting with other marine users via potential major accidents and/or disasters.

Legislation	Summary	How/Where This Chapter has Considered This
	assessment process that engages a range of stakeholders and is underpinned by evidence. The aims of the draft updated Plan are to: 2. Assess the potential national and regional level opportunities and constraints resulting from potential development with a generating capacity of up to 37.4 GW, providing greater clarity to industry, investors, consumers and the public. a. Including potential in-combination and cumulative impacts of the proposed development with existing and planned offshore developments and other marine policies, on the environment, economy, marine users and on local communities; 3. Strategically consider the impacts of storage, construction and maintenance of devices (commonly referred to as 'wet storage').	

20.3.3 All guidance directly applicable to major accidents and disasters includes the following documents:

- Institute of Environmental Management and Assessment (IEMA) (2020). Major Accidents and Disasters in EIA: A Primer; and
- European Commission (2017) Environmental Impact Assessment of Projects- Guidance on the preparation of the Environmental Impact Assessment Report. While not applicable to Scotland, this document has been designed to be useful to EIA practitioners globally when conducting risk assessments and has been used as a reference to provide a wider vision of the assessment of the Proposed Development.

20.3.4 All guidance considered directly applicable to individual topics referenced within the major accidents and disasters assessment are included in the technical Chapters themselves.

20.4 Consultation

20.4.1 Continuous consultation (statutory and non-statutory) and incorporation of feedback is critical in developing a robust Offshore EIAR. The Offshore Scoping Report for the Proposed Development (**Volume 3, Appendix 6.1: Offshore Scoping Report**) was submitted to the Marine Directorate – Licensing Operations Team (MD-LOT) in January 2025. MD-LOT issued a detailed response to the Offshore Scoping Report in the Offshore Scoping Opinion dated and received in May 2025 (**Volume 3, Appendix 6.2: Offshore Scoping Opinion**), covering its own opinion on the Offshore Scoping Report as well as the statutory and non-statutory consultees' advice on each topic.

20.4.2 A summary of the stakeholder consultation activities specific to major accidents and disasters is provided in Table 20.3 in which the issues are raised and the actions to address them are incorporated throughout the Offshore EIAR.

20.4.3 Further detail on the Proposed Development's overall EIA stakeholder consultation process is presented in **Volume 1, Chapter 6: Consultation** of the Offshore EIAR.

Table 20.3 Consultation Relevant to Major Accidents and Disasters

Date	Consultee and Type of Consultation	Description/Issues Raised	How This has Been Considered in This Chapter
May, 2025	Scottish Ministers - Offshore Scoping Opinion (via MD-LOT)	The Scottish Ministers note that risks of major accidents and/or disasters has been scoped out, however, it is advised that this is scoped into the EIA Report.	The risks of major accidents and disasters is considered throughout this Chapter.
May, 2025	Scottish Ministers - Offshore Scoping Opinion (via MD-LOT)	The Scottish Ministers advise that the EIA Report must include a description and assessment of the LSE deriving from vulnerability of the Proposed Development to major accidents and disasters.	A description and assessment of LSE deriving from vulnerability is presented in section 20.7.
May, 2025	Scottish Ministers - Offshore Scoping Opinion (via MD-LOT)	The Applicant should make use of appropriate guidance, including the recent Institute of Environmental Management and Assessment ("IEMA") 'Major Accidents and Disasters in EIA: A Primer	Reference to appropriate guidance has been implemented as set out in section 20.3 and referenced as required throughout the Chapter.
May, 2025	Scottish Ministers - Offshore Scoping Opinion (via MD-LOT)	Existing sources of risk assessment or other relevant studies should be used to establish the baseline rather than collecting survey data and note the IEMA Primer provides further advice on this. This should include the review of the identified hazards from your baseline assessment, the level of risk attributed to the identified hazards and the relevant receptors to be considered.	The sources of risk assessment and other relevant studies used to establish the baseline are set out in sections 20.3 (Guidance) and 0 (Baseline) of the Chapter.
May, 2025	Scottish Ministers - Offshore Scoping Opinion (via MD-LOT)	The assessment must detail how significance has been defined and detail the inclusions and exclusions within the assessment. Any mitigation measures that will be employed to prevent, reduce or control significant effects should be included in the EIA Report.	The Chapter details the assessment criteria in section 20.6. Mitigation is also identified in section 20.6.6 and section 20.7.

20.5 Baseline Environment

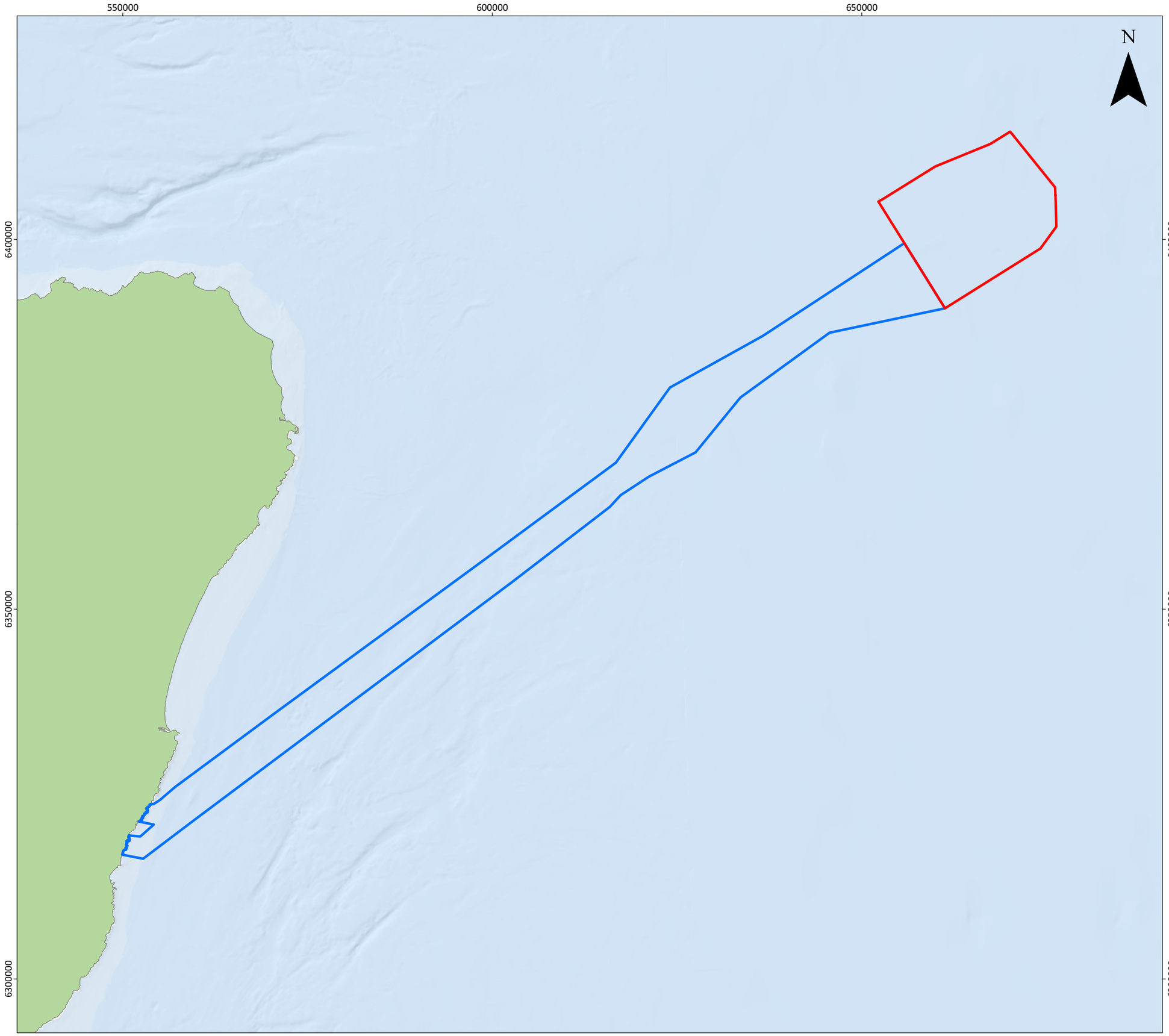
20.5.1 This section presents a summary of the major accidents and disasters baseline environment study area, the methodology, baseline conditions and limitations and assumptions of the data used.

Study Area

20.5.2 Figure 20.1 shows the location of the Proposed Development. This includes the following:

- Aspen Array Area; and
- OTC Corridor.

20.5.3 Due to the unique structure of the major accidents and disasters document, there is no study area specifically defined for the assessment. Instead, the major accidents and disasters assessment uses the study areas defined by the individual technical specialists in their respective chapters and technical appendices. These study areas are detailed in the relevant Chapters as set out in section 20.5.5.



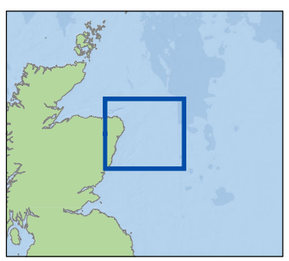
CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Proposed Development Location

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor



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Coordinate System:
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0 5 10 nm

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Figure 20.1

Figure Reference: ASPEN_MA_Fig20.1_ProposedDevelopmentLocation_v1

Methodology

20.5.4 Baseline data to inform the major accidents and disasters assessment was collected using the following methods:

Desktop Study

20.5.5 For the purpose of this major accidents and disasters chapter, a desk-based review was undertaken using relevant spatial and scientific data sources by reviewing the EIAR Chapters for the Proposed Development as listed in section 20.1.4.

Site Specific Surveys

20.5.6 In accordance with advice provided by IEMA (IEMA, 2020) no site-specific surveys have been undertaken to inform the assessment for major accidents and disasters. This is because receptor information and data related to this topic can be readily collected through desktop study using data sourced by technical specialists.

20.5.7 Site specific surveys were conducted to inform the baseline presented in **Volume 2, Chapter 14: Shipping and Navigation**. A detailed overview of the methodology of the shipping and navigation site-specific surveys for the Proposed Development is presented in section 3.1 *et seq*. of the technical appendix associated with the shipping and navigation Chapter (**Volume 3, Appendix 14.1: Navigational Risk Assessment**).

Description of Baseline Environment

20.5.8 A summary of the major accidents and disasters baseline environment is provided in the following sections.

20.5.9 There are several baseline features that contribute a potential source of both anthropogenic and biogenic sources of hazards 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.

Commercial Fisheries

Study Area

20.5.10 The Proposed Development is located within the southern portion of the International Council for the Exploration of the Sea (ICES) Division 4a (northern North Sea) and northern portion of ICES Division 4b (central North Sea) statistical areas; within UK EEZ (exclusive economic zone) waters. For the purpose of recording commercial fisheries landings, ICES Divisions are divided into statistical rectangles, of which the Proposed Development overlaps with 44E9, 43E9, 43E8, 43E7 and 42E7.

20.5.11 Two study areas (shown in Figure 20.2) are defined for commercial fisheries:

- the Local Commercial Fisheries study area covering ICES rectangles 44E9, 43E9, 43E8, 43E7 and 42E7; and

- the Regional Commercial Fisheries study area covering ICES rectangles 42E7 to 42F0, 43E7 to 43F0, 44E8 to 44F0 and 45E8 to 45F0.

20.5.12 The Local Commercial Fisheries study area focuses on the overlap of the Proposed Development with ICES rectangles.

20.5.13 A wider regional study area is considered to provide context to the description of commercial fishing activity in the Local Commercial Fisheries study area, and to inform assessment of displacement impacts within the Offshore EIA Report. The Regional Commercial Fisheries study area includes those ICES rectangles immediately adjacent to the Local Commercial Fisheries study area as indicated in Figure 20.2.

20.5.14 There are no current fishery related restrictions across the Aspen Array Area. The nearshore section of the OTC Corridor overlaps the Aberdeen to Mons Craig managed area where use of mobile fishing gear is restricted between 1st January to 31st March and 1st October to 31st December in each year.

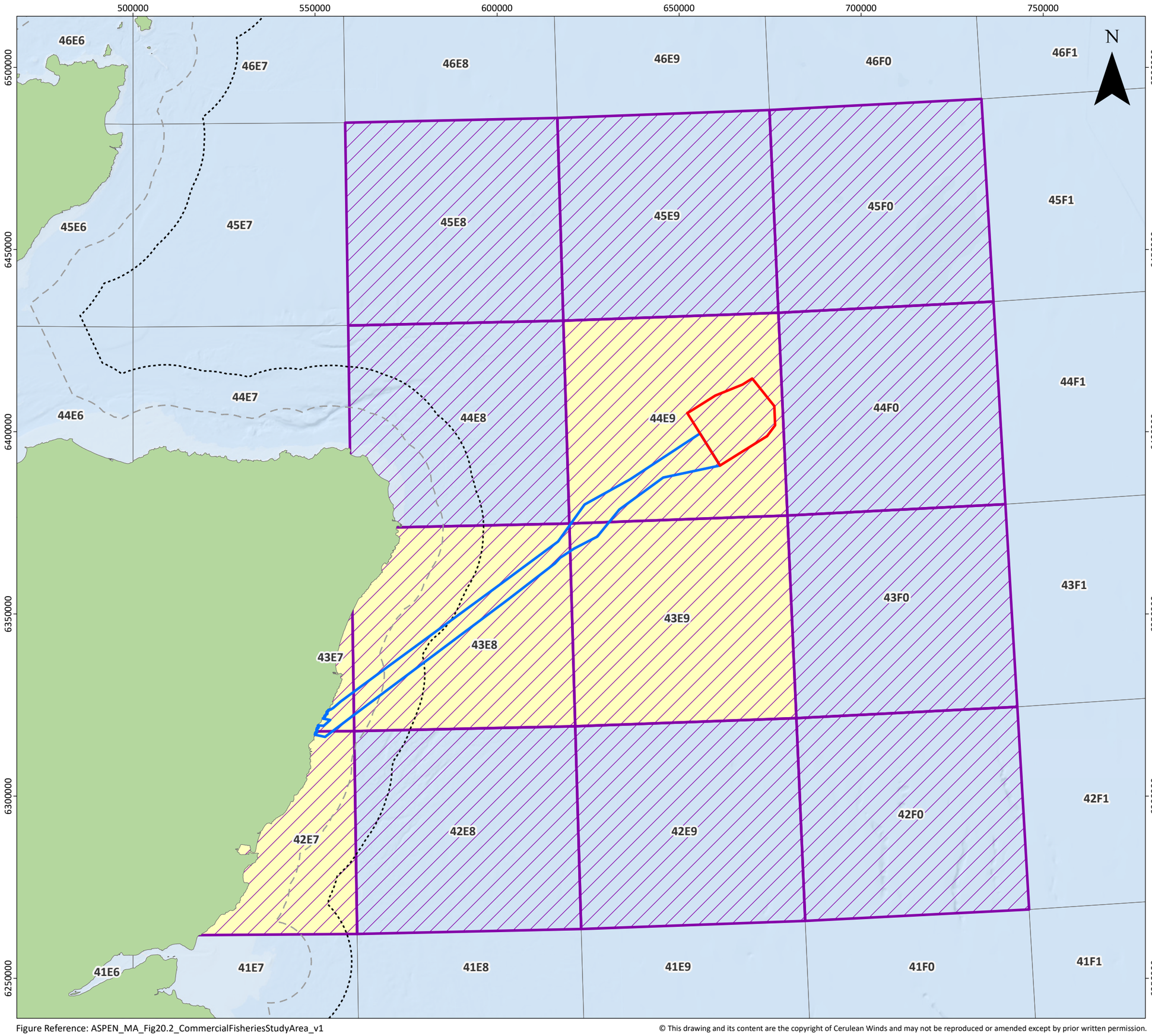

Figure Reference: ASPEN_MA_Fig20.2_CommercialFisheriesStudyArea_v1

CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Commercial Fisheries Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- ICES Rectangles
- 6nm Limit
- 12nm Limit

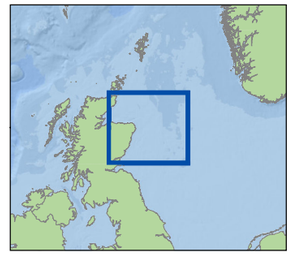

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Figure 20.2

20.5.15 To assess the risk to commercial fisheries from major accidents and disasters in relation to the Proposed Development, it is important to understand the current levels of fishing activities within the study area and any potential changes in fishing trends in the future. The Shipping and Navigation assessment found that the most common vessel lengths within the Aspen Array Area were 0-49 m (50%) and 50-99 m (39%), driven in part by the high presence of fishing vessels, which are typically < 100 m length overall.

20.5.16 For commercial fisheries landings statistics, showing annual first sales value and landed weight by UK-registered vessels operating within the Local Commercial Fisheries study area, an annual average value of £13.9 million was landed by all UK vessels across the years 2019 to 2023. The timeseries presented in the commercial fisheries chapter covers the period 2010 to 2023 and provides insight into long term trends in catches from the Local Commercial Fisheries study area, which have shown a generally increasing trend in terms of both landed weight and value.

20.5.17 The highest value landings are consistently taken from ICES rectangle 43E9 (accounting for 43% of landings from the Local Commercial Fisheries study area) with which a small section of the OTC Corridor overlaps. The average annual value of landings from ICES rectangle 44E9 with which the Aspen Array Area overlaps is £5 million.

20.5.18 The statistics indicate that Nephrops, haddock, lobsters and herring are the most economically important species as demonstrated by landed value (with an annual average landed value of £3.3 million, £2.6 million, £2.2 million and £1.9 million respectively across 2019 to 2023). Landings of these species have varied annually across the 2010 to 2023 time series.

20.5.19 The majority of landings by UK fishing vessels are made by vessels registered in Scotland (80% by value), with a smaller proportion by English (16%) and Northern Irish (4%) vessels. Landings by Northern Irish vessels have declined over the time series. Key local landings ports include Peterhead and Fraserburgh.

20.5.20 The statistics for commercial fisheries data for the annual (2010 to 2023) first sales value and landed weight by UK vessels from the Regional Commercial Fisheries study area indicate that within this wider Regional Commercial Fisheries study area, landings are dominated by similar species to those in the Local Commercial Fisheries study area, inclusive of Nephrops, haddock, and mackerel. Landings of scallop feature more prominently.

20.5.21 Landings are predominately made by Scottish vessels, operating demersal otter trawls, pots, scallop dredges and pelagic trawls.

20.5.22 UK fishing vessel landings by ICES rectangle across the Regional Commercial Fisheries study area are shown in Figure 6.14. Landings are most substantial in value from ICES rectangles 45E9 located to the north- of the Aspen Array Area. Regionally, the lowest value of landings is taken from ICES rectangle 43E7 where the OTC Corridor makes landfall.

20.5.23 Landings are relatively consistent year-round but influenced by spikes in landings of herring and mackerel which are targeted in their autumn migrations.

20.5.24 EU vessels registered in Denmark, the Netherlands, Germany, France, Lithuania and Sweden are recorded to historically fish within the Commercial Fisheries Local study area. The key target species for these international fleets are herring, targeted by large pelagic trawlers.

Shipping and Navigation

Study Area

20.5.25 The shipping and navigation study area, shown in Figure 20.3 below, comprises a 10 nm (18.5 km) buffer applied around the Aspen Array Area (hereafter referred to as the 'Array study area'), and a 3 nm (5.6 km) buffer applied around the OTC Corridor (hereafter referred to as the 'OTC study area'. This shipping and navigation study area has been agreed with consultees and is consistent with industry best practice (MCA, 2021a) as applied to previous offshore renewable shipping and navigation studies.

Baseline Environment

20.5.26 This section provides a summary of the **Volume 2, Chapter 14: Shipping and Navigation** baseline environment as presented in the shipping and navigation Chapter. Full details of the analysis undertaken to develop the shipping and navigation baseline is provided in **Volume 3: Appendix 14.1: Navigational Risk Assessment**.

20.5.27 For the purposes of the shipping and navigation assessment, a desk-based review was undertaken using relevant spatial and scientific data sources alongside site specific surveys and numerical modelling.

20.5.28 Vessel traffic surveys were carried out by a dedicated on-site vessel and were undertaken in agreement with the MCA, details of which are provided in Table 20.4. Each survey consisted of 14 full days of vessel traffic data collection via AIS, Radar, and visual observation which combined comply with MGN 654 requirements (MCA, 2021). A summary of the survey details are provided within **Volume 3: Appendix 14.1: Navigational Risk Assessment** (NRA).

Table 20.4 Project Specific Surveys Undertaken to Inform the Shipping and Navigation Assessment

Survey	Summary	Area Coverage
Dedicated summer Aspen Array Area vessel traffic survey, NASH Maritime Ltd, 24-Aug to 07-Sep 2024.	A total of 14 days AIS, Radar, and visual observation data collected between 24-Aug to 07-Sep 2024 which is used to characterise vessel traffic movements within and in proximity to the Aspen Array Area, collected via a survey vessel, in line with MGN 654 (MCA, 2021) requirements.	Full study area
Dedicated winter Aspen Array Area vessel traffic survey, NASH Maritime Ltd, 18-Nov to 05-Dec 2024.	A total of 14 days AIS, Radar, and visual observation data collected between 18-Nov to 05-Dec 2024 which is used to characterise vessel traffic movements within and in proximity to the Aspen Array Area, collected via a survey vessel, in line with MGN 654 (MCA, 2021) requirements.	Full study area

20.5.29 Numerical modelling was conducted as part of the NRA using the International Association of Lighthouse Authorities (IALA) Waterway Risk Assessment Program (IWRAP Mk II), (IALA 2017). The modelling process is designed to inform the qualitative assessment by providing quantitative estimates on potential frequencies at which impacts may occur.

20.5.30 It is noted that no International Maritime Organisation (IMO) routeing measures, aggregate extraction license areas or dredge disposal sites were identified within or adjacent to the study area. Two yellow flashing buoys are situated 9 nm from the Aspen Array Area and mark the well sites of Ettrick Oil & Gas field. Both buoys transmit AIS.

20.5.31 One UK Military Practice and Exercise Area is categorised as an Area of Intense Aerial Activity (AIAA) intersects the OTC Corridor. The area is managed by the Ministry of Defence (MoD) and used as a flight practice area but is not a controlled airspace.

20.5.32 The OTC landfall site is located between two anchorage sites. Stonehaven anchorage positioned within Stonehaven Bay is approximately 2 nm from southern OTC boundary. The anchorage is used by vessels with draughts less than 11 m which is the minimum depth. Small craft anchor further inshore in Stonehaven Bay.

20.5.33 A 0.2 nm^2 spoil ground is located just north of the OTC Corridor and the UK Hydrographic Office (UKHO) has identified 12 wrecks intersecting the OTC Corridor, all of which are located in water depths between 47 – 97 m.

20.5.34 Other navigational features of importance include the operational Kincardine OWF which is situated approximately 8 nm to the southeast of Aberdeen and approximately 3 nm south of the OTC Corridor. Kincardine is a 50 MW floating windfarm project that features five semi-submersible WTGs and covers an area of 7 nm^2.

20.5.35 Peterhead Port, the largest fishing port in Europe, is the closest port to the Aspen Array Area located approximately 47 nm south-west. Peterhead Port Authority operates a Vessel Traffic Service with Radar surveillance. Within Peterhead Port is Peterhead Bay Marina which was noted by RYA Scotland at the Hazard Workshop as a common stopping point for transiting recreational vessels (Table 1.3). The OTC makes landfall between the Port of Aberdeen 5 nm to the north, and Stonehaven Harbour 2 nm to the south. The pilot boarding station for the Port of Aberdeen is located at approximately 1.5 nm north-east of the harbour entrance (0.9 nm from the study area and 3.5 nm from the OTC corridor). There is no pilot boarding facilitated at Stonehaven Harbour.

20.5.36 The Proposed Development is surrounded by several oil & gas fields. There is one decommissioned site within the study area namely Ettrick Oil & Gas field. The Buchan Oil Field is undergoing redevelopment with increased vessel activity described within **Volume 3: Appendix 14.1: Navigational Risk Assessment**. The redevelopment is expected to involve the drilling of five new wells and the installation of new subsea infrastructure tied back to a Floating Production and Storage Offloading vessel.

20.5.37 Vessel traffic density within the Aspen Array Area is low, with less than 10 transits per month through 98% of 500 m² grid cells. There are two areas of moderate density within the Array study area at the Buchan Oil Field, and along a narrow northeast-southwest route between Aberdeen and the Buchan Oil Field. These areas have 10 – 50 transits per month per 500 m² grid cell, as a result of the tug and service vessels that regularly service the oil field. The main vessel types recorded within the Aspen Array Area overall were tug and service vessels (45%), fishing vessels (42%), and cargo vessels (9%). Tanker vessels accounted for 2.5% of transits within the Aspen Array Area, and both recreational vessels and passenger vessels accounted for <1% of transits.

20.5.38 Vessels within the Aspen Array Area ranged in size from small recreational sailing vessels to large commercial vessels (a 382 m crane ship). Excluding the proportion of vessels for which length was not available, the most common vessel lengths within the Aspen Array Area were 0-49 m (50%) and 50-99 m (39%), driven by the high presence of fishing vessels and oil & gas service vessels, which are typically < 100 m length overall.

20.5.39 Main commercial and tug & service routes have been identified using the principles set out in MGN 654 (MCA, 2021). A total of 21 routes were identified within the Array study area. The main routes are presented and described in **Volume 3: Appendix 14.1: Navigational Risk Assessment** and are generally of low frequency/intensity.

20.5.40 Vessel traffic density within the majority of the OTC Corridor is low-moderate, with less than 25 transits per month through 95% of 500 m² grid cells. There is a density hotspot (>50 transits per month per 500 m² grid cell) in the OTC study area at the approach to Aberdeen, which extends across the OTC Corridor at moderate density in two directions: northwest-southeast between Aberdeen and Kincardine OWF, and east-west between Aberdeen and offshore to oil and gas infrastructure. Near the landfall area, there is low density of transits, which is lowest at the charted depth of <20 m. The main vessel types recorded within the OTC Corridor were tug and service vessels (50%), fishing vessels (19%), and cargo vessels (19%). Tanker vessels accounted for 8% of transits within the OTC Corridor, and both recreational vessels and passenger vessels accounted for <2.5% of transits.

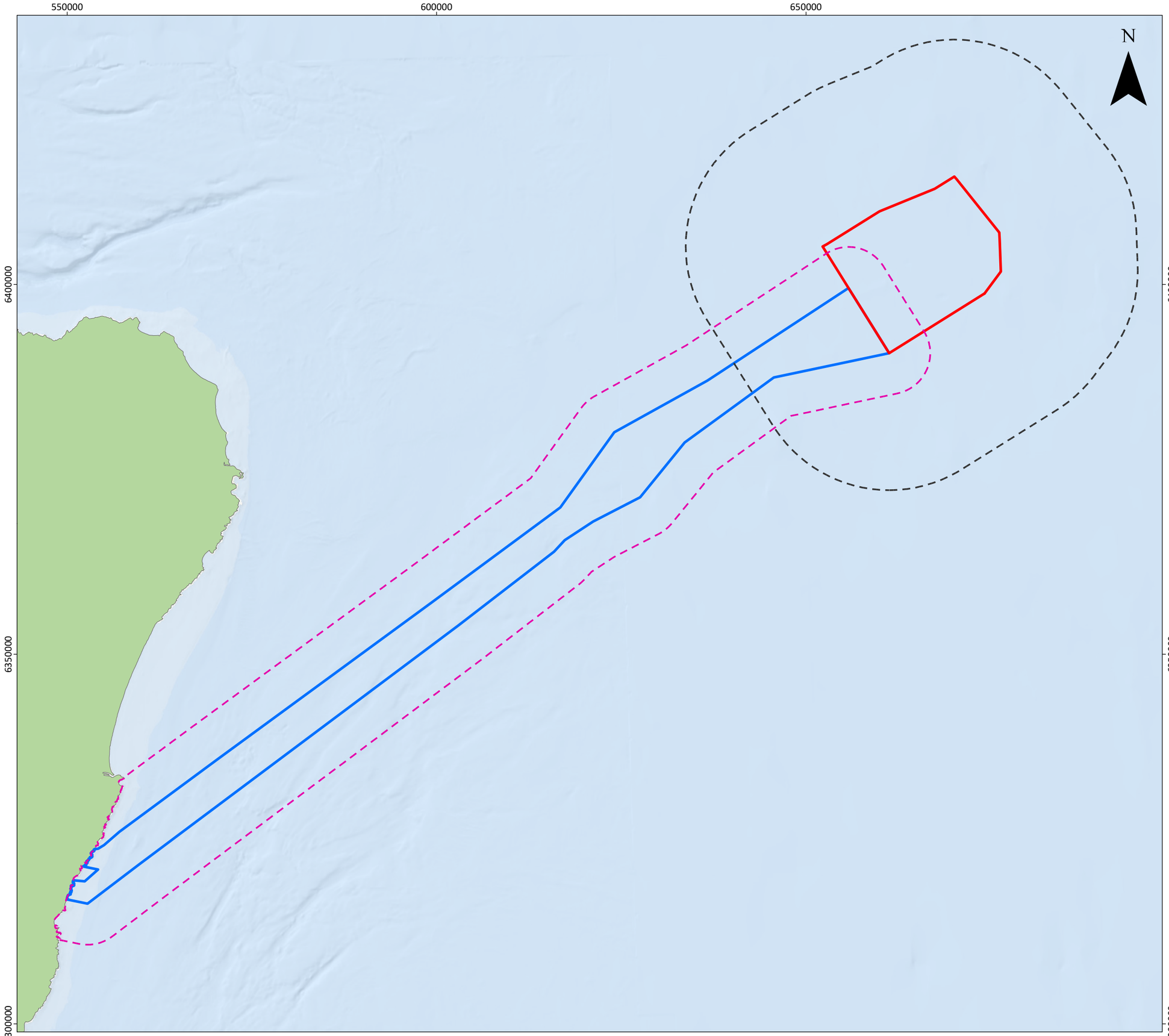
20.5.41 Vessel sizes within the OTC Corridor ranged from 4 m length overall (recreational vessel) to 345 m (cruise ship). Excluding the proportion of vessels for which length was not available, the most common vessel lengths within the OTC Corridor were 50-99 m (53%) and 0-49 m (28%), driven by the higher proportion of cargo vessels and larger service (supply) vessels compared to the Aspen Array Area.

20.5.42 There was comparably low loitering/anchoring activity within the OTC Corridor, with one key area of anchoring and loitering at the Drilling Rig Anchorage southeast of Aberdeen. The moderate non-transit activity at the Anchorage extends northwards towards the Pilot Boarding Station outside of Aberdeen and primarily constitutes shuttle tankers or service vessels awaiting entry to Aberdeen harbour.

20.5.43 Maritime incidents recorded in the study area by the Marine Accident Investigation Branch (1992-2024) and Royal National Lifeboat Institution (2008-2023) databases have been collated and presented within Volume 3: Appendix 14.1: Navigational Risk Assessment. This was the most up-to-date incident data available at the time this assessment was undertaken. When processing the incidents, non-navigational incidents were removed, such as shore-based activities (e.g. people cut off by the tide or swimmers in distress). Furthermore, duplicate values recorded in both databases were removed to not incorrectly increase the count of incidents.

20.5.44 Most incidents are recorded close to shore, around the nearby ports, with reducing frequency the further offshore the location is. There was one recorded incident within the Aspen Array Area, which was a mechanical damage involving a recreational vessel while fishing. 39 incidents were recorded within the OTC Corridor which included a range of personal injuries, mechanical damage, loss of control, fire/explosion, near misses / close quarters, and flooding/foundering incidents. Two collisions and one grounding incident were also recorded.

20.5.45 A summary of incidents occurring on other offshore wind farms was also provided within Volume 3: Appendix 14.1: Navigational Risk Assessment noting the higher frequency of project vessels and allisions as opposed to commercial vessel incidents or those resulting in serious consequences.



CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Shipping and Navigation Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- 10nm Buffer from Aspen Array Area
- 3nm Buffer from Offshore Transmission Cable Corridor

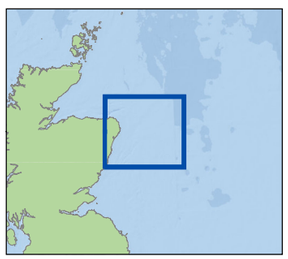


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Figure 20.3

Figure Reference: ASPEN_MA_Fig20.3_ShippingStudyArea_v1

Study Area

20.5.46 The military and civil aviation study area is defined by the Proposed Development footprint together with the airspace between the Aspen Array Area and the UK mainland. The study area also considers the construction of WTGs at Ardersier Port and the towing of WTGs from port to the Aspen Array Area. The study area extends from Inverness Airport to the west, to Aberdeen International Airport to the south-west.

20.5.47 WTGs will be constructed at Ardersier Port and then towed out one by one to the Aspen Array Area. Although the towage route has not yet been defined, aviation receptors may be impacted along the coastline. For this reason, aviation receptors within the vicinity of Ardersier Port and along the coastline from the report have been considered.

Baseline Environment

20.5.48 The Aspen Array Area lies within the Scottish Flight Information Region (FIR), airspace regulated by the UK Civil Aviation Authority (CAA). The boundary between the Scottish FIR and London FIR, also regulated by the UK CAA is located approximately 292 m to the south of the Aspen Array Area. Located approximately 171 km to the north-east of the Aspen Array Area is the boundary between the Scottish FIR and Polaris FIR, regulated by CAA Norway.

20.5.49 A portion of UK FIR airspace known as the Balder Control Area (CTA), located 113.2 km to the east-northeast of the Aspen Array Area, is delegated to CAA Norway. Within this area, CAA Norway provide Air Traffic Services (ATS) to aircraft from a lower limit of 1,500 ft Above Mean Sea Level (AMSL) to an upper limit of Flight Level (FL) 85 (approximately 8,500 ft AMSL). Procedures and communications within this area are as if the airspace was an integral part of the Polaris FIR.

20.5.50 Immediately surrounding the Aspen Array Area is class G uncontrolled airspace. This airspace extends from sea level to FL 195 (approximately 19,500 ft AMSL).

20.5.51 This airspace is used by both military and civil aircraft, predominately for low level flight operations and generally by aircraft flying under Visual Flight Rules (VFR). Aircraft operate under one of two flight rules: VFR or Instrument Flight Rules (IFR). VFR flight is conducted with visual reference to the natural horizon while IFR flight requires reference solely to aircraft instrumentation. Under VFR flight the pilot is responsible for maintaining a safe distance from terrain, obstacles and other aircraft.

20.5.52 Above FL 195 (approximately 19,500 ft AMSL) is class C controlled airspace in the form of a Temporary Reserved Area (TRA). This airspace, specifically TRA 007B, has an upper limit of FL 245 (approximately 24,500 ft AMSL) and is available for use by both military and civil aircraft, though its main use is to accommodate VFR military flying activity. Above the TRA the upper limit of class C airspace is FL 660 (approximately 66,000 ft AMSL).

20.5.53 The Aspen Array Area also lies beneath Moray CTA 15, class C controlled airspace. This airspace has vertical limits of FL 195 to FL 245 (approximately 19,500 ft to 24,500 ft AMSL respectively).

20.5.54 Located 9.3 km to the south-west of the Aspen Array Area is Moray CTA 2, class E controlled airspace. This airspace has vertical limits of FL 105 to FL 195 (approximately 10,500 ft to 19,500 ft AMSL respectively) and is a Transponder Mandatory Zone (TMZ). Within a TMZ, the carriage and operation of aircraft transponder equipment is mandatory. This enables such aircraft to be detected and tracked by Secondary Surveillance Radar systems.

20.5.55 Another TMZ is located 128.4 km to the west-northwest of the Aspen Array Area, the Moray Firth TMZ. This airspace is defined from sea level to an upper limit of FL 100 (approximately 10,000 ft AMSL) and was established to mitigate the impact on PSR coverage of Beatrice Offshore Wind Farm (OWF), Moray West OWF and Moray East OWF.

20.5.56 ATS routes are airways along which aircraft fly navigating via ground based electronic aids, or, increasingly, Global Navigation Satellite System (GNSS) waypoints. ATS routes are used where high levels of traffic move between areas. They may be standalone sections or embedded, either wholly or in part, within a segment of airspace. The Aspen Array Area lies beneath the ATS route, P600.

20.5.57 The nearest airport to the Aspen Array Area is Aberdeen International Airport, located 123.6 km to the south-west. The Aspen Array Area does not coincide with any established Instrument Flight Procedure (IFP) at Aberdeen International Airport.

20.5.58 The nearest military airspace to the Aspen Array Area is the Central Danger Area (DA) Complex, one of four DA complexes in UK airspace that provide segregated airspace for military training. This airspace is not permanently active but is activated on request. Specifically, the nearest section of this airspace is DA EGD613A.

20.5.59 When activated, EGD613A has vertical limits from FL 100 to FL 660 (approximately 10,000 ft to 66,000 ft AMSL). Activities within EGD613A include high energy manoeuvres, ordnance, munitions, and explosives.

20.5.60 The Aspen Array Area is located within the vicinity of AirtoAir Refuelling Areas (AARAs) 02, 03, and 04, situated 54.5 km to the north-east, 53.2 km to the east, and 4.2 km to the north respectively. AARA 02 and 03 have a lower limit of FL 100 and an upper limit of FL 290 (approximately 10,000 ft and 29,000 ft AMSL respectively). AARA 04 has a lower limit of FL 70 and an upper limit of FL 240 (approximately 7,000 ft and 24,000 ft above MSL respectively).

20.5.61 The Aspen Array Area is located within the Aberdeen Offshore Safety Area (OSA), which has a vertical limit of sea level to FL 100 (approximately 10,000 ft AMSL). The Aberdeen OSA contains a network of offshore routes over the North Sea that are flown by helicopters in support of oil and gas installations. These routes are published on charts as Helicopter Main Routing Indicators (HMRIs) and, together with the OSA, alert other airspace users of the potential for frequent low-level helicopter traffic.

20.5.62 Overlapping the Aspen Array Area are the centrelines for HMRIs 071 and 074. In addition, the Aspen Array Area is within 2 nm of the centrelines for HMRIs 068 and 077.

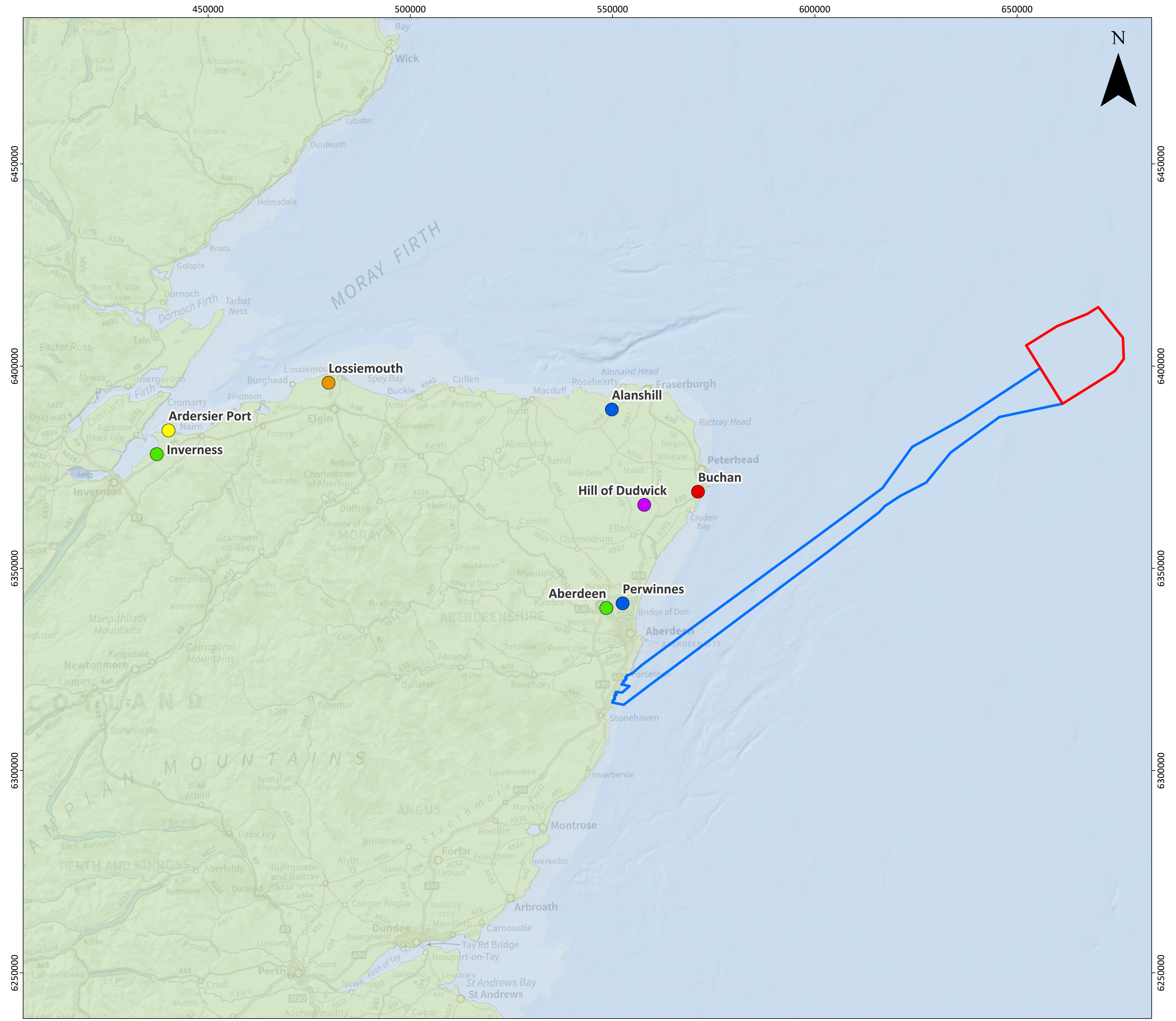
20.5.63 Search and Rescue (SAR) operations are a highly specialised undertaking involving not only aviation assets, but also small boats, ships, and shore-based personnel. There are ten helicopter SAR bases around the UK with Bristow Group providing helicopters and aircrew on behalf of the Maritime and Coastguard Agency (MCA).

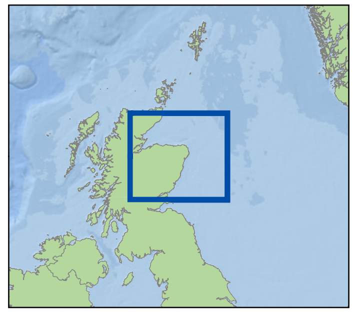
20.5.64 The nearest SAR base to the Aspen Array Area is at Inverness Airport, located approximately 216 km to the west.

20.5.65 WTGs will be constructed at Ardersier Port and then towed out one by one to the Aspen Array Area. Ardersier Port is within close proximity to Inverness Airport and Royal Air Force Lossiemouth situated 6.6 km to the south south-west and 41.3 km to the east north-east respectively.

20.5.66 The towing route may overlap the Tain DA, EDG703, and Moray Firth DA, EDG809S, located 17.2 km to the north and 98.1 km to the east north-east of Ardersier Port. Both of these DAs are active from sea level. Activities within EDG703 include ordnance, munitions, explosives, unmanned aircraft systems, high energy manoeuvres, para dropping, and electrical and optical hazards. Activities within EDG809S include ordnance, munitions, explosives, unmanned aircraft systems and high energy manoeuvres.

20.5.67 EDG702 accommodates the firing range activities at Fort George and is the closest DA to Ardersier Port, located less than 500 m to the west of the port. At this range it can be assumed WTGs may be towed through this area. This airspace is active from sea level. Activities within this area include ordnance, munitions, explosives and unmanned aircraft systems.





Aspen Offshore Wind Farm

Environmental Impact Assessment

Military and Civil Aviation Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- Air Defence Radars
- Ardersier Port
- Civil Airports
- Military Airfields
- NATS Radars
- Weather Radar

Notes

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Coordinate System:
WGS 1984 UTM Zone 30N

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Figure 20.4

Figure Reference: ASPEN_MA_Fig20.4_AviationStudyArea_v1

20.5.68 This section presents a summary of the socio-economic, tourism and recreation baseline environment study area and baseline conditions. A more detailed baseline is set out in **Volume 2, Chapter 17 Socioeconomics, Tourism and Recreation**.

Study Area

20.5.69 The main local epicentres of socioeconomic impact are expected to be the ports used during the construction and O&M for the Proposed Development. Therefore, the following socioeconomic study areas (as shown in Figure 20.5) have been considered:

- Highland;
- The North of Scotland (defined as the local authorities of Highland, Aberdeenshire, and Moray);
- Scotland; and
- The UK.

20.5.70 The tourism and recreation study area (Figure 20.6) has been identified based on where the epicentres of impact would be that could impact on tourism and recreation receptors. These would mostly be localised around the nearshore construction activities by the landfall area. On this basis, the following study area has been identified:

- The electoral ward of Stonehaven and Lower Deeside in Aberdeenshire.

Baseline Environment

20.5.71 For the purposes of the Socioeconomics, Tourism and Recreation Chapter, a desk-based review was undertaken using relevant socioeconomic and tourism data sources. Some data sources included are specific to the different countries of the UK. This is because where UK figures were not available, country level figures were aggregated to produce equivalent UK statistics.

20.5.72 In 2023, Highland had a population of 236,330, accounting for 39.7% of the population in the North of Scotland (595,320), and 4.3% of the total population of Scotland (5,490,100) (NRS, 2024). The share of the working age population (those aged 16-64 years old) across Highland and the North of Scotland was 60.2%. This is a smaller proportion than that across Scotland (63.4%) and the UK (62.8%) (ONS, 2024a) (NISRA, 2024).

20.5.73 At the same time, the share of the population aged 65+ in Highland (24.2%) is higher than that accounted for by this demographic group across the North of Scotland (22.9%), Scotland (20.3%), and the UK (18.9%). This suggests Highland and the North of Scotland have an older population than Scotland and the UK, supported by a relatively smaller population of working age.

20.5.74 In 2024, the economic activity rate in Highland was 81.5%, broadly similar to that of the North of Scotland (81.2%), and larger than that of Scotland (77.0%), and the UK (78.4%) (ONS,2024a). The unemployment rate in Highland (2.3%) was slightly lower than that of the North of Scotland (2.5%), Scotland (3.3%), and the UK average of 3.8% (ONS,2024b).

20.5.75 At £38,823, the median annual income of Highland's residents (ONS,2024c) is slightly below that of those living in the North of Scotland (£38,876), but higher than for Scotland (£38,286) and the UK (£37,430). Overall, the labour market in Highland and the North of Scotland is characterised by relatively high economic activity and low unemployment.

20.5.76 In 2023, there were 128,450 jobs in Highland, representing 4.8% of the 2.7 million jobs in the Scottish economy. Scotland accounts for 8.0% of total jobs across the UK (ONS,2024d) (NISRA,2023).

20.5.77 During the development stage of the Proposed Development, which includes project management, project design and environmental impact assessments, there will be opportunities for the professional, scientific and technical sector, which accounts for around 6,000 jobs in Highland, or 4.7% of employment in the region.

20.5.78 Employment in the electricity, gas, steam and air conditioning supply sector accounts for 0.8% of employment in Highland. There are 20,000 jobs associated with this sector in Scotland, accounting for 16.7% of UK's employment in the sector, indicating that relative to the UK, Scotland has a stronger renewable energy sector.

20.5.79 Sectors relevant to the construction phase of the Proposed Development include manufacturing and construction. Manufacturing accounts for around 6,000 jobs in Highland, accounting for 4.7% of total employment. There are approximately 178,000 manufacturing jobs in Scotland, accounting for 7.2% of the UK's manufacturing employment.

20.5.80 Construction accounts for 6.2% of employment in Highland, with approximately 8,000 jobs in the sector. This proportion is above average compared to the UK, where construction accounts for 4.9% of total employment.

20.5.81 The number of jobs in Highland increased by 6.7% (ONS, 2015) (ONS, 2024d) from 2013 to 2023, a higher rate of growth than the North of Scotland (5.6%), but slightly lower than Scotland (7.9%) and the UK (14.4%) (NISRA, 2015) (ONS, 2015) (ONS, 2024d).

20.5.82 Data on the General Practitioners (GP) Workforce in Scotland collected by the NHS, indicates that, as of 2022/23, there were 307 GPs in Highland, 5.9% of the 5,209 GPs across Scotland (PHS, 2022). In the same year, there were 43,147 GPs across the UK (BSO, 2024).

20.5.83 Given that the number of registered patients in Highland is 245,258, there were approximately 799 patients per GP (PHS, 2022). This was lower than in the North of Scotland, where there were approximately 982 patients per GP, and Scotland, where on average there were 1,132 patients per GP across the country (PHS, 2022). Across the UK, there were approximately 1,706 patients per GP (BSO, 2024).

20.5.84 Based on this data, there is less pressure on GP services, in terms of the number of patients per GP, in Highland and the North of Scotland, than across Scotland and the UK.

20.5.85 The tourism and recreation baseline identifies the scale of the tourism economy and provides an overview of marine recreation. This includes an overview of visitor numbers and their spending. Since this information is not available at the electoral ward level of Stonehaven and Lower Deeside (the TRSA), data on Grampian has been used to form a view of more localised trends. This includes Aberdeenshire, Aberdeen City and Moray.

20.5.86 The latest figures show that in 2023, Grampian attracted 1.1 million domestic overnight visitors, who spent an average of approximately £230 per visit, amounting to a total of £252 million. This accounted for 8% of the total spend in Scotland from domestic overnight visits in 2023.

20.5.87 Grampian also attracted 278,000 international overnight visitors in 2023, or 8% of all international overnight visitors to Scotland. These visitors contributed a total £158 million in spending.

20.5.88 In 2015, the Scottish Government identified sustainable tourism as a growth sector in Scotland's Economic Strategy (Scottish Government, 2015). These are economic sectors where Scotland had a comparative advantage.

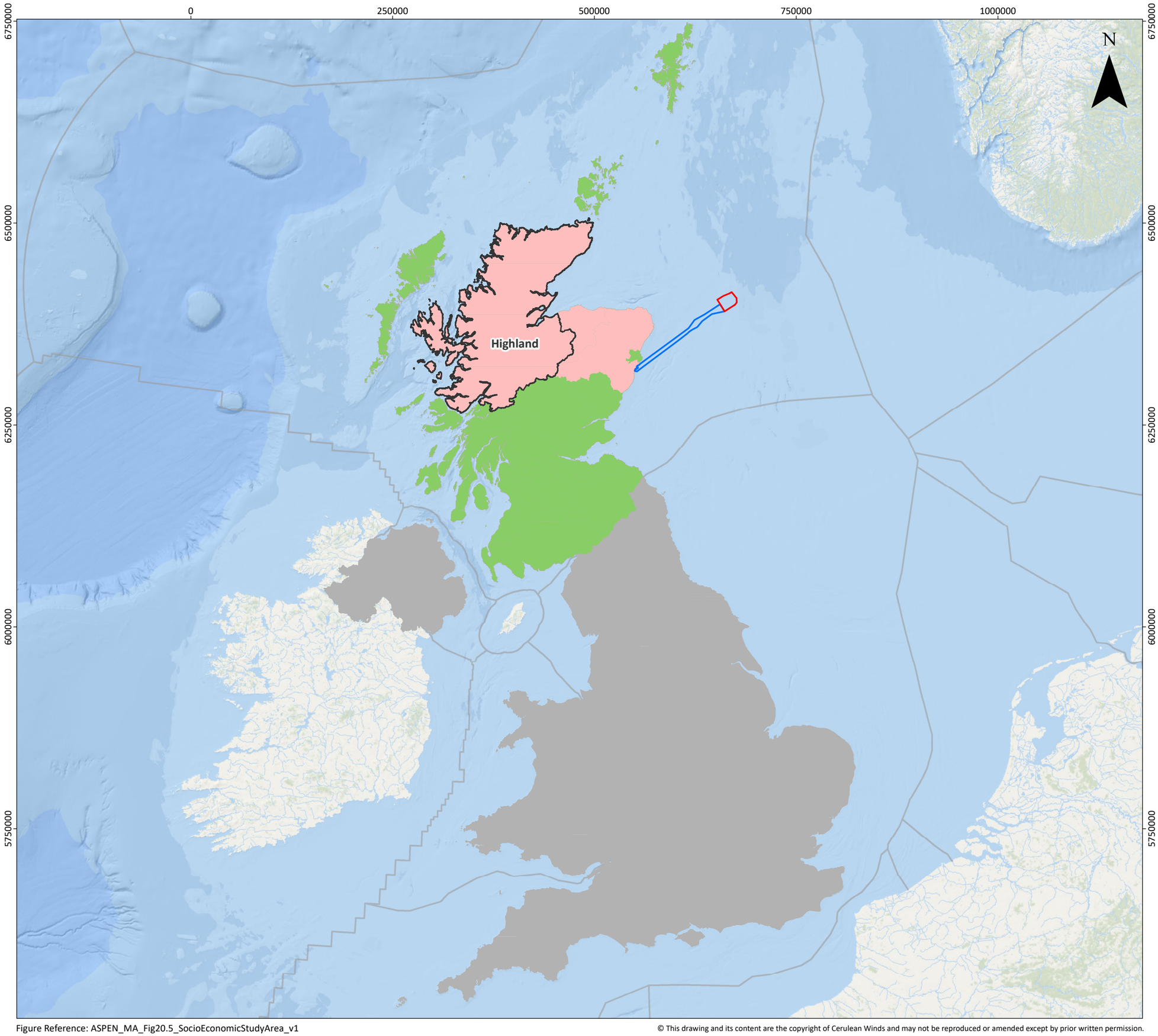
20.5.89 In 2022, the sector generated £169.9 million Gross Value Added (GVA) in Aberdeenshire, equivalent to 3.5% of the total £4.8 billion GVA generated by the sector across Scotland that year. The sector employed 8,000 people in Aberdeenshire, accounting for 3.5% of the total employment of 229,000 in sustainable tourism across Scotland (Scottish Government, 2023).

20.5.90 In 2023, employment in tourism related sectors accounted for 8.5% of total employment in Aberdeenshire, a smaller proportion than that across Scotland (11.3%), and the UK (10.5%) (ONS, 2024b).

20.5.91 Whilst the facilities at Ardersier Port are not designed for leisure purposes, the coastline nearby hosts a range of marine recreational activities.

20.5.92 Chanonry and Nairn Sailing Clubs, located in Fortrose and Nairn respectively, offer dinghy and yacht cruising and racing. Several training centres are also located around Inverness, including the Seaport Marina, Highlands & Islands University Sailing Club, Compass Sea School Ltd, and SCC Inverness (RYA, 2025).

20.5.93 Inverness Sub Aqua Club (ISAC), a scuba diving club, is also located in Inverness, offering regular dives for most of the year, and providing access to dive sites along the coastline (ISAC, 2025).



CERULEAN WINDS

Aspen Offshore Wind Farm
Environmental Impact Assessment

Socio-Economics Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- United Kingdom
- Scotland
- The North of Scotland
- Highland Local Authority Area

Notes

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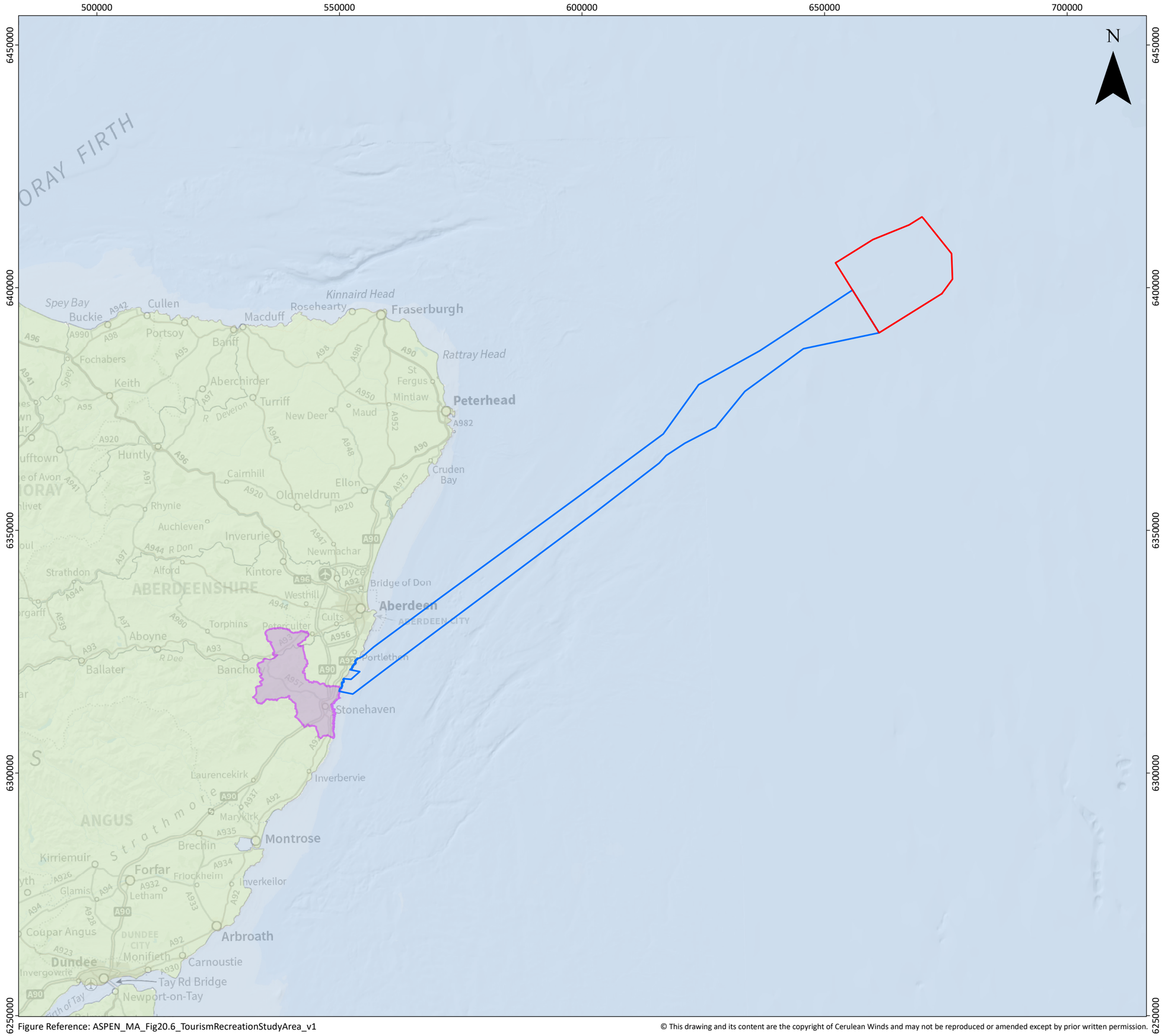
Figure 20.5

Figure Reference: ASPEN_MA_Fig20.5_SocioEconomicStudyArea_v1



Aspen Offshore Wind Farm
Environmental Impact Assessment

Tourism and Recreation Study Area

Legend

- Aspen Array Area
- Offshore Transmission Cable Corridor
- Stonehaven and Lower Deeside Electoral Ward

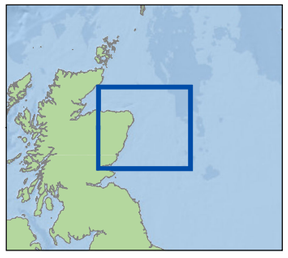


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Figure 20.6

Figure Reference: ASPEN_MA_Fig20.6_TourismRecreationStudyArea_v1

Study Area

20.5.94 The study area for the Climate Change Resilience Assessment (CCRA), as outlined in **Volume 2, Chapter 18: Climate,** encompasses the offshore boundary of the Proposed Development (including the Array Area, Offshore Transmission Cable (OTC) Corridor, and the intertidal area seaward of MHWS), inclusive of construction and operational areas.

20.5.95 The study area for the In-combination Climate Impact (ICCI) assessment corresponds to the study areas outlined for each EIA topic, as detailed in Chapters 7 to 19.

20.5.96 The study area for the Green House Gas (GHG) impact assessment covers all of the infrastructure and activities required to construct, operate and maintain, and decommission the Proposed Development.

Baseline Environment

20.5.97 To provide a broad overview of the baseline climate for Scotland, the State of the UK Climate 2023 report (International Journal of Climatology, 2024) is summarised in this section.

20.5.98 Scotland has experienced an upward trend in mean annual temperatures. Specifically, the most recent decade (2013-2022) has been 0.2°C warmer compared to the 1991–2020 average and 1.1°C warmer relative to the 1961–1990 baseline.

20.5.99 The annual rainfall intensity in Scotland has slightly increased, with values showing a marginal rise from 7.4 millimetres per day (mm/day) during 1961–1990 to 7.8 mm/day in 2013–2022. Scotland saw a 52% increase in rainfall during February over the 1961–1990 baseline, reflecting a broader trend of increased precipitation intensity during the colder months.

20.5.100 Wind speeds have shown no significant long-term change, maintaining a consistent annual mean wind speed around 11.2 knots (kt) in recent years. Notably, the named storms Malik and Corrie brought extreme wind speeds in January 2022, with gusts exceeding 100 kt on Scotland's mountain summits.

20.5.101 Sea level around Scotland is rising, in line with global trends. The rate of sea-level rise since the 1960s has increased to approximately 2.4 ± 0.3 millimetres per year (mm/year). Notably, the period from 1993 to 2022 saw an increase in sea level by 11.4 cm around the UK, indicative of accelerated sea-level rise during recent decades.

20.5.102 The 'Met Office Eastern Scotland: Climate' report (Met Office, 2016) also provides a regional climate summary for land conditions in eastern Scotland with a focus on the 30-year averaging period of 1981-2010.

20.5.103 Mean annual temperatures over the region vary from about 9 °C close to the Firth of Forth to less than 6 °C over the higher ground of the Grampians. Within the region, significant variations in temperature arise from the combined effects of proximity to the coast, topography and, to a lesser extent, urban development.

20.5.104 January is the coldest month, with daily minimum temperatures varying from about 2 °C in areas of East Lothian and Fife bordering the Firth of Forth and on the NE coast of Grampian, to less than -2 °C over the higher ground

20.5.105 Maximum temperatures can occur in July or August and are usually associated with heat-waves. July is the warmest month, with mean daily maximum temperatures at low levels inland approaching 20 °C, the highest in Scotland. Elsewhere in Eastern Scotland the mean maxima are somewhat lower and are less than 17 °C over the higher ground and along the coast of Grampian region.

20.5.106 Eastern Scotland is one of the windier parts of the UK, being relatively close to the track of Atlantic depressions. The strongest winds are associated with the passage of deep areas of low pressure close to or across the UK. The frequency and strength of these depressions is greatest in the winter half of the year, especially from December to February, and this is when mean speeds and gusts are high.

20.5.107 Annual rainfall totals vary from less than 700 mm in areas sheltered from the rain-bearing westerly winds (such as along the coasts of East Lothian, Fife and the Moray Firth) to over 1500 mm in the wettest area (the southern Grampians).

Infrastructure and Other Marine Users

20.5.108 This section presents a summary of the Infrastructure and Other Marine Users (IOMU) baseline environment study area and baseline conditions. A more detailed baseline is presented in Volume 2, Chapter 19: Infrastructure and Other Marine Users.

20.5.109 The IOMU study area is defined by the footprint of the Proposed Development, including the Aspen Array Area and OTC Corridor up to MHWS, plus a 10 nautical mile (NM) (18.5 km) buffer. This buffer aligns with the buffer used in the assessment of shipping and navigation shown in Figure 20.3 (see also **Volume 2, Chapter 14: Shipping and Navigation**), and considers the movement of other mobile marine activities.

Baseline Environment

20.5.110 A desk-based review identified the following key IOMU receptors and activities that overlap with the Proposed Development IOMU study area:

- Offshore renewable energy (wind, wave and tidal marine infrastructure);
- Subsea cables and utilities (telecommunication and subsea power cables);
- Carbon Capture Storage (CCS);
- Marine dredging and disposal activities; and
- Oil and Gas pipelines and other infrastructure.

20.5.111 A review of existing or proposed OWFs overlapping with the IOMU study area identified seven developments (excluding the Proposed Development) at varying stages of development:

- Muir Mhòr Offshore Wind Farm (submitted consent application),
- Hywind Scotland Pilot Park (operational),
- Aberdeen Offshore Wind Farm (operational);
- Kincardine Offshore Wind Farm (operational);
- Green Volt Offshore Wind Farm (consented);
- Salamander Offshore Wind Farm (submitted consent application); and
- Flora Offshore Wind Farm (early planning stage).

20.5.112 Muir Mhòr Offshore Wind Farm is a Joint Venture (JV) between Fred Olsen Seawind Limited and Vattenfall. The Muir Mhòr array area covers an area of approximately 200 km^2 and is located approximately 63 km east of Peterhead on the east coast of Scotland, and 20 km from the Aspen Array Area and 5.7 km from the OTC Corridor. Muir Mhòr Offshore Wind Farm will have a capacity of 1GW comprising floating offshore wind technology. The project is currently awaiting consent determination (Fred Olsen Seawind Limited and Vattenfall, 2024).

20.5.113 Hywind Scotland is a floating OWF operated by Equinor that covers approximately 4 km^2 and consists of five WTGs, four inter-array cables and one export cable connecting to Peterhead Grange substation. The Hywind Scotland array area is located approximately 25 km east of Peterhead and approximately 60.6 km west of the Aspen Array Area and 11.3 km from the OTC Corridor. The project has been operational since 2017 and has an installed capacity of 30 MW, and the 5 MW floating WTGs are moored to the seabed by three anchors, powering approximately 200,000 homes (Equinor, 2024).

20.5.114 Aberdeen OWF is also known as the European Offshore Wind Deployment Centre (EOWDC) and is Scotland's largest offshore wind test and demonstration facility. The project is located 3 km east of Aberdeen and 106.6 km from the Aspen Array Area and 9.1 km from the OTC Corridor and is made up of 11 8.8 MW fixed foundation WTGs with a capacity of 97 MW and has been operational since 2018 (Vattenfall, 2024).

20.5.115 Kincardine Offshore Windfarm Limited is an operational floating offshore wind farm to the south east of Aberdeen, approximately 8 miles from the Scottish coastline and approximately 112.8 km from the Aspen Array Area and 5.2 km from the OTC Corridor. The OWF has a capacity of 50 MW and powers 35,000 homes annually. It's the largest floating offshore wind farm in the world with the most powerful turbines installed on a floating offshore wind platform (Kincardine Offshore Windfarm Limited, 2024).

20.5.116 Innovation and Targeted Oil and Gas (INTOG) is a leasing round for offshore wind projects which aims to attract investment in innovative offshore wind projects in Scottish waters, as well as help decarbonise North Sea operations. Crown Estate Scotland awarded 13 INTOG projects Exclusivity Agreements in March 2023, of which Aspen OWF makes up one of three INTOG lease areas awarded to the Applicant, alongside Beech Offshore Wind Farm and Cedar Offshore Wind Farm. The Applicant proposes to develop connecting floating OWFs (Aspen, Beech and Cedar) within each of the Lease Areas with the potential to produce a total capacity of 1 GW of green energy. Another three INTOG sites fall within the IOMU study area, Green Volt, Flora and Salamander.

20.5.117 The Green Volt OWF is being developed by Green Volt Offshore Windfarm Ltd and is situated on the decommissioned Ettrick and Blackbird oil and gas developments 11.6 km from the Aspen Array Area and 18.1 km from the OTC Corridor. Green Volt OWF received consent in April 2024 and is due to become operational in 2029 with a fully connected UK grid connection back to the New Deer substation in Aberdeenshire. (Green Volt, 2024).

20.5.118 Salamander OWF is being developed by Simply Blue Energy (Scotland) Limited, a joint venture partnership between Ørsted, Simply Blue Group and Subsea7. The project is in the consent determination stage with a Scoping Report submitted to Scottish Ministers in March 2023 and a consent application in April 2024. The project will have an installed capacity of up to 100 MW and is located 44 km from the Aspen Array Area and 14.1 km from the OTC Corridor (Ørsted, Simply Blue and Subsea7, 2024).

20.5.119 Flora Offshore Wind Farm is currently at the early stages and has not yet been scoped but it has been proposed that it should produce 50 MW.

20.5.120 Within the IOMU study area, there are three open marine dredging and disposal sites licensed for various activities:

- Aberdeen (CR110);
- Stonehaven (FO003); and
- Stonehaven B (FO007).

20.5.121 Several subsea cables overlap with IOMU study area, including one operational telecommunication cable as well as two operational and six proposed power cable routes connecting onshore to offshore assets:

- Tampnet Central North Sea Fibre Telecommunications Company fibre-optic telecommunications cable (operational);
- Hywind Scotland OWF export cables (operational);
- Kincardine OWF export cable (operational);
- Green Volt OWF export cable (consent granted);
- NorthConnect power cable (consent granted);
- Eastern Green Link 2 power cable (consent granted);
- Muir Mhòr OWF export cable (awaiting consent decision);
- Cenos OWF export cable (awaiting consent decision); and
- Salamander OWF export cable (awaiting consent decision).

20.5.122 The Proposed Development is located in the Central North Sea (CNS), a well-developed area for oil and gas infrastructure including pipelines, wells, and surface and subsurface structures. It is anticipated that a number of these assets within the CNS will be decommissioned in the coming years.

20.5.123 There are eighteen oil and gas licence blocks that overlap with the IOMU study area and there are no oil and gas platforms within the IOMU study area (NSTA, 2023).

20.5.124 There are multiple oil and gas wells within the IOMU study area, all of which have been decommissioned, and nine subsea structures (five active and four abandoned).

20.5.125 There are three pipelines that cross the Proposed Development (NSTA, 2023):

- The Britannia to St Fergus gas pipeline (active);
- Forties C to Cruden Bay (PL8) and (PL721) oil pipeline (active); and
- Gas Fulmar A – St. Fergus natural gas pipeline (active).

20.5.126 There are currently no planned wave or tidal energy projects identified within the IOMU study area (Marine Scotland, 2024).

20.5.127 No current or potential marine aggregate extraction is licensed within the IOMU study area (Marine Scotland, 2023).

20.5.128 There are no existing nuclear developments in the study area and no new nuclear power stations will be built in Scotland under current Scottish Government policy (Scottish Government 2025).

20.5.129 There are no aquaculture facilities within the IOMU study area, and it is considered unlikely that there would be any future aquaculture development offshore in the vicinity of the Proposed Development due to the high number of OWF developments and associated cable routes in the area (DECC, 2016).

20.5.130 CCS is one of the methods used by the Scottish Government to aid the policy of decarbonising electricity generation by 2030. There are two carbon storage licences blocks within the IOMU study area (CS0003 and CS011), CS003 is 13.67 km from Aspen Array Area and 25.7 km from the OTC corridor and CS011 is 12.08 km from Aspen Array Area and 27.47 km from ECC. For the purposes of the IOMU assessment, they are considered alongside the O&G licence block.

Future Baseline Conditions

20.5.131 In line with the EIA regulations, this EIAR requires a *"description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge"*. This reflects how the baseline relevant to major accidents and disasters is expected to evolve without the Proposed Development.

Commercial Fisheries

20.5.132 Commercial fisheries patterns change and fluctuate based on a range of natural and management-controlled factors (such as market demand and prices, stock abundance and sustainability, fisheries and environmental management and gear improvements). The variations and trends in commercial fisheries activity are an important aspect of the baseline assessment and form the principal reason for the consideration of up to 13 years of key baseline data used in the commercial fisheries assessment.

20.5.133 Given the time periods assessed, the future baseline scenario would typically be reflected within the current baseline assessment undertaken. However, in this case, existing baseline data do not fully capture potential changes in commercial fisheries activity resulting from the withdrawal of the UK from the EU.

20.5.134 Following withdrawal, the UK and the EU have agreed to a Trade and Cooperation Agreement (TCA), applicable on a provisional basis from 01 January 2021. The TCA sets out fisheries rights and confirms that from 01 January 2021, and during a transition period until 30 June 2026, UK and EU vessels will continue to access respective EEZs (12 nm to 200 nm) to fish. In this period, EU vessels will also be able to fish in specified parts of UK waters between 6 nm to 12 nm.

20.5.135 Twenty five percent of the EU's fisheries quota in UK waters will be transferred to the UK over the five-year transition period; most of this quota has already been transferred and distributed across the four nations of the UK. After the five-year transition there will be annual discussions on fisheries opportunities. The TCA gradually reduces EU fishing opportunities for 55 shared stocks from 2021 to 2026 though most of the total reduction in EU fishing quota shares comes from a limited number of fish stocks. Of relevance to the North Sea, the greatest reduction in EU quota is associated with species including those targeted in the Commercial Fisheries study areas, namely herring, mackerel and Nephrops (European Parliamentary Research Service, 2022).

20.5.136 Market changes have the potential to impact fishing activity in the Regional Commercial Fisheries study area; some of the catch landed by UK vessels is exported to EU markets (e.g. brown crab) and potential tariff/non-tariff barriers could affect which species are targeted and to what extent.

20.5.137 Commercial fisheries receptors (i.e. relevant fishing fleets) could theoretically be impacted by climate change over the lifetime of the Project. Increased sea temperature/change in pH levels have the potential to affect the distribution of commercially targeted fish and shellfish stocks in the Regional and Local Commercial Fisheries study areas. Changes may result from changes in seabed habitat or natural disturbance events. Changes would be expected to have limited effects on mobile species, but with potential for effects on substrate-dependent species such as herring, and on shellfish. Changes may in turn affect commercial fishing activity in the Regional and Local Commercial Fisheries study areas over the long term; for example, altering fishing methods, targeted grounds and seasonal patterns in activity. An increase in storm events may also directly impact fishing activity in the Commercial Fisheries study areas, with changes with seasonal fishing patterns in response to changes in weather and periods of safe fishing conditions.

Shipping and Navigation

20.5.138 Analysis of the future case commercial traffic profile has been undertaken within **Volume 3: Appendix 14.1: Navigational Risk Assessment**. Overall, port traffic is forecast to remain relatively flat in the short term but grow in the long term, with tonnage 39% higher in 2050 compared to 2016. This equates to approximately a 15% increase in national freight tonnage by 2035. The long-term growth in port traffic is driven by increases in unitised freight traffic, which compensates for decreases in other freight in the short term. More locally to the Proposed Development, a gradual decline in annual freight has been seen since the early 2010s, at regional ports such as Cromarty Firth and Aberdeen, as well as local ports such as Peterhead and Dundee.

20.5.139 The majority of passenger vessel traffic through the study area are cruise ships. Therefore, the historic trend of annual cruise vessel calls at Aberdeen Harbour was considered to provide insight into the potential future passenger traffic through the area. The data indicates that the number of cruise calls to Aberdeen has historically fluctuated but remained low, although it is possible long-term increases may occur. It is unlikely that there will be a significant change to any established ferry routes in the region.

20.5.140 The UK-wide RYA Water Sports Participation Survey conducted in 2019 found that the proportion of adults participating in boating activities has fluctuated between 6% and 8% between 2002 and 2018. Between 2008 and 2018, the proportion participating in yacht cruising, motor boating and power boating have remained consistent at 0.8%, 1.1% and 0.7% respectively. Given the distance offshore and lack of major changes, it is unlikely that there will be an appreciable change in the number of recreational users due to macro trends.

20.5.141 Climate change effects may have indirect impacts on shipping and navigation. For example, the increasing frequency and severity of extreme weather events may result in negative adverse weather impacts to standard operations including, vessel speed, route efficiency, and ability to enter port. At the Proposed Development site, trends in historical data suggest adverse weather typically results in a reduction in general vessel traffic.

20.5.142 Climate projects forecast insignificant changes in the short term. The Met Office (2019) reports no clear evidence of significant changes in future storm surges based on the UK Climate Projections 2018 (UKCP18) model. Therefore, the effect on adverse weather routeing by commercial vessels due to climate change is assessed to be negligible.

20.5.143 Several factors influence a vessel's ability to safely access a port, such as the depth of navigable waters. According to UKCP18 projections, the annual time-mean sea level anomaly is expected to rise from 0.03 m in 2007 to 0.16 m by 2040 and 0.29 m by 2060. While this sea level rise may increase navigable depths, it could also negatively impact the functionality of port infrastructure. This may lead to greater tidal constraints and increased sensitivity in vessel scheduling. However, such impacts are not anticipated to be severe within the bounds of the UKCP18 projections. As a result, the overall impact of climate change on port access for commercial vessels is considered to be broadly acceptable.

20.5.144 Overall, the rate of change in relevant climate variables is considered very low. Consequently, climate change is anticipated to have minimal additional impact on shipping and navigation receptors over the lifetime of the Proposed Development, although some uncertainty remains within the projections.

Military and Civil Aviation

20.5.145 Although the aviation industry is under long term pressure to reduce its contribution to climate change, this is not considered to have significant implications for the Military and Civil Aviation baseline.

20.5.146 As oil and gas infrastructure is decommissioned, this will potentially reduce the volume of helicopter traffic to and from offshore platforms. However, this may be offset by the traffic associated with offshore wind developments. An increase in low-flying autonomous drone traffic can also be foreseen.

Socioeconomics, Tourism and Recreation

20.5.147 From 2023 to 2043, the population of Highland is expected to decrease by 1.3%, from 236,330 to 233,250. This projected loss of population is over six times greater than the 0.2% population decline projected for the North of Scotland over the same period. In contrast, the total population of Scotland is projected to increase by 5.1% by 2043, whilst the population of the UK is expected to grow by 10.7% (ONS, 2025).

20.5.148 An important aspect of these demographic changes is the shift in the population of individuals aged 16 to 64 years old. During the period to 2043, the share of the population aged 16-64 years old in Highland is expected to reduce by 4.2%, equivalent to the overall reduction of approximately 11,650 working age people. Similarly, the share of the working age population across the North of Scotland is projected to decline by 3.8%, equivalent to the reduction of more than 23,350 working age people. Over the same period, this population demographic is projected to decrease by 2.4% and 0.6% percent across Scotland, and the UK, respectively.

20.5.149 The anticipated reduction in the 16–64-year-old population of Highland and the North of Scotland presents a challenge to economic and labour market stability. Without effective measures to attract and retain a skilled workforce, Highland and the North of Scotland may face workforce shortage. The opportunities for employment within the oil and gas sector are likely to decline (Robert Gordon University, 2022) and unless this is matched by a growth in employment opportunities from the renewables sector it is likely to exasperate projected population decline in the working age population. Since 2015, the number of people employed in the oil and gas sector has decreased by a third and the working age population of the North East of Scotland has declined by 5%. The growth of sectors that provide high quality jobs will therefore be an important driver of the population trends and economic performance of Highland and the North of Scotland.

Climate

20.5.150 Volume 2, Chapter 18: Climate goes into detail regarding the effects of climate change including in the event that the Proposed Development is not constructed.. The summary of relevant points in this Chapter looks at the changes in storm surge events and sea level rise.

20.5.151 There is potential for changes in the severity of future storm surge events, however, the Met Office finds no evidence for significant changes in future storm surges using the United Kingdom Climate Projections 2018 (UKCP18) model (Met Office, 2018).

20.5.152 While sea level rise over the coming centuries may affect tidal characteristics substantially (including total range), the atmospheric contribution to storm surges is unlikely to change. Extreme sea levels will increase due to the rise in mean sea level. However, best estimates suggest no additional change due to the atmospheric contribution to extreme sea level.

20.5.153 In relation to wave height and frequency, under the Representative Concentration Pathway 8.5 emission scenario, the Coupled Model Intercomparison Project 5 simulations suggest an overall decrease in mean significant wave height around most of the UK coastline of 10-20% over the 21st century. The model projections show changes in annual maximum significant wave height also of up to 10-20%, but the sign of change differs among models and coastal location (Met Office, 2018).

20.5.154 There is potential for significant growth in offshore wind energy within Scotland, with the Scottish Government setting out plans to increase offshore wind capacity to 11 GW of energy installed by 2030. Within the IOMU study area, Muir Mhòr Offshore Wind Farm, a Scotwind project, is currently awaiting consent determination (Fred Olsen Seawind Limited and Vattenfall, 2024).

20.5.155 There are two INTOG sites (Flora and Salamander OWFs) located within the IOMU study area. Salamander OWF is in the consent determination stage with a Scoping Report submitted to Scottish Ministers in March 2023 and a consent application in April 2024. Flora OWF, this will be the first of British Petroleum's (BP) floating offshore developments. This project has not yet been scoped and there is little information about this in the public domain.

20.5.156 In relation to the future baseline for subsea cables, there is potential development for export cables from Scotwind and INTOG projects within the study area. The scoping boundary for the ECC for Bowdun windfarm runs through the southern section of the study area.

20.5.157 The scoping boundary for ECC for the MarramWind OWF which is being developed by ScottishPower Renewables and Shell also overlaps with the study area. A Scoping Report for the project was submitted to Marine Scotland and Aberdeenshire Council in January 2023 (ScottishPower Renewables and Shell, 2023).

20.5.158 The offshore export cables for Cenos, an INTOG floating offshore windfarm development project located 185 km offshore east of Aberdeen, run through the centre of the IOMU study area. The Developers (a JV between Flotation Energy and Vårgrønn) submitted a consent application in December 2024.

20.5.159 The offshore export cables for the proposed Salamander OWF marginally overlap with the northern section of the IOMU study area (15.4 km from the OTC corridor) (Ørsted, Simply Blue and Subsea7, 2023).

20.5.160 Additionally, there are power cables/interconnectors that are also in the future baseline. The consented NorthConnect power cable between Scotland and Norway, to enable the exchange of renewable wind and hydro power, also runs through the study area. Construction of the NorthConnect interconnector cable was proposed to be undertaken between 2021 to 2024 (NorthConnect, 2018). The NorthConnect interconnector project has been consented, but offshore works have yet to commence at the time of writing.

20.5.161 The Buchan oil field is under the ownership of Jersey Oil and Gas and Neo Energy Group. NEO Energy proposed to redevelop the Buchan field and rename it Buchan Horst field. The cable route (power from shore) runs through the IOMU study and is in an early planning phase with little public information available.

20.5.162 Scottish & Southern Electricity Networks Transmission and National Grid Electricity Transmission have secured consent in August 2024 to install a power cable (Eastern Green Link 2) between Peterhead and Fraisthorpe, on the East Yorkshire coast. The EGL2 project has been consented but offshore works have yet to commence at the time of writing.

20.5.163 The future baseline scenario for recreational activities is considered unlikely to change substantially in the absence of the Proposed Development. The future baseline scenario for recreational sailing and motor cruising, recreational fishing and other recreational activities is likely to gradually increase in line with population growth in Scotland, however, this is unlikely to represent a substantial change in the short term.

20.5.164 Oil and gas are vital to Scotland and were responsible for nearly 90% of the country's primary energy in 2015 (Scottish Government, 2017). Although the sector is seen as a critical and integral component to the economy, support for oil and gas programs moving forward will be conditional on the sector's actions to facilitate sustainable energy transitions for the future (Scottish Government, 2017). Oil and gas are expected to remain an important part of the energy security as the Scottish Government transitions towards net zero emissions by 2045 (Scottish Government, 2023). As there is a shift towards more utilisation of renewable sources of energy, the baseline environment for oil and gas activity in the vicinity of Proposed Development is unlikely to change. However, there may be a possibility of developments in oil and gas blocks in the future.

20.5.165 There are currently no active licences for marine aggregate extraction in the IOMU study area and therefore the baseline environment for marine aggregates mining activity in proximity to the Proposed Development is unlikely to change. However, there is currently potential for marine aggregate extraction to increase in line with the increased demand for aggregate utilisation in gravity bases for marine renewable energy infrastructure and in coastal defence construction (Scottish Government, 2015).

20.5.166 The future baseline scenario for marine disposal sites is subject to gradual changes as new projects and/or sites are further identified.

Data Limitations and Assumptions

20.5.167 The Major Accidents and Disasters Chapter has captured all relevant and up-to-date data that has been publicly available, as cited in the relevant EIAR Chapters. The data are therefore limited to what is available and by what has been made available, at the time of writing the Offshore EIAR. It is considered that the data employed in the assessment are robust and sufficient for the purposes of the assessment of effects presented.

20.6 Major Accidents and Disasters Assessment Methodology

20.6.1 The major accidents and disasters assessment of effects has followed the methodology set out in the following guidance:

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

20.6.2 This approach directs the assessment to focus on low likelihood but potentially high consequence events such as a major spill, explosion, fire, etc. Smaller incidents (spills, sediment loss, etc.) are addressed elsewhere in the Offshore EIAR in the relevant topic chapters and this Chapter therefore focuses on major events only.

20.6.3 The approach to assessment in this Chapter includes three steps:

- Screening: identifies if a development has a vulnerability to major accidents and/or disasters and to consider whether a development could lead to a likely significant effect;
- Scoping: determine in more detail whether there is potential for likely significant effects as a result of major accidents and/or disasters associated with a development; and
- Assessment: provides further understanding on the likelihood of a risk event occurring and identifies the requirement for further mitigation.

20.6.4 In addition, the major accidents and disasters assessment of likely significant effects has considered the legislative framework as defined by Health and Safety at Work, etc Act 1974 and its relevant statutory provisions.

Criteria for Assessment

20.6.5 Table 20.5 provides the level of harm which is considered to represent a major accident or disaster. So, any level of harm which is less than that given in Table 20.5 is discounted as it is not considered to be a major accident or disaster under commonly accepted major accident criteria drawn from standard industry practice endorsed by the HSE and the Environment Agency (CDOIF, 2016), (HSE, 2001). The criteria are set at different levels based upon the relative sensitivity and scarcity of the receptors, and the thresholds have been determined using industry best practice based upon a) criteria for notification of a major accident to the European Commission under Article 18(1) of Seveso III Directive and Regulation 26 of the COMAH Regulations 2015 (cited in IEMA, 2020) and b) DETR (1999).

Table 20.5 Major Accident threshold by Receptor Type

Receptor Type	Major Accident/Disaster Threshold
Population and Human Health – Human Populations (public)	Substantial number (5+) of people requiring medical attention or any life-changing injuries/fatalities. Events of this magnitude may also involve some damage to housing, with low numbers of people being displaced. Potential for localised interruption to utilities and damage to infrastructure.
Population and Human Health – Human Populations (workers)	Multiple life changing injuries or fatalities.
Designated Land or Water Sites (Internationally important)	>0.5 hectares (ha) or 5-25% of site area or 5-25% of associated linear feature or population.
Designated Land or Water Sites (Nationally important)	>0.5 ha or 10-50% of site area, associated linear feature or population.
Other Designated Land	10-100 ha or 10-50% of land.
Scarce Habitat	2-20 ha or 10-50% of habitat.
Widespread Habitat – non-designated land	Contamination of 10-100 ha of land, preventing growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10ha or more of vacant land.
Widespread Habitat – non-designated water	Contamination of aquatic habitat prevents fishing or aquaculture or renders it inaccessible to the public.
Particular Species	Loss of 1-10% of animal or 5-50% of plant ground cover.
Marine	2-20ha littoral or sub-littoral zone, 100-1,000ha of open sea benthic community, 100-1,000 dead sea birds (500-5,000 gulls), 5-50 dead or significantly impaired sea mammals.
Fresh and Estuarine Water Habitats	Water Framework Directive (European Commission, 2000) chemical or ecological status lowered by one class for 2-10km of watercourse or 2-20ha or 10-50% area of estuaries or ponds. Interruption of drinking water supplies, as per Groundwater Source of Drinking Water.
Groundwater (drinking water source)	Interruption of drinking water supplied from a ground or surface source (where persons affected x duration in hours [at least 2] >1,000) or for England and Wales only 1-10ha of SPZ where drinking water standards are breached.
Groundwater (non-drinking water source)	1-100ha of aquifer where water quality standards are breached (or hazardous substance is discernible).
Soil or Sediment	Contamination of 10-100ha of land etc. as per widespread habitat; contamination sufficient to be deemed environmental damage (Environmental Liability Directive).
Built Environment (designated buildings/sites)	Damage sufficient for designation of importance to be withdrawn.

20.6.6 As part of the project design process, several designed-in measures have been proposed to reduce the potential for impacts on environmental and human receptors. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Proposed Development and have therefore been considered in the assessment (i.e., the determination of magnitude and therefore significance assumes implementation of these measures).

20.6.7 These measures are considered standard industry practice for this type of development. The embedded commitments relevant to major accidents and disasters are presented in Table 20.6. Volume 3, Appendix 4.2: Commitments Register, provides additional information on how these commitments are secured.

20.6.1 In accordance with the Institute of Environmental Management and Assessment Guide to Delivering Quality Development (IEMA 2016), embedded commitments are described using the following classifications:

- Primary mitigation – embedded commitments built into the design of the Proposed Development which reduce or avoid the likelihood or magnitude of an adverse environmental effect, including location or design (also referred to Embedded Mitigation);
- Secondary mitigation – additional measures implemented to further reduce environmental effects to 'not significant' levels (where appropriate) and do not form part of the fundamental design of the Proposed Development; and
- Tertiary mitigation – commitments that are required through standard practice or to meet legislative requirements and are independent of any EIA assessment.

20.6.2 The embedded commitments presented in Table 20.6 collectively aim to mitigate the impact of offshore infrastructure on major accidents and disasters.

20.6.3 The commitments are a combination of measures including:

- Clearly defined design and layout parameters (C-OFF-02, C-OFF-05, C-OFF-26, C-OFF-43);
- Preparation and adherence to construction, O&M and decommissioning plans (C-OFF-07, C-OFF-08, C-OFF-10, C-OFF-11, C-OFF-21, C-OFF-26, C-OFF-31, C-OFF-41, C-OFF-49);
- Marking of the Proposed Development on charts (C-OFF-20, C-OFF-29, C-OFF-30);
- Appropriate lighting and marking of the Proposed Development (C-OFF-20, C-OFF-29, C-OFF-46, C-OFF-51);
- Promulgation of information about construction, O&M and decommissioning activities alongside ongoing liaison with the fishing industry (C-OFF-13, C-OFF-14, C-OFF-15, C-OFF-16, C-OFF-17, C-OFF-25, C-OFF-28);
- Use of guard vessels (C-OFF-24) and Safety Zones (C-OFF-23) will work to mitigate risks to and from surface navigation during all project phases; and
- Development of emergency response plans through consultation with appropriate bodies (C-OFF-52, C-OFF-55, C-OFF-56).

20.6.4 Snagging risks will be minimised by:

- Appropriate cable installation (C-OFF-04. C-OFF-26, C-OFF-28);
- Cable burial as the preferred method of protection (C-OFF-39);
- Adherence to a dropped objects procedure (C-OFF-09);
- Protection of crossed cables and pipelines (C-OFF-32, C-OFF-50); and
- Cable surveys (C-OFF-42).

Table 20.6 Embedded Commitment Measures of Relevance to Major Accidents and Disasters

Code	Commitment	Commitment Type	How Commitment is Secured
C-OFF-02	Wind Turbine Generators (WTGs) will have a maximum blade tip height of 310 m above Highest Astronomical Tide (HAT), the rotor diameter will not exceed 280 m and have a minimum blade clearance of 23 m above HAT.	Primary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Design Statement.
C-OFF-04	Development of and adherence to a Cable Plan (CaP). The CaP will confirm planned cable routing, burial and any additional protection and will set out methods for post-installation cable monitoring as secured by Section 36 and Marine Licence consent conditions. The CaP is likely to be supported by a Cable Burial Risk Assessment (CBRA), which will outline how external cable protection shall be used and/or reduced, should cable burial be practicable.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Cable Plan.
C-OFF-05	Development of and adherence to a Development Specification and Layout Plan (DSLP). The DSLP will confirm layout and relevant design parameters.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Development Specification and Layout Plan.
C-OFF-07	Development of a Construction Method Statement (CMS) which details the proposed construction methods and roles and responsibilities of parties involved.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Method Statement.
C-OFF-08	Development of and adherence to a Construction Programme (CoP) to confirm the timeline for construction.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Programme.
C-OFF-09	All dropped objects will be reported. Where recovery is practicable and the dropped object may cause a hazard, object will be retrieved.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be

Code	Commitment	Commitment Type	How Commitment is Secured
			provided in the Project Environmental Management Plan.
C-OFF-10	Development of and adherence to an Outline Environmental Management Plan (EMP) as part of the consent application and finalisation of the EMP prior to the start of construction. This will set out mitigation measures and procedures relevant to environmental management, including but not limited to chemical usage, invasive and non-native species, pollution prevention and waste management.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Project Environmental Management Plan.
C-OFF-11	Development of and adherence to a Decommissioning Programme (DP). The DP will outline measures for the decommissioning of the Proposed Development.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Decommissioning Programme.
C-OFF-12	Development of and adherence to a Vessel Management Plan (VMP). The VMP will confirm the types and numbers of vessels that will be engaged on the Proposed Development and consider vessel coordination including indicative transit route planning.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Vessel Management Plan.
C-OFF-13	Appointment of a Fisheries Liaison Officer (FLO) to facilitate engagement with the commercial fishing industry.	Tertiary	Appointing a FLO
C-OFF-14	Development of and adherence to a Fisheries Mitigation Monitoring and Communication Plan (FMMCP). The FMMCP will set out the means of ongoing fisheries liaison through construction and operation and maintenance (O&M) phases of the Proposed Development and detail any mitigation measures of relevance to commercial fisheries to be put in place.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Fisheries Mitigation, Monitoring and Communication Plan.
C-OFF-15	Ongoing liaison with fishing fleets will be maintained during construction, maintenance and decommissioning operations via an appointed Fisheries Liaison Officer (FLO) and Fishing Industry Representative.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Fisheries Mitigation,

Code	Commitment	Commitment Type	How Commitment is Secured
			Monitoring and Communication Plan.
C-OFF-16	Adherence to best practice guidance with regards to fisheries liaison and procedures in the event of interactions between the Proposed Development and fishing activities (e.g., FLOWW, 2014; 2015).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Fisheries Mitigation, Monitoring and Communication Plan.
C-OFF-17	Participation in any fisheries working group to assist with liaison between the Proposed Development and the fishing community.	Tertiary	Participation in fisheries working groups
C-OFF-20	Development of and adherence to a Navigational Safety Plan (NSP). The NSP will describe measures put in place by the Applicant related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Proposed Development activity to other sea users (e.g., via Notice to Mariners).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.
C-OFF-21	Development of a Construction Environmental Management Plan (CEMP) to identify the project management structure roles and responsibilities with regard to managing and reporting on the environmental impact of the construction phase.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Environmental Management Plan.
C-OFF-22	Development of and adherence to an Operation and Maintenance Programme (OMP) to safeguard environmental interests during operation and maintenance (O&M).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Operation and Maintenance Programme.
C-OFF-23	Applications to be made, where appropriate, for Safety Zones (500 m) for construction and major maintenance works, and for pre commissioning works (50 m).	Secondary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.

Code	Commitment	Commitment Type	How Commitment is Secured
C-OFF-24	Use of guard vessels where deemed appropriate to ensure adherence with Safety Zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation during construction, maintenance and decommissioning phases. Such impacts may include partially installed structures or cables, extinguished navigation lights or other unmarked hazards.	Secondary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.
C-OFF-25	Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notices to Mariners and Kingfisher Bulletins.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.
C-OFF-26	Compliance with Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2021) and its annexes where applicable (including consideration of a Search and Rescue (SAR) checklist, an Emergency Response and Cooperation Plan (ERCoP) and Under Keel Clearance. Consideration will also be given to MGN 654 Search and Rescue (SAR) Annex 5 (MCA, 2024).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Cable Plan, Construction Method Statement and Development Specification and Layout Plan.
C-OFF-27	Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably the International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1974) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.
C-OFF-28	Notification of damage or decay to cables to the Maritime and Coastguard Agency (MCA), Northern Lighthouse Board (NLB) Kingfisher and UK Hydrographic Office (UKHO) within 24 hours of discovery.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan.
C-OFF-29	Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance and as advised by Northern Lighthouse Board (NLB), MCA and CAA and MoD as appropriate. This will include a buoyed construction area around the array area in consultation with NLB.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan and Lighting and Marking Plan.

Code	Commitment	Commitment Type	How Commitment is Secured
C-OFF-30	Appropriate marking of the Proposed Development on Admiralty and aeronautical charts. This will include provision of the positions and heights of structures to the UK Hydrographic Office (UKHO), CAA, Ministry of Defence (MoD) and Defence Geographic Centre (DGC).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Navigational Safety Plan and Lighting and Marking Plan.
C-OFF-31	Compliance with regulatory expectations on moorings for floating wind and marine devices published by Maritime and Coastguard Agency (MCA) and the Health and Safety Executive (HSE).	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Method Statement.
C-OFF-32	Crossing and proximity agreements with known existing pipeline and cables operators will be sought.	Tertiary	Secured by commercial agreements with pipeline and cable operators.
C-OFF-39	Where practicable, cable burial will be the preferred means of cable protection. Cable burial will be informed by the Cable Burial Risk Assessment (CBRA) and detailed within the Cable Plan (CaP). In areas where CBRA deems burial not feasible, suitable implementation and monitoring of cable protection will be employed.	Primary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Cable Plan.
C-OFF-41	Unexploded Ordnance (UXO) hazards will be avoided where practicable and appropriate. If avoidance is not possible, decision making will relate to removal, with detonation considered if avoidance or removal is not possible. If detonation is required, and where practicable and appropriate, low-order deflagration will be the preferred method. Licensing of UXO clearance works will be subject to a standalone Marine Licence (and EPS licence) application. These applications will provide details of measures to minimising impacts on marine mammals where appropriate.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Construction Environmental Management Plan.
C-OFF-42	Over trawl surveys of offshore cables will be undertaken through the operational life of the project where mechanical protection of cables laid on the sea bed has been deployed.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Cable Plan.

Code	Commitment	Commitment Type	How Commitment is Secured
C-OFF-46	Development of and adherence to a Lighting and Marking Plan (LMP). The LMP will confirm compliance with legal requirements with regards to shipping, navigation and aviation marking and lighting.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Lighting and Marking Plan.
C-OFF-49	Development of and adherence to a Wet Storage Plan (WSP) to provide details on requirements (if applicable) for assembled WTGs and cabling. WTGs to be held at a nearshore wet storage location before being transported to site.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Wet Storage Plan.
C-OFF-50	Where Offshore Transmission Cables (OTCs) must cross third party infrastructure, such as existing cables and pipelines, both the third-party asset and the installed cables will be protected.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details to be provided in the Cable Plan.
C-OFF-51	Lighting and marking failures appropriately reported/rectified as soon as possible and interim hazard warnings put in place as required.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Lighting and Marking Plan.
C-OFF-52	Development of and adherence to a Marine Pollution Contingency Plan (MPCP). The MPCP will identify potential sources of pollution and associated spill response and reporting procedures.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Marine Pollution Contingency Plan.
C-OFF-55	Development of and adherence to an Emergency Response Cooperation Plan (ERCoP) to identify measures in place to support emergency response. Prepared in line with Marine Coastguard Agency guidance.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Emergency Response Cooperation Plan.
C-OFF-56	An Invasive Non-Native Species (INNS) mitigation plan will be developed, which details the actions that will be taken to reduce the risk of INNS introduction and spread, and therefore minimise their potential impacts.	Tertiary	Secured through Section 36 and/or Marine Licence conditions. Details provided in the Invasive Non Native Species

Code	Commitment	Commitment Type	How Commitment is Secured
			Mitigation Plan and Emergency Response Cooperation Plan.

20.6.5 This section identifies and provides descriptions of the LSE deriving from the vulnerability of the Proposed Development to major accidents and disasters. Additionally included are instances where the Proposed Development increases the probability of a hazard occurring or where the presence of the Proposed Development might exacerbate the consequences of a hazard.

20.6.6 Risks were identified using the National Risk Register (NRR), professional judgement and review of the relevant EIAR Chapters, as listed in paragraph 20.1.4.

20.6.7 The NNR separates hazards into seven themes, as set out below:

- Accidents and system failures;
- Conflict and instability;
- Geographic and diplomatic;
- Human, animal and plant disease;
- Natural and environmental;
- Societal; and
- Terrorism.

20.6.8 Under these hazard themes, identified risks are highlighted individually. Not all of the highlighted hazards are relevant to the Proposed Development and are therefore not included in the screening process. The hazards not included, and the justification for not including them, are set out in Table 20.7.

Table 20.7 Hazards in the National Risk Register That Have Been Removed From the Screening Exercise and the Justification for Doing so

Hazard Scoped Out	Justification for why the Hazard is not Relevant
Terrorism	
International terrorist attack with strategic implications	This risk is defined by a terror attack occurring internationally. The Proposed Development is in UK territory.
Northern Ireland (NI) related terrorism	The NRR defines NI related terrorism as acts that would target sites of British symbolic importance in NI. The Proposed Development is not in NI and would not be a symbol of the British State.
Terrorist attacks in publicly accessible locations	The Proposed Development is not in a publicly accessible location.
Terrorist attacks on transport	The Proposed Development is not a transport infrastructure project.
Strategic hostage taking	The NRR defines this risk as low likelihood with limited impact and would therefore not constitute a major accident or disaster.
Assassination of high-profile figure	The Proposed Development does not involve a high-profile public figure.
Larger scale Chemical, Biological, Radiological and Nuclear (CBRN) attacks	A CBRN attack is designed to cause mass casualties. As the Proposed Development is not in a public place and will have minimal persons on site, it would not be a target.

Hazard Scoped Out	Justification for why the Hazard is not Relevant
Smaller scale CBRN attacks	As above.
Medium scale CBRN attacks	As above.
Geographic and Diplomatic	
Disruption to global oil trade routes	The Proposed Development is not on a global oil trade route.
Accidents and System Failures	
Major adult social care provider failure	The Proposed Development is not part of adult social care provision.
Insolvency of supplier(s) of critical services to the public sector	The Proposed Development is not a supplier of critical services for the public sector.
Rail accident	The Proposed Development is not a railway nor supplied by one.
Accident involving high consequence dangerous goods	The Proposed Development does not involve high consequence dangerous goods.
Radiation exposure from transported, stolen or lost goods	The Proposed Development will not be transporting radioactive goods.
Failure of gas supply infrastructure	The Proposed Development is not part of gas supply infrastructure.
Civil nuclear accident	The Proposed Development is not a nuclear development.
Radiation release from overseas nuclear site	The Proposed Development is not an overseas development. Impacts on UK sites would be highly dependent on weather patterns and distance from the UK. The NRR defines this risk as extremely unlikely.
Accidental fire or explosion at an onshore major hazard (COMAH) site	The Proposed Development is an offshore site.
Accidental large toxic chemical release from an onshore major hazard (COMAH) site	The Proposed Development is an offshore site.
Accidental fire or explosion at an onshore fuel pipeline	The Proposed Development is an offshore site.
Accidental fire or explosion at an onshore major accident hazard pipeline	The Proposed Development is an offshore site.
Accidental work-related (laboratory) release of a hazardous pathogen	The Proposed Development is an offshore site with no laboratory. It is also not closely located to any known laboratory that handles pathogens.
Reservoir/dam collapse	The Proposed Development is an offshore site.
Water infrastructure failure or loss of drinking water	The Proposed Development is an offshore site and not part of water infrastructure.
Food supply contamination	The Proposed Development is an offshore site and is not related to food supply.

Hazard Scoped Out	Justification for why the Hazard is not Relevant
Natural and Environmental Hazards	
Wildfire	The Proposed Development is an offshore site.
Humanitarian crisis overseas – natural hazard event	The Proposed Development is within UK territory and therefore cannot be involved in an overseas disaster.
Disaster response in the Overseas Territories	The Proposed Development is within UK territory and therefore cannot be involved in an overseas disaster.
Fluvial flooding	The Proposed Development is an offshore site and would have no impact on rivers.
Surface water flooding	The Proposed Development is an offshore site and would have no impact on flood risk or defense.
Human, Animal and Plant Disease	
Animal Disease – major outbreak of: ▪ Foot and Mouth Disease; ▪ Highly pathogenic avian influenza; ▪ African horse sickness; or ▪ African swine fever.	The Proposed Development is an offshore site with no connection to animal husbandry.
Major outbreak of plant pests: ▪ *Xyella fastidiosa; or* ▪ *Agrilus planipennis.*	The Proposed Development is an offshore site with no connection to terrestrial plants.
Societal	
Public disorder	The Proposed Development is an offshore site that is not publicly accessible.
Reception and integration of British Nationals arriving from overseas	The Proposed Development has no impact on British Nationals arriving from overseas.
Conflict and Instability	
Attack on a UK ally or partner outside NATO or a mutual security agreement requiring international assistance	The Proposed Development is within UK territory and therefore cannot be involved in an overseas agreement.
Nuclear miscalculation not involving the UK or its allies	The Proposed Development has no connection to overseas nuclear usage.

20.6.9 The remaining risks identified by the NRR have been included in the screening exercise alongside project specific hazards identified by the industry. Table 20.8 lists the hazards identified, the potential receptors and whether they are scoped in and therefore require assessment within this chapter.

Table 20.8 Impacts Scoped in to and out of the Major Accidents and Disasters Assessment with Justification

Hazard	Scoped into Assessment	Justification	Receptors
Terrorism			
Conventional attacks on infrastructure	No	The NRR states that there have been no successful attacks on electricity infrastructure in the UK and that both the government and the Electricity System Operator have robust response plans in place in the unlikely event that significant electricity supply disruption should occur. A reasonable worst-case scenario would be a regional loss of power, likely to be resolved in the short term. The Proposed Development is no more vulnerable to this type of hazard than any other project.	Population and human health, Biodiversity, material assets
Cyber-attacks on infrastructure	No	This event would likely result in a short term incident revolving around financial gain for the attacker(s), and not result in a major accident or disaster. The Proposed Development is no more vulnerable to this type of hazard than any other project.	Material assets
Accidents and Systems Failures			
Insolvency affecting fuel supply	No	This event would have a negligible effect on the Proposed development, likely resulting in delays to construction, O&M or decommissioning activities.	Material assets
Large passenger vessel accident	Yes	The NRR defines this hazard as a large passenger vessel sinking in UK waters. Risk of loss of life, environmental damage and damage to Project infrastructure and other marine users. Is considered under Vessel Interactions (collision, allision)	Population and human health, Biodiversity, material assets
Major maritime pollution incident	No	The NRR defines this hazard as a spillage of oil from a tanker or leakage from a pipeline. Marine pollution is considered under Proposed Development specific risks below.	Biodiversity, material assets
Incident of a vessel blocking a major port	No	This event would have a negligible effect on the Proposed development, likely resulting in delays to construction, O&M or decommissioning activities. Should the vessel that is blocking the port be related to the Proposed Development, the assessment considers it under Vessel Interactions (collision, allision). The Proposed Development is no more vulnerable to this type of hazard than any other project.	Population and human health, Biodiversity, material assets
Aviation collision	No	The NRR defines the reasonable worst case aviation collision as two aircraft colliding during landing maneuvers over a major urban area. As the Proposed Development is not an airport, nor located over a major urban area, this hazard can be scoped out of the assessment.	Population and human health, Biodiversity, material assets
Disruption of space-based services	No	This event would have a negligible effect on the Proposed development.	Material assets
Loss of Positioning, Navigation and Timing (PNT) services	No	This event would have a negligible effect on the Proposed development. Loss of navigation systems would likely result in vessel collisions or allisions which are considered under Vessel Interactions (collision, allision).	Population and human health, material assets
Simultaneous loss of all fixed and mobile forms of communication	No	This event would have a negligible effect on the Proposed development. Loss of communication systems would most likely result in vessel collisions or allisions which are considered under Vessel Interactions (collision, allision).	Population and human health, Material assets
Failure of the National Electricity Transmission System (NETS)	No	The NRR defines this risk event as a total failure of the NETS resulting in a nationwide loss of power including critical systems. The Proposed Development is no more vulnerable to this type of hazard than any other project and managing the event would be a national effort. The incident itself would have a negligible impact on the Proposed Development as the OWF is an electricity generation asset.	Material assets
Regional failure of the electricity network	No	This event would have a negligible effect on the Proposed development.	Material assets
Technological failure at a systemically important retail bank	No	This event would have a negligible effect on the Proposed development.	Material assets
Technological failure at a UK critical financial market infrastructure	No	This event would have a negligible effect on the Proposed development.	Material assets
Accidental fire or explosion on an offshore oil or gas installation	No	The Proposed Development is not an offshore oil or gas installation.	Population and human health, biodiversity, air quality and climate, material assets
Major fire	Yes	A major fire may lead to serious damage to the environment through harmful emissions to air and sea and create a localised fire hazard, however the location away from populated areas limits the scale of impact.	Population and human health, biodiversity, air quality and climate, material assets and land

Hazard	Scoped into Assessment	Justification	Receptors
Natural and Environmental Hazards			
Volcanic eruption	No	The Proposed Development is not located near to any known volcanic activity	Population and human health, Biodiversity, material assets
Earthquake	No	The Proposed Development is not located in a geologically active area.	Population and human health, Biodiversity, material assets
Severe space weather	No	This event would have a negligible effect on the Proposed development.	Population and human health, Biodiversity, material assets
Storms (extreme weather)	No	Damage to infrastructure from severe weather is unlikely to result in hazards with significant risk. In cases where infrastructure is damaged and turbine blades are lost to sea, this is considered unlikely to cause injury.	Biodiversity, material assets
High temperatures and heatwaves	No	**Volume 2, Chapter 18: Climate** considers the effect of high temperatures; however, such events are considered unlikely and would have minimal interaction with the Proposed Development.	Biodiversity, climate
Low temperatures and snow	No	**Volume 2, Chapter 18: Climate** considers the effect of low temperatures; however, such events are considered unlikely and would have minimal interaction with the Proposed Development.	Biodiversity, climate
Coastal flooding	No	The Proposed Development is an offshore site, and all the construction activities will be conducted in the marine environment, having no impact on coastal flooding.	Population and human health, Biodiversity, material assets
Drought	No	This event would have a negligible effect on the Proposed development.	Biodiversity, climate
Poor air quality	No	This event would have a negligible effect on the Proposed development.	Population and human health, air quality
Human, Animal and Plant Disease			
Pandemic	No	This event would have a negligible effect on the Proposed development, likely resulting in delays to construction, O&M or decommissioning activities.	Population and human health
Outbreak of an emerging infections disease	No	This event would have a negligible effect on the Proposed development, likely resulting in delays to construction, O&M or decommissioning activities.	Population and human health
Societal			
Industrial Action	No	This event would have a negligible effect on the Proposed development, likely resulting in delays to construction, O&M or decommissioning activities.	Population and human health, material assets
Conflict and Instability			
Deliberate disruption of UK space systems and space-based services	No	This event would have a negligible effect on the Proposed development.	Population and human health, biodiversity, material assets
Proposed Development Specific Hazards			
Vessel interactions (collision, allision)	Yes	Risk of loss of life, environmental damage, and damage to Proposed Development infrastructure and other marine users	Population and human health, biodiversity, material assets
Aviation collision with infrastructure	Yes	Risk of loss of life, environmental damage, and damage to Proposed Development infrastructure and other marine users	Population and human health, biodiversity, material assets
Workplace accidents	Yes	Risk of loss of life and/or major injuries impacting human health.	Population and human health
Exposed cables leading to vessel snagging	Yes	Risk of loss of life, environmental damage, and damage to Proposed Development infrastructure and other marine users	Population and human health, biodiversity, material assets
Disturbance of UXO	Yes	Risk of loss of life and damage to infrastructure	Population and human health, biodiversity, material assets
Floating WTG breaking free from moorings	Yes	Risk of loss of life and damage to Project infrastructure and other marine users.	Population and human health, biodiversity, material assets
Floating WTG breaking free during towing activities	Yes	Risk of loss of life and damage to Project infrastructure and other marine users.	Population and human health, biodiversity, material assets
Marine Pollution	Yes	Risk of environmental damage and impacts on human health.	Population and human health, biodiversity

20.7 Assessment of Likely Significant Effects

20.7.1 The hazards scoped in to the assessment of LSE are:

- Major fire;
- Vessel interactions (collision, allision);
- Aviation collision;
- Workplace accidents;
- Exposed cables leading to vessel snagging;
- Disturbance of UXO;
- Floating WTG breaking free from moorings;
- Floating WTG breaking free during towing activities; and
- Marine Pollution.

20.7.2 The following sections outline the relevant mitigation measures that reduce the level of risk for each identified hazard and the likelihood of their occurrence.

Major Fire

20.7.3 The risk of WTG or OSP fires is low; however, OSP fires can impact the supply of electricity and create a localised fire hazard. The highest appropriate levels of fire protection and resilience will be specified for the substation to minimise fire risks to ALARP. The small quantities of lubricants, fuel and cleaning equipment required within the Proposed Development will be stored in suitable facilities designed to the relevant regulations and policy design guidance. Emergency Response and Cooperation Plans (ERCoP) will be developed following discussions with the MCA, including risk assessments and designated evacuation plans for workers on board in the unlikely event of fire breaking out. Given the Proposed Development's offshore location limits access to the public, and prevents fires from spreading, including mitigation the risk of the consequences meeting the threshold for the applicable receptors is considered to be ALARP.

Vessel Interactions (collision, allision)

20.7.4 The impacts, mitigation and evaluation of the residual risk is discussed in depth in **Volume 2, Chapter 14: Shipping and Navigation** which also discusses the risk that the increased vessel movement to and from the site may pose to navigational safety during construction and operational phases, and further detail is provided in the Navigational Risk Assessment (Appendix 14.1).

20.7.5 The embedded mitigation measures (as presented in Table 20.6) include:

- Appropriate lighting and marking of infrastructure;
- Appropriate marking on admiralty charts;
- Cable Burial Risk Assessment;

- Compliance with MGN 654;
- Design Specification and Layout Plan;
- Guard Vessels during construction;
- Marine coordination;
- Minimum blade clearance;
- Navigational Safety Plan;
- Promulgation of information to mariners; and
- Vessel Management Plan;

20.7.6 In terms of shipping and navigation risks, the Navigational Risk Assessment (**Volume 3, Appendix 14.1: Navigational Risk Assessment**) includes consideration of the potential allision, collision and re-routeing both for the Proposed Development alone and cumulatively, with all effects either tolerable or broadly acceptable

Aviation Collision

20.7.7 Mitigation to avoid impacts upon aviation receptors is discussed in **Volume 2, Chapter 15: Military and Civil Aviation**. This mitigation incorporates:

- Mitigation for construction (including towing of turbines and lighting of construction plant);
- Compliance with requirements for SAR;
- Aviation obstacle lighting; and
- Helicopter Main Route mitigations.

20.7.8 With the agreement and implementation of suitable mitigation the risk is considered ALARP.

Workplace Accidents

20.7.9 Workplace accidents which could lead to major accidents will be avoided by means of training of personnel and ensuring that all personnel have all required qualifications, that qualifications are maintained, and that regular project specific information (e.g. toolbox talks) is promulgated to staff. All equipment, plant and vessels will be fit for purpose and maintained as required. In addition to training, all necessary requirements for dealing with accidents (first aid equipment, firefighting equipment) would be in place to deal with workplace accidents/incidents. With the aforementioned mitigations in place, the risk is considered ALARP.

Exposed Cables Leading to Vessel Snagging

20.7.10 The impacts, mitigation and evaluation of the residual risk resulting from this hazard are discussed in the **Volume 2, Chapter 14: Shipping and Navigation and Volume 2** and **Chapter 13: Commercial Fisheries**.

20.7.11 A Cable Plan (CaP) will be developed to set out the cable installation methods, and to identify environmental and navigational issues. The Proposed Development will use cable burial techniques, where practicable, for both the inter-array and export cables. This will enable a reduction in the potential for interactions between other marine users and the deployed cabling infrastructure associated with the Proposed Development. This is particularly important to enable the continuation of fishing activities in the locations where the cabling infrastructure has been buried. The Applicant will seek cable crossing agreements with other existing cable operators where a cable crossing is required. The Proposed Development will comply with all cabling industry standards in locations where the Proposed Development's cable infrastructure will be buried. Cable protection will be monitored as per cable suppliers' recommendations, and in agreement with power purchase customers. Further information on the intended pre-construction campaigns is outlined in **Volume 1, Chapter 3: Project Description**. The risk of this hazard occurring is considered to be ALARP

Disturbance of UXO

20.7.12 Pre-construction surveys will be undertaken by the Applicant in order to identify any potential hazards within the Aspen Array Area and OTC corridor. These will include geophysical surveys to identify seabed hazards such as discarded fishing gear or unidentified objects and magnetometer surveys to identify for the presence of UXO devices. Further information on the intended pre-construction campaigns is outlined in **Volume 1, Chapter 3: Project Description**.

20.7.13 The following strategies are presented as industry standard practices for handling UXO safely and effectively:

- Avoidance - a strategy of potential unexploded ordnance (pUXO) detection and avoidance is proposed as the most cost effective and efficient method of reducing UXO risks to ALARP. By surveying for and avoiding, where practicable, direct or indirect contact with any pUXO (the source of the risk) and by moving any intrusive activity away from such prospective hazards (where practicable), such risks are avoided;
- Removal of risk receptors - an alternative option is to remove the receptor element (of the source-pathway-receptor model), by moving certain sensitive and vulnerable receptors (typically the crews of offshore vessels), to a safe distance from the point of the intrusive activity and thus the pUXO hazard, so that it will diminish sufficiently the prospective blast, fragmentation (the former and latter are through air effects) and/or shock wave (a through water effect) consequences, in order to reduce UXO risks to ALARP;
- Removal of threat sources - Where pUXO cannot be avoided, another alternative option, is to verify pUXO by investigation and where it is confirmed unexploded ordnance (cUXO), to remove it (effectively removing the source element of the source-pathway-receptor model), either by moving it to a position where it can do no harm (but only when it is safe to do so and wherever permit licencing and consent condition allow such actions), and/or by destroying it or otherwise rendering it safe;

- In high and medium risk zones geophysical UXO survey is recommended prior to the commencement operations that are planned within the boundaries of the study area, in order to provide the basis for a strategy of pUXO avoidance, or for its identification and removal;
- Surface detection for threat spectrum UXO should consist of either Side Scan Sonar, Multi Beam Echo Sounder and/or Work Class Remotely Operated Vehicle camera search (subject to visibility and resolution, especially in areas where shallow water operations are planned), over the area of proposed operations and prior to their commencement;
- Sub-surface detection for threat spectrum UXO should also be undertaken ahead of seabed intrusive operations should consist of magnetometer/gradiometer survey over the area of the proposed operations; and
- Any vessels involved in intrusive works should be equipped with UXO specific Emergency Response plans, so that in the event of an unplanned UXO discovery the vessel Master and/or the offshore superintendent/party chief (or similar) are informed in advance about what safety actions must be taken.

20.7.14 With the mitigation in place the risk of a major accident occurring due to this hazard is determined to be ALARP.

Floating Wind Turbine Generator Breaking Free from Moorings

20.7.15 The MCA require under their Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA & HSE, 2017) that developers arrange Third party verification (TPV) of the mooring systems by an independent and competent person / body. The Regulatory Expectations state that TPV is a “continuous activity”, and that any modifications to a system or if new information becomes available with regard to its reliability, additional TPV would be required.

20.7.16 On this basis, a WTG breaking free of its moorings is considered likely to represent a low frequency event, noting that for a total loss of station, all moorings would be required to fail.

20.7.17 The Regulatory Expectations also require the provision of continuous monitoring either by Global Positioning System (GPS) or other suitable means, the Applicant will put such a system in place, with each WTG continuously monitored, and with capability of being tracked via AIS in the event of a loss of station as detailed in MGN 654. Each WTG will also have an alarm system in place, whereby an alert will be provided to the Marine Coordination Centre in the event that any floating substructure leaves a pre-defined ringfenced alarm zone. This means in the unlikely event that a floating substructure suffers total loss of station and drifts outside of its alarm zone, the Applicant would be made aware, and would be able to track its position and make the necessary emergency arrangements. The Navigational Risk Assessment concludes therefore this this impact would be broadly acceptable.

20.7.18 Any issues during tows of WTGs to and from the Aspen Array Area (either during construction or O&M) (vessel breakdowns etc) would be mitigated by existing procedures relating to shipping and navigation listed in Table 20.6, the most relevant being Navigational Safety Plan; project vessel compliance with international marine regulation; promulgation of information and the Vessel Management Plan.

20.7.19 The aim is to design out the scenario where an emergency tow is required by following appropriate design codes and draw on experience gained by the oil and gas industry. The number of mooring lines per floating substructure allows for some failure (in relation to metocean conditions or vessel allision, for example) whilst maintaining integrity of the mooring system. The materials for each mooring line are selected to ensure stability and wear resistance, whilst the attachment points are designed for fatigue.

20.7.20 During construction, all aspects of the mooring system and the attachment points will be subject to thorough scrutiny. As the floating substructures are classed as ships, there will be compliance with flag state rules and a class surveyor will be present throughout. TPV of the mooring systems will be undertaken by an independent and competent body to ensure they meet the required standards. Once at the wind farm site, a programme of inspection of the floating substructures and mooring systems will be in place on a pre-determined cycle.

20.7.21 Each unit will have a GPS system which sets off an alarm if movement goes beyond a pre-set limit, for example from a ship allision. It should be noted that this limit is less than what would be expected from a mooring failure and would trigger a response to check the moorings. The alerts will be provided to the Marine Coordination Centre.

20.7.22 The floating substructures will probably have mooring bollards that could take tow lines. However, onboard access would be required to attach tow lines, which may be challenging in adverse weather conditions. In such an event, warning mechanisms will be used to give adequate notification to ensure the safety of other sea users until weather conditions are suitable for a towing connection to be made. The procedures for emergency situations will all be detailed in an ERCoP that will be approved by the MCA and the NLB.

20.7.23 When the units are under tow to or from the Aspen Array Area there will be emergency tow bridles in place, in addition to the tow lines. The bridles float on the surface with a buoy at the free end, but these are not permanent features as the floating lines can be degraded by Ultra Violet light and marine growth, potentially failing at a critical moment.

20.7.24 With the mitigation in place the risk of a major accident occurring due to this hazard is determined to be ALARP.

20.7.25 During construction, O&M activities and decommissioning the use of fuels will be required, and some chemicals may be required on board vessels involved in the marine installation of Horizontal Directional Drilling works, as discussed in **Volume 1, Chapter 3: Project Description**. Accidental spillage of these substances has the potential to occur within the red line boundary of the Proposed Development and has the potential to spread beyond this area.

20.7.26 The Applicant will commit to undertaking construction works in adherence will all relevant best practice guidance and legislation and will prepare all necessary plans in advance of construction activities. As such, the risk of pollution due to leaks and spills from construction, O&M and decommissioning vessels and plant equipment is considered ALARP.

20.7.27 Where there is the potential for an accidental spill or leak, the focus will be on control measures that would be employed to reduce accidental releases to the environment. To ensure these are captured and implemented, a separate outline Construction Environmental Management Plan (CEMP) will be developed prior to construction. The CEMP will include measures for planning for accidental spills, address all potential contaminant releases and include key emergency contact details.

20.7.28 A Marine Pollution Contingency Plan will set out for approval, the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials. The plan will include measures to reduce instances of spills, remedial action and response measures to be used in the event of a spill or collision, and detail measures for refuelling at sea. These measures will prevent a release of hazardous material of a scale large enough to meet the thresholds set out in Table 20.5 for the affected receptors and the risk is therefore considered ALARP.

20.7.29 Table 20.9 contains a summary of the assessment of how vulnerable the Proposed Development is to major accidents and disasters and how likely it is to cause a major accident and/or disaster.

20.7.30 The Applicant has embedded mitigation measures to ensure that ALARP is achieved for all potential risks scoped into the assessment. In the unlikely scenario of an incident occurring due to processes outside of the Applicants control, the consequence of the event may include adverse significant effects on receptors within the relevant study areas.

20.7.31 In EIA terms, there are no likely significant effects identified in relation to major accidents and disasters.

Table 20.9 Assessment of Effects on Major Accidents and Disasters

Risk Event	Source / Pathway	Relevant Project Phase (s)	Source Document / Chapter	Receptor (s)	Reasonable Worst Consequence if Event did Occur	Embedded Commitments to mitigate risk	Could this Reasonably Lead to a Major Accident and / or 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?
Major Fire	Fire on a WTG or offshore structure caused by lightning strike, system, electrical or mechanical failure	Construction Operation and Maintenance Decommissioning	**Volume 1, Chapter 3: Project Description** Project Environmental Management Plan Emergency Response Cooperation Plan	Population and human health – Workforce for Proposed Development	Serious – Multiple minor injuries or injuries resulting in medium health concerns. Potential loss of life.	C-OFF-10 C-OFF-28 C-OFF-55	No	Yes	N/A
				Material assets – Infrastructure and vessels associated with the Proposed Development	Moderate – Damage to a single vessel or asset that is not critical to operations		No	Yes	N/A
Vessel Interaction (Collision and allision risk)	Vessels collide or allide with offshore infrastructure or vessels associated with the Proposed Development. Increased vessel to vessel collision due to presence of infrastructure.	Construction Operation and Maintenance Decommissioning	**Volume 2, Chapter 14: Shipping and Navigation** **Volume 3, Appendix 14.1: Navigation Risk Assessment**	Population and human health – Workforce for Proposed Development, mariners	Serious – Multiple minor injuries or injuries resulting in medium health concerns. Potential loss of life.	C-OFF-02 C-OFF-05 C-OFF-20 C-OFF-23 C-OFF-24 C-OFF-26 C-OFF-29 C-OFF-30 C-OFF-43 C-OFF-46 C-OFF-51 C-OFF-52	No	Yes	N/A
				Material assets – Infrastructure and vessels associated with the Proposed Development, third party vessels	Moderate – Damage to a single vessel or asset that is not critical to operations		No	Yes	N/A
				Environment – Species and habitats in the area of a collision	Moderate – Spilled fuel and/or chemicals from a collision event harm species or habitats in the area.		No	Yes	N/A
Aviation Collision	Aircraft collide with offshore infrastructure or vessels associated with the Proposed Development.	Construction Operation and Maintenance Decommissioning	**Volume 2, Chapter 15: Military and Civil Aviation**	Population and human health – Workforce for Proposed Development, aircrew	Serious - Multiple minor injuries or injuries resulting in medium health concerns. Potential Loss of Life.	C-OFF-02 C-OFF-05 C-OFF-20 C-OFF-26 C-OFF-29 C-OFF-30 C-OFF-43 C-OFF-46 C-OFF-51 C-OFF-52	No	Yes	N/A
				Material assets - Infrastructure and aircraft associated with the Proposed Development, third party aircraft	Moderate - Damage to infrastructure that is not critical to operations, loss of or damage to single aircraft		No	Yes	N/A

Risk Event	Source / Pathway	Relevant Project Phase (s)	Source Document / Chapter	Receptor (s)	Reasonable Worst Consequence if Event did Occur	Embedded Commitments to mitigate risk	Could this Reasonably Lead to a Major Accident and / or 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?
				Environment – Species and habitats in the area of a collision	Moderate – Spilled fuel and/or chemicals from a collision event harm species or habitats in the area.		No	Yes	N/A
Workplace Accidents	Workforce constructing, operating, or decommissioning the Proposed Development are injured	Construction Operation and Maintenance Decommissioning	**Volume 1, Chapter 3: Project Description**	Population and human health – Workforce for Proposed Development	Serious - Multiple minor injuries or injuries resulting in medium health concerns. Potential loss of life.	C-OFF-26 C-OFF-27	No	Yes	N/A
Subsea Cable snagging risk – Commercial Fisheries	Fishing vessels snagging on offshore export cables	Operation and Maintenance Decommissioning	**Volume 2, Chapter 13: Commercial Fisheries** **Volume 3, Appendix 14.1: Navigational Risk Assessment**	Population and human health – Fishing vessel crew	Serious – Multiple injuries and/or fatality.	C-OFF-04 C-OFF-13 C-OFF-14 C-OFF-15 C-OFF-16 C-OFF-17 C-OFF-25 C-OFF-26 C-OFF-28 C-OFF-32 C-OFF-39 C-OFF-50	No	Yes	N/A
				Material assets – Infrastructure associated with the Proposed Development, third-party vessels (fishing vessel)	Serious – Damage to cables resulting in fault that is crucial to operations. Severe damage to fishing equipment or vessel		No	Yes	N/A
Seabed anchoring cable snagging risk – Commercial Fisheries	Fishing vessels snagging on mooring lines	Operation and Maintenance Decommissioning	**Volume 2, Chapter 13: Commercial Fisheries** **Volume 3, Appendix 14.1: Navigational Risk Assessment**	Population and human health – Fishing vessel crew	Serious – Multiple injuries and/or fatality	C-OFF-13 C-OFF-14 C-OFF-15 C-OFF-16 C-OFF-17 C-OFF-20 C-OFF-25 C-OFF-28 C-OFF-29 C-OFF-30 C-OFF-46 C-OFF-51	No	Yes	N/A
				Material assets – Infrastructure associated with the Proposed Development, third-party vessels (fishing vessel)	Serious – Damage to mooring lines resulting in fault that is crucial to operations. Severe damage to fishing equipment or vessel		No	Yes	N/A
UXO	Accidental or improper detonation of a UXO	Construction	**Volume 1, Chapter 3: Project Description** Project Environmental Management Plan	Population and human health – Workforce for Proposed Development, mariners	Serious – Multiple serious injuries and/or fatality	C-OFF-10 C-OFF-41	No	Yes	N/A
				Material assets – Project infrastructure, vessels	Serious – Severe damage to		No	Yes	N/A

Risk Event	Source / Pathway	Relevant Project Phase (s)	Source Document / Chapter	Receptor (s)	Reasonable Worst Consequence if Event did Occur	Embedded Commitments to mitigate risk	Could this Reasonably Lead to a Major Accident and / or 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?
					infrastructure that is crucial to operations				
Floating WTG breaking free of mooring	Mooring failure leading to floating platform to drift creating navigational risk	Construction Operation and Maintenance	**Volume 1, Chapter 3: Project Description** **Volume 3, Appendix 14.1: Navigational Risk Assessment**	Population and human health – Workforce for Proposed Development, mariners	Serious – Multiple severe injuries and/or fatality	C-OFF-07 C-OFF-08 C-OFF-10 C-OFF-11 C-OFF-21 C-OFF-23 C-OFF-24 C-OFF-26 C-OFF-31 C-OFF-55	No	Yes	N/A
				Material assets – Infrastructure associated with the Proposed Development	Serious – Damage or loss of infrastructure that is crucial to operations		No	Yes	N/A
Floating WTG breaking free during transit and from site for installation, component repair / replacement	Weather or sea conditions unfavourable and create risk to the assets, vessels involved and project workforce	Construction Operation and Maintenance	**Volume 1, Chapter 3: Project Description** **Volume 3, Appendix 14.1: Navigational Risk Assessment**	Population and human health – Workforce for Proposed Development, mariners	Serious – Multiple severe injuries and/or fatality	C-OFF-07 C-OFF-08 C-OFF-10 C-OFF-11 C-OFF-21 C-OFF-23 C-OFF-24 C-OFF-26 C-OFF-31 C-OFF-49 C-OFF-55	No	Yes	N/A
				Material assets – Infrastructure and vessels associated with the Proposed Development	Serious – Damage or loss of infrastructure that is crucial to operations		No	Yes	N/A
Marine Pollution	Accidental spills of hazardous materials such as fuel.	Construction Operation and Maintenance Decommissioning	Project Environmental Management Plan Marine Pollution Contingency Plan	Environment – Species and habitats in the area of pollution	Moderate – Spilled fuel and/or chemicals harm species or habitats in the area.	C-OFF-10 C-OFF-52	No	Yes	N/A

20.8 Cumulative and Inter-Related Impact Assessment

20.8.1 Major accidents and disasters are by their nature extremely unlikely events, it is extremely unlikely therefore that two unrelated major accidents or disasters could occur in the same time period or affecting the same receptors. The identified risks, in relation to the Proposed Development, assessed in this chapter are all managed to an ALARP level following the application of mitigation. As the same legally binding Health, Safety, Environment and Quality regulations apply to all workplaces, this would limit the exposure of receptors to significant (intolerable) risk from other industrial processes.

20.8.2 Additionally, if receptors such as construction workers are significantly exposed to risk from the Proposed Development, then their exposure to risk from other sources will be extremely limited, (because workers can only be employed and actively working at a single location at any one time). Any exposure to risk from sources other than the Proposed Development is not considered likely to make their total risk exposure significant (intolerable) when considered cumulatively (assuming third parties comply with their legal obligations). Therefore, the total level of risk posed to any specific receptor is anticipated to be below the boundary of intolerability. As such, there is no anticipated potential for cumulative effects arising from major accidents and disasters.

20.8.3 There is a requirement to tow floating structures during the construction phase and potentially during the O&M phase for major component replacement purposes. In terms of the cumulative effects of towing structures, it is predicted that standard mitigation will be in place across all other offshore wind farms within the vicinity of the Proposed Development. As such, no likely significant cumulative effects have been identified.

20.8.4 On the basis of the above, no 'other developments' are scoped into the major accidents and disasters assessment of cumulative effects. In EIA terms, there are no likely significant cumulative effects identified in relation to major accidents and disasters.

20.9 Assessment Summary

20.9.1 To establish a baseline of likely receptors and potential sources of risks in relation to major accidents and disasters, Information was collected through a desktop review of the following Chapters (and the Offshore Scoping Report):

- Volume 1, Chapter 3: Project Description;
- Volume 1, Chapter 5: Site Selection and Alternatives;
- Volume 2, Chapter 13: Commercial Fisheries;
- Volume 2, Chapter 14: Shipping and Navigation;
- Volume 2, Chapter 15: Military and Civil Aviation;
- Volume 2, Chapter 17: Socioeconomics, Tourism and Recreation;
- Volume 2, Chapter 18: Climate;
- Volume 2, Chapter 19: Infrastructure and Other Marine Users;

- Volume 3, Appendix 4.1: Offshore Cumulative Effects;
- Volume 3, Appendix 13.1: Commercial Fisheries Technical Report;
- Volume 3, Appendix 14.1: Navigational Risk Assessment; and
- Volume 3, Appendix 15.1: Military and Civil Aviation Technical Report.

20.9.2 Table 20.9 details the assessment of the vulnerability of and potential for the Proposed Development to be impacted or cause major accidents and/or disasters. It was found that all reasonably predicted worst consequences will be managed to an acceptable level with existing control measures in place.

20.9.3 The identified risks relating to major accidents and disasters assessed in this chapter are all managed to an ALARP level following the application of mitigation. In EIA terms, there are no likely significant effects identified in relation to major accidents and disasters. No likely significant cumulative effects have been identified.

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